

REPORT
ON
INDUSTRIAL EDUCATION.

PART II.

PROCEEDINGS OF CONFERENCES.

INDEX.

BENGAL.

	Page
Proceedings of the Conference in Calcutta	1
Note on the State of Technical Education in Bengal, by Mr. J. S. Slater, Principal, Sibpur C. E. College	10
Table A of Industrial Schools	12
" B shewing present state of Bifurcation of Studies in District Schools	13
" C shewing Annual Cost of Industrial Schools	"
A List of the Principal Industries of Bengal, by Dr. G. Watt, C.I.E., Reporter on Economic Products	14
Replies to the questions of the Committee, by Mr. E. Pegler, Superintendent, Alipur Reformatory	"
Letter from Messrs. C. Lazarus & Co., Calcutta, on the subject of Guilds	15
The encouragement of Indigenous Industries in India, by Mr. E. B. Havell, Principal of the School of Art, Calcutta	16
Scheme of Industrial Instruction suggested by Mr. A. Pédler, F.R.S., C.I.E., Director of Public Instruction	20

NORTH-WESTERN PROVINCES AND OUDH.

Proceedings of the Conference in Allahabad	24
Table of Industrial Schools	30
Note on the Allahabad Government Press, by Mr. F. Laker, Superintendent	32
Proceedings of the Conference in Cawnpore	32
Discussion on the proposed European School in Cawnpore	36
Note on the Cawnpore Conference, by the President	37
" Pay of Experts, by the President	"
" Wages in Cawnpore, " "	"
Replies to the questions of the Committee, by Mr. P. H. Swinchatt, Head Master, Lucknow Industrial School	38
Memorandum on the Improvement of Industries, by Mr. Siva Prasad, Deputy Collector, Lucknow	39
Letters from S. C. S. L. Sath, Farukabad City	40
Letter from Mr. Burn to M. Lutf Hussain, and a reply to it	41
Memorandum on the Teaching of certain Trades at Muttra	"
Proposed new curriculum of studies for the Industrial School, Lucknow, by G. N. Chakrabarti, Inspector of Schools	42

PUNJAB.

Proceedings of the Conference in Lahore	44
Replies to the questions of the Committee, by Mr. Percy Brown, Principal, Mayo School of Art, Lahore	51
Replies to the questions of the Committee, by Chiranji Lall, B.A., Head Master, Railway Technical School, Lahore	59
Description of the Artisan Evening Classes of the Railway Technical School, Lahore	65
Replies to the questions of the Committee, by Lala Sukh Dial, B.A., Secretary to the V. D. J. H. Institute, Lahore	69

PUNJAB—*contd.*

	Page
Note on Industrial Schools, by Hansraj, B.A., Principal, D. A. V. College, Lahore	70
Note on Improvement of Local Industries, by Mr. W. A. Stein, Inspector of Schools	71
Note on some Trade Guilds at Lahore by Lala Buehi Ram Sabini, Honorary Secretary, Punjab Science Institute	72
Note on the Punjab Science Institute, Lahore, by the Honorary Secretary	"
Proceedings of a meeting of the Committee of Management of the Railway Technical School, Lahore, held on the 19th April 1895	3
Table of Industrial Schools	75

CENTRAL PROVINCES.

Proceedings of the Conference in Nagpur	76
Replies to the questions of the Committee, by Mr. F. G. Sly, I. S. C., Commissioner of Settlements and Agriculture	2
Letter from Mr. F. G. Sly, I. C. S., Commissioner of Settlements and Agriculture	84
Note on the Local Industries of the Central Provinces, by Mr. F. G. Sly, I. C. S., Commissioner of Settlements and Agriculture	85
Letter from Mr. A. M. Monro, Inspector-General of Education	91
Annexure A.—Principal Institutions where Industries are taught	92
„ B.—Syllabus of subjects taught	93
Replies to the questions of the Committee, by Mr. A. Monro, Director of Public Instruction	96
Note by Mr. Monro on the American Methodist Episcopal Mission School, Narsingpur	99
Table of Industrial Schools	100
Replies to the questions of the Committee, by Mr. Krishna Rao Phatak, Pleader, Nagpur	101
Replies to the questions of the Committee, by Revd. F. R. Felt, Methodist Episcopal Mission	103
Note on Industrial Schools, by Mr. P. M. Greany, Superintendent, Reformatory School, Jubbulpore	104

BOMBAY.

Proceedings of the Conference in Bombay	106
Joint Report by the Hon'ble Mr. E. Giles, Director of Public Instruction, Dr. A. W. Thomson, Professor of Engineering, College of Science, Poona, and Mr. C. Burns, Acting Principal, Sir J. W. School of Art, Bombay	113
Replies to the questions of the Committee, by the Hon'ble Mr. E. Giles, Director of Public Instruction	116
Table of Industrial or Technical Schools	120
Replies to the questions of the Committee, by :—	
Dr. W. Thomson, Professor of Engineering, College of Science, Poona	121
Mr. Cecil L. Burns, Principal of the School of Art, Bombay	124
Mr. J. Wallace, C. E.	129
Mr. H. W. Fry, Industrial Aids Society, Ahmednagar	130
Mr. Veerchund Despchand	132
Messrs. Vasudev K. Kirloekar and Mahadev R. Bodas, Honorary Secretaries, Provisional Committee, Sholapur Industrial School and Orphanage	136
Mr. B. A. Gupte, Honorary Member, Bombay Art Society, Bombay	138
Note on Industrial Education, by Mr. B. A. Gupte	145
Note on Industries, by Mr. D. Pudumjee	146
Appendix to Mr. Pudumjee's Note	149

MADRAS.

	Page
Proceedings of the Conference in Madras	151
Replies to the questions of the Committee, by Mr. A. Chatterton, Inspector of Technical Schools, Madras	155
A brief history of the Madras School of Arts	171
Note on the system of training Apprentices, by M. R. M. Velayuda, Asari	174
Replies to the questions of the Committee, by J. P. Lewis, Esq., Deputy Superintendent, Reformatory School, Chingleput	177

BURMA.

Proceedings of the Conference in Rangoon	180
Scheme of Industrial Education, by the Director of Public Instruction	185
Memorandum on Technical Education in Burma, by the Director of Public Instruction	186
Replies to the Committee's questions, by Mr. H. L. Tilly, Chief Collector of Customs	188

BENGAL.

Proceedings of the Industrial Education Conference held in the Office of the Director of Public Instruction, Bengal, on the 14th December 1901.

Present :

LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C., *President.*

THE HON'BLE MR. F. H. SLACKE, I.C.S., *Secretary to the Government of Bengal.*

MR. A. PEDLER, F.B.S., C.I.E., *Director of Public Instruction.*

DR. G. WATT, C.I.E., *Reporter on Economic Products to the Government of India.*

MR. W. R. STEEL, *of Messrs. Burn & Co.*

„ J. S. SLATER, *Principal, Sibpur Civil Engineering College.*

„ E. B. HAVELL, *Principal, Calcutta School of Art.*

„ C. A. RADICE, I.C.S.

„ R. E. ENTHOVEN, I.C.S.

REV. FOSS WESTCOTT, M.A.

} *Members of the Committee.*

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

Q. (1) Please give a complete list of Industrial Schools, Government and private, in the Province, with date of foundation, industries taught, average attendance, and output of artisans annually.

A. MR. PEDLER said that a list of the Industrial Schools was given in the Annual Reports. The last Annual Report he sent in was a condensed one, which had been prepared by the Government of India's orders, and it did not give the names of the special Industrial Schools so fully as in the previous reports, but the following was a list of Industrial Schools, leaving out the School of Art :—

The Government Industrial School of Ranchi.
The Burdwan Technical School.
The Rungpur Technical School.
The Pubna Technical School.
The Barisal Technical School.
The Commillah Technical School.

All these are Government Schools or District Board Schools, as the case may be, and all these schools teach mainly a certain amount of theoretical work, practical work being generally confined to wood-work and iron-work ; a little tin-work is sometimes done.

In addition, there is at Rampur-Boalia a Sericulture School, which is supported by the District Board. There are also a certain number of aided Industrial Schools, of which a list can be supplied, but they are usually small ; so that, practically speaking, there are 7 Industrial Schools supported from public funds, 16 smaller Industrial Schools which are aided annually with grants-in-aid, and 2 unaided Industrial Schools. Of the higher classes, there are the Sibpur College, the Behar School of Engineering, which may possibly be raised to a second-grade industrial or engineering college, and there is another at Dacca, at present only working up to a low standard, but which will probably in the next year or two work up to a higher standard like the Behar School. It will be seen, therefore, that the main work which has hitherto been done on the technical and industrial side is either for engineering, pure and simple, or for the encouragement of the wood-work and blacksmith's industry, the only outside subjects that have been taken up at all in earnest. A small school was started in Rampur-Boalia, but so far only the fringe of industrial and technical education in Bengal has been touched. A list* can be furnished in a few days, giving particulars of the number of Government and private Industrial Schools, with dates of foundation, industries taught, average attendance, and output of artisans annually.

* See page 12.

MR. SLATER did not think that they could answer definitely the question relating to the annual output of artisans, as the real artisans were the sons of workmen who came to the school, stayed there for two or three months, and then went out to the district on salaries of about ₹10 per month. On being told by the President that the word "artisan" might be taken to mean all classes of men trained in Industrial Schools, not including high class Technical Colleges, or in other words, the *output* of the school, Mr. Slater undertook to supply as far as he could the number of artisans that were annually trained out by the schools.

THE HON'BLE MR. SLACKE thought that there would be no difficulty in finding out all the schools that were technical schools actually working in the Province.

THE PRESIDENT asked that the information noted in A(a)(1) might be supplied in a tabular form as early as possible.

Q. (2) Was there any special reason for the selection of the present location?

A. THE HON'BLE MR. SLACKE stated that generally speaking the reasons were as follows:—

- (i) Action of interested leading local inhabitants;
- (ii) Special interest taken by local authorities;
- (iii) Demand for special trained labour.

DR. WATT said that years ago he had been asked to establish an Industrial School in Behar, and he did so, selecting Carpentry and Ironwork, no other subject occurring to him.

MR. PEDLER added that this was the origin of the Behar School of Engineering.

Q. (3) How is each school or group of schools governed?

A. MR. PEDLER said that District Board Schools were managed by Committees or Boards, and they were always under the inspection of the Inspector of Schools. In the case of Aided Schools, the general principle was that any school that received aid from a public source was under the inspection of the Inspector of Schools who had no technical knowledge whatever. A few years ago the Government directed Mr. Slater to make a proper inspection of schools, and he had practically done this for the last three years. Private unaided schools were governed by themselves and were not under Government inspection.

Q. (4) Are the schools self-supporting; if not, what is the average annual net cost?

THE PRESIDENT requested that the information required might be supplied with that for A(a)(1).

Q. (5) Why were the particular trades selected which are taught in the schools?

A. MR. PEDLER said that a great majority of the schools were teaching blacksmith's work and carpentry; this, he thought, was a great improvement as it enabled a certain number of pupils, after having acquired some knowledge in these two trades, to come up to Sibpur and continue their courses up to the Overseer Standard.

MR. SLATER added that these pupils passed the Second Year Examination and were awarded a Sub-Overseer's certificate.

DR. WATT said that in Rampur-Boalia the Silk industry was started in consequence of the natural demand, it having been an industry there for a long period; he also thought that there was a great demand for improved carpentry work in Bengal even now.

Q. (6) How are Superintendents selected; and what are their qualifications, duties, and pay?

The reply to this question is contained in Appendix III, Part I of the Report.

MR. PEDLER said that a Carpenter or Blacksmith as an Instructor drew about three times as much pay as a "B.A." could often earn.

Q. (7) How are the Superintendents and Instructors trained? Is there any regular training school or other source or supply?

A. MR. SLATER said that local men were found and their qualifications tested at Sibpur and if satisfactory they were appointed. There was no regular training school.

DR. WATT stated that the Superintendent of the Sericulture School at Rampur-Boalia was taught by an Indian expert who had studied in Europe.

Q. (8) How are students selected, from what classes of the population? Are there any tests applied? Have you attracted the classes aimed at?

A. MR. SLATER said that they had tests, but they could not always be applied. There is no educational test.

MR. PEDLER thought that as regards artisans, they had not attracted the proper classes. In the higher technical classes the applicants were mainly those who had failed in literary examinations.

Q. (9) What are the rules regarding age, fees, scholarships, period of training, test of final qualifications, character, and discipline?

Part of this information will be found on page 12.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

A. This information cannot be supplied as registers have not been kept up.

Q. (11) How are materials and tools provided? What is done with the work turned out?

A. MR. PEDLER said that materials and tools are provided from District Board Funds or the Government Funds, as the case might be; they were provided by the funds at the disposal of the schools.

The work is sold locally.

MR. SLATER said that the rates secured for work depended in some measure on what the purchaser was prepared to pay.

Q. (12) Are there any special methods of instruction employed; if so, have any of these shown marked promising results?

A. MR. SLATER said that the general system was that students went through a regulated course of instruction under a teacher. He could not say definitely as to whether this had shewn any marked promising results.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

A. MR. SLATER said that artisan training only was specialized. English methods generally were used.

Q. (14) What general education is given in addition to regular industrial training? (N. B.—Drawing is industrial.) What is the test of the quality of the work turned out?

A. MR. SLATER stated that there was no regular general education given at present in addition to the industrial training in the Industrial Schools.

The test of the quality of the work turned out was its selling value.

Q. (15) Has any attempt been made to improve the quality of work in particular industries or the tools or machines? If so, please specify industries, and the improvements made.

A. MR. PEDLER stated that attempts had been made to improve the quality of work done at Rampur-Boalia in Sericulture.

THE HON'BLE MR. SLACKE stated that efforts were being made to spread abroad a knowledge of the use of the fly-shuttle applied to the common hand loom at Serampore, trained men being deputed to different districts, and that the Government had made arrangements to record the progress in this direction for the next five years. Three of the best Serampore weavers were retained on Rs. 20 a month each; fifteen District Boards had each sent to Serampore two weavers to be taught by them for one month, and a carpenter to learn how to make the lay and fly-shuttle; while under instruction they each received Rs. 10 a month. They then returned to their Districts provided with a Serampore pattern loom to spread the knowledge they had acquired. District Officers had been asked to sketch out a programme for the diffusion of this knowledge, and to report annually for the next five years on the success of the scheme.

Q. (16) Do you consider the present system the best, or can you suggest improvements?

A. MR. SLATER did not think that the present system was the best, but he could not suggest anything better.

2.—Native system of Apprenticeship.

Q. (1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

DR. WATT stated that there was no known special Native system of keeping up the supply of artisans in Bengal, but that the subject seemed to deserve some enquiry.

Q. (2) Is one system or method common to all trades, or are there several different systems or methods?

A. No information is available on this point.

Q. (3) Are there any special objections to or advantages in the Native systems? Please specify.

A. MR. STEEL said the absence of indentures militated against apprentices of Native artisans ever receiving a complete training. Moreover in Calcutta the wages of unskilled labour were so high that workers were diverted from trades requiring skill.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. MR. HAVELL said that the chief man of the caste was usually the best workman, and that he found out good men by local enquiry.

On being questioned about Trades Guilds, no information was forthcoming.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. MR. PEDLER said that the Native system of apprenticeship was superior in Bengal; but it was bad in that it was not carried far enough.

DR. WATT thought that it would not be judicious to attempt to interfere with the Native system of apprenticeship by experts from home, because the expert would be without proper control, and suggested the extension of industrial research.

MR. HAVELL considered with regard to Art matters and industries, that expert advice might be used judiciously, if the right man under proper control could be got out.

Q. (6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education?

A. There is no information available as to whether fees are paid by Native apprentices or not; they, however, receive remuneration for the work as soon as they become efficient.

DR. WATT stated that with the Natives it was the custom to put toy tools in the hands of children when very young, and this was all the preliminary education that they received in the particular trade which they eventually adopted.

Q. (7) Will the craftsmen take in apprentices of all classes or only of their own class?

Nothing was known on this point.

Q. (8) Have famine sufferers been taught trades by Native agency which they would not ordinarily follow? Was such Native agency readily procurable, and on what terms?

(This question does not apply to Bengal.)

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

A. It was considered by the members that these objects could be attained:—

- (a) Generally by suitable exhibitions of good types of work, and the offer of rewards for good work;
- (b) The payment of fees to the Head Craftsmen for pupils;
- (c) Expert advice and good models and drawings supplied to craftsmen training pupils or apprentices.

DR. WATT drew attention to the Technical Art Series.

Q. (10) Are there trade guilds in the Province, and, if so, in what trades, and where?

A. MR. PEDLER AND DR. WATT were certain that there were trade guilds in the Province, but nothing definite was known regarding this point. The Caste System was a trade guild, but this was disappearing under the influence of education.

MR. STEEL thought there was a special guild among moulders.

Q. (11) Where they exist, can they be utilized for the improvement and expansion of industries?

DR. WATT kindly undertook to sift out this point of guilds in Bengal.

3.—Principal Industries of the Province.

Q. (1) Please state the principal industries of the Province.

A. DR. WATT kindly consented to supply a list * of these industries.

Q. (2) Which of the above would you recommend being specially supported or encouraged?

A. THE HON'BLE MR SLACKE recommended Weaving.

MR. HAVELL recommended Metal Work (silver, copper, and brass).

MR. SLATER thought that there was a fair field for the introduction of acetylene.

DR. WATT recommended the iron and steel industry, and saltpetre.

MR. PEDLER suggested the Glass Industry and Tanning, but with regard to the latter he thought that there was danger of it being cut out altogether by the Electric System of Tanning.

THE HON'BLE MR. SLACKE recommended, in regard to the Glass Industry, that the Government might secure the services of Mr. J. Wagle (a Brahmin) who was now at home studying the matter, and get him to investigate this industry and report upon the prospects of introducing it into India, giving him a fixed salary, etc., for his services. His whereabouts could be ascertained by inquiry from Sir Charles Stevens, 32, Hertford Gardens, London, S. W.

DR. WATT further recommended the manufacture of matches, but said that the selection of the wood and the manufacture of the material required careful investigation.

DR. WATT further recommended the matting, basket work, and braiding industries, some of which he thought would be better worked by machinery than in the manner they are now worked by hand. He further said that some inquiry might be made into the rates of railway and steamer freights for raw produce to be used in this country, as the restrictions and the cost of these frequently greatly hamper local industries. He thought, too, that Cutlery and Locksmith's work required encouragement and improvement.

MR. HAVELL recommended Pottery and Terra-cotta Work.

Q. (3) Can you give any reasons why support or encouragement is specially required, and what direction should the support or encouragement take?

A. DR. WATT stated that the oil industry of Bengal required attention in order that the proper seed might be supplied for the extraction of oil. He also thought that the manufacture of *Surki* for building purposes in Calcutta was a very large and interesting industry which required investigation.

MR. STEEL was of the opinion that Government should make an effort to improve the industries of the country with the view to enabling them to expand as much as possible, and this, he thought, would certainly be brought about by the placing of Government orders in the country, which undoubtedly would have the strongest influence on the improvement of industries. In cases where such stores were not at present manufactured in the country, the placing of the order for them by Government would lead to their manufacture.

DR. WATT and MR. PEDLER confirmed Mr. Steel's views and said that all Government stores, where possible, should be purchased in India.

DR. WATT suggested also encouragement by research.

THE HON'BLE MR. SLACKE added—by training schools and expert advice.

MR. STEEL was further of opinion that Government should look more carefully into the question of rates and freight and their influence on industry in the country.

MR. SLATER suggested periodical exhibitions of Indian manufactured articles, machinery, etc., to be held on a definite forward date; combined with special rewards for excellence of work.

It was suggested by all the Members that an efficient registration of designs and trade-marks might be useful in advancing industries.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

Q. (1) Do you approve of the existing methods of schools, or would you propose any other methods of training in the existing schools?

A. MR. SLATER thought that the Casanova method was better than the present method, if it could be put in force, because the Expert's interest is to make all the boys he is training at home experts like himself.

MR. PEDLER did not think that any one would support the present method of training.

Q. (2) If you do not approve of the school system, how do you propose to provide a training for artisans in the future?

A. MR. SLATER said that if it could be put in force he would like the Neapolitan system, and in places where this system could not be put in force he would have a definite apprenticeship system. He kindly promised to give a memorandum of the system he would adopt where the Neapolitan system was not possible.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. It was unanimously recommended that a system of Industrial Scholarships was required for specially promising students.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of works?

A. MR. SLATER said that the proper system in his opinion was, day in the workshop, combined with night school attendance two or three times a week at certain centres.

MR. STEEL said practical work by day and the opportunity of improving this at night. He also considered that the attendance at the night school should be voluntary, combined with a small fee.

MR. SLATER further recommended that Foremen or Assistant Managers of works should have such a course of training in both theoretical and practical work simultaneously as was done at the Sibpur College, but that the method of training should be systematized—an improvement he had not so far been able to introduce.

Q. (5) Do you think their training can be completed in a College or School?

A. MR. SLATER and MR. STEEL were both of opinion that the training of Foremen and Assistant Managers could not be completed in a College or School.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

A. MR. STEEL said that this was the only possible way of finishing a man's training.

MR. PEDLER and MR. SLATER both agreed with Mr. Steel.

MR. STEEL did not think that a fee should be paid to a shop, but that a man's previous training should be recognised as a set-off for a certain number of years of apprenticeship which he otherwise would have gone through. He suggested that in the case of European apprenticeships would be desirable.

MR. PEDLER and MR. SLATER thought that scholarships might also be given to the Native as he had very often to incur debt to complete his education; scholarships would assist him to a great extent.

MR. STEEL added that as regards scholarships the apprentice from the college would join as if he had completed a certain number, say four, years of his apprenticeship, and his work should be valued at what it was worth; under these circumstances if the amount he earned was sufficient to support him no scholarship would be required, but if it was not, assistance should be given.

DR. WATT was of opinion that Native traders would not take in an apprentice without a fee; therefore, fees should be paid in such cases.

Q. (7) As regards the methods employed in private schools, what measures are you prepared to take for ensuring that they are conducted in conformity with Government Industrial Institutions? Would you give—

- (i) An annual grant?
- (ii) A grant to cover initial expenses?
- (iii) Free expert advice?

accompanied with conditions?

A. MR. PEDLER recommended all the above three measures, but accompanied with conditions.

2.—Proposed alterations and additions in schools and of the want of new schools.

Q. (1) Can you suggest any improvements to existing schools apart from changes in the methods of teaching or training?

A. MR. SLATER stated that the improvements that he suggested would be found in his "inspection notes." He would also give a special note on the improvements required if funds were forthcoming.*

Q. (2) Would you approve of the institution of new schools or a new school in the Province now or in the near future, and if so—

- (i) In what locality, and are premises available?
- (ii) For what trades?
- (iii) Under what system and method?
- (iv) How would you finance it? Are there any special funds available?

A. Mr. PEDLER suggested the inauguration of an Industrial Central School, and then specialized schools in the districts.*

THE HON'BLE MR. SLACKE suggested a Weaving School in Serampore of a temporary nature, so that it could be moved to other places. He would utilize the trained men of Serampore to train other men in other schools. He did not know of any premises that were available for the Serampore School.

He recommended weaving as the special trade at the present moment.

As to what system or method he would adopt, he preferred, he said, a system of training in which specially trained men would be utilised to instruct others. It should be financed by Government, but there were not, he thought, any special funds available. It would not do to start the Weaving School at once, at least not until proper arrangements were made to obtain the proper instruction and expert advice.

DR. WATT proposed that all schools should be affiliated to a Central School of Research, which could be provided by adding to the present Economic Museum at Calcutta.

He also proposed the institution of schools in the following districts which he thought might advantageously handle the undermentioned industries, viz. :—

Calcutta : Metal-work, Basket-work, and Weaving ;

Dacca : Textiles, Ivory, and Silver-work ;

Palna : Glass, Weaving, and Pottery ;

Cuttack : Mats and Canes, Silver-work, and Weaving.

Q. (3) Do you approve of night schools for the voluntary improvement, in theory, of artisans and industrial students who are willing to attend and pay a small fee. Are the local conditions likely to lead to success ?

A. MR. PEDLER approved of night schools, but thought that there were many difficulties in working them ; however, he considered that they should be tried.

THE HON'BLE MR. SLACKE also approved of night schools, but thought that there were only a very few who would be able to take advantage of them.

MR. STEEL approved also of this system and said that he thought in some cases employers would even go so far as to let men out a little earlier or at a convenient hour, to attend them, without loss of earnings.

Q. (4) Should such night schools be under the General Education Department or the Industrial School Management ?

A. MR. PEDLER and MR. STEEL thought that these night schools should be under the General Education Department, but that suitable teachers must be chosen with power of adapting their teaching to the occupations of their pupils.

Q. (5) Are you in favour of the establishment of Training Schools for Superintendents and Instructors, and do you propose to take steps in this direction at once ?

A. The unanimous opinion was that the Technical Schools such as those proposed by the Honourable Mr. Slacke for Serampore would really be training schools for teachers of trades.

Q. (6) Can the necessary instructors be provided in existing institutions ?

(This question is answered by 5.)

3.—How the Neapolitan Scheme would apply. †

Q. (1) Do you approve of the method of the Naples scheme generally ?

(This question has already been answered.)

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a superintendent ?

A. THE HON'BLE MR. SLACKE thought they would.

DR. WATT said that in Mysore they would not come in.

MR. SLATER stated that at the Alipore Reformatory School, when it was known that the Neapolitan Scheme might be introduced, two or three applications were received from employers for permission to work in the school.

MR. PEDLER thought that the Neapolitan Scheme could be worked, but with difficulty.

Q. (3) Should such schools be in an enclosed private area or open freely to the public ?

The members were unanimous in the opinion that the schools should be opened freely to the public.

Q. (4) What special inducements should be offered to craftsmen to co-operate ?

MR. SLATER said that they should be given free quarters, the use of all the students without payment to begin with, and the privilege of selling their own wares at the school or at their homes.

DR. WATT proposed that they be allowed to exhibit their manufactures at museums, and he also thought, with the Honourable Mr. Slacke, that it would be necessary to pay these craftsmen at first, as was done in Serampore.

MR. SLATER, however, did not quite think that the Neapolitan System would be likely to work favourably in schools, except in special cases, if the workmen were taken away from their homes.

Q. (5) How would you suggest dealing with the following detail points :—

(i) Supply of materials ;

* MR. PEDLER subsequently sent a scheme of Industrial Instruction. See page 21.

† Vide Appendix III of SIR EDWARD BUCK'S Report on Practical and Technical Education, 1901, Government of India Press.

- (ii) Wastes of materials ;
- (iii) Sale of work ;
- (iv) Exhibitions of work ;
- (v) Support of impecunious apprentices while unable to do remunerative work ;
- (vi) Division of profits (when apprentice becomes more or less expert, between the school, the craftsman and the apprentice ;
- (vii) Holidays including Sundays ;
- (viii) Discipline of apprentices ;
- (ix) Fees ?

- A.—(i) The general opinion was that no assistance should be given for the supply of materials beyond the necessary credit ;
- (ii) MR. STEEL thought that a record should be kept of the prices received and articles turned out, so that some materials might be to hand for showing how much compensation for loss should be paid.
- (iii) & (iv) This has already been referred to.
- (v) The general opinion was that they would have to be supported but that great care should be shown.
- (vi) See Mr. Steel's reply to (ii).
- (vii) The general opinion was that this should be left to the craftsman.
- (viii) Ditto ditto ditto.
- (ix) The general opinion was that fees should certainly be paid by students when circumstances allowed of this being enforced.
- Q. (6) Would you attempt to improve the craftsman's practice of work, and how ?
(This has already been dealt with.)

4.—Would you accept Experts from abroad in each Industry.

Q. (1) Generally speaking, would it be best to have a general working expert, i.e., a general hand for each school ; or a specialised working expert for several schools ? Is it possible to obtain a sound general expert, and if so, in what trades ?

A. DR. WATT considered that there was no such thing as a "general hand," and approved of experts being specialised.

Q. (2) If you approve of specialised working experts, should they be Provincial or Imperial ?

A. DR. WATT thought that there might be a difficulty in language in regard to Imperial experts.

THE HON'BLE MR. SLACKS, however, thought that there would be no difficulty in regard to having Imperial experts as they were at present working very satisfactorily ; for instance, the Factory Inspector, the Mining Inspector, etc.

Q. (3) What would be the average annual cost of such an expert ?

A. MR. STEEL said that the monthly cost would be from about R300 to R700 according to the class of expert.

Q. (4) For what trades at present do you consider specialised working experts are required in this Province ?

A. The general opinion was that one trade in particular required a specialised working expert, viz., Weaving.

THE HON'BLE MR. SLACKS added that the present Inspector of Factories for the purposes of the Cotton Duties Act had no technical knowledge of weaving.

Q. (5) Can you define the status and qualifications required in these experts ?

(There was no answer.)

Q. (6) How should the expert proceed to improve manipulation and practice ?

A. DR. WATT and THE HON'BLE MR. SLACKS considered that the expert would have to study the industry very carefully first, and only introduce alterations very cautiously and by suggestion.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (1) Apart from the Superintendent in direct charge of the school, what system of Local control do you think the best—

(i) For Rural schools ?

(ii) For Urban schools ?

A. (i) For Rural schools—THE HON'BLE MR. SLACKS thought that the Chairman of the District Board would be the best suited.

(ii) For Urban schools—whoever pays for the school, plus the Principal of the Sibpur College, through the Director of Public Instruction.

Q. (2) What should be the functions of the Local control in each case ?

(There was no answer.)

Q. (3) The Local systems of control must, it is presumed, be focussed for the Province by some technical officer who will be generally responsible for executive administration and management. Who should this be ?

(This has already been replied to in (1).)

Q. (4) Would it not be best to relieve the Educational Department of the extra burden

that Industrial Schools must constitute owing to this Department not having, as a general rule, any special technical qualifications?

A. MR. PEDLER suggested that a special staff of Technical Inspectors be appointed under the Director of Public Instruction.

Q. (5) Is direct and special Imperial control of Industrial Education necessary for its efficient development?

A. MR. PEDLER thought that Industrial Education had not yet developed to such an extent as to require an Imperial Officer, but that if it were necessary to have an Imperial Officer his functions should be of an advisory nature.

THE HON'BLE MR. SLACKE was of opinion that Imperial control must come.

DR. WATT thought that it would be absolutely necessary to have Imperial control at the beginning, leading subsequently to decentralization.

MR. SLATER considered Imperial control was very necessary even at the present moment.

MR. HAVELL would have direct Imperial control.

DR. WATT amended his proposal to Advisory Imperial Control.

6.—Exhibitions and sales, whether required.

Q. (1) Are exhibitions of any real value—

- (i) Local?
- (ii) Provincial?
- (iii) Imperial?

A. It was unanimously agreed that exhibitions were of real value, especially at *melas*.

Q. (2) Can you suggest any conditions which would make exhibitions of value to the Industrial progress of India?

A. DR. WATT suggested that money rewards should be given in this connection for good work, and not certificates or medals; and, secondly, that the better classes of articles might be purchased as samples.

MR. HAVELL suggested that these exhibitions should be under expert control.

Q. (3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus, it may be

- (i) scrapped;
- (ii) made to order only, private or by regular agent;
- (iii) sold through agents as produced;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan system;
- (v) sold in a regular school sale-room.

Should prices be marked or fixed at all?

A. MR. SLATER thought that (iv) and (v) would be the best methods.

DR. WATT would give preference to wholesale dealers (so as to try and checkmate the workmen from interfering with private enterprise), when it was possible to get wholesale dealers to buy the products of the schools.

He also thought that prices should be frequently revised and kept up to date so that out-of-date marked figures might not be misleading.

Q. (4) Regarding industries generally in India, are you aware of any financial conditions which affect—

- (i) Production,
- (ii) Price,
- (iii) Returns to Workmen;

which could be removed by the reasonable action of Government?

A. THE HON'BLE MR. SLACKE thought that freight and railway charges, generally, affected the above; and was of opinion, with DR. WATT, that Industrial Banks, if opened, would be very useful.

Q. (5) Can you say whether, generally speaking, the workman gets the best wage or profit return from—

- (i) Expensive fine work?
- (ii) Cheap common work?

A. MR. HAVELL thought from fine work.

MR. SLATER was of opinion that in towns the workman earned much more on his Fine work, and in rural districts on his Coarse work.

(c) HOW ARE FUNDS TO BE PROVIDED.

Q. (1) Could the Provincial Funds provide the cost of starting the necessary schools? If not, how should the cost be divided between the Local Government and the Government of India?

A. THE HON'BLE MR. SLACKE stated that, as far as he could judge, the Provincial Government would make provision if the Provincial Contract was revised to that end.

Q. (2) Do you propose to find funds for the schools until they are self-supporting and, in addition, for the setting up in trade of pupils taught at the schools? How would you recover such advances if made, and in what period?

A. THE HON'BLE MR. SLACKE recommended the application of a system of "taccavi" advances.

Q. (3) Would you support the present position of workers in hand industries by a system of advances on the method of State loans to agriculturists, either—

- (i) for the purchase of improved implements?
- (ii) to free them from the exactions of the middleman?

A. THE HON'BLE MR. SLACKE recommended that schools should keep a register showing the names and addresses of the most expert pupils for the purposes of trade.

B.—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

Q. (1) Name the industries to be introduced.

(In replying to this question it may be assumed that no industry can be at once introduced,—

- (i) which requires preliminary research as to methods and practice;
- (ii) which does not necessitate the remunerative employment of a large number of workers;
- (iii) which can be better exploited in a mill or by private agency;
- (iv) which does not supply some requirement of India;
- (v) which cannot in the future be transferred for commercial working to private agency.)

A. MR. STEEL suggested the railway carriage and waggon building industry, and said that this industry could be started if Government would undertake to supply themselves from the local market if the articles were up to the standard. He added that a definite guarantee as to quantity would not be required.

Q. (2) Has your experience with Jail industries suggested any such?

A. No.

Q. (3) What goods made in Jails are not made elsewhere in the province? Do they find a ready sale at prices which would pay a free man?

A. None known.

Q. (4) Have you any scheme for starting these new industries by securing that discharged prisoners should work on at their trade after they leave the Jail?

A. No scheme.

(b) WHAT ARTISANS ARE REQUIRED.

Q. (1) Are there any lines of work requiring trained artisans of which the supply is now limited or badly trained?

A. MR. STEEL said that any number of trained mechanics were required, such as Rivetters, Fitters, Blacksmiths, Carpenters, etc. Burn & Co. employed about 5,000 men and they have no reserve to fall back on.

NOTE ON THE STATE OF TECHNICAL EDUCATION IN BENGAL,

WITH PROPOSALS REGARDING ITS EXTENSION AND DEVELOPMENT, BY MR. J. S. SLATER,
PRINCIPAL, SIBPUR CIVIL ENGINEERING COLLEGE.

1. There are two grades of Industrial Schools in Bengal, excluding Colleges, Schools of Engineering, Survey Schools, and Art Schools. In one grade, namely, those started by District Boards, the pupils are trained as sub-overseers, amins, and artisans. In the other as artisans. The only school wholly devoted to training artisans, supported by Government, is the school at Ranchi; the other purely artisan schools are either under private management, or are aided by District Boards and Municipalities.

2. Table A is added at the end of this note giving as much information as is at present available. It is not absolutely reliable, as the figures vary month by month, and in some cases the returns are not to be traced in Government records. It is impossible to embody in this table the number of artisans who are being trained in private manufacturing firms, where the sons of workmen are allowed to enter the workshops, and work with their relatives. In the first place it would take a very long time to get this information, and secondly, the figures would not be reliable, owing to the constant variation in these records. The figures this enquiry would supply are sure to be considerably in excess of the returns now submitted, as without this valuable educational assistance on the part of private firms, the rapid progress in the work done by mills and engineering firms could never have been made.

3. From an examination of Table A, it will be seen that as far as District Board schools are concerned, the most popular class is that which leads up to employment under the Public Works Department as Lower Subordinates. These schools are affiliated to the Sibpur College, and students who pass the 2nd-year examination of the Apprentice Department of the Sibpur College are eligible either for a Sub-overseer's certificate, or for admission to the 3rd year class of the Apprentice Department for training up to the grade of Upper Subordinate and Foreman Mechanic. The popularity of this class is assured, as is shown by the yearly increase in the number presenting themselves for examination at Sibpur, and the boys so trained are, owing to the instruction they receive in surveying, eligible for Aminships. The consequence is that the amin classes are being gradually closed, as a sufficient supply of men is available from this source. The closing of these classes for training amins is to be desired, and in a few years these classes will probably disappear altogether.

4. The artisan class is the one that is really most required. The figures in Table A show only 664 artisans in all classes of schools where returns are sent in, including Art schools; this is a small number compared with the size of the Province. The chief difficulty in connection with this class is to induce boys to join. By offering scholarships District Boards do manage to get a few, but a good many are the sons of Babus who merely join for the sake of the scholarship, and have no intention of following the trade they learn in after-life. Some sons of workmen are induced to join, but they will not stay long enough to become really good workmen, and so help to raise the standard of bazar work, which is what is required. This difficulty will continue until a real demand exists for better finished articles. Natives will buy very crude work, and Europeans in India put up too often with badly finished bazar-made work. As long as inferior articles have a market, it is hopeless to expect artisans to stay long enough to become really proficient. Special inducements are now being held out to artisans in Government and District Board schools to stay longer and become better workmen, but the scheme has not been in force long enough to judge whether it is likely to succeed.

5. Table A does not include the great work of training artisans which is going on in private manufacturing concerns. Enquiries show that all manufacturing firms admit artisans; and artisans are also trained by natives under a slack apprentice system; but it is impossible to get any reliable figures in this connection. Large employers of skilled labour state that they experience the same difficulty regarding the thorough training of these artisans, who seek employment before they acquire the requisite skill at their trade. The demand for the services of artisans is so great that firms have to employ raw hands, who gradually acquire a little extra skill after their employment, and this at the expense of the employer, who has to entertain a large number of supervisors to see that mistakes are not made. The result of employing inferior workmen is that the Bengal artisan is not improving. A direct confirmation of this is to be found in the large number of Chinese carpenters who are employed in Bengal on wages double of those given to local carpenters. This may in some measure be accounted for by the extra work a Chinaman can do, but most probably it is largely due to the high standard of work these foreign carpenters can produce, and that without supervision.

6. A scheme has recently been sanctioned by the Bengal Government for opening technical classes in zilla schools and the available information is given in Table B. The object of this scheme is to enable the sons of the higher classes of natives to see the advantages that are to be gained by thoroughly learning a handicraft, and to break down, if possible, the present aversion to manual labour. The object is not to train these boys to earn their living in after-life by working with their own hands, but to give them sufficient skill and knowledge in the most useful handicrafts, so that they might invest their capital and manage one or other of the industrial enterprises. These classes are so taught as to enable students to leave school, and enter a Technical College, like Sibpur, in one of the higher classes. Each school should, in addition to the above training of students, have an artisan class. If the classes now formed

are successful, proposals for the extension of the scheme to all zilla schools will be submitted. The B class is fairly successful; but the C class does not seem to thrive. Another year or two must elapse before any definite opinion can be formed of the ultimate success of the scheme.

7. Table C gives the cost of maintaining the various technical and industrial schools mentioned in Table A.

8. In order to advance technical education in Bengal, and provide intelligent organizers and supervisors of industries, without whose active co-operation the industrial development of the country cannot advance, the present system of technical education requires consolidation on some such lines as the following :—

- (i) Special training should be given to all persons appointed as superintendents of existing technical schools, in order that the instruction in these schools should be such as to turn out really high class finished work.
- (ii) The present technical schools should be gradually developed, and all these schools should by degrees have modern machinery and appliances for the execution of good work. If the knowledge of the value of machinery is ever to be introduced into the country, the advantages of its use must be brought home to the people in their own districts.
- (iii) The scheme of technical education should be gradually extended to all zilla schools, with artisan classes attached.

9. As regards the improvement of local industries, this should be done by appointing European and American experts in the various industries it is intended to foster. These experts might be appointed as Inspectors of Local Industries. Their duty should be to study existing industries, and by degrees introduce such improvements in manufacture as will be within the means of the Indian workman to adopt. It will be very necessary to select these men carefully, and they should be employed for a definite period.

Those who show by their recommendations and suggestions that existing industries can be advanced for the benefit of native workmen might be retained and given a wider field to work in, whereas those who fail to introduce any economic improvement would cease to be employed at the end of their term of agreement.

10. To control this work it would be desirable to keep it under the Education Department. The Principal of the Central Technical College might be *ex-officio* Director of Technical and Industrial Schools. The experts should be under his immediate orders, and experiments might be made in the improvement of existing methods of work by these experts at the Central College, and at any suitable place where technical schools are established. This might be done by getting men pursuing various industries, which are likely to be remunerative, to carry on their work at the College, or in any other suitable place, and giving them a salary, or some other inducement to work under supervision. Their methods of manufacture should be carefully supervised, and improved methods suggested by the expert. If these improved methods, as they ought to be, are productive of a larger return to the workman, he might be sent back to ply his trade in his own home, and if necessary he might be provided with the appliances, which would help to make his trade more profitable, at cost price, the necessary plant being made at the Central College. By this means a number of workmen would return to their own districts, and by their example and practice show the local workmen the value of the improved methods of work which they had learned, and also help to train apprentices who would naturally carry on their trades on the more lucrative lines on which they had been trained. The gradual introduction of improvements in industries must be the prelude to greater industrial activity. The length of time necessary for any appreciable results to be manifest depends on the importance that Government attaches to the industrial development of the country. India is full of natural resources, and the labour available, under proper guidance, is cheap and plentiful. All that is wanted is an enlightened policy which will devote a fair share of the revenues of the country to advance its material progress. Private enterprise has already done a great deal in this respect by the establishment of various mills and factories. This is not sufficient, as it only ends in employing uneducated workmen working under expensive imported skilled supervisors. Where Government could step in is by establishing centres where Supervisors could be trained locally. This cannot be done without money. If the Government of India could be induced to sanction a really liberal policy in this respect, a distinct advance would be apparent in 15 or 20 years. With the way in which funds are now doled out for the advance of technical education, any decided advance can scarcely be expected.

TABLE A.

Of Industrial Schools.

1	2	NUMBERS OF STUDENTS, ETC., BEING TRAINED—			Date of foundation.	REMARKS.
		Sub-Overseer grade for Public Works Department.	Amins.	Artisans.		
3	4	5	6	7	8	
I	Behar School of Engineering	104	43	...	1894	Supported by Government. Trains students as Upper and Lower Subordinates for Public Works Department.
	<i>Survey Schools.</i>					
II	Dacca Survey School	31	78	...	1876	Government; also teaches the Sibpur course for Sub-Overseers.
	Cuttack Survey School	...	85	...	1876	Government; only trains amins. No workshops.
	<i>District Board Schools.</i>					
III	Midnapore Technical School	19	5	5	1885	The object of these schools is to train Lower Subordinates for Public Works Department and District Boards; also amins and artisans. All affiliated to the Sibpur College for further training of selected students.
	Rangpur ditto	22	65	26	1888	
	Barisal ditto	16	...	16	1890	
	Pabna ditto	43	21	2	1892	
	Comilla ditto	31	...	18	1892	
	Burdwan ditto	32	8	...	1893	
	<i>Purely Artisan Schools aided by Government, District Boards, and from Private Funds.</i>					
IV	Giridih Industrial School	...	...	25	1891	Chiefly supported by East Indian Railway.
	Ranchi Government Industrial School.	...	...	45	1880	By Government and Chutia Fair Funds.
	Howrah Night School	...	...	23	1900	Private funds. Teaches apprentices Engineering, Mensuration and Drawing.
	Jamalpur ditto	...	...	P	1883	East Indian Railway. No returns submitted to Government.
	Madhupur ditto	...	...	76	P	Ditto ditto.
	Oxford Mission Industrial School	...	...	104	P	Private funds. Teaches carpentry. Oxford Mission Society supports it. It is attached to local middle English School and teaches carpentry.
	Koarpnkar Diamond Jubilee School.	...	...	12	P	
	Murshidabad Technical School	...	...	19	1885	Carpentry, embroidery, and bidri work. Not thriving. Aided by local municipality.
	Kankinara Diamond Jubilee School	...	...	P	1897	Some of the students learn gardening and manipulation of mechanical instruments in local mills.
	Teghari Sramajibi U. P. School	...	...	...	P	Private. Some boys learn gardening, carpentry, and lock-making. No returns submitted to Government.
	Katikund Aided Industrial School	...	...	12	P	Attached to upper primary school. Carpentry and gardening in addition to upper primary course.
	Pakaur ditto ditto	...	...	12	P	Carpentry. Attached to Mission Orphanage.
	Bhanpur Industrial School	...	...	11	P	Carpentry. Private.
	Alalpur ditto	...	...	21	1868	Carpentry and needlework. Aided by District Board of Balasora.
	Mourbhanj Amin Training School	...	6	...	P	Trains amins for the Mourbhanj State.
	Hurlong Industrial School	...	...	12	P	Trains blacksmiths.
	Bagda ditto	...	...	15	P	Ditto.
	Chitrapur	...	...	23	P	Ditto.
	Silli	...	...	21	P	Ditto.
	Baranda	...	...	25	P	Ditto.
	Bunda	...	...	25	P	Carpenters and blacksmiths.
	Jhalda	...	...	7	P	Blacksmiths.
	Ghatsila	...	...	10	P	Carpenters.
	Boalia Diamond Jubilee School	...	...	11	1897	Sericulture.
	<i>Art Schools.*</i>					
V	Indian Art School	...	...	30	P	Unaided.
	Jubilee Art Academy	...	...	59	1887	Do.

* The Government School of Art has not been included in this list.

TABLE B.

Showing present state of Bifurcation of Studies in District Schools.

NAME OF SCHOOL.	NUMBER OF PUPILS IN —		REMARKS.
	B class.	C class.	
Midnapore Zilla School	5	...	Not yet opened. Will train boys for B class. The B class is amalgamated with the Survey School; the C class has been closed. The Barisal Technical School and Zilla Schools are being amalgamated.
Hare School, Calcutta . . . . .	...	5
Utterpara Government School . . . . .	...	6
Rangpur Zilla School	20	...	
Mymensingh Zilla School . . . . .	...	...
Dacca Collegiate School . . . . .	...	...
Barisal Zilla School	10	...	
Comilla " "	3	...	
Patna Collegiate School	P	P	
TOTAL	38	11	

Note.—The B class trains boys who desire to enter the Engineering profession; the C class those who wish to follow commerce. A scheme is still in its infancy, and the first public examination will not be held until the end of this year or the beginning of 1903.

TABLE C.

Showing Annual cost of Industrial Schools.

NAME OF SCHOOL.	ANNUAL COST FROM —			Total annual cost.
	Provincial Funds.	District Board and Municipalities.	Private sources.	
	R	R	R	R
Bihar School of Engineering	19,180	...	2,302	21,482
Dacca Survey School	16,433	...	4,850	21,283
Cuttack " "	3,495	...	1,048	4,543
Midnapore Technical School	400	1,281	793	2,474
Rangpur " "	640	3,362	1,815	5,817
Barisal " " . . . . .	...	3,580	1,511	5,091
Pabna " "	600	1,472	2,724	4,796
Comilla " " . . . . .	...	5,723	1,591	7,314
Burdwan " " . . . . .	...	1,507	893	2,400
Giridih Industrial School	120	...	...	...
Ranchi Government Industrial School	1,599	...	1,122	2,721
Howrah Night School . . . . .	...	...	...	...
Jamshpur " " . . . . .	...	...	...	...
Madhupur " " . . . . .	...	...	120	120
Oxford Mission Industrial School	300	...	12,465	12,765
Koaraupur " " . . . . .	...	...	...	...
Murshidabad Technical School . . . . .	...	144	...	144
Kankinara Diamond Jubilee School . . . . .	...	...	...	...
Teghari Sramajibi Upper Primary School . . . . .	...	...	...	...
Katikund Aided Industrial School . . . . .	...	...	384	384
Pakur " "	360	...	900	1,260
Bhanpur " " . . . . .	...	...	300	300
Alalpur " " . . . . .	...	180	540	720
Mourbhanj Amin Training School . . . . .	...	...	280	280
Hurbong Industrial School	48	...	180	228
Bagda " " . . . . .	...	48	180	228
Chitrapur " " . . . . .	...	63	180	243
Silli " "	72	...	...	72
Baranda " " . . . . .	...	72	...	72
Bunda " " . . . . .	...	192	...	192
Jhalda " " . . . . .	...	60	...	60
Ghatsila " "	32	...	120	152
Boalia Diamond Jubilee School	180	1,049	578	1,807
Indian Art School . . . . .	...	...	900	900
Jubilee Art Academy . . . . .	...	...	4,120	4,120

A LIST OF THE PRINCIPAL INDUSTRIES OF BENGAL.

BY DR. G. WATT, C.I.E., REPORTER ON ECONOMIC PRODUCTS.

Weaving—Cotton—

Muslins—Dacca, Santipur
 Dhotis, etc.—Chandernagore, Howrah, Pabna.
 Napkins, etc.—Dinapur.
 Curtains, etc.—Birbhum, Midnapur.
 Darris—Rangpur, Purneah, Bhagalpur.

Weaving—silk—Murshidabad, Maldah, Bankura.

„ —jute (Gunny bag)—Calcutta, etc.

Carpet manufacture—Bhagalpur.

Embroidery—Calcutta (Chikan work), Santipur.

Mat making and basket making—Calcutta, Midnapur, Monghyr, Rangpur, Farridpur,
 Dacca, Chittagong, etc.

Paper making—Calcutta.

Tanning and curing skins—Patna, etc.

Wood carving—Muzaffarpur, Monghyr.

Ivory carving—Murshidabad.

Horn carving and manufactures—Hooghly.

Glass making—Patna.

Metal work—

Jewellery—Sham Jewellery—Calcutta.

Silver Filigree—Dacca, Cuttack.

Brass—Calcutta.

Silver Repoussé—Calcutta.

Bidri ware—Murshidabad and Purneah.

Brass and bell metal vessels—Midnapore.

Iron—Barakur.

Pottery making—Raneegunge.

Clay model making—Calcutta, Kishnagar.

Lac manufacture and lac toy making—Calcutta, Patna.

Coal mining—Jherriah, Raneegunge, etc.

Mica mining—Chota Nagpur.

Saltpetre refining—Calcutta.

Lime and cement—Calcutta.

Manures—Calcutta, etc.

Chemical works—Calcutta, etc.

Gun-powder and arms—Calcutta, Cossipore, Ichapur.

Tea manufacture.

Indigo manufacture.

Jute—preparation of fibre.

Betel—preparation of.

Ganja—preparation of.

Opium—preparation of.

Tobacco Curing—Rangpur.

Sugar—preparation of,—jaggery clarification, etc.—Calcutta.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

BY MR. E. PEGLER, SUPERINTENDENT, ALIPUR REFORMATORY.

INDUSTRIAL SCHOOLS.

Q. (1) Please give a complete list of Industrial Schools, Government and private, in the Province, with date of foundation, industries taught, average attendance and output of artisans annually?

A. The Alipur Reformatory School was started by the Government in 1878 for the general and industrial training of juvenile offenders under Act VIII of 1897.

The following trades are taught :—

Carpentry,
 Wood polishing and painting,
 Tin-work,
 Cane and bamboo work,
 Book-binding,
 Printing,
 Gardening,
 Cooking ;

and there is a proposal to introduce—

Composing,
 Shoe-making,
 Tailoring.

The School has accommodation for 226 inmates, including 2 European and Eurasian boys, and during the current year admission has had to be refused to several for want of room. In schools of this class each boy has to sleep in a cubicle.

About 50 boys leave the school annually after learning their trades.

Q. (5) Why were the particular trades selected which are taught in the school?

A. There is nothing to show why particular trades were selected for the school, but the Jail Department tried their best to make the school a paying business. The original idea was to select the most profitable industries, *i. e.*, the products of which will sell best. This view has however been entirely done away with by the change of control to the Education Department. Every attempt is now being made to introduce caste trades.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

A. The experience of the past shews that about 10 per cent. of the students follow the trades they have been taught in the school, but some improvement is expected in the future by the introduction of caste trades.

Q. (11) How are materials and tools provided? What is done with the work turned out?

A. Materials and tools are provided at the expense of Government, and the goods manufactured command a ready sale in the Calcutta market.

Q. (12) Are there any special methods of instruction employed, if so, have any of these shewn marked promising results?

A. There are no special methods of instruction.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trade taught in the school? Are English or Native methods of instruction used?

A. Caste trades are selected from those which are available in the school, but each boy is allowed his choice during his detention for the first 6 months and no change is allowed afterwards. The period of detention of boys varies from 3 to 7 years according to the orders of the Magistrates. Native methods of instruction are followed.

Q. (14) What general education is given in addition to regular industrial training? (*N. B.*—Drawing is industrial). What is the test of the quality of the work turned out?

A. In addition to regular industrial training the boys are taught up to the Upper Primary Standard. The work turned out in this school is generally satisfactory, except the "finish" of the furniture and the tin-work. This is mainly due to a desire to make things to sell at a profit.

Q. (15) Has any attempt been made to improve the quality of work in particular industries, or the tools or machines? If so, please specify industries, and the improvements made.

A. No attempt has yet been made to improve any particular industries, but every endeavour will be made in this direction if defects are pointed out by the experts of the Sibpur College.

Q. (16) Do you consider the present system the best, or can you suggest improvements?

A. The present system needs improvement. The native method of instruction should at least be partially replaced by the English. At present there is no limit to the number of boys a Trade Instructor should teach. The following remarks of Capt. Jackson, the Superintendent of the Central Jail, Yerrowda, recorded in the Annual Report of the Yerrowda Reformatory School for 1900, are worthy of note:—

"The Reformatory School should not be overcrowded. The larger such institutions are, the less useful they are in a Reformatory sense; for to reform you must individualize and not deal with juveniles in a mass."

It is not possible to train the Native mistris, who are at present working as Trade Instructors, by English methods, as they are illiterate. They may be good workmen but greatly fail in tact and the art of teaching others. My idea is to supplement their instruction by men of superior training. Passed students of the Sibpur College, or any other Government Institution, are preferable, but a Training College for teachers of Industrial Schools is necessary in the same way as has lately been done for teachers of general instruction at Kurseong.

LETTER FROM MESSRS. C. LAZARUS & CO., CALCUTTA,

ON THE SUBJECT OF GUILDS.

Dated Calcutta, 25th January 1902.

So far as the particular industry with which my firm is connected is concerned I fear the information I can give you will be of very little assistance to you in your enquiries, but such as it is, I give it with much pleasure.

There is no organised guild of this class of workmen nor is the work confined to one special caste alone. In our business we employ Hindu and Muhammadan workmen alike and probably there are as many of the one as of the other. Most of the Hindus belong to the "Carpenter" caste, but this fact is more due to accident than design and among the workmen in our firm, as also generally in Calcutta, several castes are represented.

There is no institution that I know of or have heard of which can be called a trade or training school, other than those which have been started under missionary or private auspices but which really do not touch or affect the mass of this class of work people.

Boys from the age of ten or twelve come to the factory with their fathers or some other relative and begin by making themselves useful in small ways. What they learn they apparently pick up for themselves, for there seems to be no special system of training. They begin by using the saw, the plane, the chisel, etc., until they gradually get accustomed to the use of tools, and if they have any aptitude for the work, and are possessed of ordinary intelligence, they become fairly good mechanics by the time they are sixteen or seventeen. The "Mistry" or Contractor is paid by the piece. He is responsible for the work and employs under him several other workmen whom he pays by the month, and to whom he generally gives small advances on his pay with the idea that by doing so he is able to secure their services better. These workmen in turn become mistries.

The number of learners is not in any way restricted, this being a question which I judge is regulated largely by the rule of demand and supply.

In addition to the replies I have given to your enquiries, may I be permitted to express an opinion formed after an experience of some thirty-three years in the country, and in my business. I am quite in accord with the education of the masses as a general principle. I believe that an educated boy, educated, that is to say, to a certain point, will probably make a better handicraftsman than one who has had no education whatever, inasmuch as his training would teach him to use his brains in his work as well as his hands, but it is an undoubted fact that to make a really good mechanic early training is necessary, and the boy must be taken in hand very young. The hand and eye of the would-be mechanic must be trained while he is still young, quite as much as the brain of the would-be scholar. The present system of education, I speak guardedly and with reserve, seems to me to be having the effect of disorganising the artisan classes. The parents appear to be imbued with the ambition of making their progeny into writers, clerks, hangers-on in offices, and in fact anything rather than expert mechanics, able to earn their living anywhere and under any circumstances. I have myself seen many cases where the sons of men in my own employ have been turned out of educational establishments with only a superficial smattering of an Anglo-Indian education and fit for nothing more than a post as a *sircar* on ten or fifteen rupees a month, when they might, if they had been properly trained, have been earning three or four times that amount had they followed their fathers' trade. One can of course commend a laudable ambition which prompts the desire that the son should be better than the father, but the actual results fall far short of the ambition and desire.

In any scheme for technical education we have to take into consideration the conservative disposition of the people, and there is always the possibility, to provide against, that they would prefer their own systems of training to any which Government might provide for them. Still, as against this, we have before us the success attained by technical training schools already in existence. But in these schools there is, I believe, always some educational test to be undergone before the youth is taken in hand for his mechanical training. I would, with all reserve, suggest a change in this direction. I think the establishing of training schools might with advantage be extended among the lower classes and that small schools of this nature should be opened and maintained in as many places as possible where there is a large working class population. Technical education should be the chief object in them all and book learning entirely a secondary consideration, which might, if possible, run concurrently with the other but not as a *sine qua non*. The primary object should be to turn out boys who could earn their living with their hands. An initial difficulty would present itself in finding sufficiently skilful men who would be willing to undertake the work of teaching and devote themselves to that alone. There would always be the temptation to convert the place into a workshop for their own gain and at the expense of Government, but I think that difficulty could be overcome with care.

The Government has it in its power to do much in this direction. The existing institutions, such as the Telegraph, Railway, and Public Works workshops, Dockyards and other such establishments, could be made of very effective use for the purpose. Lads could be taken in young and trained in their respective handicrafts and then they would have no difficulty in finding work and employment in outside workshops. There would be no obligation on the part of Government to find them permanent posts after their term of tuition, nor need there be any compulsion as to the time they would have to serve.

These are my views in brief, and I should be only too glad, if time and opportunity offered, to follow them up in further detail. If I can be of any further help to the Committee, my services are at its disposal.

THE ENCOURAGEMENT OF INDIGENOUS INDUSTRIES IN INDIA.

By MR. E. B. HAVELL, PRINCIPAL OF THE SCHOOL OF ART, CALCUTTA.

The Government of India, I understand, are anxious to render such assistance as is in their power to encourage a revival of the indigenous manual industries. To this end they are willing to provide funds to the extent of four or five lakhs of rupees and to entrust the expenditure and control of this money to a specially selected committee, in whom absolute

confidence will be placed that the experiment, for such it must be termed, will be conducted with discreet enterprise and in the way best calculated to afford the greatest prospect of a successful issue. It is thought that, properly organized and skilfully directed, the cheap labour of the millions of India may find profitable employment in the manufacture of articles of commerce which for various reasons are still produced by manual labour, and that, as such forms of industrial enterprise offer little attraction to the ordinary capitalist, Government intervention is desirable in the interests of the workers themselves. Hitherto the policy has been to studiously avoid any course of action that could be regarded as inimical to the perfectly free development of private trade, and the result has in certain directions been far from satisfactory. The capitalist has developed the fields in which capital could be most profitably employed and all his efforts have been concentrated on the saving of labour in manufacturing operations, and the proportion of the population which look to the soil for the means of subsistence has steadily increased in consequence of the success which he has achieved. The old arts of India have gradually deteriorated in competition with the outturn of the modern factory system, and the middleman, through whom all the trade has of necessity passed, anxious only for his immediate profits, has done nothing to assist the artisan but rather the reverse, for by encouraging the production of cheap inferior work he has gradually destroyed the high estimation in which the hand work of India was formerly held. It is now proposed to change this policy of inaction and to take active measures to better fit the artisan of this country to meet the stress of Western competition. He is to remain a hand-worker, but his rude hereditary skill is to be trained and developed, he is to strive no longer to compete with machinery, but his energies are to be directed into channels where machinery is of little use, and he is to be supplied with good tools and taught methods of production in which advantage is taken of our increased knowledge of the properties of matter. He is to be supplied with the best raw materials purchased in the cheapest market and the finished work is to be sent direct to the places where it will be found to be in ready demand. In fact, instead of leaving him severely alone, the highest technical skill and the keenest commercial intelligence are to be devoted to his service in the hope that gradually a new condition of affairs will be brought about and a prosperous and flourishing artisan community established.

In carrying out what is partly an educational and partly a commercial scheme, it is desirable that the action of Government should as far as possible be confined to the educational work and should only be extended to commercial matters in so far as it is necessary to ensure complete efficiency in the exercise of their proper functions. Dealing with the matter in its broadest aspect, it is proposed to establish what in reality are Industrial Schools, to give the best available instruction in the industries carried on in the neighbourhood, to collect in these schools certain members of the artisan classes who are already experts at the trade in the local estimation, to train them to work with better tools and consequently greater efficiency, and, above all, to practically demonstrate to them the directions in which they can most profitably employ their labour. To do this satisfactorily a comparatively large amount of work must be done and a market must be found for the goods manufactured. To work on a small scale would be of little practical use and would prove exceedingly expensive. Not only is it necessary to raise the standard of industrial skill and provide efficient instructors, but above all things it must be demonstrated that under the new conditions the industry or industries can be made to pay and will yield to the artisans a better wage than they have ever before received. With the exception of the general charges due to the employment of an expensive directing staff these industrial institutions must be made to pay their way and yield a fair return on the capital invested in them. Unless this result is achieved, private enterprise is hardly likely to be attracted into channels which Government, with all its resources, cannot work on a profitable basis. The difficulties that will be met with in carrying out this scheme will resolve themselves into two groups—(1) those connected with the development of the Indian hand industries on modern lines but in sympathy with the poverty of the workers and their very marked idiosyncracies; (2) those attending the disposal of the manufactured goods in such a way that the consumer shall not pay an undue proportion of the total cost of an article to the salesman or agent. The former group do not appear to be very serious, and already there is a large amount of experience available throughout the country which could easily be obtained for the guidance of the managing committee, should that body ever obtain a corporate existence. The commercial difficulties on the other hand are the crux of the whole matter, and even a partial solution of them would probably lead to an industrial expansion in India which would materially contribute to establish her prosperity. Exports from India must always be greater than imports, and the rapid increase in the population is gradually absorbing the surplus of raw materials which at present forms the bulk of the outward trade. It is desirable that the raw materials in the country should be converted into finished products in the country and their value enhanced by the expenditure of labour upon them. In this way both exports and imports will be increased in value and the foreign trade will measure the commercial activity of the Empire. On the other hand, the country may be made to supply its own requirements and the internal trade fostered at the expense of the external. Hitherto this has not been largely done and mainly because, in the absence of protective tariffs, it has been very difficult to set up an industry against the competition of the highly organized and splendidly equipped manufactories of England, America, and the Continent. The United States of America and Japan afford excellent examples of what can be done in this direction under initially adverse circumstances. Protection of home industries has been the key-note of their policy, and it would be an easy matter to follow in their footsteps if such a remedy were possible in India. It is true that local manufactures enjoy the advantages due to freight on imported goods and a five per

cent. duty on the bulk of the imports, but the assistance is not sufficient. Government is by far the largest importer of manufactured goods and by far the largest purchaser in local markets. Of late years a more favourable policy has been adopted towards country-made goods and the effect has been satisfactory, but much more might yet be done to encourage the investment of capital in industrial undertakings in India. The iron trade is probably the most important industry which can be established in any country, and in India abundant stores of the raw materials are known to exist, though unfortunately they are not favourably situated. Much has been written about this trade, many projects have been mooted, but, with the single exception of Barakur iron works in Bengal, nothing practical has resulted. The old native iron trade was very important, and there are some who yet believe that it might be resuscitated if efforts were made to place at the disposal of the iron smelters the results of modern advances in chemistry, physics, and mechanical knowledge. How this could be done is a question which might well be discussed when considering in what way Government can contribute to the advance of industrial progress.

Passing from the general aspect of the question to the consideration of how effect can best be given to the wishes of the Government of India, I regret that my scanty knowledge of the conditions under which village industries are carried on in most parts of India renders it impossible for me to contribute any information which is likely to be of practical value, except in regard to the results of my experience in the Madras Presidency, where for the last fifteen years some attempt has been made to foster and encourage industries somewhat in the manner it is now proposed should be adopted throughout the country. I have read certain papers and letters written by Mr. S. J. Tellery, in which he claims that his firm has met with considerable success in selling the products of Indian handicraft in America and London, and states that he could do an enormously greater business if he had more capital invested in it. In his final proposal he suggests that, if Government will undertake to get goods manufactured, he will find a market for them *at his price*. I am very nearly certain that the *limits* of cost fixed by Mr. Tellery would be such that the goods would have to be sold to him at a loss, and that gradually the initial capital provided by the Government of India would melt away and nothing tangible would be obtained in exchange. It is suggested that 4½ lakhs of rupees should be devoted to opening up a trade in certain industries (five in number). As Messrs. Tellery & Co. would pay for the finished goods by drafts at six months, either these would have to be discounted at a heavy loss or the capital provided would not permit of a turn over of more than 7 lakhs of rupees per annum. An average outturn of ₹60,000 per mensem would mean that ₹3,60,000 of the capital were in the hands of Messrs. Tellery & Co., and ₹90,000 only would be available for the industry. Looked at in this light it is obvious that the scheme would benefit no one but Messrs. Tellery & Co.

I have formed no very strong opinion on the point, but so far as my own experience goes I am not inclined to think that very much can be done by Government to establish an export trade.

The Indian hand industries are all in a more or less decadent condition, and any serious revival will take many years and must be a gradual process. Skilled workers, whether in wood, metal, or the textile trades, are commercially not very numerous and additions to their numbers can only be made very slowly. I would, therefore, begin rather by attempting to supply local demands, and only when some measure of success has been attained in this direction do I think it would be desirable to extend the field of operations and attempt to establish an export business.

To manufacture in India goods which are now imported into the country will have the same effect on the balance of trade with foreign countries as to manufacture goods for export. The difficulties connected with the attempt to resuscitate the native hand industries are likely to be so very great that it would seem to be desirable to adopt a line of policy which would not involve placing the proposals at the mercy of middlemen, or as an alternative the creation of an expensive staff of commercial correspondents and foreign agents. Export trade from the outset must be on a comparatively extensive scale; a home industry with a local market on a much more satisfactory basis can be worked with limited means and with much greater chances of success and much less risk of loss.

Cottage industries flourish in the silk districts of France and in the mountainous region of Central Europe for very special reasons, but the efforts made to establish similar industries among the poor peasantry of Ireland or the cottars of the Western Highlands have not met with much success, although there is a market near at hand and much influence has been exerted in their favour. India is in my opinion too far away to hope to achieve any success in those textile trades where hand work is employed on account of the frequent changes which must be introduced into the patterns to obtain any continuous demand for the fabrics.

Into Madras alone upwards of two crores of rupees' worth of piece-goods are annually imported, and it seems to me a much more hopeful matter to try and regain the local market.

I.—THE BUILDING.

This need not be very large. It would be a two-storied building, containing show-rooms and offices on the ground floor and quarters for the Art Director on the first floor. The style of the architecture should be Indian, adapted so as to afford scope for showing the skill of Madras stone-carvers, wood-carvers, and decorators. The building alone, properly carried out, would be a more tangible, appropriate, and useful memorial than all the work of the "Victoria Jubilee Technical Institute."

II.—CONTENTS OF THE BUILDING.

In the show-rooms would be arranged for sale the specimens of Madras Industrial Art collected by and made under the supervision of the Art Director, and illustrations or electrotype reproductions of the finest specimens of old Madras work, of which there are many in European Museums, but very few, alas! in the Museums of India.

III.—THE STAFF OF THE INSTITUTE.

The chief officer would be the Art Director, who must be an artist—not merely a picture painter, but one with a thorough and wide practical knowledge of industrial art design, more especially of the principal art industries carried on in Madras, which are metal work in gold, silver, brass, and copper, furniture-making, cotton-printing, carpet weaving, and textile fabrics generally. There are scores of young men available in England, excellently well qualified in these particulars, and if red tape is not allowed to stand in the way there would be no difficulty in finding a proper man for the post.

It would be a matter of consideration whether the artistic and business side of the Institute should be combined in the same person. The combination can be obtained, but if funds permit, I think, it would be best to divide the duties of Art Director and business manager into two appointments. Only let it be clearly understood from the beginning that the first and the chief object of the Institute must be to revive the reputation of Indian Art in the European market, not to make the Institute a paying concern. This is the only sound policy to go upon and any divergence from this would only bring failure and eventual discredit to the work of the Institute. Besides the Art Director and perhaps the business manager, a clerical staff would of course be necessary.

IV.—THE WORK OF THE INSTITUTE.

I have already indicated that the work would include an art side and a business side. The work of the art side can be best explained by concrete examples. The cotton print industry of Masulipatam is a declining one, the best work is only turned out to order, and there are, or rather were ten years ago when I went there, only two or three families who can make the traditional hand painted designs of Persian origin for which Masulipatam is famous. In every house of the cotton printers, however, there are stores of old blocks, no longer used, much more beautiful in design and execution than those now in use for the block printed patterns. In the South Kensington Museum there are specimens of old Indian cotton prints of still more beautiful design. A qualified Art Director would have no difficulty in utilising these materials and teaching the workmen to design hand-printed and block-printed curtains, hangings, furniture coverings, etc., which could compete both in price and quality with similar first class European art work. A great deal of cotton printing is now done by hand instead of by machine in Europe, and in art work of this description the cheapness of living in India would give the hereditary skill of the native workman an immense advantage in the European market. Placed in the right market such work would soon bring prosperity back to the Masulipatam cotton printers. Take again such industries as Vizagapatam horn and ivory work,—Madras, Trichinopoly, and Tanjore silver work. Here we have highly skilled workmen turning out for the most part atrocious designs. Properly directed they could just as easily produce high class art work which would command four times the prices they obtain now. The Art Director would not only be able to instruct but to give orders for and to purchase any good work that was done and thus give a direct and powerful incentive to the production of good work.

The business side of the Institute would be to establish agencies in Bombay, Calcutta, and other large towns in India, and in London, Paris, Berlin, Vienna, and in New York and other places in America, to advertise and push the sale of the work done for the Institute. The golden principle to guide the business side of the Institute must be that only first rate art work should be offered for sale. I have not the slightest doubt that, if this principle were rigidly adhered to, the Institute would in time become a paying concern, but it should from the first be in such a position as to enable it to carry its principles into practice.

It will be noticed that this plan is essentially different in principle to that which is observed in the arrangements made for the sale of native industrial art work in the Art and Economic Section of the Indian Museum, at the Jeypore Museum, and elsewhere. These merely provide a sale Agency and make no attempt at what is really wanted, the maintenance of a high artistic standard by expert control.

6. To sum up my general views, I would say that the whole question should be treated in two sections. The first and most important is that which concerns the internal trade. In this section the most important problems to take in hand are technical improvements in the weaving and other industries. The second and subsidiary section is the development of the export trade in art-ware. In this direction I think that Government interference should be limited to promoting or assisting some such scheme as that which I have sketched in the last paragraph. For the carrying out of technical improvements and for developing the export trade we must have, first, proper organization, secondly, a definite programme, and, thirdly, men with practical experience and knowledge, who must be given a sufficiently free hand in carrying out the programme. Artistic and business principles must each be given their due consideration. In Indian industries it is often exceedingly difficult to draw the line between an art industry and a commercial industry. The neglect of artistic considerations may do infinite harm to an industry from a purely commercial point of view.

7. In conclusion, I would only make a few observations on Mr. Howe's remark on hand-loom weaving in Europe. His statement that only the most expensive brocades are woven by hand is very misleading. The following striking facts given by Miss Cline Bayley of the Weaving School at Bushey, Herts, in a lecture before the Society of Arts in 1898, present a much more correct view of the state of hand-weaving in England:—

"The recrudescence of the silk trade in the hand branches has drawn its workers away from the congested city streets into the purer air and cheaper regions of Suffolk and Essex, Ipswich, Brambree, Sudbury and the villages around—Haveril, Glemsford, and others—are becoming centres of renewed activity." "The districts in which hand-weaving in wool flourishes are notably the outlying districts of Ireland and Scotland, where the principal sources of profit are the various tweeds which have won for themselves a well-deserved fame." "One large silk firm is already raising the roof of its establishment in order to accommodate a large number of such hand-working apprentices. Another applied, though for what exact purpose I have not discovered, for 500 similar workers. Another, and I believe a linen firm, was reported to need 2,000 workers."

In Scandinavia at the present day the peasant woman not only weaves by hand all the household linen, but actually spins the thread she uses for sewing. At Lyons the hand-weaving industry in silk is even now an important one. If this is the state of things in Europe, it is obvious that there is still great scope for the hand-weaver in India, whose skill is so great that, even with a loom which is from 50 to 100 per cent. less effective than the European hand-loom, he has still been able to maintain a struggle against the most scientific power looms of Europe. I append a note on the hand weaving at Serampore drawn up for Sir Edward Buck which may be useful in considering this question.

The 16th March 1901.

SCHEME OF INDUSTRIAL INSTRUCTION.

SUGGESTED BY MR. A. PEDLER, F.R.S., C.I.E., DIRECTOR OF PUBLIC INSTRUCTION, BENGAL.

Up to the present time in Bengal, the only attempt at what may be called a trade school has been started in Rampur Boalia, where a "silk school" is now at work. This, however, has only partially fulfilled its purpose, and the main work done is the rearing of silk-worms free from disease. The other parts of the silk industry, such as weaving, etc., by modern methods, receive comparatively little attention, and it cannot, I think, be said that the local silk industry has learned any new methods of weaving, etc., from the school. The second other instance of what may develop into a school for the improvement of a local industry is the case of the introduction of the fly-shuttle among the weavers at Serampore. This is at present in the stage of an experiment, but it promises to be a most successful one, and it is somewhat on the lines of this experiment that I am of opinion success in other experiments may be hoped for.

2. What would appear to be the most desirable method of procedure would be then to select certain new localities, say six or eight, in which to start schools in places where supervision is easily obtained, and to select trades which are common in the locality. Mr. Collin, in his report on the existing arts and industries in Bengal (Bengal Secretariat Press, 1890), enumerates a very large number of industries existing in very varied localities. Even this survey, made 13 or 14 years ago (in 1854-89), is probably now incomplete, and it will in the first instance be desirable for the Government of Bengal to decide whether this survey should not be brought up to date.

The facts, however, are probably sufficiently available for present purposes and to enable a beginning to be made.

3. As regards the localities where experimental trade or craft schools should be started, I would suggest in or near Serampore, Calcutta, Dacca, Patna, Cuttack, Midnapore, Rampur Boalia, Obra (or Daudnagar) in Gaya, Monghyr, Murshidabad (or Purnea), and Burdwan.

Then in regard to the industries to be fostered, I would make—

- (1) Serampore the centre for a weaving school.
- (2) Calcutta the centre for schools for silver work, curing and tanning skins, for dyeing and calico printing, for tinsmith's work, and brass work. Probably these schools would have to be started in several different centres.
- (3) Dacca for weaving (cloth with edges of gold thread, muslins, etc.), shell bracelets, etc.
- (4) Patna for glassware, pottery (Saran), gold and silver embroidery.
- (5) Cuttack for mat weaving and basketware and silver filigree work.
- (6) Midnapore district (Kharu) for brass or bell-metal ware industry (there are said to be 5,000 workers here) and perhaps for mat weaving.
- (7) Rampur Boalia for silk industry (to be extended).
- (8) Obra for carpet industry.
- (9) Monghyr for carved wood-work.
- (10) Murshidabad (or Purnea) for bidriware and ivory work.
- (11) Burdwan for locksmith's work and cutlery.

4. This in itself represents a very comprehensive list, but it still only touches the fringe of the industrial education of the masses.

Then I believe that Census reports show that in Bengal about 90 per cent. of the population are engaged in agricultural pursuits, and roughly 10 per cent. in industrial or artisan callings.

5. In the above list nothing is said of the training of this 90 per cent. of the people, and indeed it is difficult to suggest schemes which will tend to elevate the agricultural knowledge of the masses of the agricultural population; for such people could scarcely be induced to come to school for any technical instruction. It is indeed only with difficulty that a portion of them are induced to attend the ordinary primary schools for a few years of their boyhood. General agricultural continuation schools or evening schools might of course be started, but their success would be problematic.

On the other hand, it might be possible to start schools dealing only with certain specified items of agricultural produce in selected areas, and the products in which the greatest success or improvement might be expected are, I think, lac, jute, various kinds of seeds, tobacco, rice, betelnut, safflower, etc. Such things as sugar, tea, and indigo are not included in the list, as they are already the subject of special enquiry and special endeavours to improve the conditions

under which these articles are produced. All such industries might be made the basis of instruction in trade schools in definite localities ; but no precise localities at the present time need perhaps be assigned to such schools.

6. It is, however, a comparatively easy matter to indicate the localities in which trade schools might be established and the industries they should be intended to foster ; but it is a far more difficult matter to lay down the methods under which such schools should be started with the best prospect of success, and of their doing really good and valuable work among the artisan classes.

7. In each school, not only will the handicraft portion of the teaching have to be developed to the highest attainable point, but also if real progress is to be made, some form of additional teaching in the craft, probably from both the theoretical and practical aspects of the trade or calling, will have to be attempted. Indeed, in certain of the industries which have been enumerated, before such additional teaching can be attempted, it will be necessary for the industry, etc., to be examined by a competent expert, who may probably have to conduct specific researches into the industry to ascertain in which directions improvements can be best introduced. Hence it will be seen that the teaching in the trade or craft school will have to be considered under three separate heads—

- (a) the necessity for original research in the industry ;
- (b) the provision of teaching to advance the industry and which teaching may be partly theoretical and partly practical ; and
- (c) the teaching of the handicraft portion of the industry by a master workman.

8. If anything practical is to be the outcome of the present movement in favour of trade or craft schools and of the resolutions of the Simla Conference, it will probably be necessary to reverse the theoretically correct order of procedure as laid down in the last paragraph, and to work backwards in the order of (c) (b) and (a) in the matter of the provision of instruction, but it must always be clearly borne in mind that all three directions of work are essential to real progress.

9. Taking up (c) therefore in paragraph 7, it will be seen that in starting a new trade or craft school, the first essential point is the selection of the master workman who will be competent to instruct the students attending such schools, and it is in this point that considerable difficulty will be experienced in the first instance.

In the first place then the industries mentioned in paragraph 3, sub-sections (1) to (11), may be started in the places indicated.

All that probably then can be done is to throw the responsibility on the local authorities, those of the Executive and Educational Departments being made collectively responsible, and to ask them to select the most competent workman, foreman, or master engaged in the industry selected, to act as the instructor in the proposed school. The school can then either be started in the workshop of the individual selected, or, if necessary, a convenient workshop can be built at the expense of Government or the local authority, and students or apprentices then collected. The number of such students must be left to local decision, and the method of subsidizing the instructor and his pupils can also be varied according to the local circumstances.

10. Then in the case of each industry selected, or of each individual school, the next point for consideration would be whether any additional teaching, either of theoretical or practical nature, can be added on to the instruction which will be given by the master workman. It appears to me to be impossible to lay down any general rule for all the industries, and even for all the schools teaching the same industry in this matter, and hence probably this form of additional work would have to be considered and decided on in the case of almost each individual school after it had been started in its work. A few general remarks, however, might be made on this point to show the general kind of extra instruction which might be wanted. All teaching, however, should be intimately connected with the work at which the student is engaged ; and this teaching should not form any part of general education. In a very considerable proportion of the industries enumerated under the headings (1)-(11) in paragraph 3, it would appear that a knowledge of drawing and designing would be of great help to the education of such artisan pupils. Drawing and designing should really form an essential part of the training of young weavers, silver workers, calico printers, artistic mat workers, carpet weavers, carved wood workers, bidri and ivory workers, etc., but I would not suggest that to each such school a master to teach drawing and design should be attached ; for it might be that the master workman himself could teach the greater part of what was necessary. Also in the case of tinsmith's work, brass workers, glass and pottery workers, a certain amount of knowledge of drawing and designing might be desirable, but in addition, such students would be the better for some instruction in the nature of solders, construction of small furnaces, nature and properties of materials, the nature of glazes, etc. In each individual industry and school, therefore, after a start had been made, it would be kept clearly in view that such additional instruction should be provided as soon as it is found necessary or desirable.

11. Taking the subject of (a) in paragraph 7, there are undoubtedly many industries such as those mentioned in paragraph 5 in which the native workmen, etc., are at present groping in the dark and carrying out processes by purely rule of thumb methods, with, in some cases, undoubted deterioration of results. In the matter of the preparation of such things as lac, jute, tobacco, etc., for the market, it may be safely said that much remains to be learned as to the best procedure. Now improvements cannot be expected from the agencies mentioned in (c) and (b) of paragraph 7, and in such cases, unless the aid of original research is invoked,

the industries will stagnate. Hence such industries as those mentioned in paragraph 5 may have to be fostered and developed only after a certain amount of research has been done in them. It may probably be truly said in this age of industrial competition that to stand still is to steadily lose a position already gained when compared to other nations and other places, for the progress being made in almost all directions is phenomenal. Hence provision should be made as soon as possible for the class of workers required for (a) in paragraph 7.

12. Such persons would in my opinion have to be experts imported from Europe for a term of years, and their first duty on arrival would be to make themselves acquainted with the local conditions of the industry of which they have some expert knowledge. Having gained this, they would have to work at research at some central institution or institutions with a view of improving processes or of inventing new departures. Possibly for the investigation of natural products the research laboratories of the Reporter on Economic Products at the Imperial Museum would be the most suitable place, but for research on more or less manufacturing industries or those in which mechanical work is required, possibly a more appropriate site might be obtained in connection with the Sibpur Engineering College. Perhaps my meaning in this respect may be made clear by an example. If, for instance, improvements in the curing, storing, etc., of tobacco or hides are being investigated, probably the laboratory of the Reporter on Economic Products would be the best place for the work, but if the steeping of jute with the aid of machinery or if processes for the improvement of the local glazes for pottery had to be carried on, then probably the Sibpur Engineering College would be the best site for the work.

13. Such experts having been brought out from Europe and having added on local knowledge to their previous expert knowledge, could then perform other functions in addition to those of their researches, such as:—

- (a) The actual instruction of the master workmen in the trade schools in classes held from time to time;
- (b) The training of students to act as teachers in such subjects; and
- (c) They would also be the most appropriate inspectors of these trade schools.

The determination of the industries in which experts would have to be imported would have to be the subject of mature and separate consideration, and probably by experts—at all events by gentlemen who are better acquainted with the local industries than I am.

14. It remains to be considered in what form Government aid should be given to schools started with a trade instructor, as suggested in paragraph 9.

Government aid should certainly be given sufficient to cover the cost of the teaching required under (b) in paragraph 7; for it is undoubtedly the object of Government to improve and elevate the position of the various industries and provide such teaching as would be required for them.

In the case of the master workman under (a) in paragraph 7 and his pupils, three plans can be followed—

- (1) The master workman can be allowed to utilise the services of his pupils in his trade, and hence make a profit out of them. But as against this, the fathers of the pupils might say they are losing the service of their children while the master pupil is gaining the value of the pupils' services, and hence the tendency would be for the parent to remove his son from the school. This might perhaps be obviated by Government or the District Board giving a small stipend, say ₹2 or ₹3 a month, to the pupil for as long as he remained at the trade or craft school, and this possibly is the best form in which public aid can be given. The stipend would really go to the pupil's father to recompense him for the loss of his son's services.
- (2) Government would pay the fees, which would be small, of the students working in the trade schools for a certain period, a period sufficiently long to enable the pupil to learn his work.
- (3) Government would pay the master workman a salary, and provide materials and tools for work, disposing of the produce in the same way as is now done in the various technical schools working under the District Boards, and taking the profits or bearing the losses of the work. This, however, would, in my opinion, be a most unsatisfactory method of procedure.

I would hence advocate the payment by Government of any theoretical instruction required and of the small stipends required in (1) as being the most satisfactory plan on the whole, and the one involving Government in the smallest amount of liability and trouble. It is, however, probable that when the value of such instruction is understood, the necessity of paying stipends to the pupils may pass away.

15. Government would of course have to bear the whole expense of the work required under (a) of paragraph 7. No estimate can be given of the probable cost of the work until of course the industries to be selected have been decided on by Government. In the same way also no estimate of the cost of the trade schools working with a master workman or working with a master workman and one or more theoretical teachers can be given till Government decides in what industries and in what places such experimental schools shall be started. However, the cost of these latter arrangements should be small, and be limited possibly to say ₹2 a month for 20 boys in each school, and to a teacher on ₹20 or ₹30 a month in each such school where, for instance, drawing and designing are to be taught in an elementary fashion.

Each such school therefore should not cost Government more than R40 in the one case or R60 or R70 a month in the second.

16. In the first instance, therefore, Government would have to decide on the industries mentioned in paragraph 3 which are to be fostered and the places in which such attempts should be made, while the industries mentioned in paragraph 5 should also receive consideration by the appointment of experts who are required to investigate the best conditions under which the industry can be encouraged.

NORTH-WESTERN PROVINCES AND OUDH.

Proceedings of the Industrial Education Conference held in Government House, Allahabad, on the 20th December 1901.

Present :

HIS HONOUR SIR JAMES DIGGES LATOUCHE, K.C.S.I., *Lieutenant-Governor of the North-Western Provinces and Oudh, Presiding.*
 THE HON'BLE MR. IMPEY, I.C.S., *Chief Secretary to Government, North-Western Provinces.*
 MR. L. M. THORNTON, I.C.S., *Judicial Secretary to the Government of the North-Western Provinces and Oudh.*
 „ W. H. MORELAND, I.C.S., *Director of Land Records and Agriculture.*
 „ T. C. LEWIS, I.C.S., *Director of Public Instruction*
 „ W. N. BOUTFLOWER.
 LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C. }
 MR. C. A. RADICE, I.C.S. } *Members of the Committee.*
 „ R. E. ENTHOVEN, I.C.S. }
 REV. FOSS WESTCOTT, M.A.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction:

Q. (1), (3), (4), (6), (9), and (10) The information furnished by Mr. Lewis in answer to these questions will be found in the table on pages 30 and 31.

Q. (2) Was there any special reason for the selection of the present location?

A. MR. LEWIS said that the object of the Lucknow School was originally to train boys to go into the Railway Workshops there which are very large ones, and since then Wood-work, Iron-work, Dyeing, Glass-blowing, Tar-kashi, and clay-modelling have been added to the curriculum.

Q. (5) Why were the particular trades selected which are taught in the schools?

A. MR. LEWIS said that the Lucknow School was not started with the view to improving particular trades, but simply these trades were taken up partly because they were local industries, and in some cases because it was thought that they afforded an opening for students to make a good living out of them. The third reason was, as in the case of Tarkashi, that it might help to preserve a dying art.

Q. (7) How are the Superintendents and Instructors trained? Is there any regular training school or other source of supply?

A. MR. LEWIS said that Superintendents were not trained in the school itself, but they got as good men as they possibly could secure by the means at their disposal; originally, they had a man who had been trained in an engineering school and who had also been to other technical schools; but now, with more funds at their disposal for the purpose, they had a trained Mechanical Engineer from England, who had been a manager at Home and had also taught some science and art classes—drawing, etc.—there. Their object, therefore, was to get as good men as they possibly could with the means at their disposal. There was no regular training school, nor was there any other source of supply.

Q. (8) How are students selected, from what classes of the population? Are there any tests applied? Have you attracted the classes aimed at?

A. MR. LEWIS said that students were selected from all classes of the population: originally the schools were intended for the sons of artisans—for the sons of workmen in the railway workshops, but as they did not get as many of these as they wanted and there was a demand from outsiders, these were admitted on the payment of fees.

When questioned as to whether any tests were applied, Mr. Lewis said no; they tried, however, to prescribe an entrance qualification for elementary knowledge as far as reading, writing, and arithmetic were concerned, but they could not always get boys with this qualification as they were generally too poor to afford to go to schools, so they had often to take them without any education at all.

Q. (11) How are materials and tools provided? What is done with the work turned out?

A. MR. LEWIS said that Government provided the funds for the materials and tools, and the work turned out was sold as far as possible; last year the sales realised about ₹400 or a little under.

Q. (12) Are there any special methods of instruction employed; if so, have any of these shewed marked promising results?

A. MR. LEWIS stated that their object in Lucknow was to turn out as good work as they possibly could and the result had been that some of the boys had done so well that they were now earning a very fair livelihood.

On the whole the work turned out was very fair indeed. They had, however, sometimes considered whether they could not improve the work, as for instance the glass-blowing, by getting better material to work with. Their principle always had been to get the best and most capable man in each branch of industry and pay him to teach the lads to do the same work.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

A. MR. LEWIS said that the instruction was specialized for particular students, and that the methods used were partly English and partly Native.

Q. (14) What general education is given in addition to regular industrial training? (N. B.—Drawing is industrial). What is the test of the quality of the work turned out?

A. MR. LEWIS said that hitherto the students have had a certain amount of general education in the Vernacular and in English for a selected number, with the view of preparing them to go on to the Mechanical Apprentice Class at Roorkee, where the instruction given was entirely in English. They had to be taught English, else they could not possibly go to Roorkee.

His Honour thought that the language in which instruction was given was very important.

When questioned by Colonel Clibborn as to whether he would still continue to give artisans a general education, Mr. Lewis said that so far as he understood the matter, it was proposed not to give any general education in the school at all, but to have classes rather apart from the school in which anything that was necessary in the way of general education might be given to the students.

When asked as to whether any test was applied for the quality of the work turned out, Mr. Lewis replied that the school was inspected by the Principal of the Roorkee College, and that the work turned out was sold,—therefore there was the selling test. It was added by Mr. Lewis that complaints had been received of bad work.

Q. (15) Has any attempt been made to improve the quality of work in particular industries or the tools or machines? If so, please specify industries, and the improvements made.

A. MR. LEWIS said that, generally speaking, no effort had been made, except that referred to in answer to question 12.

Q. (16) Do you consider the present system the best, or can you suggest improvements?

A. MR. LEWIS did not consider the present system the best, but he was not prepared at the moment to offer any suggestions.

2.—Native system of Apprenticeship.

Q. (1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

A. The members thought that it was, in general, hereditary, natives taking on apprentices from the near members of their family.

Q. (2) Is one system or method common to all trades, or are there several different systems or methods?

A. MR. MORELAND said that he did not think there was any other system but the family system, mentioned before. He had come across some Trade Guilds.

Q. (3) Are there any special objections to or advantages in the Native system? Please specify.

A. MR. LEWIS said that the Native system of teaching had at least one special advantage, viz., thoroughness in the training. Take for example, when a boy is working under his father, he is made to work hard, and the father, as is only natural, keeps no secret from his son. There was also the advantage of the number under instruction being limited.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. It was thought by the majority of the members that the head man of the guild was naturally the best craftsman, but Mr. Moreland dissented from this view.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. MR. LEWIS' opinion was that the Native system was certainly better in method than the English, and that it would be possible to extend it in practice if the Natives saw that by adopting such a course they would increase their profits.

The members thought that there must be Trade Guilds amongst the natives, and Mr. Lewis and Mr. Moreland kindly undertook to investigate this matter.

MR. MORELAND thought that Native methods could certainly be influenced by outside expert suggestion and advice, but that to do this effectively depended entirely upon the personal qualities of the expert employed.

3.—Principal Industries of the Province.

Q. (1) Please state the principal industries of the province.

A. MR. MORELAND kindly undertook to send in a list in due course.

Q. (2) Which of the above would you recommend being specially supported or encouraged?

A. MR. MORELAND said that as far as he was concerned, he would strongly recommend the sugar refining as the principal industry which required support and assistance because it was suffering very much from competition. There were, he said, some cheap installations in Cawnpore which so far had been giving good results, but on the whole the competition in this industry was very keen and matters were beginning to look ominous. He was in favour of establishing season schools in this connection. He also recommended weaving and was in favour of the introduction of the fly-shuttle, and it was the general opinion of the members that the Serampore experiment might, with advantage, be carried out for the improvement of the industry locally.

HIS HONOUR added that any real improvement that would be introduced in the weaving industry would be of the highest importance to the country.

MR. MORELAND further recommended the Ghi industry, citing the big trade that was done in this commodity in Bundelkhand, and His Honour quite agreed with Mr. Moreland, further adding that there was a great increase of grazing in that district and already a promising trade with Bengal existed in this commodity, and therefore it should be encouraged in order that we might get a better and cleaner quality.

MR. MORELAND, when questioned, stated that no improved method had yet been worked out, but that Mr. Keventer was capable of carrying out the necessary investigations.

Q. (3) (This has already been dealt with.)

Q. (4) What are the reasons for other industries not requiring support?

A. The members stated that the other industries were too much scattered to be dealt with, and, further, they were of the opinion that it would not be advisable to take up too many industries at the commencement, but that they should wait and see the results which would follow, by taking up the industries above mentioned.

(d) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

MR. LEWIS said, in answer to Questions (1) and (2), that the Naples system was good if it could be adopted, but he had grave doubts as to whether it would prove a success in this country, seeing the many difficulties which this system naturally involves, that would first have to be got over.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. MR. LEWIS thought that provision should be made by Government for the advancement of specially promising students, limiting, of course, the number.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of Works?

A. MR. THORNTON thought that the managers of the large workshops could best answer this question.

MR. LEWIS stated that it should be partly theoretical and partly practical.

Q. (5) Do you think their training can be completed in a college or a school?

A. The general opinion was that it could not.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

A. MR. LEWIS was of opinion that a final training in a large workshop would be as practicable as it would be advantageous. He thought that neither fees nor scholarships were necessary as pay would be forthcoming; and His Honour was of opinion that such pay should be supplemented, if necessary, so as to keep the apprentice in good health and clothing, this help being given either by the shop or by Government.

MR. LEWIS quoted a case which occurred in England of a premium being remitted in the case of a pupil who wished to enter a workshop, having had a previous training.

Q. (7) Regarding this question His Honour suggested (ii) and (iii), accompanied with conditions.

2.—Proposed alterations and additions in schools and of the want of new schools.

Q. (1) No suggestions could be offered.

Q. (2) Would you approve of the institution of new schools or a new school in the province now or in the near future, and if so—

(i) In what locality, and are premises available?

(ii) For what trades?

(iii) Under what system and method?

(iv) How would you finance it? Are there any special funds available?

A. HIS HONOUR suggested the opening of a boarding and day school for European and Eurasian lads in Cawnpore. At present he did not know of any premises that were available, but thought that probably Government would give the land.

(ii) HIS HONOUR thought that in this connection it would be well if the lads had a commercial and general education, combined with technical training.

(iii) HIS HONOUR was of opinion that the Mills would be the best place for the practical training.

(iv) HIS HONOUR said that the Mills might volunteer to give financial assistance.

Q. (3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee? Are the local conditions likely to lead to success?

A. HIS HONOUR approved of Industrial Night Schools, and Mr. Lewis was of opinion that they could be made a success.

Q. (4) Should such night schools be under the General Education Department or the Industrial School management?

A. HIS HONOUR said that these schools should be under the management of the General Education Department, the other members agreeing.

Q. (5) Are you in favour of the establishment of training schools for Superintendents and Instructors, and do you propose to take steps in this direction at once?

A. HIS HONOUR said that if a training school for Superintendents and Instructors were established, it should be a central school for the whole of India.

Q. (6) Can the necessary instructors be provided in existing institutions?

A. It was thought that there would be some difficulty in obtaining those instructors but that it was sometimes possible to get men with special technical knowledge.

3.—How the Neapolitan scheme would apply.

Q. (1) Do you approve of the method of the Naples scheme generally?

A. MR. BOUTFLOWER thought that the method was sound enough.

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a superintendent?

A. MR. BOUTFLOWER said that difficulties were certain to be experienced in enforcing any form of control.

MR. THORNTON said that such difficulties had already been experienced in the course of making enquiries.

MR. LEWIS stated that the difficulties which Mr. Thornton referred to were that the craftsmen working in their own homes do not have to pay any extra rent for the workshop, so that it would be of no pecuniary advantage to them to work in any particular place, such as the Industrial School and, further, they would feel it rather irksome to have to go and work in any other place but their own homes.

Q. (3) Should such schools be in an enclosed private area or open freely to the public?

A. The general opinion was that they should be open freely to the public.

Q. (4) to (6) were retained for enquiry at Lucknow.

4.—Would you accept Experts from abroad in each Industry.

Q. (1) Generally speaking, would it be best to have a working expert, *i. e.*, a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and, if so, in what trades?

A. MR. MORELAND was of opinion that it was impossible to get a sound general expert, and that it was necessary to have specialized working experts.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

A. MR. THORNTON thought that there were not sufficient schools to warrant the employment of Provincial experts.

Q. (3) Not known.

Q. (4) For what trades at present do you consider specialized working experts are required in this Province?

A. MR. MORELAND said ghi, weaving, and sugar.

Q. (5) Can you define the status and qualifications required in these experts?

A. MR. MORELAND in reply said: The expert for ghi must have a thorough practical knowledge of dairy work and its chemistry; he could then very easily apply this knowledge to the making of ghi.

The manufacture of sugar, he said, was rather complicated: he must have a great deal of mechanical knowledge for the plant, and he must also have considerable knowledge of fermentation,—and that is a difficult branch of science.

As to weaving, he said he did not know enough on that subject to give an opinion.

Q. (6) How should the expert proceed to improve manipulation and practice?

A. MR. MORELAND said that the expert has first to see exactly how things are done in different parts of the Province, and then he must set to work to put up an experimental laboratory and this would, of course, take some time, before he began to give advice. During that period he should reside in the Province.

5.—*Proposed Department of Control, Central and Local, for Urban and Rural Schools.*

Q. (1) Apart from the superintendent in direct charge of the school, what system of local control do you think the best—

- (i) For rural schools?
- (ii) For urban schools?

A. HIS HONOUR thought that the District and Municipal Boards should provide the local control for both Rural and Urban Schools.

Q. (2) What should be the functions of the local control in each case?

A. MR. IMPEY was of opinion that they should get something more than inspecting functions.

HIS HONOUR recommended that they be given inspecting control in the first place, and if it proved satisfactory, financial control could be added later.

Q. (3) The local systems of control must, it is presumed, be focussed for the Province by some technical officer who will be generally responsible for executive administration and management. Who should this be?

A. MR. MORELAND was in favour of a Board of control, including the Director of Agriculture and the head of a Technical College.

HIS HONOUR was not in favour of Boards, and suggested the Principal of Roorkee College.

Q. (4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this department not having, as a general rule, any special technical qualifications?

A. HIS HONOUR said that it should be done if possible.

Q. (5) Is direct and special Imperial control of industrial education necessary for its efficient development?

A. MR. LEWIS was of opinion that direct and special Imperial control was necessary, at least to commence with.

HIS HONOUR was also in favour of the control being Imperial, which, he thought, would make things run more smoothly.

6.—*Exhibitions and Sales, whether required.*

Q. (1) Are exhibitions of any real value—

- (i) Local?
- (ii) Provincial?
- (iii) Imperial?

A. The general opinion was that exhibitions are of value, and Mr. Moreland added that he should prefer local exhibitions with provincial exhibits.

Q. (2) Can you suggest any conditions which would make exhibitions of value to the industrial progress of India?

A. MR. MORELAND said that side shows should not be allowed to obscure the primary object of the exhibitions.

Q. (3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus it may be—

- (i) scrapped;
- (ii) made to order only, private or by regular agent;
- (iii) sold through agents as produced;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan system;
- (v) sold in a regular school-room.

Should prices be marked or fixed at all?

A. MR. THORNTON said that it would depend upon the results of the application of the Neapolitan system. If this system were put in force, he should employ (iv), but if not, (v).

MR. MORELAND would prefer that they be sold through agents as produced.

MR. IMPEY said that prices should be fixed and revised.

Q. (4) Regarding industries generally in India, are you aware of any financial conditions which affect—

- (i) production,
- (ii) price;
- (iii) returns to workmen;

which could be removed by the reasonable action of Government?

A. MR. MORELAND was of opinion that the high rate of interest militated against the development of industries.

Q. (5) Can you say whether, generally speaking, the workmen get the best wages or profit return from—

- (i) expensive fine work?
- (ii) cheap common work?

A. HIS HONOUR said that it depended on the demand, but naturally high class work commanded better wages.

MR. LEWIS was of opinion that the cheap common work was the thing that paid workmen best.

(c) HOW ARE FUNDS TO BE PROVIDED.

Q. (1) Could the Provincial Funds provide the cost of starting the necessary schools? If not, how should the cost be divided between the Local Government and the Government of India?

A. HIS HONOUR said that it depended upon the Provincial contract.

Q. (2) Do you propose to find funds for the schools until they are self-supporting and, in addition, for the setting up in trade of pupils taught at the schools? How would you recover such advances if made, and in what period?

A. MR. THORNTON thought that it would be better for the pupils to serve a certain number of years till they had saved enough to start industry for themselves.

HIS HONOUR suggested that a fee might be given to those who wished to start a trade for taking on apprentices.

MR. MORELAND said it would be a good thing if pupils at the end of their course were provided with implements and tools on the easy purchase system.

Regarding advances, it was unanimously agreed that fees to craftsmen should be restricted to the case of pupils taken from those outside the caste.

Q. (3) Would you support the present position of workers in hand industries by a system of advances on the method of State loans to agriculturists, either—

(i) for the purchase of improved implements?

(ii) to free them from the exactions of the middlemen?

A. HIS HONOUR was in favour of giving them the implements of work on the easy purchase system.

Q. (4) Are you in favour of any scheme of industrial banks?

A. HIS HONOUR was in favour of the subject generally, but before starting these Banks he would wait and see the results of the experiments in connection with the Agricultural Banks.

B.—INTRODUCTION OF NEW INDUSTRIES.

Q. Name the industries to be introduced.

A. HIS HONOUR refrained from suggesting the introduction of any new industries as he thought there was quite enough in hand at the present moment to engage attention.

MR. MORELAND said that there was a scarcity at the present moment of artisans to manage small steam engines and to effect small repairs. There was also a want of Plumbing and Electric Light artisans, as also of Cycle and Typewriting mechanics.

No information was available for the rest of the questions.

This brought the proceedings to a close.

1	2	3	4	5	6
Name of School.	Date of foundation.	Industries taught.	Average attendance.	Out-put of artisans annually.	How is the school governed.
Industrial School, Lucknow.	1st November 1892 .	Carpentry, Iron-work, Glass-colouring, Clay modelling, Dyeing, Drawing, Mathematics, English, and Vernacular.	100 during the last quarter ending 31st December 1901.	The output of Artisans up to the present date has been about three or four and four boys have taken up posts as Drawing Masters.	By a Committee consisting of (1) the Director of Public Instruction, North-Western Provinces and Oudh, (2) the Inspector of Schools, II Circle, (3) the Superintending Engineer, Oudh Circle, (4) the Locomotive and Carriage Superintendent, Oudh and Rohilkhand Railway, and (5) the Principal, Roorkee College.
Industrial Orphanage, Cawnpore.	The Orphanage in 1890 the Workshops in November 1899.	Wood-work, Iron-work, and painting.	Thirty-five students and six trained workmen teachers.	.....	The Methodist Mission Authorities, and is under the immediate charge of the Superintending Missionary who has had years of practical training in this form of work in America.
S. P. G. Girls' Orphanage Industrial School, Cawnpore.	April 1900.	Shoe-making and knitting by machinery.	20	.....	The School is not separated from the orphanage, so the girls are under the ordinary Orphanage Government.
Industrial School, Mirzapore.	November 1900	Carpentry . . . .	.....	.....	.....
Reformatory School, Bareilly.	1st April 1889 . .	Cane work, Tailoring, shoe-making, Carpenter's and Blacksmith's work, Gardening and Farming, Cloth weaving, Potter's work, Barber's work, Dhobi's work.	245.15 during the year 1900.	.....	From the month of February 1901, the control of the School has been transferred to the Director of Public Instruction and is under the immediate control of the Superintendent, and the Committee of visitors, as required by the Reformatory Schools Act, VIII of 1897. Previous to this the institution was under the Jail Department.
Boys' Orphanage and Industrial School, Shahjahanpur.	About 1865	Carpentry, Blacksmith's work, Weaving, Rope or ban making, Shoe-making, Gardening and Field Cultivation, Tailoring of Hindustani clothes, Dairying with modern appliances, Bearer's work, and also, to a limited extent, Bread-making.	From 30 to 40. At present about 30.	.....	In each Department there is a foreman, with a general manager.
Sardhana Orphanage	Not known. Of the Industries taught some were started and some improved in 1900-01.	Tailoring, Shoe-making, Carpentry, Smith's work, Tinkering, Masonry, Cookery, Bearer's work, Woodcutting and sawing, Farming, Horticulture, Laundry work, Waterman's work.		.....	By the Director and his Assistants, and by a mistri for each Industry.
Mission Industrial School, Saharanpur.	1848	Carpentry, Shoe-making, Gardening, and Blacksmith's work.	53	.....	By different managers.
Vaish Orphanage, Meerut.	1st September 1900 .	Carpentry, Tailoring, and Drawing.	22	.....	By a Committee consisting of an Honorary Secretary, Honorary Manager, 20 Executive Members, and a paid Superintendent.

TRIAL SCHOOLS.

7	8	9	10	11
Is the School self-supporting; if not, what is the average annual nett cost.	How are Superintendents selected and what are their qualifications, duties and pay.	Rules regarding age, fees, Scholarships, period of training, test of final qualifications, character, and discipline.	What proportion of students follow the trades they are taught in the School.	REMARKS.
The School is supported by the Government out of the Provincial funds, and the average annual cost is about £11,000 at present.	.....	Thirty-six Scholarships to the value of £88 on the whole per month are sanctioned by Government for the students of this School.	Not more than two per cent.	
Not self supporting. Cost about £200 per month.	The Superintendent is appointed by the Bishop in charge of the Methodist Episcopal Church in India. Usually a man fitted by experience is appointed to the post. No separate salary is given. His duty is to make the shops succeed. The Missionary has his usual salary.	Boys 10 or 12 years old are preferred. No fees are exacted, for the boy is supposed to earn his way, the training extends over a period of five years, the test of final qualification is ability to fully and properly do the work of the Department. No boy of bad character is permanently retained and every boy is required to produce valuable and remunerative articles.	.....
Self-supporting	The School with the rest of the Orphanage is under the charge of the Lady Superintendent appointed by the Committee at Home, but the work is superintended by two Mistris sent by the two Factories which supply the work and for whom the work is done. The Mistris' duty and pay are therefore regulated by the managers of the Factories.	The age for beginning work is 15. No fees are paid and there are no Scholarships. The work has not been going on long enough to admit of an answer to queries respecting period of training and test of final qualifications. Character and discipline in no wise differ from those maintained in the orphanage generally.	.....
.....	.....	.....	.....	The School is a new one and is in its experimental stage. A number of School boys learn carpentry under the Drawing Master, a Graduate of the Mayo School of Art, Lahore, and other carpenters before and after School hours.
Not self-supporting. The average annual nett cost from 1889 to 1900 was £9,115-4-7.	Hitherto the Superintendent of the Central Jail, Bareilly, used to hold charge of this Institution, but since its transfer to the Education Department, Mr. G. H. Smith, the Latin Professor of the Rangoon College, Burma, has been appointed as Superintendent on a salary of £300 to £350. The management of the School Factories, etc., is under his charge.	This is a School for reception of juvenile offenders. Neither any fees are charged, nor are any scholarships given. Boys of good conduct, according to the marks gained, get a gratuity of two annas, one anna, and six pies per week, respectively. Neither is there any fixed period of training, nor test of final qualifications; this depends upon their term of sentence. As a rule the boys are not sent to this School before they have completed their ninth or after they have completed their 14th year of age. This Institution is guided by the Reformatory Schools Act, VIII of 1897, and other rules framed by Government.	1898-1900, 51 boys out of 166 follow the trades taught:— Proportion . 30-72 1897-1899, 37 boys out of 129 follow trades taught:— Proportion . 28-68 1896-98, 33 boys out of 109 follow trades taught:— Proportion . 30-27	
Not quite self-supporting. Putting the aggregate output as £3,100, the aggregate expenditure is about £3,500.	The Superintendent or Missionary is appointed annually by the authorities of the Methodist Episcopal Church. All the others are under his control.	No general rules are observed: boys come and go at all ages.	The Manager states we can very well trace our boys after they leave us. We know of several who are doing well at their trades learnt while with us. We know of several, however, who after leaving us have been engaged in other kinds of Mission work.	
Not self-supporting. It costs about £10,000 a year.	The Superintendents and Assistants are priests selected by the Archbishop of Agra. They get no pay.	Age unlimited, fees and Scholarship nothing, scholars are trained till they become self supporting. Certificates are delivered when necessity demands.	The greater part of the students follow the trades they learn.	
Not self-supporting. Annual cost £13,200.	Trained men who are generally Europeans are selected to be Superintendents. Their salaries vary from £50 to £100 according to qualifications. Their chief duty is to guide and instruct the workers.	No special rules regarding age, fees, and scholarships. Boys remain in shoe shop for a period varying from two to three years, and in the Carpenter's and Blacksmith's shop from three to four years. No special examination. Boys generally come recommended by some Missionary.	Nearly all the students follow the trade they are taught in the School.	
Not self-supporting. Cost £250.	The Superintendent is selected by the Committee. He gets £20 per mensem. One carpenter £16 and others at £12, one tailor at £4, one Drawing Teacher at £10. Each has a good knowledge of his work. The Superintendent has to manage and supervise the orphans.	Eight years. No fees and Scholarships. No period of training is fixed. No final examination has been held up to this time.	.....

NOTE ON THE ALLAHABAD GOVERNMENT PRESS.

BY MR. F. LUKEE, SUPERINTENDENT.

The following remarks on the question of technical instruction may be of use to your Committee. They refer only to printing and allied trades in the Government Press, Allahabad.

Trades carried on at the Government Press :—Composing (English, Urdu, and Hindi). Presswork, Machine Printing, Type-casting, Stereotyping, Engraving (wood, brass, and steel), Lithography (Writing, Drawing, Press-work, Colouring), Bookbinding (including the manufacture of envelopes and file boards), Die-stamping.

Present method of training.—Composing Department.—The Composing Department is recruited either (1) by promotion given to lads who have learnt distributing or (2) by engaging trained compositors. Candidates for employment as English distributors are only taken if they can read English print fairly well. As a rule no pay is given until they have learnt how to distribute type properly and have a knowledge of the various descriptions of type used. The period of training in the distributing department varies from six to twelve months. No boy is promoted to case-work unless he can read plain manuscript well. Having passed this simple test the lad is put to work as an assistant to a compositor, and from him he learns the correct—very often the incorrect—methods of type-setting, whether it be solid composition or the more intricate table work. Of original display work—*viz.*, the selection of suitable founts for special work requiring the use of various sizes of type, (title pages for instance)—the ordinary Indian compositor may be said to know absolutely nothing, and it is a hopeless task to attempt to teach this, admittedly one of the most important and also one of the most difficult branches of the compositor's trade, to men who, with few exceptions, have no inherent taste for designing, and who do not possess sufficient intelligence to understand the most elementary principles of display. Such work, when required in the Government Press, has to be done under instructions given by myself or by my assistant. The Urdu and Hindi Sections are similarly recruited from the distributing department.

Machining and Presswork Department.—Machining.—Most of the men at present in charge of printing machines have been engaged as "feeders" or layers on, and have picked up whatever knowledge they possess of *making ready* from occasional instruction given by myself or by senior machine-men. They have practically no mechanical knowledge, and as they are mostly illiterate they cannot be expected to learn to do satisfactory work.

Pressmen.—These are appointed usually on promotion from the staff of inkmen and fly-boys—both of which have facilities for learning pressmen's duties. Generally speaking, they are not intelligent workmen, instruction imparted one day being either forgotten or unheeded on the morrow. The work is too hard to attract a better class of men.

Binding Department.—There is no difficulty in obtaining men of the right stamp in this department. Binders and forwarders are usually promoted to these posts from sewers and folders. The finishing department is a small one and seldom requires augmentation; when it does, the finishers are permitted to nominate learners.

Type-casting.—Type-casters and stereotypers are appointed by promotion from typerubbers and cleaners. The work turned out is of very fair quality, but constant supervision is required to ensure this. The men employed understand electro-typing, and I have been able to make complete founts of matrices from English patterns.

Before discussing the method that should be adopted to obtain better all round work, the question arises, is Government prepared to pay higher rates for superior work, and also the initial cost of training the men. Presuming that it is, the best course to be followed to obtain competent journeymen would be to obtain the services of English trained foremen to impart instruction in the most important branches of the trade to apprentices.

Teaching staff necessary.—As an experimental measure I would suggest the employment of an English compositor and an experienced machineman for a term of three years on salaries of Rs250 per month, and a small bonus for each pupil passing a final examination satisfactorily at the end of their apprenticeship. The duties of the teaching staff would be strictly confined to training apprentices in their respective departments, the course of studies (theoretical and practical) to be followed being prescribed by myself.

Apprentices.—In England apprentices are usually indentured between the ages of thirteen and fifteen, the term of the apprenticeship being seven years. The conditions prevailing in India are of course different, and it would be necessary to accept candidates up to seventeen years of age to obtain lads with sufficient educational attainments. For the first three years it would, in my opinion, be advisable to limit the number of apprentices as follows :—Compositors 25; Press and machinemen 15, at the end of which term the question of the advisability of continuing or modifying the system could be considered in the light of results already obtained.

Salaries of apprentices.—Apprentices should be remunerated as follows :—

First year Rs5 per month.

Second year Rs10 per month.

Third year Rs15 per month.

For many years to come Government could find remunerative employment for trained journeymen in the local press—remunerative to Government as well as to the men—for there is no disputing the fact that a properly trained compositor or machine-minder can do infinitely better work and in much less time than one who has never had the advantage of a practical training.

The best training ground for a printer's apprentice is undoubtedly a printing office: the success of any alternative arrangement would, in my opinion, be very problematical.

Proceedings of the Industrial Education Conference held in the
Collector's House, Cawnpore, on the 24th December 1901.

Present :

LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C., *President.*

MR. J. MACCALLUM WRIGHT, I.C.S.

„ W. E. COOPER, C.I.E. (*Cooper, Allen and Co.*).

THE HON'BLE MR. A. MCROBERT (*Cawnpore Woollen Mills Co.*).

MAJOR WALKER, R.A. (*Government Harness Factory*).

MR. C. PARRY, M.C.E.

„ H. LEDGARD (*Cooper, Allen and Co.*).

„ C. W. DAWSON (*Allen Bros. and Co.*).

„ A. G. NEWCOMEN (*Cooper Allen and Co.*).

„ S. GAVIN JONES (*Empire Engineering Co.*).

„ A. BEER, *Merchant.*

LALLA MUL CHAND, *Mill Proprietor.*

MR. D. W. KARMAKAR, *Engineer (East Indian Foundry).*

„ C. A. RADICE, I.C.S.

„ R. E. ENTHOVEN, I.C.S. } *Members of the Committee.*

REV. FOSS WESTCOTT, M.A.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

(1) *Native System of Apprenticeship.*

Q. (1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

A. MR. GAVIN JONES and LALLA MUL CHAND said that the training was not altogether a business matter but that it acquired in nearly every case a religious aspect,—the father not teaching the son himself but sending him to an *ustād* as an apprentice. No bond existed between them, and there were no fees paid; but as the boy's work became of value he was remunerated for it. He could leave at any time.

Q. (2) Is one system or method common to all trades, or are there several different systems or methods?

A. LALLA MUL CHAND said that there was only one system, *viz.* that referred to above.

Q. (3) Are there any special objections to or advantages in the Native system? Please specify.

A. MR. COOPER, speaking for the leather industry, was not in favour of the Native system of training; he said that they (Cooper, Allen and Co.) employed a large number of so-called skilled workmen—they were skilled in a way, but absolutely short of the European standard of excellence—so they had to become schoolmasters and make craftsmen for themselves. In this then, he thought, the Native system of turning out skilled workmen had unquestionably failed; he therefore recommended the adoption of a perfectly different system of training if it was desirable to fill the workshops with really efficient men.

The majority of the Committee quite agreed with Mr. Cooper's views and desired that modern and up-to-date ideas might be adopted as soon as possible, leaving the Native system of training severely alone, as, added Mr. Ledgard, it was better and easier to take in an entirely ignorant man and train him than it was to undo the results of a faulty system.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. MR. GAVIN JONES said that he would go to his own workmen in the same trade and ascertain from them; they would certainly know the best workman.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. MR. COOPER and MR. LEDGARD said that an apprentice working by the side of a man is much better than if he were working by himself under a teacher.

MR. COOPER added that in the workshops of Cooper, Allen and Co., they had apprentices whom they made over to skilled workmen to be shown the trade, whilst they were learning they received an allowance of Rs 5 or Rs 6 a month; on the other hand the workmen had the benefit of the apprentice's help which they thought was quite good enough inducement for imparting their knowledge to these beginners. When they were competent they were of course removed and put on to regular work.

MR. NEWCOMEN said that if it were left to the pleasure of these Native craftsmen they would rather not employ any apprentices in their own department, as it was the nature of skilled workmen to be averse from imparting their knowledge to others and thus reducing their own chances of earning high wages, so they (Cooper, Allen and Co.) had to find these apprentices themselves and put them in the workshops and pay them whilst under instruction.

When asked as to whether the Native system of apprenticeship could be extended in practice, Mr. Gavin Jones was of opinion that it would be somewhat difficult, as there being such a limited number of really good men they would be unwilling to bind themselves down to anything, unless tempted by very high wages.

LALLA MUL CHAND said that the Native craftsman would never accept outside advice, suggestion, or interference.

Q. (7) Will the craftsmen take in apprentices of all classes or only of their own class?

A. MR. GAVIN JONES said that they would only take in apprentices of their own caste.

MR. LEDGARD was of opinion that pressure of work would induce them to take in apprentices of any caste.

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

A. MR. GAVIN JONES said constant, steady work.

MR. COOPER was not of opinion that constant, steady work with high wages would induce craftsmen to extend their work; on the contrary, as was the case in England with the Miners, it would only tend to idleness; the men would, being assured of a constant supply of work, with high wages at the back of it, simply work just a sufficient number of days to earn a sufficient sum of money to live comfortably. And, further, he was of opinion, with Mr. McRobert, that they would even leave a permanent employment for a temporary one if offered higher or daily as compared with monthly wages.

Q. (10 and 11) *Re Trade Guilds.*

A. MR. COOPER and LALLA MUL CHAND were of opinion that there were no Trade Guilds.

3.—Principal Industries of the Province.

Q. (2) Which would you recommend being specially supported or encouraged?

A. MR. McROBERT strongly recommended glass-blowing, giving an instance of the glass works at Achalda near Etawah, which had made several attempts, but had hopelessly failed. There was, he said, a big demand for medicine phials, etc., and he did not see why, when they could be made out here, they should have to be imported.

MR. DAWSON recommended the match industry, and

MR. COOPER the paper industry, but

LALLA MUL CHAND was of opinion that persons who had once used the machine-made paper would never revert to the hand-made article.

MR. LEDGARD suggested cotton printing.

MR. NEWCOMEN recommended blacksmith's work as he said there was a great demand, almost double the number at present available could be employed.

MR. KARMAKAR was of the same opinion.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

Q. (2) If you do not approve the school system, how do you propose to provide a training for artisans in the future?

A. MR. McROBERT remarked that if trade was flourishing he would take in artisans for training in his factory, but he was not prepared to allow them to accept positions elsewhere after their training had been completed.

Q. (4), (5), and (6)

A. MR. COOPER said had he the means he would erect a well equipped College regardless of cost for the purpose of turning out expert Foremen; it was not that they so much wanted Foremen, but rather Under Overseers, as they could import expert foremen from England and put them in charge of the various departments.

MAJOR WALKER, however, did not quite agree with Mr. Cooper's views and pointed out that their own workshops were quite sufficient training colleges for these men. He was of opinion that if a manager saw that a boy had inclination and intellect, he was sure that that manager would take a certain amount of interest in the lad and afford him every facility of picking up the work, as it would pay him to do so. He was also in favour of giving foremen theoretical training together with practical training, and was inclined to think that they would pick up the former whilst under apprenticeship.

A. MR. COOPER, whilst admitting Major Walker's experience, was of opinion that to apprentice a lad in a workshop under an expert overseer was the very worst thing in the world, for, as far as his experience went, the expert overseer would not teach a man under any circumstances,—he would impart very little practical knowledge and certainly nothing of theory. He therefore suggested that if we wanted to have greater facilities and meet the demand that was constantly arising, we should have to adopt other methods of *local training*.

Q. (5) Do you think their training can be completed in a college or school?

A. MR. McROBERT said that you could no more complete a man's training in a college or school than you could fit a man out for the world from Oxford or any other University;

his training is only completed when he is out in the world. All that they could reasonably expect the schools to do, however, would be to *fit* him for the work.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

A. MR. NEWCOMEN did not think that firms would undertake to complete a man's training; they might take a man on from a technical college, pay him a wage, and let him pick up what he could for himself, utilizing, of course, his services for their own benefit.

MR. COOPER thought that as the State was so much interested in the education of the man it should bear a part of the expense in the training of him in the workshop, paying the firm a certain fee. This procedure, he thought, would induce firms to give a man a complete training. He was not in favour of giving a scholarship, but was rather inclined to let the boy rely on his own exertions.

MR. McROBERT when asked if he agreed with Mr. Cooper, said that we could not speak of training of Managers or Foremen or Assistant Managers in the same way as we would of the training of workmen, and if we were to draft our supply of men who were to become Foremen and Assistant Managers from a college, he did not think we would need to have a lien on them, because if they were good enough we ought to be able to retain their services in spite of any temptations from elsewhere; if they were good enough we ought to be able to pay them as good a salary as anybody else.

MR. COOPER modified his views and was in accord with Mr. McRobert.

New Schools.

MR. LEDGARD suggested the opening up of a workshop for blacksmiths, where boys could be set to learn Turning, Forging, Drilling, etc., so that they could find employment readily. He was also in favour of Shorthand and Typewriting.

MR. McROBERT agreed with Mr. Ledgard and said that what a man would pick up working in a factory by the side of an expert in a week or ten days, he would take a month to learn in a school. As to what system or method should be adopted, Mr. McRobert said that Government should give the lads a preliminary training and nothing beyond that: something after the fashion of the Kindergarten system, *i. e.*, the acquiring of a deftness of their fingers so that they would come with some practical knowledge to the workshops to complete their training.

MAJOR WALKER, when questioned as to what should be the preliminary training for the leather (tanning) trade, said that no such training would be of any advantage to the student. The tanning of leather being so very complicated in its method, he must have a high technical knowledge of the business. He, however, agreed with Mr. Ledgard (and Mr. Cooper also agreed) that there was a large field for preliminary training in iron-work.

MR. GAVIN JONES suggested the opening of a school where boys could be taught reading, writing, arithmetic, and practical geometry, applying their knowledge of the latter subject to the several trades. Higher education, he thought, was not necessary, and as for the hand manipulation recommended by Mr. McRobert, this they could acquire in the workshops.

Night Schools.

The members generally were of the opinion that the establishing of night schools for artisans would not meet with success, especially with the native class, although they thought that it was one of the best means of training them. In order to get them to attend, Mr. Gavin Jones said, bribes would have to be resorted to; and Mr. Newcomen was of opinion that they would not go there even if they were paid. Mr. Ledgard asserted that the only instance in which these night schools would be at all successful would be in connection with the "model villages" they proposed to erect where a large number of workmen would live together some of whom might possibly be induced to join the school if they were led to believe that these schools were supported by their employers.

MR. KARMAKAR said that he knew of a large number of men in Cawnpore who, having somehow heard that Night Schools were going to be opened in the place, expressed their desire to join them and were asking why they had not as yet been opened.

MR. COOPER said that mistries (native head workmen) and their sons might very likely join these schools, and urged that they be given a chance, although the attendance at first might not be very large.

Neapolitan Scheme.

MR. COOPER said that, presuming Government started a school on the Neapolitan system, they should look upon it exactly in the same way as they do their factories, that is to say, buy their raw materials in the best markets and sell them in the best markets. Government should regulate their prices by existing market rates. All these questions should be dealt with on commercial principles.

MR. McROBERT said that the object of the Government should always be to train workmen or any other class, for the good of the country, as it was the object of employers to train men for the benefit of themselves.

Experts.

The general opinion was that you could not get a general expert and that you could not get a good man under Rs. 350, with house and travelling allowance, *plus* pension. A Weaving Expert would expect more, although Mr. McRobert seemed to think that an expert weaver could be secured for Rs. 350. A Tanning Expert would have to be paid from Rs. 500 to Rs. 700.

Q. (4)

A. MAJOR WALKER said Dyeing.

MR. McROBERT: Glass-blowing.

MR. DAWSON was of opinion that an expert in Dyeing could be more easily obtained than in any other trade.

Q. (5)

A. MR. McROBERT said regarding Dyeing he would stipulate for a man having a theoretical knowledge of the chemistry of the subject and a practical knowledge of Dyeing.

MAJOR WALKER added that he should hold a diploma of the Yorkshire College, Leeds.

Q. (6)

A. MR. McROBERT said he should practise Dyeing and show the pupils how he worked.

Exhibitions.

Q. (1)

A. MR. LEDGARD was of opinion that Exhibitions encouraged trade, but did not impart much instruction.

Q. (2)

A. MR. COOPER said that these Exhibitions hitherto have not resulted in very much good because they have not been persistently made use of. He thought that if Local Exhibitions were to become a matter of constant recurrence and the various productions of the country, Native and European, brought persistently before the public, great good would result therefrom. Nobody hitherto had taken much interest in them and he was strongly of opinion that if support were extended in this direction, it would result in time in much good to industries and the country generally.

Q. (4)

A. MR. COOPER said that the Forest Department should pay more attention to the economical use of the products of the forests.

MR. LEDGARD said indebtedness or absence of necessary capital.

NEW INDUSTRIES.

Q. (1)

A. MR. COOPER and MR. NEWCOMEN suggested House-decorating and Furniture-making.

MR. McROBERT suggested Plumbing, Electric Lighting, and Tinsmith's work.

MR. KARMAKAR suggested Enamelling.

MR. LEDGARD suggested the Tin Plate industry.

MR. NEWCOMEN and MAJOR WALKER suggested the manufacture of Fish Oil, a crying need in the Tanning industry.

DISCUSSION ON THE PROPOSED EUROPEAN SCHOOL IN CAWNPORE.

MR. COOPER: All I can say is that we have read this paper and heard your speech; personally, I think the scheme is workable and practical, provided it be run on proper lines. I shall personally give it my own support in every way, my moral support, and, if necessary, my material support. When I say this, I am sure I am speaking on behalf of my two partners here present, and I think they will endorse all I say.

MR. McROBERT: There is no doubt that a very fair number of boys of European and Eurasian parentage may be provided for in such a school as this, and I think there is bound to be an opening for them in course of time.

MAJOR WALKER and MR. LEDGARD quite agreed with Mr. Cooper.

COL. CLIBBORN then asked whether there was any likelihood of the school receiving pecuniary support.

MR. McROBERT said that if trade was good it would no doubt receive pecuniary help.

MAJOR WALKER also thought the same.

Two sites were suggested for the school, but no conclusion was arrived at.

N.B.—A satisfactory site has since been selected.

NOTE ON THE CAWNPORE CONFERENCE.

At the Cawnpore Conference to-day, Mr. Ledgard, Army Boot Factory, stated he preferred to work raw material up into trained men for the trade in preference to retraining Native trained workmen, presumably because, as is well known, it is easier to instil good habits than to eradicate bad ones. The mistri (a sub-foreman), rises by natural intelligence from this class.

Mr. McROBERT (Woollen Mills) has since informed me that he prefers to start with a man trained as a mechanic if he can get him, and thinks this is better material than a raw hand. When discussing the matter he agreed with me that a man specially prepared in the elements of the trade he is to follow would be better material still, particularly if this man is to have a chance of rising to be a mistri.

Mr. LEDGARD this afternoon said, on the whole he would prefer to take on men trained in a Government Industrial School to the raw material. He also said he believed European foremen could be trained satisfactorily in this country.

Cawnpore, 24th December 1901.

J. CLIBBORN.

NOTE ON THE PAY OF EXPERTS.

Mr. DAWSON says Rs250 is the proper pay; his experience leads him to the opinion that the same men apply whether you offer Rs250 or Rs400. Special experts will of course have to be specially paid.

Mr. McROBERT says if you offer more than the working expert expects you get the wrong man; Rs250 is the fair average pay and will attract the proper man.

Mr. McROBERT AND Mr. DAWSON both say that the Moonj Matting Industry is a growing one for export, and that Jail trained hands are eagerly looked for by outside local manufacturers.

Mr. McROBERT says he has tried the Native Contractor System of supply of labour (the same as that adopted by the Amritsar Carpet Manufacturers) and the result was the workers were miserably paid.

Mr. McROBERT says he has proposed a model village for his workmen; that his ideas are not yet definite, but he at present believes he can work in a primary school on the Kindergarten system with this village.

Mr. DAWSON says the high prices paid by the Cawnpore manufacturers cause the men to idle.

Mr. McROBERT says this is due to scarcity of workmen and competition. This principle also leads to workmen being disinclined to teach others and calls for an increased supply of labour. Mr. McRobert adds that the high wages compared with those for agricultural labour lead to idleness and so there is no general desire on the part of the workmen to improve their position.

Site—Mr. McRobert recommends the site proposed by the Rev. Foss Westcott. (See note on European Industrial School.)

24th December 1901.

J. CLIBBORN.

NOTE ON WAGES IN CAWNPORE.

It appears that the wage paid daily has a strong attraction for workmen in Cawnpore; they prefer this to even higher monthly pay. Curiously enough if two Mills compete for men—one with long hours and higher pay, and the other with regular short hours, lower pay, and overtime (paid for)—the men prefer the first, even, apparently, when the overtime is regular enough to give them more in the month. An hour or so in the middle of the day for "lazing" is much appreciated; even more than short hours. In many places in Cawnpore there are no holidays (except Sundays), one or two days for the "Holi," and one each for "Diwali" and "Dassera;" even Christmas Day is not observed as a holiday.

25th December 1901.

J. CLIBBORN.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

By MR. P. H. SWINCHATT, HEAD MASTER, LUCKNOW INDUSTRIAL SCHOOL.

Native System of Apprenticeship.

Q. (1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

A. By taking apprentices who are not "bound" to serve a stated number of years.

Q. (2) Is one system or method common to all trades, or are there several different systems or methods?

A. One system for all trades.

Q. (3) Are there any special objections to or advantages in the Native system? Please specify.

A. The objection is that the boys who give the most presents to the artisan are generally looked after better.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. By the manner in which he handles his tools and also the quantity of work he turns out of good quality per day.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. I have not spent sufficient time among the workers to have a definite opinion as to the manner of training their apprentices, but I take it, that with their methods they do make workmen of a sort. As regards the methods in force at the Industrial School, Lucknow, and others if they have been worked on the same lines, they teach the boys the use of different tools, but it is impossible for the boys to learn the trade. In fact I may say only three or four boys have left the school to do artisan's work.

Q. (6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education?

A. Small presents of sweets are given when the boys commence to learn the trade, and also at different festivals during the year. The boy, when he is able to do saleable work, is paid a pice or two daily and as he improves this is increased.

Q. (7) Will the craftsmen take in apprentices of all classes or only of their own class?

A. All trades, with the exception of the gold and gold wire workers, who only take in their own relations, take any boys.

Proposed alterations and additions in system and methods.

Q. (1) Do you approve of the existing methods of schools, or would you propose any other methods of training in the existing schools?

A. I do not approve of the methods in force at the Industrial School, Lucknow, as a sample of what schools should be. If schools are to do any good they must devote the whole of their time to practical work and make work to be sold.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. Yes.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of works?

A. By giving them a fair education up to say eleven or twelve years and afterwards train them in a factory. There should, however, be facilities for them for learning the theoretical parts of the trade in their spare time at a night school.

Q. (5) Do you think their training can be completed in a college or a school?

A. No. Most decidedly no.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

A. Yes, this would be very useful if the ideas of the man have not wandered and been changed by too much theoretical education.

Night Schools.

Q. (3) Do you approve of night schools?

A. Yes.

How the Neapolitan Scheme would apply.

Q. (1) Do you approve of the method of the Naples scheme generally?

A. Yes.

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a superintendent?

A. Yes, by financing them.

Q. (3) Should such schools be in an enclosed private area or open freely to the public?

A. Schools should be on a busy public thoroughfare.

Q. (4) What special inducements should be offered to craftsmen to co-operate?

A. Employ them as workmen to begin with at piece work rates.

Q. (5) How would you suggest dealing with the following detail points—

- (i) Supply of materials;
- (ii) Waste of materials;
- (iii) Sale of work made;
- (iv) Exhibition of work made;
- (v) Support of impecunious apprentices while unable to do remunerative work;
- (vi) Divisions of profits (when apprentice becomes more or less expert) between the school, the craftsman, and the apprentice;
- (vii) Holidays including Sundays;

A. "On business lines."

A. Leave it to the men, as they will have their own shops.

(viii) Discipline of apprentices;

(ix) Fees?

A. No fees.

Q. (6) Would you attempt to improve the craftsman's practice of work, and how?

A. Yes, by showing him how to do the work quicker and with a better finish, by having well designed though simple and not costly tools.

3.—Would you accept experts from abroad in each industry.

Q. (4) For what trades at present do you consider specialized working experts are required in this Province?

A. I have seen very little of the trades of the Province, but in metal working and cabinet work there is ample scope for improved methods.

Q. (6) How should the expert proceed to improve manipulation and practice?

A. By first getting a good insight into all the native methods and afterwards giving useful hints as to alterations and methods of working with tools and dividing up work so as to get a maximum output.

5.—Exhibitions and sales, whether required.

Q. (3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus it may be—

A. Yes.

(i) Scrapped;

(ii) Made to order only, private or by regular agent;

(iii) Sold through agents as produced;

(iv) Sold directly by the producer as in the case of schools on the Neapolitan system;

(v) Sold in a regular school sale-room.

A. Made to order and if work is scarce make up saleable stuff for stock.

Should prices be marked or fixed at all?

A. Prices should be fixed but not marked.

MEMORANDUM ON THE IMPROVEMENT OF INDUSTRIES.

BY MR. SIVA PRASAD, DEPUTY COLLECTOR, LUCKNOW.

Before going into further details I may state at the very outset that as far as my experience goes—and I can say this with confidence of all the districts in Oudh and the Benares division—there is no legal apprenticeship for learning a trade here, no premium is ever paid, and there are no regular "ustāds" whose sole business is to take "shāgirds" and instruct them for a certain term on remuneration, or who always have such "shāgirds" learning from them. As a general rule a boy always learns the trade of his caste or at any rate that of his father or other relations. A "joluha" will always teach weaving to his son unless he himself has some other trade, for instance embroidery or *chikan* making, when the son will always be taught the same. Again, as a general rule, a boy always learns from his father, uncle, relations, or a friend of the same caste, and seldom, if ever, goes to a stranger. Villagers never go to cities, to say nothing of other districts, to learn a trade. It often does happen, however, that when a man has learnt his trade at home, and is an exceptionally intelligent man, he goes to the city near his village and works at some big shop as an ordinary paid workman till he becomes an expert and collects some money to establish himself as an independent and recognised artisan. There are exceptions also to the other broad rules set up above as will be seen from the short notes I give below about different handicrafts. I will begin with Benares trades first of which I have more personal knowledge than those of Lucknow.

1. *Benarasi Cloth*.—The manufacturers take apprentices—boys and adults both—who are taught the art. They are paid wages according to their capabilities. Sometimes the payment is nominal, say, a few annas a month, with midday *chabena* or food. The apprentices do not have to pay anything. There is no engagement of any sort between the manufacturer and the apprentices. There is no fixed term of apprenticeship. The wages are gradually increased according as the apprentice makes progress in picking up his trade; it rises to Rs. 15 a month and over. If he is not satisfied he goes, not infrequently to another manufacturer where he can get better wages. Apprentices of all castes and creeds (except the very low castes) are taken. In other words the would-be "shāgird" does go to strangers in this trade and does not confine himself to relations or fellow castemen. One will occasionally see Hindus learning the art in the manufactories of *julahas* of Alaipura and Modapur in Benares. When they become experts and arrange for capital they often start business independently.

Tarkashi, Chaproie, Zardozi.—The “shágird” has to pay some “nazrána” and sweetmeats to the “ustád” when he commences to learn the work. The amount of “nazrána” is nominal and cannot be called a regular premium. The sweetmeats are distributed among the members of the household or the guild. When the “shágird” learns a little he is paid wages proportionate to the value of work done. The wages increase as the “shágird” improves. When he becomes an expert he is at liberty to go and start business on his own account; but at the time of doing this he often pays some “nazrána” or cloths to the “ustád” and some sweetmeats for distribution to the men of the “kárkhána.” These trades are not restricted to any caste and both Hindus and Muhammadans learn them alike.

Benares Brass-work.—The same is the state here as well. For the first few days the beginner is not paid anything. He is paid a few annas a month, on learning some rough work, with midday *chábena*. If the apprentice is a regular *thathera* and has learnt his ordinary work at home before joining a good *kárkhána*, he is paid according to his workmanship from the very beginning. The wages increase according to the experience gained and skill shown by the apprentice. A Hindu of any caste is taken, Muhammadans are not. There are non-*thathera* good workers. Nothing has to be paid by the *shágird*. But here as well as in other trades, the employers pay themselves handsomely, seeing that they have little or nothing to pay to the apprentices for work done by them for long periods. It is said that instead of fixed wages they sometimes share the value of their day’s work with the manufacturer in whose *kárkhána* they are employed. This, however, is not generally done.

There is no legal engagement in any case, but there is always a moral binding, and an apprentice working in one *kárkhána* will seldom go to another unless there are special reasons for the change.

Lucknow Chikan.—This is not the profession of any special caste. Poor *pardanashín* ladies, generally Muhammadans but very often Hindus of respectable castes, take up this trade as a means of livelihood. *Khatris* and others of the cloth-merchant class do the work for their own shops. The girls of every family, rich or poor, Hindu or Muhammadan, are taught (by their own mothers and relations) the art of sewing and making *chikan*. They afterwards do the work for themselves, but if necessary, owing to pecuniary troubles, they work for others for payment. Males also learn *chikan*-making but they generally do this with some other trade in their leisure time. The art is not a very difficult one and is easily learnt. Everyone learns it at his or her house; there are no *kárkhánas* as in other trades where it can be learnt. The traders give cloth to known or respectable makers; the latter make the *chikan* at their homes and return the piece when ready.

Gold and Silversmiths.—Leaving aside exceptional cases, the trade is limited to *sonárs*. It is seldom if ever taught to strangers. There are good artisans in Lucknow. They have learnt the art at home from their father, uncle, or friends without payment of any premium.

Lohár and Barkaie.—The remarks about goldsmiths apply with greater force to *lohárs* and *barkaies*. There are frequent cases, however, where a *lohár* learns the carpenter’s work as well, especially in the eastern districts of the North-Western Provinces.

Clay-modelling.—This is another well-known art in Lucknow. The experts, however, are prone not to teach their art to outsiders even of their own caste. They will teach their own son or nephew and would not go an inch further owing to the narrow-minded idea of keeping the thing confined to their own families, with the result that there are only two or three recognised good artisans in Lucknow.

The main principle underlying the whole system is that where there are big *kárkhánas* any man and every man is welcome to go there and work on wages and improve his skill and wages both according to his intelligence and industriousness, but where there are no such opportunities each handicraft is confined to its own particular caste and the teaching to the man’s own family and relations. In Lucknow, drawing, carpentry, smith’s work, glass-blowing, dyeing, clay-modelling are now taught in the Local Government Industrial School for a term of six years on a nominal monthly fee of 4 annas rising to one rupee.

19th January 1902.

**LETTERS FROM SUMER CHAND SHAM LALL SADH, FARUKABAD CITY,
TO MR. R. BURN.**

Your favour of 22nd December was duly reached, since we were out, had gone to Bombay for making arrangement of machineries. After returning we find your letter, are glad to learn for your kind enquiry of our cotton printing work. We are glad to explain whatever we know, but we beg to say that we have not learned well, whatever we learn from England. But we minded to go to Europe again to learn in printing business. When we will know all then we will bring the machine of printing with us. We expected, if you may be able to go to Europe you can learn well and then we can learn something from you because you are well experienced with Europe. If we might get chance to go to Europe sooner then we can learn whatever be needed and then we can help you whatever you require. Our work are going: as usual, when all machine will be complete then we hope to be progress. With best wishes to you.

14th February 1902.

Your letter of 16th instant just to hand. We are glad to say that Messrs. Liberty & Co. have all our designs printed. Any new design, whether Indian design or English, we get from French Artists as we request them, and when the drawing comes from them then we give up to our special carpenters who cut the blocks or *chhāpas* and afterwards our printers print them on the cloth.

18th February 1902.

LETTER FROM MR. R. BURN TO M. LUTIF HUSSAIN.

An enquiry is going on about the improvement of industries in India, and the following point has been referred to me for enquiry. I should be glad if you could let me have any information.

The question is, how do workmen in this country learn a trade? In England, for example, if a man wants to make his son, say, a carpenter or a jeweller, he finds out a carpenter or jeweller who is willing to take the boy, and the boy is, as we call it, apprenticed to the man. Apprentice, as you probably know, is the same as "shágird" (شاگرد). In most large towns in England they now have classes in the evenings where workmen go and learn designing, drawing, and other useful things for their trades. In this country, owing to the caste regulations, a boy's trade is usually the same as his father's; but the point I want to find out is whether a boy *always* learns from his father or uncle or a friend, or whether he is ever sent to a stranger? Would a lohár or a barhai or a sonár, living in a village or small town, send his son to a big city or even to another district to learn his trade? In big cities are there men in each handicraft recognised as good workmen and teachers who always have shágirds learning from them, who are not connected with them? If so, do they pay the shágirds, or do the latter pay? I do not want any elaborate enquiry. The most important point at present is to ascertain whether boys ever go away from home to strangers to learn their trade. If they do it may be possible to start classes in many places.

The custom probably varies in different trades. Could you find out what it is amongst the stone-carvers (sangtarásh) and the mosaic-workers (pachekári), in Agra? Do men of other castes ever start these trades?

22nd December 1901.

REPLY TO THE ABOVE LETTER.

In compliance with your order, I made an enquiry about the questions raised by you at Agra, the result of which is as follows:—

- I.—The stone-cutters (sangtarásh) and stone-carvers (pachekárs) mostly learn the work from their parents and relatives, as well as from strangers, who may accept them as their apprentices.
- II.—There are no regular classes or professional teachers of this work, because the nature of work does not require them.
- III.—The boys pay no fee to, nor get any wages from their teachers when apprenticed until they might deserve themselves to do a work worth something. They are then paid very low.
- IV.—The village boys do not come to learn the trade in big cities, for it would be useless for them in mud huts, or until they may take up their abode in places abounding with stones and work to do.
- V.—Only low class people learn the *sangtarásh* work, because of the low wages they get. The mosaic workmen (pachekárs) are found among the low and high classes, but very rarely, because the profession in itself is less lucrative and yields no good profits. The European gentlemen are the only buyers. The natives of India are not generally inclined to make purchases of the things of such work, because they are very costly.

22nd January 1902.

MEMORANDUM ON THE TEACHING OF CERTAIN TRADES AT MUTTRA.

COMMUNICATED BY MR. BURN.

Stone-cutters and Masons.—Among the stone-cutters and masons the custom of learning their work is as follows:—

At Muttra there are certain firms where stone-cutting and mason's work is taught. The owners or masters of these firms are called "Ustáds." When a person wishes his son to learn the work, he sends him to one of these firms (workshops) and makes him an apprentice (shágird). Caste restriction is not observed in these two professions, *i. e.*, people of different castes, such as Garadia, Rájkhúar, Thákúrs, Masons, Muhammadans, etc., learn these works. When a boy is first sent to a workman his father pays the "ustád" at least one "narial" (cocoanut) and some cash (not less than a rupee) as a present. The "shágird" goes on learning the work for at least three or four years. During this period when he is able to do rough work, the workman begins to send his "shágird" to work and whatever wages he gets these are paid to the "ustád." Out of it a very small portion, say, one anna or so, is given to the "shágird" for sweetmeats. When the "shágird" is perfect at his work and is able to do his work alone, the ceremony of declaring him as a pacca "shágird" is held and the "ustád" is then paid some cash (say, R20 or so) and given a suit of clothes, etc., and sweetmeats are distributed among his fellow workers. People living in villages do not send their sons to learn work in towns, unless they have any relative or friend in the town with whom his son can live comfortably. A man who has a large workshop trains his own men and also employs men who have learnt elsewhere.

The stone-carvers at Muttra do not send their sons to Agra, nor do the Agra men send theirs to Muttra to learn work.

Jewellers.—Jewellers' sons learn their work at home with their fathers or other relatives. They do not send them to any other firm, nor is it the custom among them to make their sons "shágirds."

Brass-workers.—Brass-workers' sons also learn their work at their houses. Any other man, of whatever caste he may be, who goes to learn work to a brass-worker's shop is paid his wages for work done. Brass-workers do not make their sons "shágirds," nor do they send them to any other workshop.

(Sd.) MAN MOHANLAL.

**PROPOSED NEW CURRICULUM OF STUDIES FOR THE INDUSTRIAL
SCHOOL, LUCKNOW.**

By G. N. CHAKRABARTI, M.A., LL.B., INSPECTOR OF SCHOOLS.

The School will be under the management of a Committee consisting of the following gentlemen :—

1. Director of Public Instruction, North-Western Provinces and Oudh,
2. Inspector of Schools, II Circle,
3. Locomotive and Carriage Superintendent, Oudh and Rohilkhand Railway,
4. Superintending Engineer, Oudh Circle,
5. Principal of the Roorkee College.

II.—Subjects of Instruction.

The industrial instruction at the Industrial School will consist of :—

- (a) 1. Carpentry,
2. Iron-work,
3. Clay-modelling,
4. Dyeing,
5. Glass-blowing,
6. Drawing,
7. Elementary Mechanics and Workshop practice.
- (b) 1. Calico Printing,
2. Tarkashi,
3. Copper and Brass-work,

are also to be introduced and carried on in a special building as explained in paragraph XII. Only one trade is to be given to each boy with sufficient instruction in Drawing suited to that particular trade.

III.—Literary Education.

No literary education will be given except in the Night School and in the Special Roorkee Preparatory Classes, particulars of which are given under separate heads.

IV.—Period of Instruction and Duration of School Time.

The course of instruction shall ordinarily extend over a period of six years and the school hours will be from 9 A.M. to 5 P.M., with one hour's interval for recreation.

The seven working hours will be divided into eight periods and the number of students accordingly into eight sections, so that the two classes for beginners may, for the facility of management, have two sections in each.

V.—Proportion of Hours.

The proportion of hours to be given to each trade will be (7) seven school periods to be devoted to Drawing suitable to the requirements of each of the trades.

Instruction in Elementary Mechanics and Workshop Practice will be given in 5th and 6th year classes of the trades for which it is necessary. This instruction will be given in the workshops and during the workshop hours.

VI.—Qualifications for Admission.

A boy should, on admission into the Industrial School, satisfy the following requirements :—

English :—To know the English alphabet and figures.

Vernacular (Urdu or Hindi) :—To read a simple vernacular reader. To write passages from it to dictation.

Arithmetic :—To know the four simple rules. To be well acquainted with the tables of money and bazaar weights.

VII.—Age.

No boy shall under any circumstances be admitted who is over 15 years of age or less than 10 years, and no boy may remain in this school after he has completed the age of 21 years.

VIII.—Free Students.

The sons and the nearest relations of artisans and of Railway workmen will be exempted from the payment of any fees. Also the sons of Europeans and Eurasians of the poorest class, to the proportion of 20 per cent. over the number of free students, will be admitted free. As an exception to the rule, conferring free education to the artisan boys, the students from orphanages will be admitted free on condition that their boarding arrangements are approved of by the Head Master. In addition to the above such boys as are debarred from free education, but are very poor may be admitted free or at half rate up to 5 per cent. of the total of fee-paying students as in District Schools.

IX.—Fees.

The scale of fees (which must be paid in advance on or before the 10th of every month to be charged to other than free students will be as follows :—

Class.	Fees.
1st and 2nd years	1 anna.
3rd and 4th „	2 annas.
5th and 6th „	No fees, as they will be doing work that will sell.

X.—Bonus and Subsidies to the Students.

The Head Master will grant bonuses and subsidies to the students, the amount of which will depend upon the number of the successful students and upon the success of the Institution itself. The Head Master will, however, use as much moderation as possible not to go beyond the limits of the Government sanction under the head of “scholarships,” which may be increased, if required, after obtaining the necessary sanction.

XI.—Special Roorkee Preparatory Class.

The following rules will be observed in the Special Preparatory Class of three years' course of study for the students wishing to join the Mechanical Apprentice Class at Roorkee :—

- (1) That a student, who has passed the Lower Middle Examination of any Anglo-Vernacular School, or has at least acquired a knowledge equivalent to the same, and passes the Test Examination to be held at the Industrial School annually, will be eligible for admission into this class ;
- (2) That the subjects to be taught in this class will be ordinary Mathematics with Trigonometry, English, Drawing, Mechanics, Workshop Practice, and other manual training in Wood and Iron ;
- (3) That it will consist of three sections with 20 students, at the most, in each ;
- (4) That each section will devote two hours to the acquirement of literary knowledge in English and Mathematics out of the Workshop time.

XII.—Experimental Work of additional Industries.

With reference to the experimental work, which it has been suggested should be carried on in the Maharaja of Balrampur's Dharamshala* to endeavour to improve the method of working of several Native Industries, preliminary arrangements have been made with the following artisans :—

- (i) Clay modeller,
- (ii) Metal worker, (brass and copper),
- (iii) Calico printer,

who have all agreed to come only on the understanding that a definite bonus is given to them monthly, until such time that they can see the scheme is workable and to their profit.

XIII.—Night School.

1. A night school, in connection with the Industrial School, will be held in the premises of the same, from 7 to 9 P.M. in the night on every day of the week, except on Sunday.
2. The subjects to be taught in the Night School will be Mathematics and Drawing.
3. The number of students will at present be limited to 30 only, which will also be divided into two main classes to be taken up by two teachers in the Night School.
4. No boy shall get admission into this school unless his name is actually on the registers of the Industrial School, or he is employed in any of the local workshops.
5. The scale of fees in this school will be annas four (₹0-4) only per mensem for all the students.
6. All the students and artisans wishing to join the Night School must be able to read and write either in Urdu or Hindi.

* A more suitable site has been selected subsequently.

PUNJAB.

Proceedings of the Industrial Education Conference held in the Mayo School of Art, Lahore, on the 4th and 6th January 1902.

Present :

LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C., *President.*

MR. W. BELL, *Secretary to the Government of the Punjab, Education.*

„ PERCY BROWN, *Principal, Mayo School of Art.*

„ H. T. KNOWLTON, *Principal, Central Training College.*

RUCHI RAM SAHNI, M.A., *Assistant Professor of Science, Government College, Lahore.*

BHAI RAM SINGH, *Vice Principal, Mayo School of Art.*

CHIBANJI LALL, B.A., *Head Master, Railway Technical School.*

MR. C. A. RADICE, I.C.S.

„ R. E. ENTHOVEN, I.C.S. } *Members of the Committee.*

REV. FOSS WESTCOTT, M.A. }

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of schools, Government and Private, with methods of Instruction.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

A. MR. BELL said that there should be a register maintained showing the career followed by pupils in Industrial Schools.

MR. BROWN and CHIBANJI LALL kindly undertook to put in statements.

Q. (12) Are there any special methods of instruction employed, if so, have any of these showed markedly promising results?

A. MR. BROWN was in favour of having the best artisan in the School made into a teacher, and though he did not believe that whilst teaching he would forget his trade, he recommended, as a precaution, that he be allowed to take in a certain amount of outside work to be done by himself.

MR. KNOWLTON was not in favour of the present method of training of artisans in the workshops and commented on the faulty system adopted in the Lahore Railway Workshops, where a number of boys would go in every year and after an apprenticeship of several years turn out at best to be only firemen. They were left, he said, to pick up the work themselves instead of having to go through a properly graded course of instruction which, if enforced and properly carried out, would give the boys some chance of becoming foremen in time. The boys, he said, never had the opportunity of improving themselves, they were given the rough, plain work to do, and this was finished off by skilled artisans. Some of the lads had got quite disgusted and left for other occupations. He knew of a case in the bazar where he observed a course of apprenticeship being carried out. A man had taken on six or seven boys, keeping them at simple work for several years, and the training which he gave the boys was so thorough, that they had been employed on the railway for the last two years.

MR. BELL, too, did not approve of the present system of training and strongly advocated the adoption of a definite course of instruction under a master. There was no fear, he said, of the teacher forgetting his work. He pointed out that Bhai Ram Singh, Vice Principal of the Mayo School of Art, had not forgotten any of his work.

BHAI RAM SINGH, when referred to, endorsed Mr. Bell's statement, adding that there could be no possibility of the teacher forgetting his work as he was constantly among his boys showing them how to do this and that.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

A. MR. BROWN said that the instruction was specialized in the Mayo School, the same being the case with the Railway Technical School. He would like that this course be adopted everywhere.

His Honour the Lieutenant Governor of the Punjab has expressed concurrence.

His Honour agrees.

MR. BELL said that the instruction was specialized in the whole of the Province after the students had received a preliminary instruction in the use of tools.

Q. (16) Do you consider the present system the best, or can you suggest improvements?

His Honour approves of specialized training after the preliminary stage is passed.

MR. BELL did not consider that the system at present adopted in the Industrial Schools was as good as it might be. Sometimes industries were taken up which did not particularly belong to the locality. This, he thought, should not be the case. In his opinion the object of an Industrial School should be to improve and develop the principal industry or industries belonging to the particular locality in which it was. For instance, if a school were established at Hoshiarpur, it would be with the object of improving the Inlaid Wood-Work there; if at Mooltan, the Mooltan Pottery, and so on. He admitted that a certain amount of education was given in 'hand-and-eye training' in the schools as they existed at present, but it was obvious this did not in any way directly promote or develop the industrial position of the Province.

On being questioned as to what the present schools led their students up to, what influence they had, Mr. Bell said that it seemed to him that the most valuable purpose at present served by the schools was that they helped to break down the caste feeling in the Province. The schools of the Punjab were filled with boys of various castes, thus bringing into the manual trades men from non-artisan castes.

MR. BROWN agreed.

MR. BELL continued and said that if they had Industrial Schools widely scattered all over the Province they would do much in breaking down the caste feeling and turning out better workmen. To name one industry in which the Industrial Schools have done particularly well, *viz.*, wood-carving, nearly all the best carvers in Amritsar were the ex-pupils of the Mayo School of Art; they got much higher prices for their work than any other workmen.

MR. BROWN remarked that once a coach-builder's son came to his school, and after undergoing his training there, he improved his father's trade considerably.

CHIRANJI LALL said that an artisan trained in an Industrial School would in most cases stick to his trade. An Industrial School, he said, checks the tendency often exhibited in the sons of artisans to seek clerical appointments.

His Honour agrees and thinks this important.

His Honour agrees.

MR. BELL said that the cause why the schools had failed so far in not doing as much good as was expected of them, was that they were not started in co-ordination with local industries and that general education was rather overdone.

2.—Native system of Apprenticeship.

Q. (5) Do you think the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. LALA RUCHI RAM was of opinion that the native craftsman would accept expert advice if he found it to be really sound and advantageous. Mr. Kipling, he said, used to give advice and the workmen accepted it; he would prepare designs for them.

MR. BROWN said that native artisans had frequently come to him for advice, but there was one man in Lahore, a glazer, who would have nothing to do with outside interference.

CHIRANJI LALL was of the same opinion as Lala Ruchi Ram.

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

A. MR. BELL said that in the case of Industrial Schools he would recommend instruction grants, which, he thought, could even be extended to the case of boys who left school and obtained employment in recognized workshops. Craftsmen must be remunerated, for loss of time incurred in training the boys and also for accepting expert advice and acting up to it. One would have to find out, he said, by some agency or other, which shop owners are willing to co-operate and to accept advice, registering their names and the number of apprentices they are prepared to maintain, giving them a certain monthly allowance, provided, of course, the Inspecting Officer was satisfied that the training of the apprentices was satisfactory.

MR. BROWN added that an examination of apprentices in these workshops should be undertaken once a year.

Q. (10) Are there Trade Guilds in the province, and if so, in what trades, and where?

Q. (11) Where they exist, can they be utilized for the improvement and expansion of industries.

MR. BELL said that presuming there were Trade Guilds, which he did not doubt there were, he certainly thought that the expert adviser should make a point of meeting them in the *punchayat* or otherwise, talking to them on trade matters and giving them advisory lectures, by this means utilizing them as channels of communication with the workmen.

His Honour agrees.

BHAI RAM SINGH was of the same opinion.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

Q. (1) Do you approve of the existing methods of schools or would you propose any other methods of training in the existing schools?

A. MR. BELL was very much in favour of the opening up of a large number of schools with slightly modified curriculum and with the advantage of expert advice.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

His Honour agrees.

A. MR. BELL recommended that the Mayo School of Art should be fed more by Industrial Schools than at present, and that a system of scholarships be introduced to encourage this.

MR. BROWN agreed.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of work?

A. MR. KNOWLTON thought that the workshop system was not at all suitable.

MR. BELL was not in favour of training a man to be a Foreman in a school; this, he thought, the schools could not do. He would like to have a class for artisans where they could rise according to their capacity, finally finishing their training in a workshop. The Head Master of a technical school was not always competent to select men for the Foreman class. If a man desired to become a Foreman he should be given opportunities, the Victoria Jubilee Institute might be advantageously used in this connection, as evening classes could be maintained at which lectures on technical subjects could be given.

Q. (5) Why were the particular trades selected which are taught in the schools?

A. The general opinion was that the training of Foremen could not be completed in a school, and MR. BELL further added that this not only could not be done but that it was unwise to attempt it.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

His Honour agrees.

A. MR. BELL said he should certainly like to see some system enforced by which the Railway here should be compelled to take in boys from the Railway Technical School, and on the understanding that they were not beginners, but that their work in the school was equivalent to a certain proportion of their apprenticeship term. If they were compelled to do this then this would answer the question: it would be equivalent to saying that the Railway must give them a final training. There would necessarily be no fee, it was a Government Railway, and this was a Government School.

In certain cases, *e.g.*, where students were taken on in excess of a private shop's requirements, stipends might be granted in order to induce such shops to take in the boys, thus giving them the labour of the boy and a stipend.

Q. (7) As regards the methods employed in private schools, what measures are you prepared to take for ensuring that they are conducted in conformity with Government Industrial Institutions? Would you give—

- (i) An annual grant?
- (ii) A grant to cover initial expenses?
- (iii) Free expert advice? accompanied with conditions?

His Honour agrees.

A. MR. BELL was in favour of a money grant approximating to the cost of a drawing master; (ii), he thought, was most suitable to the case of private institutions.

2.—Proposed alterations and additions in schools and of the want of new schools.

Q. (8) Would you approve of the institution of new schools or a new school in the province now or in the near future, and if so—

- (i) In what locality, and are premises available?
- (ii) For what trades?
- (iii) Under what system and method?
- (iv) How would you finance it? Are there any special funds available?

His Honour agrees.

A. MR. BELL said that it was desirable that the Mayo Art School should be the central school of instruction in order to enable it to receive pupils from the various Industrial Schools that he proposes should be started throughout the province.

MR. BROWN would like to develop industrial research and proposed that 30 new schools be started.

MR. BELL thought that a beginning might be made with 13 in those localities where there were important industries, *viz.*:

Lahore for pottery and glazing, glass, and silk weaving.

Hoshiarpur for Ivory Inlay and Wood-work.

Mooltan for Pottery.

Bhera for Cutlery and Jade Stone work.

Sialkot for Damascening work.

Wazirabad for Cultery.

Pathankote for Bamboo Furniture.

Jullundur for Wood-carving and Turning.

Chiniot for Wood and Brass work.

Peshawar for Pottery and Wax Cloth work.

Delhi for Ivory-carving and Jewellery.

Ludhiana for Cotton Weaving.

Dera Ismail Khan for Lacquer work.

His Honour would add Kangra for Silver work.

The Committee were asked by Mr. Bell to visit Mooltan, Sialkot, Wazirabad, and Ludhiana. MR. BELL was of opinion that special funds might gradually be made available to meet the expenditure for new schools.

Q. (3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee. Are the local conditions likely to lead to success?

A. CHIRANJI LALL said that night schools had not been very successful so far, although he quite approved of the valuable training they afforded to artisans; the attendance at the evening classes of the Railway Technical School averaged about 17, thirteen for the past year and 21 the year before. He put the cause down for this poor attendance to the workmen having to work till very late at nights. No fees are charged.

MR. BROWN said in the Mayo School a fee of from As. 8 to As. 4 was charged.

The meeting in general approved of night schools.

Q. (4) Should such night schools be under the General Education Department or the Industrial School Management?

A. MR. BELL said he should like to see both the day and night schools under one authority, and that the Industrial School Management.

MR. KNOWLTON said that they tried this at home for a number of years, but had eventually to drop it and replace the management under the Education Board.

Q. (5) Are you in favour of the establishment of training schools for superintendents and Instructors, and do you propose to take steps in this direction at once?

A. MR. BELL and MR. KNOWLTON were in favour of the students of the School of Art, after having passed out as instructors, going to the training schools to learn something of class management and discipline.

3.—How the Neapolitan System would apply.

MR. BELL said: "My own view is that if we have the school system and also expert advice for the native artisan then we have no need of this system. The scheme is merely a combination of the other two, which is, the Industrial School *plus* the artisan working under expert supervision; so that I do not quite see, if we are to have Industrial Schools and also expert advice for the artisan, where this scheme comes in, and why it is necessary. If there is to be no system of expert advice for the outside artisan, then this might be tried. It was tried in Gujranwala but it failed owing to lack of supervision".

Meeting continued on the 6th January 1902.

Present :

The same as on the 4th January, and Mr. L. E. H. YATES, *Indian Public Works Department, Railways.*

Several questions were put to MR. YATES regarding the taking on of boys turned out by the technical schools, in the Railway workshops. He said that as far as he knew the boys who applied to him all wanted more pay than the railway were prepared to give, although they were not physically fit to do the hard work there. In nearly every case they had applied to be made apprentice carriage examiners and they were taken on as such on annas eight a day, the boys thinking this to be the most genteel work. He did not think, as far as he knew, that any of the boys from the technical schools were given less than eight annas a day. He preferred boys trained at the technical schools as what they learned there was very useful to them. These boys, he said, had a better chance of employment than outsiders and were paid more. After passing the carriage examiner's test, the boys were given a salary of Rs. 18 per mensem. He preferred boys being given a general education and did not think that it would lead to conceit on the part of the boys, but if unfortunately it did the Railway would have to put up with it. He would like to see them educated, although in some cases it disinclined them to do manual labour, but on the whole they were better fitted to do their work.

MR. BELL was also in favour of their receiving some general education.

MR. YATES knew for a fact that boys who had had a sufficient amount of education and came to the workshop thought that they were worth much more than the ordinary workman, and in cases where they were taken on and placed under foremen, the latter did not seem to care about having them, knowing the trouble they would have in the manual labour, but he did not see how this could be cured.

When asked if the technical school was of any real value to him, he said that it was; at present he had a man from a technical school who was very clever: he could draw excellently, and in fact he has done excellent service. In his opinion it was quite advisable to keep up the technical schools.

At this stage Mr. BELL put in a list, as under, showing the careers some of the boys have followed from the year 1894 to date :—

Clerks	8
Head Master, Technical School	1
Carpenters	6
Carpenter Instructor	1
Draftsmen	13
Mistria (Foremen) in Mines	3
" in the Public Works Department	2
Sub-Overseers	3
Carriage Examiners	12
Veterinary Surgeons	1
Guards	1
Painters	1
Signallers	1
Art School pupils	1
College	3
TOTAL	57

Concerning the training of foremen :—

MR. YATES was of opinion that a foreman's training could not be completed in a college or school; it would be necessary for him to go to a big workshop to complete it, he was in favour of a systemized education for foremen.

His Honour approves generally of Evening Classes.

MR. YATES on the whole, was in favour of night schools, he knew many cases where natives were anxious to attend them, but they had none. The Railway have night schools for Europeans but these had to be compelled to attend them. In these night schools, the instruction did not bear on the work during the day, the curriculum was therefore going to be altered. They did not teach drawing so the boys were obliged to go to the Railway Technical School to learn this. A new type of night schools was about to be created.

The apprentices in the workshops were mostly sons of workmen connected with the works. The Railway was always willing to take in outsiders and would like to see more of them.

On being questioned as to whether the Lahore workshops would be willing to give a final training to European or Native foremen who had been previously trained in a responsible college, e.g., if a few men were sent on from Roorkee, Mr. Yates said that he certainly would be prepared to do this if they came in as workmen, and he would even pay them for what their services were worth. He had already taken on one or two men from Roorkee. He did not think that by their doing this it would in any way discourage the mistria as they would all have their chance. The Railway did not have any natives as foremen, but simply as "chargemen." It was very difficult for a native to become a foreman, in fact it was beyond their aspirations, the Railway was therefore obliged to get out their foremen from England. Their fitters were also imported. There was not, in his opinion, a great dearth of artisans in the Province.

LALLA RUCHI RAM said that he knew of a great many carpenters and blacksmiths who had gone to the Central Provinces on double pay as chargemen.

MR. YATES said that the Railway would not be prepared to take over the Railway Technical School, or to subscribe to its cost, even though it received a number of workmen from it.

His Honour does not wish the school taken over by the Railway.

4.—Would you accept experts from abroad in each industry.

Q. (1) Generally speaking, would it be best to have a working expert, i.e., a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and if so, in what trades?

A. MR. YATES was of opinion that it was not possible to obtain a sound general expert.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

His Honour agrees in a general way.

A. MR. BELL was in favour of Provincial Control and in case it failed he would revert to Imperial. He went on to mention how this Provincial Control might be satisfactorily managed. The Government of India, in the case of European schools, had suggested that they would now be inspected by an officer quite apart from the Education Department and that the North-West Provinces and Punjab should combine to maintain this Officer; similarly, he thought, these two Provinces might combine and maintain the Provincial experts; the Punjab of itself could not do it.

Q. (3) What would be the average annual cost of such an expert?

A. MR. BROWN said about Rs. 400 a month with travelling expenses.

MR. YATES did not think the proper man could be got for this figure; he would say Rs. 500 and travelling allowance, but no quarters.

MR. BROWN said that the expert in Glass who was brought out a little time back was paid Rs. 500 and free quarters.

Q. (4) For what trades at present do you consider specialized working experts are required in this Province?

A. MR. BROWN said Weaving, Pottery and Glazing, and Metal Work.

MR. BELL agreed.

Q. (5) Can you define the status and qualifications required in these experts?

A. MR. BROWN said that an expert may be of one of two kinds: one a highly educated college man with a sound knowledge of theory but a slender one of practical work, the other an out-and-out practical man; he preferred the latter.

MR. KNOWLTON suggested that instead of importing experts from abroad, he thought it a better plan if specially selected men were sent home from this country to learn the work.

MR. BELL said that in the first place he would utilize the Principal of the Mayo School to supply all necessary expert advice to start the schools as at present proposed, and later on additional expert advice from Europe might be necessary. *His Honour agrees.*

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (1) Apart from the superintendent in direct charge of the school, what system of local control do you think the best.—

- (i) For rural schools?
- (ii) For urban schools?

A. MR. BELL said that in the case of rural schools the local control should be under the District Boards, and for urban schools the Municipal Bodies. *His Honour agrees.*

These Local Boards, he said, should be invited to convene a sub-committee to look after the schools.

Q. (2) What should be the functions of the local control in each case?

A. MR. BELL thought that this question should be considered along with the orders of the Government of India regarding education generally. *His Honour agrees but there appears to His Honour to be no objection to the*

In the recent Conference at Simla great dissatisfaction was expressed with the results of local control and a suggestion was made by the Government of India that in future the Budget should be passed by the Local Government, i.e., it should not be left open for the Local Body to say that there were not funds for this or that; the Budget should be prepared by the Local Body and scrutinized by the Education Department, who would decide what money was to be spent and the local bodies would then have no option. He was, therefore, of opinion that they should not be given financial control, not even as to details, Industrial Schools should be managed in the same way, as regards finances, as ordinary schools. *General and the Industrial Schools under Local Bodies being controlled by the Local Government in one and the same way as regards finances.*

MR. BELL further said that the teachers would be regarded as servants of the local body. A proposal had been made that the Bombay principle should be adopted, that all appointments, transfers of teachers, dismissals, etc., should be in the hands of the Educational Department; in the Punjab they would have to be in charge of the central body whatever it would be, whether the Education Department or some new industrial body. The functions of the Local Bodies should be to visit schools, see how teachers are working, etc. The same check should be brought to bear on the local control as it was proposed to be done in the case of General Education.

Q. (3) The Local systems of control must, it is presumed, be focussed for the province by some technical officer who will be generally responsible for executive administration and management. Who should this be?

A. MR. BELL was in favour of employing the Principal of the Mayo School of Art as the Organizing Inspector in the beginning, and recommended, to this end, that the staff of the Mayo School be so strengthened as to give the Organizing Inspector a better chance of taking up this extra duty.

Q. (4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this Department not having, as a general rule, any special technical qualifications?

A. MR. BELL would like to see the Industrial Schools under the management of this technical officer (the Principal, Mayo School of Art) who would be under the Educational Department, naming him 'Superintendent of Industrial Education.' The appointment should be a non-interchangeable one. He had no objection to Technical Education being under a separate department under Government in the Educational Department.

Q. (5) Is direct and special imperial control of Industrial Education necessary for its efficient development?

A. MR. BELL said that a certain amount of Imperial control was absolutely necessary in order to carry out a perfect, regular system of education; he was rather in favour of the control being of an advisory nature. *His Honour agrees.*

6.—Exhibitions.

MR. BELL thoroughly approved of the development of Economic Museums all over Europe and India permanent ones being established at large centres and temporary ones at places of pilgrimage. *His Honour agrees.*

He thought that the Organizing Officer should take advantage of gatherings wherever they were, to exhibit improved machinery bearing upon native industries and also the best work turned out. This Organizing Inspector could arrange with the Deputy Commissioner, Extra Assistant Commissioner, or the Tehsildar of the District to collect specimens of the industries of the province and exhibit them in the Fairs, with the names of the places of their manufacture, the names of the manufacturers, and the prices.

(c) HOW FUNDS ARE TO BE PROVIDED.

Q. (1) Could the Provincial funds provide the cost of starting the necessary schools? If not, how should the cost be divided between the Local Government and the Government of India?

A. MR. BELL said that if the full amount of contribution were recovered, many schools could be started with Provincial funds.

Q. (2) Do you propose to find funds for the schools until they are self-supporting and, in addition, for the setting up in trade of pupils taught at the schools? How would you recover such advances if made, and in what period?

A. MR. BROWN and BHAI RAM SINGH thought that the proper system was the giving of orders for work accompanied with advances, same as they were at present doing in the Mayo School of Art.

Q. (3) LALLA RUCHI RAM said that the 'Taccavi' system was a good one, but that much of the benefits to be derived from it were lost by the exactions of the middlemen.

A. MR. BELL, too, thought the same.

Q. (4) Are you in favour of any scheme of Industrial Banks?

A. MR. BELL approved of Industrial Banks provided that precautions were taken to eliminate the middleman.

B.—INTRODUCTION OF NEW INDUSTRIES.

LALLA RUCHI RAM proposed Lens Grinding.

MR. BROWN proposed the Photo-process, Papier-maché, and Whip-making.

His Honour approves generally of the conclusions arrived at, but has no time to go into details. He promises to give the Committee's final suggestions his fullest and most sympathetic consideration.

Replies to the questions of the Committee by Mr. Percy Brown, Principal, Mayo School of Art, Lahore.

A.—IMPROVEMENT, ETC.

1.—Description of Schools, etc.

Queries 1—6.

1					2	3	4		5	6			
List of Industrial Schools.	Date of foundation.	Industries taught.	Average attendance.	Output of artisans annually.	Reason for selection of present location.	How governed.	Whether self-supporting.	Average annual net cost.	Why were the particular trades selected which are taught in the schools.	How are Superintendents and Instructors selected.	Qualifications.	Duties.	Pay.
Mayo School of Industrial Art.	1875	Drawing, pottery, carpentry, metal-work.	288	In 1900-1901, 18 craftsmen, 13 engineers.	Capital of Province and centre of many industries.	Educational Department.	No	Rs. 21,286	They appeared to be the most useful.	Principal, by the Secretary of State. Instructors, by the Principal.	South Kensington certificates and experience in teaching sons of artisans in England. Superior workmanship during School of Art training.	Teaching of Design, Drawing, and Modelling, and general supervision. They teach in the sections in which each one appears to be specially capable.	Rs. 549 per mensem. Ranges from Rs. 80 to Rs. 250.
Railway Technical School	1889	Drawing, carpentry, metal-work.	818	25	For instruction of sons of artisans in Railway Workshop and to supply artisans to Railway Workshops.	By Committee of Railway and Educational Officers.	No	Rs. 8,000	Because of use in the Railway Workshop.	By the Educational Department.	University qualifications and School of Art certificates.	Teaching of general subjects and general supervision. Instructors teach different handicrafts.	Rs. 140 per mensem.
Municipal Board Industrial School, Amritsar.	1886	Drawing, carpentry, metal-work.	117	18	Amritsar is an industrial centre.	Municipal Board.	No	Rs. 3,245	They are the principal trades of the locality.	By the Municipality.	Educational Department qualifications and Mayo School of Art certificates.	Teaching of drawing and general supervision.	Rs. 45 per mensem.
District Board Industrial School, Ludhiana.	1896	Drawing, carpentry, metal-work.	93	6	Town of commercial importance also some local industries.	District Board.	No	Rs. 2,300	Metal-work, because blacksmith's work is the local industry.	By the District Board.	University qualification and Mayo School of Art certificates.	Teaching of general subjects.	Rs. 50 per mensem.
District Board Industrial School, Delhi.	1890	Drawing, carpentry.	70	...	An industrial centre.	District Board.	No	Rs. 2,135	...	By the District Board.	Mayo School of Art certificates.	...	...
Victoria Diamond Jubilee Hindu Technical Institute, Punjab.	...	...	...	...	...	Private.	...	...	...	...	...	...	...

Q. (7) How are the Superintendents and Instructors trained?

Is there any regular Training School or other source of supply?

Q. (8) How are students selected. From what classes of the population?

Are there any tests applied? Have you attracted the classes aimed at?

Q. (9) What are the rules regarding age?

Fees.

Scholarships.

Period of training.

Test of final qualifications.

Character,

Discipline.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

Q. (11) How are materials and tools provided?

What is done with the work turned out?

Q. (12) Are there any special methods of instruction employed? If so, have any of these showed markedly promising results?

A. Most of the Superintendents have received their training at the Central Training School, Lahore. Some of the Instructors are untrained, being selected artisans of the locality, others have been trained at the Mayo School of Art.

Yes, two, the Central Training School and the Mayo School of Art. The former trains teachers of general education and elementary drawing, the latter trains Instructors of handicrafts.

A. There is no selection, artisans' sons are admitted free; therefore, the majority of students are of the artisan class. At the Mayo School of Art all students are admitted free, so that artisans' sons form about one-third of the number attending this School.

No.

Yes.

A. None.

Sons of non-artisans pay fees, at the Mayo School of Art all are free.

These are granted by some of the Local Bodies to enable deserving lads to attend the Mayo School of Art. In some of these cases the boys first attend the Mayo School of Art as ordinary students for a year or two, prove themselves to be capable and deserving, and apply to the Principal to be recommended for a scholarship. In others they attend the Local Industrial School, pass examinations there, and the scholarship is awarded by the local authorities. One or two have been sent direct to Lahore apparently without any test having been applied and without any qualifications.

At the Railway Technical School and the local Industrial Schools the course extends over a period of eight years, at the Mayo School of Art a much higher course is completed in five years. This is due to the superior quality of the staff and the general education having been reduced to a minimum.

At the Railway Technical School and the local Industrial Schools, the final qualification consists in passing the examinations of the Middle Department. The final qualification at the Mayo School of Art consists in passing the examination of the 4th Class which is held every year by the Principal, the subjects being drawing, designing, clay modelling, and a handicraft.

The quality of this is usually noted on the student's discharge certificate.

The ordinary rules usually employed by schools to maintain order, regularity and punctuality. It has, however, been found a somewhat difficult matter to make the ordinary artisan and his son understand the value of regular attendance. It appears to be a fault of this class generally; recently, however, owing to special efforts, an improvement in this particular has been noticed.

A. Not known.

A. Local Industrial Schools receive occasional grants from the Local Funds. The Railway Technical School and the Mayo School of Art are provided for by Government.

In most cases it is put in a sale-room attached to the school. Much of the work is, however, practice and not of any marketable value. Where much finished work is done the actual instruction in the trade is apt to be neglected. A certain amount of marketable work forms the finish of each trade course. When a student has mastered this, there is no need for him to continue his work in the school.

A. For each handicraft a specially graduated course has been prepared founded on the lines adopted by the artisans in teaching their apprentices. These native patterns and methods have been improved and added to in order to suit the working of the schools and modern requirements. Instruction in working from drawings instead of the actual object is made a feature in every class.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school?

Q. Are English or Native methods of instruction used?

Q. (14) What general education is given in addition to regular industrial training? (N.B.—Drawing is industrial.)

Q. (15) Has any attempt been made to improve the quality of work in particular industries or the tools or machines?

Q. (16) Do you consider the present system the best, or can you suggest improvements?

Q. (1) What is the native system of keeping up a supply of artisans for the ordinary native arts and trades?

Q. (2) Is one system or method common to all trades, or are there several systems or methods?

Q. (3) Are there any special objections to or advantages in the native systems? Please specify.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

Q. (5) Do you think that the native system of apprenticeship is superior or inferior to the average Industrial Schools in method?

A. The result of these methods has been very satisfactory. The instruction is specialized, each lad as a rule following up one trade.

A. The two methods have been combined. Native methods form the basis of the instruction in all the handicrafts, but to these methods a good deal that is English has been added.

A. In most of the Industrial Schools the general education is continued up to the Middle Department.

At the Mayo School of Art instruction is given in the "3 B," only.

A. The quality of the work has been considerably improved in—

Wood-carving,
Joinery,
Hammered metal-work,
Glazed work,
Plaster work,
Papier maché.

In some cases the work has been improved by the introduction of English tools which are now becoming very general. I do not think much has been done in improving the native tools or machinery.

A. The results of the present system are encouraging. What is required now is the organization and extension of this system. Branch Industrial Schools affiliated with the Mayo School of Art and on the lines of the existing Industrial Schools at Amritsar and Ludhiana, but with a modified course, should be formed at most of the large industrial centres.

2.—Native system of Apprenticeship.

A. The native system is that of apprentices. When a child attains the age of six or seven years he is taken by his parents on some auspicious day to a master artisan, either a relative or a friend. The parents present to the artisan some sweetmeats and a pagri, and in return receive a piece of salt. This ceremony is called "nimak khawa," and the child is then bound over as an apprentice to perform any work that the artisan may require of him and to serve his master in every way faithfully and loyally, until he arrives at that age when he can work for himself. His duties are many, and include, among other things, the opening and cleaning out of the shops and keeping everything in proper order for his master.

For the first few months he receives no pay whatever, but as he begins to get more useful he may receive two pice or one anna per day from his master for his personal expenses. This is gradually increased as the work he does becomes more valuable, until he becomes old enough and capable enough to start work for himself.

A. This system is common to all trades with one or two exceptions. The "kandlakash" and "jaria" (wire-drawers and stone inlayers) keep their trades secret and never admit an outsider or even a near kinsman in their business. They train only their sons and grandsons, and, therefore, their trade is limited to a very few families, whose earnings, it is said, are much greater than any other artisans in the province.

A. The chief advantage of the native system is that the lad devotes the whole of his time to one particular line, and in all cases should become just as good a craftsman as his master. The disadvantages are that he can never become better than his master, so that by this system no improvement, development, or advance can result. He imitates the designs and methods of his master without thought or reason, and there is little doubt that to this inbreeding of ideas some of the decadence of Indian art is due.

A. In most cases it would be necessary to watch the craftsman at work in his shop. A piece of test work might be given him to do. By examining specimens of his finished work.

A. Judging by results the native system is inferior. The school trained youth is generally of more value in the market than the bazar apprentice.

Can it be extended in practice?

Can it be influenced by outside expert suggestion, advice, or interference, and how best?

Q. (6) Can you give any information regarding preliminary education?

Q. (7) Will the craftsmen take in apprentices of all classes or only of their own class?

Q. (8) Have famine sufferers been taught trades by native agency which they would not ordinarily follow?

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

Q. (10) Are there Trade Guilds in the province?

Q. (1) Please state the principal industries of the province.

Q. (2) What of the above would you recommend being specially supported or encouraged?

Q. (1) Do you approve of the existing methods of schools or would you propose any other methods of training in the existing school?

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

Q. (4) Which do you consider the best method of training foremen or assistant managers of works?

Yes. Where a school trained man or any other superior artisan is working for himself, he should be encouraged to take in a moderate number of apprentices. His shop and work should be occasionally inspected.

Arrangements might be made for the best of these apprentices to be examined at certain times at the nearest Industrial School. They would be required to execute a piece of finished work. If the apprentice did the test work successfully he would be given a certificate and the master artisan would receive a grant.

A. Native apprentices receive no preliminary education.

A. The artisan of the bazar appears in most cases to take in only those of his own class.

A. During the last famine a large number of destitute orphans were received by several religious and charitable institutions in the Punjab.

Some of these received a training in factories specially opened for this purpose. These were conducted on the Neapolitan lines. When the boy's work began to be of value the amount earned by him was placed in deposit, and for his maintenance amounts were withdrawn from this deposit.

A. By giving a grant for each apprentice who executed satisfactorily a piece of finished work.

A. There appear to be no Trade Guilds.

3.—Principal Industries of the Province.

A. Wood work, metal work, glazed pottery, carpets, ivory carving, jewellery, cotton printing, enamelling, lac turning, weaving.

A. Wood work, metal work, glazed pottery and enamelling, jewellery, cotton printing, lac turning and weaving would best repay development as the supply of really superior work in some of these trades does not appear to meet the demand. In others, as in lac turning, articles turned out to suit modern requirements would probably create a demand.

(b) WHAT IS PROPOSED (ETC.).

1.—Proposed alterations and additions in system and methods.

A. Generally I approve of the existing methods of schools. The general education should, however, be reduced somewhat and the drawing courses require modifying to suit each industry taught.

A. A specially promising student in a local Industrial School should be granted a scholarship at the Mayo School of Art to enable him to continue his training there. He would then be recommended to the Local Government for a State Scholarship to study abroad.

With regard to this the place of study and the course of instruction the candidate proposes to follow while abroad would largely depend on his qualification and the particular line of industry he had taken up. A portion of his time might be devoted to paying extended visits to several of the large manufacturing centres of Europe, so making it more of a travelling scholarship. (The visit of an intelligent metal worker of Wazirabad to Sheffield at the present time would probably make the cutlery of that district considerably more serviceable.) A diary of his travels signed by the head of each Technical Institute or School of Art at each of the manufacturing centres he visited would be required of the Local Government. For the present I do not consider it advisable to make these scholarships tenable in Japan.

A. This depends largely on what kind of works. A year-and-a-half ago I sent a young Hindoo as draftsman to a large lithograph press. He was the son of a zamindar and had been through the usual four years' course, finishing on the painting side of the Mayo School of Art. He is now head draughtsman and bids fair to become foreman of his department.

Some waste of time occurring after his joining in linking up his school work with that of the works has resulted in an arrangement whereby a number of lads are sent for one hour a day from the school to work in the press so as to more readily become acquainted with factory work. This I propose to extend with the hopes that if one firm sees an advantage in this, others may follow. No special scholarship or fee is paid, the gain to the manager is a lad trained at little expense, and the reward of the student is that immediately he is considered qualified he is given good employment in the factory.

Some arrangement of this kind appears necessary at the Railway Technical School; during the latter half of the boy's course half the time might be spent in the Railway workshops.

2.—*Proposed alterations and additions in schools and of the want of new schools.*

Q. (1) Can you suggest any improvements to existing schools apart from the changes in the methods of teaching or training?

A. Railway Technical School.—I consider it would be an improvement if the management of this school was in the hands of the Railway Department. The object of this school is to provide an education for the sons of artisans employed on the Railway and so that such of these as are qualified may find employment in the Railway workshops. It is governed by a Committee of officers of the Educational and Railway Departments. Briefly, the Educational Department provides the money and does the work, the Railway Department reaps the benefit. The drawback to this arrangement is that as very little responsibility rests with the Railway authorities regarding the general management of this institution, very little interest is taken in its output of artisans. Every year a certain number of students complete their course at the school and are qualified to fill vacancies that are occurring in the workshops; but a very small number of these are taken on. The Head Master reports that he is told there are "no vacancies," while outsiders are at the same time being received into the works. A gulf exists between the school and the shops caused by the natural indifference of the Railway Department to an institution which the Educational Department makes it its business to manage.

To do away with this, I would suggest that, while retaining the present system of inspection by officers of the Educational Department, the management of the Railway Technical School should be taken over by the Railway Department. The advantages would be that the advanced students could become "half timers" in the workshops, as both school and shops' would be under the same management, and the Railway authorities being responsible for the success of the school would see that qualified lads received suitable employment. A machine-room would be a useful addition, containing discarded machinery and some that is in working order for the use of the elementary students before commencing their course as "half timers" in the workshops.

Mayo School of Art.—The range of this school is great, extending from the teaching of the "3 Rs" and elementary drawing to the training of superintendents and instructors. It would be an improvement to divide this school into two sections; one section would be conducted on the lines of an ordinary Industrial School, the other would be for training advanced students to qualify as superintendents, instructors, etc. The industrial side would give instruction in general subjects as far as the Upper Primary Department, a course of drawing and a training in the chief handicrafts of Lahore. The training side would be open to selected students from all the Industrial Schools and would be fitted up so that these students could continue their training in any of the chief industries of the Province. Briefly, the industrial side would train lads of the locality in the industries of the locality for the improvement of the trades of the locality. The training side would train selected students of the Province in the industries of the Province to become superintendents and instructors for the trade of the Province. The expenses incurred in carrying out this proposed extension might be met by the funds now devoted to the Railway Technical School.

Municipal Board Industrial School, Amritsar.—This school would be better in a more suitable building; more money might be spent on the furniture and fittings. Science appears to be taught without apparatus.

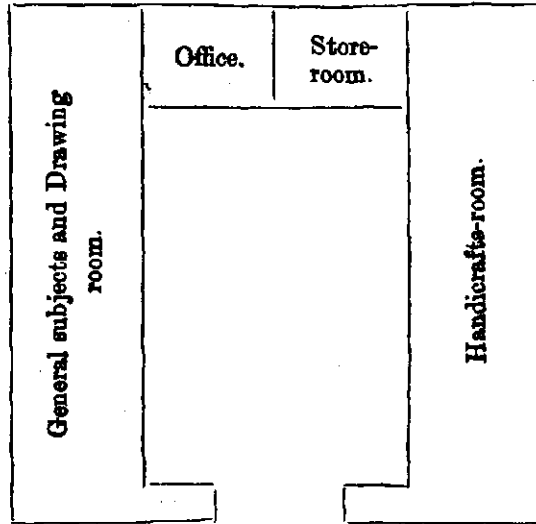
Q. (2) Would you approve of the institution of new schools or a new school in the province now or in the near future?

District Board Industrial School, Ludhiana.—Requires enlarging.

A. Industrial Schools might with advantage be instituted in the principal industrial centres of the Province. The selection of these would be the work of an organizing officer who might, after a general survey of the Province, consider it advisable to recommend the institution of a school in each of the districts of the Province at the head-quarters of the principal industry.

I think in a few cases suitable premises would be available.

I should recommend the erection of a building on the plan below—



The school would be divided into two parts, one part for the study of drawing, modelling, and general education, the other for the practice of the principal local craft or crafts.

Staff.—The staff would consist of a competent local craftsman selected by the organizing officer and a Senior Vernacular Head-master with qualifications in drawing. In some cases in addition to the above a teacher of practical design would be required who would be a trained man from the Mayo School of Art.

Course.—The course would be Drawing, to consist of freehand, elementary design, with a little geometry.

Clay modelling or in some handicrafts flat colour washing.

General subjects, as far as the Upper Primary Department, a specially revised course to comprise Object Lessons on Industries, simple native accounts and business correspondence.

A handicrafts course to be arranged according to the requirements of the local industry.

This school course would be divided into two parts equal to the Upper and Lower Primary.

The Lower Primary would include drawing, modelling, and general subjects. The Upper Primary would consist of accounts, business correspondence and a handicraft.

Fees.—These would be paid only in the Lower Primary and would be the amount usually paid by the ordinary agriculturist. In the Upper Primary the lad being then of some value to his parents, should receive the inducement of a small stipend.

On the completion of their course a number of the most promising students would be selected and would receive scholarships to continue their studies at the Mayo School of Art. Having worked through the course there the most fully qualified student would be recommended for the State Scholarships.

The Industrial Schools at Amritsar and Ludhiana, which are somewhat after the above type, are financed by the Municipal and District Boards. I think it would be found possible to run the proposed new schools on the same lines.

Q. (3) Night schools.

A. I am inclined to think that night schools for general education for the benefit of those who are engaged in the day time might be successful. A night school of this type existed in Lahore city until a year or two ago, it appears to have been a distinct success, but was discontinued for no parti-

cular reason. The students of the Mayo School of Art received a very elementary education; but a certain class of them who see the advantage of education manage to pick up a fair knowledge of different subjects in their spare time. These are increasing, and to them a night school in the city would be a boon. I think such schools should be under the general Education Department.

Q. (1) Do you approve of the method of Naples scheme generally?

3.—*How the Neapolitan scheme would apply*

A. My experience at the Mayo School of Art leads me to the conclusion that a school on the Naples system would be financially a success and would educate the students up to a certain point, but I am doubtful whether it would have any effect on the industries of the Province either by improving or developing them. As, after the education of the young artisan, the development of the industries is the principal object of Industrial Schools, this should receive consideration. At the Mayo School of Art the handicraft classes are conducted by superior artisans. Two years ago a number of orders for wood-carving and metal-work were received in the school and carried out by the masters, assisted by the students and very frequently by a good artisan from the bazar. Money made out of this work went in purchasing materials, tools, machinery, etc., and in the wages of the outside workman. Most of the classes were kept busily employed, good artistic work was being turned out and the school appeared to be meeting a demand.

The great fault, however, I found with this system was that each student was doing day after day only that work in which he was already proficient, and learning nothing outside that which he already could do and had been doing perfectly for some time. For instance, one man did all the design, another the working drawings, and a third certain portions of the detail, and the master's time was spent in putting these things together while the small lads of the class were receiving very little instruction indeed. Instruction was sacrificed for the sake of production and the School of Art instead of teaching students how to become good craftsmen was turning itself into a very successful factory which would soon have had a banking account. Instead of encouraging the artisan it discouraged him, for the school absorbed the work which in the ordinary course of events should have gone to the deserving craftsman in the bazar.

In re-adjusting this system and making the School of Art again an Educational Institution, each lad learning something to help him to improve his craft and not to merely repeat that which he could already do, it became apparent that the major part of the outside work would have to be dropped. This I now turn over to those outside artisans whose work I know to be of a superior quality, some of them are old students of the school, and their design and work are frequently submitted to me for inspection and advice. Orders regularly come to the school, and I hope before long to have a number of school-trained men working at their craft in their own shops, receiving work through the school and bringing their designs to the staff for criticisms and advice. A limited amount of outside work is still done in the school in order to give practice to the advanced students and to keep their work well up to pitch. Since this re-arrangement more advanced students have gone out into the world and obtained suitable employment than had taken place for years previously.

The Neapolitan system appears to have been already given a trial in India according to a letter I have received from the Reverend G. W. Morrison, Superintendent, Mission Industrial School, Gujranwala (copy attached).

APPENDIX

GUJRANWALA, April 4th, 1901.

To

PERCY BROWN, Esq.,
Principal, Mayo School of Art, Lahore.

SIR,

I beg to acknowledge with thanks the very kind letter you sent in return to my enquiries re Industrial Schools. I return with this the copy of the note on the Casanova School, which I have read with much interest.

That method would certainly be almost ideal could we find really competent handicraftsmen willing to take up their quarters in such a school, submit to the supervision necessary, and also willing—and to my mind here would be the great difficulty—to really thoroughly teach their trade to the apprentices.

In time past some efforts along that very line have been made by some of our missionaries, but the result was not satisfactory. Lack of proper supervision doubtless contributed to the result, but the great difficulty encountered was that the tradesman simply taught the boys only the rudiments and then tried to get the most work possible out of them for the time they were under his control. The ordinary bazar workman is too short-sighted to see the benefits of improving and pushing his business, and then training assistants to aid him in keeping up with the trade that he has.

Thanking you again for your kind suggestions, of which I hope to avail myself, and also for your kind offer of further help as to information, etc., believe me, I am

Yours very sincerely,
G. W. MORRISON,
Superintendent, Mission Industrial School,
Gujranwala.

4.—Would you accept Experts from abroad in each Industry.

Q. (1) Generally speaking, would it be best to have a working expert, i.e., a general hand for each school or a specialized working expert for several schools?

A. With regard to this province, weaving pottery and glazing, and metal-work would greatly benefit by the advice of an expert for each of these industries. The other provinces are probably requiring the same assistance with perhaps other industries added. The Government of India might arrange that an expert in each of these trades be obtained who would work for a certain time in each part of the country so that each province would turn by his benefit in advice and assistance.

Q. (6) How should the expert proceed to improve manipulation and practice?

A. Taking as an example the metal-working expert, he would first make a rough survey of the different kinds of metal-work done in different parts of the province. At Kotli he would find excellent damascening being done on sword belts which he would proceed to arrange to be done on bread knives, boxes, or any suitable article for which there is a modern use. This would be started by means of the local Industrial School at Sialkote. At Wazirabad there is a trade in cutlery which only requires an expert's advice to make it a thriving industry. The despatch boxes of Multan are good, but no doubt the trade could be developed and improved by European assistance. Here metal-work would be one of the sections of the local Industrial School. The pottery expert would proceed on the same lines, finding out where work is being done which is unsuitable to modern requirements and in which direction there is a demand, and guiding and directing the artisan, by means of the local school and frequent visits to the local workshops, the way in which his work can be improved and made to meet the demand. The chief fault of the work of the artisan is its unsuitability to present needs and no degradation of the art need be feared if really good work be merely transferred to articles of modern use.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (1) Apart from the Superintendent in direct charge of the school, what system of local control do you think the best?

A. The Industrial School at Amritsar is inspected by the District Inspector, the Inspector of the circle, and the Principal, Mayo School of Art, and is controlled by the Municipal Board, the President of which is the Deputy Commissioner. This arrangement of local control works well there and at Ludhiana, but very little is done for the school at Delhi. I think, however, this system will be found satisfactory if arrangements could be made for the Deputy Commissioner to visit the school at least twice a year.

Q. (3) The local system of control must, it is presumed, be focussed for the province by some technical officer who will be generally responsible for executive administration and management. Who should this be?

A. This technical officer would require to have a knowledge of school management and organization, a knowledge of the industries and resources of the province, and an acquaintance with the habits and customs of the artisan, and a definite idea as to the demands and requirements of the present-day market and the methods which could be best employed in meeting these demands. This knowledge is required by the staff of the Mayo School of Art in carrying on their work so that it would probably be found most expedient to combine the general supervision of that institution with the organization and management of the Industrial Schools.

6.—Exhibitions and Sales, whether required.

A system of sale-rooms, not Exhibitions, seems required.

At present a large amount of saleable work is only known in that province in which it is made. Occasional Exhibitions open out the market, but I think some arrangement of sale-rooms connected with each other so that the product of one province may find its way into another might be found successful. One sale-room would be attached to the School of Art of each province and would be in charge of an agent who would receive a salary and commission on each article sold.

Any work which the Inspecting Officers of the Industrial Schools considered good enough, whether made in the schools or bazars, would be purchased or obtained on commission sale for sale-room, only really good work being accepted. To place the most suitable of these articles before the public of another province, and other matters of this kind, might be best arranged by an occasional conference of the heads of the Schools of Art.

B.—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

Papier-maché is now being experimented with at the Mayo School of Art.

(b) WHAT ARTISANS ARE REQUIRED.

There appears to be a limited supply of good joiners, very few of them being able to work from drawings.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

BY CHIRANJI LALL, B.A., HEAD MASTER, RAILWAY TECHNICAL SCHOOL, LAHORE.

1.—Description of the Railway Technical School, Lahore, with Methods of Instruction.

(1) The Railway Technical School, Lahore, was established on the 1st of February, 1889. Wood-work, iron-work, and drawing are the industries taught in it. The average attendance for the past school year is 313, or about 82 per cent. The average number of artisans who leave the school after completing the whole of the course prescribed is eight. But if those who leave the school at the end of the primary stage for the trades taught in the school or other cognate industries be also taken into account, the output comes to about 25 a year.

(2) The school was started in connection with the Railway Workshop at Lahore.

(3) The school is under the control of the Director of Public Instruction, Punjab, and the superintendence of a Committee consisting of the following members:—

The Director of Public Instruction, Punjab.

The Manager, North-Western Railway.

The Loco. Superintendent, North-Western Railway.

The Principal, Mayo School of Art, Lahore.

(4) The school is maintained from Provincial funds. The average annual net cost is about Rs. 2,000.

(5) Carpentry and smithy work are taught, partly because intelligent carpenters and blacksmiths are in demand in the Railway Workshop, Lahore, in connection with which the school is open, and partly because exercises in wood and metal have been proved to have a great educational value in imparting hand-and-eye training, which is so very essential for success in arts. The following remarks by S. Baxter bear on the point:—

“The most suitable materials to be used are the subjects over which much discussion has taken place; but though some manual training in metal-work has been attempted with good results, and clay-modelling is sometimes adopted as an early form of art training, the most suitable material in which to work has been found by experience to be, undoubtedly, wood.

“Wood is readily capable of being brought to a given form, is strong, light, and clean, and a material familiar to everybody, qualities which are not combined in any other material; and, in addition, larger classes can be taken in wood-work than with most other substances.”

Instruction in drawing is also given, as it is most important as a preparation for industrial callings.

(8) The students are selected from among the industrial classes of the province. No educational tests are applied. The sons and near relatives of artisans are eligible for free admission to the school. A few who belong to the non-artisan class are also admitted, but they are not exempt from payment of fees. The institution is popular with the classes aimed at.

(9) No boy who has not attained the age of six years is admitted to the school. No fees are levied from the sons and other near relatives of artisans; other students, who are comparatively few in number, are charged fees under the Punjab Education Code. Lord Lawrence Scholarships are awarded under Articles 359 and 360 of the Punjab Education Code. The period of training for an infant is ordinarily eight years, at the end of which time he is required to pass the Middle Standard Examination for Industrial Schools, which is the test of final qualifications, character, and discipline.

(10) More than 15 students annually follow the trades taught in the school; the rest, who are 10 in number, engage in other manual occupations in which the hand-and-eye training acquired through the trades taught is made use of. If the boys could find easy entrance to the Railway Workshops, Lahore, on wages proper to their qualifications a far greater number of them would join the shops to follow the trades taught them. Many boys leave the school about the end of the primary stage for the Mayo School of Art, Lahore, to feed which is one of the objects of the school.

(11) For work done in the school, materials and tools are provided by the Department from Provincial funds. The few articles made by the students in the course of their training are disposed of, when customers are found for them, often at a great sacrifice. This school

does not fall into the mistake of attempting to work at a profit and to make the school workshop an organised manufactory. In fact, actual work for the market is discouraged; and the education of the pupils, the training of their minds, of their eyes, and of their hands, completely occupy the time of the masters. It is an absolutely erroneous idea about technical education that the pupils should be taught to make things for sale. The workshops attached to the school are educational class rooms pure and simple, and the whole attention of the staff is devoted to the making of intelligent, skilful artisans. Suppose we wish to make our school into a workshop and turn out things for the market—say, common stools. Before we can hope to sell our stools, they must be fairly well made, or there will be no sale for our commodities. The work of making each stool is divided between, say, two boys, A and B. A, the junior boy, can do the necessary planing, but he cannot make joints; B, the senior boy, can do the planing and make the necessary joints as well. Since A can do the planing, he is learning very little by continuing at this kind of practice; and since he cannot make the joints, this is the very kind of work he should be instructed in and in which he should have practice; his time should, therefore, from an educational point of view, be spent in this kind of work, *i.e.*, the making of joints; but since it is supposed we are turning out things for the market, there is no time for this. B can plane and also make joints; so that very small will be the educational result while B continues at this kind of work.

(12) Strictly practical methods of instruction are employed, and the education is strictly disciplinary in its character. All the practical work is done from drawings previously made by the pupils. "The blackboard is the life of the school," is fully understood and appreciated by all the general and technical masters of the school. These methods have produced markedly excellent results which could never be obtained under the native system of apprenticeship.

(13) The instruction is specialized for particular students. Woodwork (chip carving, sawing, and planing, and distinguishing and naming of different woods in common employment in the province) is taught in the Infant and Lower Primary Departments. In the classes above, the Lower Primary Department, wood-work is alternative with metal-work. Drawing is taught in all the classes except the Infant. The son of a blacksmith is, however, quite at liberty to continue wood-work in the Upper Primary and Middle classes, and not to take up smithy work, which is his ancestral craft. Both English and Native methods of instruction are used, though the former predominates over the latter.

(14) Reading and writing (in English and Urdu), Arithmetic, and Physical Science are taught up to the Middle Standard. Geography is taught to the 2nd and 3rd Primary classes only. Object lessons are taught to the 1st and 2nd Primary classes on subjects prescribed for ordinary schools, and to the 3rd Primary class on matters connected with the common industries.

The market test is the best test of the quality of the outturn. But there is very little outturn for the market in the school.

(16) The system adopted at this school is capable of some improvement, which is already under the consideration of the Director, Public Instruction, Punjab. The amount of purely literary education now given to the boys is to be reduced so as to provide more time for manual work than at present. The reduction will, it is hoped, correct the tendency shown by some of our advanced students towards clerical employment, and improve the character of the manipulative skill of the boys. With the adoption of the new scheme of studies, so briefly referred to above, the school will be a little better than the Bombay type of Industrial School, so well thought of by Sir Edward Buck in his report on practical and technical education in India, if the students, after leaving the school, follow the trades taught them, which I hope they will do under the altered improved circumstances.

2.—Native system of Apprenticeship.

(1) and (6) When a native artisan's son attains the age of, say, six or seven years, he is bound apprentice by his father to some other artisan of his own class, related to him or a friend. The parents of the infant present the tutor as a donation fee with one turban, one rupee, and some sweets. A part of the sweets, thus presented, is sometimes distributed among the other apprentices, if there be any already with the tutor. The amount of the donation fee depends upon the means of the apprentice's parents, inasmuch as some apprentices present nothing other than sweets. The number of apprentices is determined by the extent of the tutor's business and his power of control. In the Punjab, an ordinary artisan generally keeps one or two apprentices, though some big shops in towns like Amritsar and Lahore often keep as many as six or seven. The apprentice, in return for the instruction he receives, pays no monthly fee whatever, but he does all sorts of menial work, *e.g.* fetching water, cooking food, cleaning kitchen utensils, etc., etc., which occupy most of his time as long as he does not begin turning out remunerative work. The donation fee, given in the first instance, or a part thereof, is sometimes repeated, when the apprentice has finished a certain number of lessons in his craft, as when he begins jointing after finishing the ordinary chip carving. When the apprentice turns out remunerative work the tutor pays him a fraction of the profits (say two or three pice a day) which the work would bring him at the market. This allowance is gradually increased in proportion to the merit of the work turned out by the apprentice. The apprentice leaves the master artisan when he finds himself capable and old enough to shift for himself independently, and the master artisan afterwards never shares in the earnings of his pupil, though the master always remains an object of special reverence to the pupil. It is very seldom that a father artisan trains his own son, especially in infancy, simply because the father, illiterate and uneducated as he is, cannot exercise proper influence and control over the child as a tutor. There is no preliminary education required by a child when bound apprentice to an artisan.

(2) and (7) An Indian artisan, than whom no one is more conservative and narrow-minded and no one more wedded to traditions, will take in apprentices of his own class and fraternity. Caste and tribe prejudices have a very strong hold over his mind. One and the same system of apprenticeship is followed in all the manual occupations and trades. Drawers of wire coated with gold, and whetstone-makers, under no circumstances would teach their art to any one who is not of their own family. A whetstone-maker once asked his daughter to go away from the room, in which he was making a stone, fearing that she might carry the secrets of the trade to her husband.

(3) There are many objections to, and hardly any advantages in, the native system of apprenticeship. The apprentice picks up the trade by the rule-of-thumb methods and in quite an empirical way. The rationale of anything done by him, is not explained, nor any method or system employed in setting or explaining exercises to him. The teaching, if it be such, never proceeds on rational lines, and it is difficult to see what good result, beyond a certain amount of more dexterity, can result. In short, no attention whatever is paid by the tutor, untrained and unfit for the post as he himself is, to the development of any of the apprentice's mental faculties. Unmethodical, crude imitation of the tutor is the rule, and training the exception. The object of the tutor is commercial and not instructional. His, he thinks, is a shop or a factory and not an educational class-room. All his efforts are directed towards taking remunerative and useful (in the literal sense of the word) work out of the apprentice. The sad state of the children, brought up under such a system, can better be imagined than described when they reach man's estate. Such men are sadly wanting in obedience, punctuality, cleanliness, method, order, and self-reliance, though in many cases they attain great skill and dexterity. A final objection which arises in considering such a system is the length of time required to acquire the amount of hand work an apprentice possesses at the time he leaves his master artisan.

(4) The best craftsman in any particular trade can be easily identified by his dexterous manipulation.

(5) The defects of and objection to the native system of apprenticeship, pointed out in the foregoing remarks, would suffice to show that the system is in almost every way inferior to an average Industrial School, wherein the great central idea of the development of natural faculties, while teaching a trade, is steadily kept in view, and no room is ever found for the shortcomings pointed out in the native system. To quote Mr. James Baker, a member of the Board of Education in England, "the Austrians and Germans have discovered that trades cannot be efficiently taught without schools." If attempts be made, for any reason, to extend the native system in practice, cast and class prejudices, already mentioned, are sure to stand in the way and bring about disappointing results. I do not think the native artisan, conservative and wedded to traditions as he is, would accept suggestion or advice from outside experts or allow Government interference; his disinclination to adopt new implements or new methods of production and to distrust Government interference, is proverbial. Trial may, however, be given to the bribe of a monthly allowance, though the feasibility of the plan is much doubted.

(8) Institutions have been started by religious and charitable bodies in the province for teaching trades to famine-stricken persons; but they are all based on eleemosynary principles, though they have almost the same end in view as Government schools. Most of the youths thus trained follow the trades taught them at private mills and factories in the province, *e.g.*, hosiery and carpet factories at Lahore, Amritsar, Hissar, etc. Such native agency was not readily procurable. People had to be moved in the matter.

(9) Prizes and allowances may be arranged for and measures adopted in the way of education to uproot narrow-mindedness and conservatism from the minds of native artisans.

(10) There are hardly any Trade Guilds worthy of the name in the province. I have been able to discover two guilds among the local goldsmiths and repoussé-workers in gold and silver. Books in which the rules and regulations are embodied are published.

(11) Caste and prejudices would never allow of their being utilized for the improvement and expansion of industries, even among the classes following those industries.

3.—Principal Industries of the Province.

(1) The principal industries of the province are agriculture, weaving in silk, weaving in wool, wood-work, and metal-work.

(2) Agriculture and weaving in silk and wool require to be encouraged.

(3) Agriculture, being the leading industrial occupation of the country, and the mainstay of the prosperity and wealth of the greater part of its population, requires and deserves State encouragement and support more than any other trade or profession. The rural classes should be given primary education, mainly of a practical character, in imparting which the lessons should be based on agricultural objects and subjects to illustrate the more simple scientific principles that underlie the art and industry of agriculture. The object of a rural school should be to so develop the pupil's natural faculties as to prepare him for practical farming to be taught to him by his father, and to fit him to appreciate and readily accept the agricultural improvements offered.

After agriculture, weaving in silk and wool is a leading industry in the province. This industry is gradually dying out and has already suffered to an enormous extent. Every famine brings to light the fact that weavers, more than any other section of the industrial population, are living on the verge of subsistence. Encouragement and support might, therefore, be given to this industry by the State by the introduction of improved hand-looms and other implements

of production among the weavers. But this subject bristles with difficulties probably more than any other industrial subject that can be named.

(4) Other industries do not require State support, as the hand-workers following those industries are holding their own and making a strong stand against machinery.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—*Proposed alterations and additions in system and methods.*

(1) Generally speaking, I approve. A special Technical Inspector may inspect the school oftener than at present, in order to see that the training is proceeding on proper rational lines. The purely literary education should be kept and given in strict subordination to manual training.

(3) Yes. State Technical Scholarships for advancing specially promising students in the higher branches of Technical Education may be established on the model of State scholarships now given in rotation to students from the different Universities.

(4) By giving Practical and Technical education (in the modern sense of the phrase) in a school, and then practical training in a workshop.*

(5) Yes. If a school or a college is sufficiently advanced from a *Practical and Technical point of view*.

(6) Yes. No fees to be paid to the shop, but, if necessary, a scholarship may be given to the student.

(7) The Technical Inspector should inspect the private schools also for the purpose, just as is the case with our private General Education Schools, that are now inspected by the ordinary Inspector of Schools.

(i) Yes.

(ii) Yes, as long as the Industrial Training is not well advanced in the province.

(iii) Yes.

Provided the schools observe the rules laid down by Government for the purpose.

2.—*Proposed alterations and additions in Schools and of the want of new Schools.*

(2) Yes, gradually, as trained master artisans are available. One or two selected artisans from each of the several big industrial localities to be trained, say at the Mayo School of Art or some other big central institution to be established. Special schools to be afterwards opened at these localities, in which these trained artisans should be the teachers to teach and improve their respective fellow-artisans. This system may be afterwards extended to small industrial places in the country.

(i) See the above; in big towns, premises will have to be arranged for, by Government and in small places premises may be provided by municipalities if permanent premises be needed.

(ii) Trades followed in the locality and in need of improvement.

(iii) Method and system acquired at the central institution, as adapted to the requirements of the locality.

(iv) For schools in big towns, funds to be provided by Government, and for those in small places by Municipalities.

(3) Yes, most certainly. But I do not think the artisans will be willing to pay fees, however small they may be, especially in the earlier stage of such schools. The difficulties mentioned below very much beset the progress of such schools in the province:—

(a) The artisans find it difficult to sustain any mental strain at night after a day's physical hard labour.

(b) The students being generally grown-up men have to attend to their household affairs in the evening, as during the whole of the day they are employed at their crafts in workshops, factories, or elsewhere.

(c) The artisans have sometimes to work overtime till late in the evening.

But the usefulness of such schools does not admit of any question, especially in towns like Lahore, Amritsar, and Delhi.

(4) Under the Industrial School management to be attached to the General Education Department, to begin with.

(5) Training Schools for Superintendents and Instructors are a great want of the province. The Mayo School of Art, Lahore, might be utilized for the purpose at once. Drawing Masters and wood-workers are already being supplied by the Mayo School of Art for subordinate posts in Industrial and other schools.

* There is no conceivable reason why the students of the Railway Technical School, Lahore, who pass the final test, may not be fit for the posts of Foremen and Assistant Managers of Works, after some years' practical training and experience in a workshop. Perhaps their purely literary and scientific education may be considered rather low for such posts. But this deficiency can be made up by expanding the school a little. The students after the final test may join the railway workshops, and while there attend the school, say for two hours a day, to supplement their literary and scientific education for a year or so. These youths, as they are turned out at present, are remarkably fit for the posts of mistris in workshops after a few years' training and experience in shops.

3.—How the Neapolitan Scheme would apply.

(1) Yes. I very much approve the Naples scheme, but it does not appear suitable to the conditions and circumstances of the province in its entirety. The scheme is, however, worth a trial.

(2) I do not think they will readily do so. The difficulties to be overcome in the first instance will lie in their blind adherence to their traditional stereotyped ways of working and living, in making them give up their class and caste prejudices and in their interpreting the intentions of the Government.

(3) Such a school should be in an enclosed private area. None but the schoolboys should be employed as apprentices. The master artisan should be in all matters obedient to the Manager of the school.

(4) A rent-free shop will be no inducement whatever to an Indian artisan. He will have always to be paid, though not much when the school is a full success, for working on the school premises. In addition to the salary, he should be allowed all the profits accruing from the outturn. The tools should be supplied by the school.

(5) (i) Materials to be supplied by the master artisan.

(ii) The cost of materials to be divided equally between the master artisan and the school. But in the earlier stage, the whole cost should be borne by the school.

(iii) The school authorities should help the master artisan in the sale of the commodities turned out. In disposing of the finished goods lies the most embarrassing difficulty, and on the solution of this difficulty only will depend, I think, the success of the whole scheme. There is, ordinarily, no great sale in India for such goods, however well made they may be.

(iv) Exhibitions of work produced should be held; they will contribute much to the success of the scheme.

(v) Such impecunious students to be supported by the school.

(vi) All the profits to be given to the master artisan.

(vii) *Very few* holidays to be given, in order to create and promote habits of hard work and application from the very beginning.

(viii) The apprentices should be lodged in a boarding-house, attached to the school, under an able superintendent who should look after their conduct before and after the school.

(ix) In the earlier stage of the school, no fees should be charged, but when it is a success, payment should be enforced from all but very poor students.

(6) Yes. The manager of the school should suggest improvements and should see that the master artisan works them out.

4.—Would you accept Experts from abroad in each Industry.

(1) To begin with, one specialised working expert will do to supervise all the schools in the province. Yes, I think, experts can be obtained in Europe in many industries, *e.g.*, agriculture, weaving, glass-work, pottery, wood-work, engraving, varnishing, leather-work, button-making, cart-making, and various other industries.

(2) For big and important industries, such as agriculture, the expert should be Provincial. For minor industries they should be Imperial, that is, one expert for two or more provinces will do. When an expert has finished his work in one province, selected artisans might be brought to him from another province, or he might himself be passed from one province to another, in order to avoid reduplication of expense.

(4) Agriculture, weaving (if means could anyhow be devised to improve it), glass-work; wood-work engraving, varnishing, pottery, leather-work, cart-making, mathematical and scientific instrument-making, umbrella and lamp making, etc. In fact, expert instruction is greatly required for teaching the native artisans the art of finish, in which they are at present sadly wanting, in almost every industry. The shoemakers in India have been making shoes for so many centuries, but the shoe still pinches and the chain is always put at the top of the door, even if the door be eight feet high. These two cases go far to illustrate the point in view.

(5) These experts might be of a somewhat lower status than an ordinary Inspector of Schools. Besides having a practical knowledge of the trade, they should also be educated in its theory and science.

(6) The duties of the expert should be investigation, suggestion, and control of action. A central institution should be established and put in the charge of the expert. One or two selected artisans from each of the several localities, where the industry in question is carried on, to be brought to the institution and taught the improved processes and forms and the use of better tools, etc. Special schools should afterwards be established at the different industrial localities and the selected trained artisans should be the teachers at those special schools for the teaching of improvements to their respective local artisans. Permanent premises would not always be needed for these special schools.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

(1) To start with, the District Magistrate would be the best Local Controlling Officer:—

(i) For Rural schools, through the Tahsildar and the District Inspector of Schools.

(ii) For Urban schools, through his immediate assistants at the head-quarters.

In the case of agriculture, the co-operation of the Settlement Department in the matter should not be lost sight of. When the number of Industrial Schools becomes large enough in the province, an industrial controlling agency similar to the one now in existence in the Education Department may gradually be created.

(2) The duties of the Local Controlling Officers should be to frequently visit the school with a view to generally seeing that the training is imparted on proper rational lines, that the improvements suggested are being carried out, and that the general state of organisation and discipline is all that could be desired. After the visit, a report on these points should in each case be submitted to the General Inspector of Industrial Schools through the District Magistrate.

(3) A special expert, who may be a General Inspector of Schools for the whole province.

(4) Yes; but under the present conditions, I do not think that such a procedure is practicable in this province for many years to come.

(5) Yes.

6.—Exhibitions and sales, whether required.

(1) Exhibitions are of infinite value to the country. Besides affording pleasure and amusement to the idle sight-seers and others, they are a powerful educational lever. The immediate object of an Exhibition is to bring together illustrations of what a country produces and of what indigenous workmen and artisans have done in times past and are now doing, and thus, to provide ample ground for comparison and competition. The manufactures and resources of the country become widely known and kindly feelings between nations are awakened and promoted. By the facilities offered at an Exhibition for better knowledge alike to producer and consumer, to maker and buyer, to artist and lover of art, the ultimate object in view, *viz.*, to stir up emulation, to stimulate improvement, and to foster profitable industry is secured.

(a) Local—Should be held frequently, as it is they that could contribute most to the industrial progress of a locality by frequently stimulating local efforts. The system of the great market day (Painth), observed on one day in a week in small towns, could very well answer the purposes of Local Exhibitions, if it be properly encouraged, which involves little or no material expenditure. The system of Gudri (Exhibition by local artisans at a conspicuous place of their manufactures once a week for effecting sales) that was vogue in Delhi and Meerut at least sometime back, might be introduced into the chief towns of the province.

(ii) Provincial— } Yes, if valuable prizes and certificates of honourable mention
(iii) Imperial— } be given to induce real competition.

(2) The conditions, given below, are sure to make Exhibitions beneficial to Indian arts and industries;

(a) Local Exhibitions, in the shape of Painth and Gudri, should be encouraged and supported.

(b) Valuable prizes and certificates of honourable mention should be awarded.

(c) Admission to Exhibitions should be free for the industrial public, for the smallest entrance fee keeps away the classes it is most advisable to assist, namely, those who desire to improve by careful examination and study of the articles exhibited. During the time the Exhibition is open, on one day in every week admission should be allowed to working men only, thus preventing overcrowding.

(d) Free railway passage for coming to, and going back from, the Exhibition should be arranged for for a number of selected artisans of each industrial locality.

(e) Arrangements should also be made for the free carriage of all exhibits supplied by working men.

(f) The industrial classes in India are too poor to make valuable articles without advances to encourage them. Advances might, therefore, be made to enable the real producers to show their skill.

(g) Unsold exhibits supplied by artisans in straitened circumstances, may be purchased by Government at proper prices for its museums or for sale on its own account.

(3) Under no circumstances, I would recommend sale-rooms for schools. A separate sale-room may be established for one or more schools, at which the output may be exhibited and disposed of by a trustworthy Government agent.

(i) This may be sold by the school.

(ii) This may be sold by the school, but it would be convenient to receive orders through the agent in charge of the sale-room, who should also dispose of the work, when finished and sent him. The orders should not be for elaborate works.

(iii) These should be Government agents.

(iv) This would never work well.

(v) This is attended with incessant embarrassing difficulties. My daily experience teaches me that in disposing of finished goods in this way, less than cost price is realized.

The prices should be fixed and marked.

(4) This question is not quite clear to me. I, however, answer it as under:—

There are some industries in India, which in their experimental stage entail large outlay

that must be provided either by Government or by wealthy members of the community. The Indians ordinarily put their money into assured business and hold back from new undertakings which are not directly or indirectly supported by the Government. Many an industrial private enterprise, if ever conceived, has to be given up for dread of the cost of initial experiment. In such cases, the Government should either undertake initial experiment itself, or share to a reasonable extent with the private enterprise in the cost of the experiment.

(5) The workman in India generally gets the best wages or profit from cheap common work. Ordinarily, there is hardly any market among the natives of this country for expensive fine work; they have not yet had enough opportunities to develop their taste for finished superior articles.

(c) HOW FUNDS ARE TO BE PROVIDED.

(3) The method of State loans to agriculturists is a failure, as far as my information on the subject goes. Under this method, the agriculturists cannot secure loans easily and without paying a part of the loans applied for to the Government middlemen.

The system of repayment of such loans by the agriculturists, which is often followed by the Local Government authorities, is far more ruinous to the debtors than the one generally adopted by the Banias in similar cases. But arrangements do require to be made for advances to workmen in India, as I am inclined to think that one of the main obstacles to the adoption of new implements or improved methods of production by the Indian artisans is a want of funds.

- (i) Improved implements should be issued to individual artisans on credit, fixing a period of repayment by easy instalments.
- (ii) Yes; but arrangements should also be made to free them from the exactions of the Government middlemen.

(4) Yes. The scheme should be free from the defects pointed out just above in the method of State loans to agriculturists. The repayment of the advances made should be required by easy instalments.

(B).—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

- (1) Glass-work, button-making, and thread-making.
- (3) Múnj matting. Being an expensive superior article of the kind, there is no ready market for it. It is generally purchased by the public offices in the province.

(b) WHAT ARTISANS ARE REQUIRED.

- (1) Trained artisans are required for glass-work and button-making.

DESCRIPTION OF THE ARTISAN EVENING CLASSES OF THE RAILWAY TECHNICAL SCHOOL.

BY CHIRANJI LALL, B.A.

(1) Artisan Evening Classes were opened on the 1st of April 1898. The only industry taught is Drawing. The average attendance is 17. They are opened to artisans, including apprentices in the North-Western Railway Workshops, employed at their crafts during the day.

(2) They are specially meant for youths working in the local railway workshops, in connection with which the day-school to which they are attached is started.

(3) They are governed by the same controlling and superintending agency as the day-school.

(4) They are maintained from Provincial funds. The average annual net cost is Rs. 945.

(5) Drawing is taught, as it is of the utmost value as a form of hand, eye, and mental training. For artisans of all classes, it is very useful, and frequently indispensable.

(6) The classes are open to artisans, employed at their crafts during the day. None but a craftsman working as such during the day is admitted. The classes are fairly popular with artisans.

(9) An artisan of any age is eligible for admission. No fees are charged for the present. There are no scholarships awarded. The period of training is ordinarily three years. No test of final qualifications has yet been instituted, as the classes have not yet fully developed, and are in an experimental stage.

(10) All the students are already artisans working as such during the day.

(11) Only paper for drawing is supplied by the department. There is no outturn, no industry being taught.

(12) The remarks given in the case of the day-school apply to these classes also.

(13) All the students are required to learn Drawing. The English method of instruction is used.

(14) Reading and Writing in Urdu and Arithmetic are taught up to the Upper Primary Standard, and English reading and writing up to the standard for the First Middle Class of an ordinary general knowledge school.

(16) I think the present system is best, as so much instruction in the '3 Rs' and Drawing is often very useful for working men or artisans of the lower class in such establishments as railway workshops, foundries, etc., and very profitable for their employers, as artisans, thus educated, are sure to turn out better work than their illiterate brethren.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

By LALA SUKH DIAL, B.A., SECRETARY TO THE V. D. J. H. INSTITUTE, LAHORE.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with Methods of Instruction.

(1) The Victoria Diamond Jubilee Hindu Technical Institute was founded in June 1897. Instruction is given in the following subjects:—

Mechanics.
Carpentry.
Free-hand Drawing, etc.
Rubber stamp-making.
Engraving.
Photography.
Type-writing.
Shorthand writing.
Clerical and Commercial Course.
Accountants' Course.

The average monthly attendance for the last six months was 58.

The total number of scholars at present is 61 and the distribution according to subjects which they are learning is as follows:—

Mechanics Class	17	
Carpentry Class	}	The same students in these classes as in	Mechanics' Class.		
Free-hand Drawing Class				
Engraving Class				2
Rubber stamp	"	.	.	.	.	.	.	1
Photography	"	.	.	.	.	.	.	1
Type-writing	"	.	.	.	.	.	.	29
Shorthand	"	.	.	.	.	.	.	6
Clerical and Commercial Class	.	.	.	.	.	.	.	3
Accountants' Class	.	.	.	.	.	.	.	2
								<u>61</u>		

The Institute being yet in its infancy, the annual output of artisans is but nominal.

(2) No; except that Lahore, being the capital of the Punjab, and the centre of public spirit, was considered to be the best place for the Institute.

(3) The Institute is managed by a Board of Governors, elected once in every three years from among subscribers of Rs. 100 or more to the funds of the Institute.

(4) The Institute is not self-supporting, the net cost for the year 1900-1901, being Rs. 4,256-1-9. This includes the salary, etc., of a Travelling Agent for collecting subscriptions.

(5) The trades selected are those which can be easily learnt, and which are likely to pay a fair amount of remuneration to those receiving a training at the Institute.

(6) The Institute has had great difficulty in the selection of a properly qualified Superintendent. The present Superintendent has read up to B.A. Examination of the Punjab University, and is specially good in Science and Applied Mathematics. His pay is Rs. 50.

(7) So far as we know, there are no arrangements in the Punjab for the training of men for taking charge of Industrial Schools.

(8) This Institute laid down the Middle School Examination as the minimum educational qualification for admission to its classes, but failed to attract any appreciable number of students. At present no tests are applied. We cannot say we have been successful in attracting the classes aimed at.

(9) No rules regarding age are observed. No fees are charged from the students of the Mechanics' class. For the Photography class a monthly fee of Rs. 3 is charged, while for all the other classes the fee amounts to Re. 1 or less. Scholarships of the aggregate monthly value of Rs. 18 are held by the students; more scholarships are available for the Mechanics' class, but at present there are no students deserving enough to hold them. The period of training varies with different classes. For the Mechanics' class a 3 years' course is fixed, while for the Typewriting class it extends to 4 months only.

All the ordinary rules regarding character and discipline, observed in the Board Schools are strictly enforced.

(10) Leaving out the Type-writing class about one-third of the students have afterwards followed the trades which they have learnt in the Institute. This is probably due to the trades being not sufficiently remunerative, as well as to lack of capital and enterprise.

(11) The tools and materials for use in the school are provided by the Institute.

Much of the work turned out is unfinished and not fit for the market. The finished work is sold, specially to gentlemen interested in the school.

(13) Yes. The students are not run through all the trades. The methods used are an adaptation of the English modes of teaching.

(14) No general education is given.

2.—Native system of Apprenticeship.

(1) As a rule the trades are hereditary, the boys being apprenticed to either their fathers or some other relative, or any other workman actually engaged in the trade. The line between the different trades, however, is not very sharply drawn; a carpenter's son, for instance, sometimes becomes a smith or a turner. Sikh carpenters generally turn their hand to stone work also.

(2) The same system, as far as we know.

(3) The following objections to the Native system may be mentioned:—

(a) Takes too long a time to learn a trade.

(b) The method is too tyrannical, the apprentice often being no better than a slave to his master. In the earlier years of apprenticeship he spends most of his time in the menial service of his teacher.

(c) There is very little scope for the apprentice to think for himself, the methods followed by his master being almost invariably rigid and inelastic.

(d) No time is given for mental improvement or for the development of inventive faculty.

(e) Some trade secrets are sometimes kept back by the teacher.

On the other hand, the Native system possesses the following advantages:—

(a) The trade is confined to the same families, generation after generation. This gives dexterity and quickness of preception not easily attainable under other circumstances.

(b) The apprentice not only learns the work at his master's shop but is brought into contact with his customers. He comes to know the exact requirements of the people with whom he will have to deal and the prices which they will be prepared to pay. In short he learns not only the trade but the business of the trade also. This is a distinct advantage where afterwards the apprentice has to set up a shop on his own account.

(c) The apprentice is called upon to do a great variety of work.

(4) As far as we understand this question, the best craftsmen can be identified by the quality of work he can do within a given time.

(5) Taking everything into consideration the Industrial School method is in many cases the only one practicable.

In many cases the secrets of the trade are jealously preserved, and neither advice nor interference will be welcome.

(6) No regular fee is paid but very often, at the initiation, a present is made which is sometimes periodically repeated. The personal service of the apprentice stands in the place of cash remuneration.

There is no preliminary education worth speaking of, and the age at which boys are apprenticed varies between the 8th and 10th year.

(7) As a rule of their own class.

(8) Something in this direction has been done by the orphanages during the last three or four years, but we are not in a position to give further information.

(9) This can only be done through the agency of Industrial Schools by placing better patterns of work before the craftsmen and introducing them to improved tools.

(10) We do not know of any Trade Guilds, unless the castes are regarded in this light.

3.—Principal Industries of the Province.

(1) The principal industries of the province are given in the following list, but we cannot say that it is complete. Kindly refer to the Report of the last Punjab Exhibition:—

DBLHI.—(a) Ivory carving, paper knives, card cases, picture frames, and other fancy articles.

(b) Miniature painting both on paper and ivory.

(c) Ebony and sandal wood-carving.

(d) Small square carpets made of durries.

(e) Lace (gold and silver), crinkled lace. Pressing pattern on lace.

(f) Brass toys, a speciality.

(g) Sugared spices.

(h) Fine embroidery.

- UMBALLA.**—Durrries.
- JAGADHRI.**—Celebrated for its brass and iron vessels, country umbrellas are made here.
- LUDHIANA.**—Shāl, lungi, and woollens.
- KARTARPUR.**—Cane and wood-work, such as chairs, sofas, etc. Cotton-printing.
- SULTANPUR.**—The jajims (large cotton sheets used as carpets) of this place are famed throughout Upper India.
- JULLUNDHUR.**—Cotton stuffs.
- HOSHIAHPUR.**—Fancy wood-work, ivory inlaying, lacquer-ware, both fancy and useful. Toys and round boxes, stands, and other articles of furniture are coloured brilliant crimson, with blue and gold streaks which have an iridescent effect.
- AMRITSAR.**—(a) Ivory carving.
(b) Carpets for which this town enjoys pre-eminence.
(c) Fine woollens. Pashmina.
- LAHORE.**—(a) Daryai (a coarse silk textile fabric).
(b) Silk checks, a new flourishing industry.
(c) Silk-dyeing.
(d) Wood-turning.
(e) Dhussa (woollen sheets used as wrappers) in two colours, almond and snuff.
- MULTAN.**—(a) Woollen carpets, small and large.
(b) Silver enamelling.
(c) Enamelled tiles, vases, jars, etc.
- N.B.*—Enamelling in colour, once a very flourishing art in the Punjab, known as Kanshi work, is now dead. The best specimens in Lahore such as Wazir Khan's mosque, and Taksali Gate mosque cannot be reproduced now.
- WAZIRABAD.**—A village called Nizamabad close to it is noted for its cutlery.
(b) Silver and gold mounted walking sticks.
(c) Locks.
- SIALKOT.**—Koftgari and Bidri work, some of the steel-inlaid paper-cutters, card cases, vases, shields, are very beautiful.
- PATHANKOT.**—Bamboo-work of which furniture is made.
- ROHTAK.**—Fine cotton muslin.
- HISSAR.**—Phoolkari with talc and glass discs.
- REWARI.**—Tinning as good as that of Moradabad. Hookas, etc., are well-known.
- GUZRAT.**—Check cloth, saddlery.
- HAZRO.**—Snuff, which is used throughout India.
- PESHAWAR.**—Dhussa, lungis, felts.
- KASHMIR.**—Papier-maché, silver and gold filigree. Illuminating. Pashmina, etc.
- SHAHPUR (BHERRA).**—Work in soft bluish stone and lapis-lazuli, also cutlery.
- KULLU.**—Felts, putties, blankets.

2. All those mentioned in the above list ought to be preserved, but the following appear to be specially deserving of encouragement :—

- (a) Miniature painting both on paper and ivory.
- (b) Lace, cotton, gold, and silver.
- (c) Fine embroidery.
- (d) Woollens.
- (e) Cotton-printing.
- (f) Carpet-manufacturing.
- (g) Fine woollens and pashmina.
- (h) Daryai and silk checks.
- (i) Dhussas.
- (j) Enamelled tiles, vases, etc.
- (k) Lacquer wares.

(3 and 4) The industries may broadly be divided into two classes :—

- (i) Those that serve the daily wants of the people.
- (ii) Those which supply the luxuries of the higher classes of the population.

Of these the former are fast dying out on account of keen competition with the West. The latter are faring better specially on account of the patronage of European gentlemen both in India and abroad.

The reason why encouragement is specially needed is because these are the specialities of those localities and are good as specimens of art. As regards the form of encouragement, it is very difficult to make any suggestions except that it will be helpful if more capital was employed in the production of these articles which might then be sent outside India. Measures could be devised to give loans to artisans on easy terms *e. g.*, as was done in Switzerland.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—*Proposed alterations and additions in system and methods.*

(1) We approve of the existing method, but would like to do something to combine with it the advantages of the Native method of training. (see answer to A.(a) 2.(3) under advantages in Native system on p. 67.)

(2-6) We think there ought to be a Polytechnic Institute in the Province where methodical instruction in a number of trades be given, fitting the students to be the Superintendents of small Industrial Schools or proprietors of small businesses started by themselves. Foremen of workshops may also be drawn from the proposed Polytechnic Institute. In the case of Superintendents of schools, some additional instruction will be required. This can be provided in the Institute itself or in a separate place without much difficulty. To give a finish to the training received in the Institute it is absolutely necessary that the students should spend a few months in large factories or workshops. How far private factories will be willing to admit such students is a question which we are not competent to answer. Probably some factories will be glad to admit them while others won't; but it must be remembered that there are not many factories in the whole of India where students passing out of the Institute could receive their final training. They will, however, spring up in the course of time if the proposed Polytechnic Institute is established. In special cases a deserving student from an Industrial School may be admitted into the Polytechnic Institute. A certain amount of previous general education should form a necessary qualification for admission into the Institute. Under the existing circumstances the barest knowledge of the three R's of Education may qualify a student for admission into an Industrial School.

(7) Private Industrial Schools should be brought into a line with those under the Government control by laying down rules about grant-in-aid, inspection, etc., similar to those which are already observed in ordinary Board Schools. Free expert advice will be most welcome and will certainly prove beneficial.

2.—Proposed alterations and additions in schools and the want of new schools.

(1-6) We would suggest that at least a dozen Industrial Schools be started in the principal towns of the Punjab, each giving instructions in 2 or 3 of the chief industries of the locality. These institutions to be under the same control as the existing schools for General Education, and to be financed from the same sources.

All intelligent members of Municipal Committees will be glad to provide funds for the purpose, especially as the establishment of these schools will, in the course of time, probably increase the income of Municipalities.

Night Schools are not very attractive at present, and to make them so it will be necessary to offer some special inducements in the form of stipends and prizes for a number of years.

We doubt very much whether the existing schools can turn out competent instructors, except, perhaps, in one or two branches.

3.—How the Neapolitan scheme would apply.

(1) Yes.

(2) Yes, if they can get more work by this means. In the V. D. J. Hindu Technical Institute a modified Neapolitan scheme was introduced a few months back. One instructor who was previously doing business on his own account has been employed in the Institute on a fixed salary of Rs. 20 a month. In addition to this he is entitled to 75% of the value of the work done for the public. This percentage is to be reduced in case the value of the work turned out exceeds a certain limit—a sliding scale having been fixed. We cannot say positively how far the experiment will succeed, but it is hoped that some craftsmen will consent to work under the Superintendent when the advantages are made clear to them.

(3) For the present they may be made to work in an enclosed private area open only to certain inspecting officers.

(4) A fixed monthly salary along with other inducements mentioned in the following section:—

(5) (i) Cheap materials to be supplied by the school free of cost. Expensive materials to be paid for out of the value of work turned out.

(ii) The school to pay for the waste of materials.

(iii) This is one of the greatest inducements to a workman as the school can generally realize better prices than an individual craftsman working in an out-of-the-way corner of a town.

(iv) School exhibitions are certainly helpful in disposing of the articles made by the students.

(v) Our Institute offers small stipends to deserving apprentices.

(vi) Yes, the profits should be divided between the several parties, the exact portion depending largely upon the circumstances.

(vii) Workmen do not like many holidays unless they are at the same time doing business on their own account at home. In our Institute we allow all the gazetted holidays in addition to Sundays.

(viii) All the rules observed in Board Schools should be generally enforced in the case of apprentices also.

(ix) In certain cases fees can be charged, while in other cases a small stipend will have to be given.

(6) Yes, by providing better tools and insisting upon cleanliness scrupulously. The native craftsman is not in the habit of finishing his work in all its details. These defects should invariably be pointed out to him and remedied.

4.—*Would you accept Experts from abroad in each Industry ?*

- (1) Specialised working experts should be employed in the proposed Polytechnic Institute. They may also act as travelling Instructors for the Industrial Schools.
 (2) Provincial.
 (3) It will vary with his qualifications and the work he is to do. The experiment may be begun with a small number of men but they should be persons who know their business.

5.—*Proposed department of Control, Central and Local, for Urban and Rural Schools.*

(1-5) For the present and until Industrial Schools are fully organized the controlling machinery should be the same as that for General Education—the Head of the Educational Department being assisted by a specialist who may be the Principal of the Polytechnic Institute.

Imperial supervision will probably be better.

6.—*Exhibitions and Sales, whether required.*

- (1) Exhibitions in India have not, we believe, turned out as helpful to the country as they have been in Europe.
 (2) (i) Not only the finished products may be exhibited but the improvements pointed out, and if possible demonstrated.
 (ii) Greater attention should be paid to the exhibition of the means, i.e., tools, etc., of producing manufactures than the products themselves.
 (3) We are not in favour of prescribing one method of disposing of the products exclusively. It will vary with the existing circumstances and can best be determined by the officer in charge. It will depend largely upon the quantity of work turned out.
 Prices should be fixed.

(c) **HOW ARE FUNDS TO BE PROVIDED.**

- (3) Yes, by providing, if possible, money for improved implements or for Working Capital to be paid back within a certain period of time by small monthly instalments.
 (4) Yes. Industrial Banks somewhat on the lines of the proposed Agricultural Banks by inducing existing capitalists or money-lenders to advance money on certain fixed and easy terms in return for certain fixed privileges about the realization of the loans.

B.—INTRODUCTION OF NEW INDUSTRIES.

A great need of the country is the introduction of industries which could be managed and financed by individuals of moderate means. In this connection we beg to suggest the following industries which may, we think, be started with a small outlay of capital and which are sure to prove remunerative:—

- (1) Photo-Mechanical Processes for producing good, correct, and cheap illustrations. The importance of this in the industrial development of a country cannot be over-rated. We understand that the Educational Department is about to make a beginning in this direction.
 (2) Lens-grinding for spectacles and optical instruments.
 (3) Candle-making.
 (4) Button-making.
 (5) Manufacture of pencils, nibs, and slates.

NOTE ON INDUSTRIAL SCHOOLS.

By HANSRAJ, B.A., PRINCIPAL, D.A.V. COLLEGE, LAHORE.

I.—The private Industrial Schools that I know of are:—

1. The tailor class of the D. A. V. College.
2. The Ferozepur Orphanage School.
3. The Bhiwani Orphanage School.
4. The Diamond Jubilee Hindu Technical Institute.

The information about the fourth can be had from Mr. Justice P. C. Chatterjee.

The *tailor class* has got five students. They are taught Hindi, Sandhya (Arya prayer), and sewing. A scholarship of R4 per mensem is given to each scholar. A Master tailor is paid R6 per mensem. He gets also the proceeds of the work of his scholars. High caste Hindus are generally admitted to the class. The annual outturn ranges between one and three scholars. The D. A. V. College Committee supplies tools, while materials are supplied by the customers. No attempt has been to improve the quality of work, tools, or machines. The class is under the control of the D. A. V. College Committee and is located in the College buildings.

The Ferozepur Orphanage School is a big institution under the control of the Orphanage Committee. It was started to give work and employment to famine-stricken orphans of both sexes. The orphans are taught according to their desire and capacity (a) carpet-making, (b) carpentry, (c) dari-work, (d) weaving, (e) hosiery work, (f) lace-making. Some 150 orphans

are engaged in all these Industries. They are taught Hindi and Sandhya. The Industrial School as organized at present owes its existence to the influx of orphans during the last two famines. A few lads have been discharged from the orphanage after learning hosiery work ; but the school is of too short a duration to permit us to form any opinion as to the outturn of artisans every year. No attempt has been to improve the quality of work or the tools or machines.

The Bhiwani Orphanage School is just like the Ferozpur one, except that the number of orphans is 50, and carpet-making, dari-making, and *niwar* work are taught to the orphans.

II. Native artisans have generally as their apprentices their sons, relatives, castemen, and others in whom they may have confidence. Nothing is paid by the apprentices to their masters. Masters, on the contrary, pay them according to the quality of the work done by them. The chief difficulty in the native system of apprenticeship is that masters do not readily and quickly impart knowledge to apprentices. Much difficulty was not experienced in teaching work to the orphans.

Trade Guilds exist in the country, as those of goldsmiths, braziers, etc. They fix the days of work as well as rates, but I do not think their organization is so strong that they may be utilized for the improvement and expansion of industries. The members of these unions have no general education. Craftsmen will, however, be ready to receive advice if they could be made to believe that they would be benefited by such advice.

III. There are some industries which do not require any help because the people can hold their own in them ; but in those industries wherein people do not possess the skill and technical knowledge of the West, Government help is necessary, say in glass work.

NOTE ON THE IMPROVEMENT OF LOCAL INDUSTRIES.

BY MR. W. A. STEIN, INSPECTOR OF SCHOOLS.

Two classes of Industries in the Province appear to be deserving of special support and encouragement :—

- (i) Those which by means of such initial help may reasonably be expected to compete successfully with, and eventually to oust, industrial products at present imported from outside India.
- (ii) Indigenous *Art Industries* which can already hold their own in India ; but for which by proper guidance and extended sale facilities, a largely increased export could be secured to Europe and America.

I am inclined to think that as far as class (i) is concerned only a systematic policy of industrial protection in its fullest sense could effect lasting results and on a large scale. As the adoption of such a policy is not a practical contingency for the present, the efforts of Government may well be concentrated in the first place towards the development and improvement of the industries grouped under (ii).

Support and encouragement for such industries are specially required for the following reason :—

- (a) The art industries concerned, such as wood carving, art metal work, ivory and *intarsia* work, silk embroidery, etc., though of old indigenous growth and rooted in native tastes and requirements, cannot maintain or improve their standards of technical finish unless efforts are made to extend their market. The well-to-do native classes having their attention and means diverted by new requirements, afford no longer a large custom. The purchases by the resident Europeans are necessarily very limited. If, however, a ready supply of really superior work could be assured through properly conducted Industrial Schools and sale agencies a far more extensive sale would be secured for the products of capable craftsmen, particularly in Europe and to visitors from Europe.
- (b) For the sale prospects of Indian Industrial Art work, it is essential that its products, though thoroughly Indian in design, should be adapted to European conditions of living. This difficult process of adaptation requires careful guidance. This can be supplied for a long time to come only through experts, who must be at the same time in touch with the craftsmen and acquainted with the fine openings for Indian Art produce in Europe.
- (c) The inferior produce will find no appreciable sale in Europe.

Yet the traditional conditions under which the Indian craftsman works, do not allow him to turn out superior articles unless they are directly ordered and partly paid for in advance.

A wide field of practical utility is offered here to the management of an Industrial School, if it works in co-operation with an establishment for the sale of approved products and is provided with the means for offering liberal advances.

Without being acquainted with details, I suppose that the Naples scheme would meet a number of the peculiar difficulties with which the direction and control of Indigenous Art industries in India will always have to contend.

Exhibitions of work made would be held with greatest advantage where the best paying customers for Art industries could be found, *i.e.*, in Europe.

Support of impecunious apprentices could be made a special attraction to draw capable craftsmen to the school. They would be saved expenses on account of such apprentices and might be given a prior claim to the services of the apprentices whom they had trained, when their work becomes remunerative.

For the practical success of a school it seems desirable that its management should be entrusted to one general working expert. Of course, the Art Industries to be practised in one school would have to be suitably grouped so as to admit of efficient direction by *one* expert.

For Industrial Schools such as above contemplated only Imperial Exhibitions, *i.e.*, exhibitions held at great centres and, if possible, in regular succession, could be of real value. Previous to despatch exhibits might be collected and rendered accessible at the place of production for the purpose of stimulating competition among workers.

Sale direct by the producer, either to Government agency or private purchasers, would have perhaps the best effect.

In the case of the Art Industries above indicated expensive fine work would undoubtedly yield the best economic result, both for the individual and the craft as a whole.

NOTE ON SOME TRADE GUILDS AT LAHORE.

BY LALA RUCHI RAM SAHINI, HONORARY SECRETARY, PUNJAB SCIENCE INSTITUTE.

I.—Silk-Weavers' (*Daryai-báf*) Guild.

1. This was established eight or ten years ago at the instance of some Bombay merchants who visited Lahore at that time.
2. The rates have since been fixed 50 per cent. higher than those prevailing previously.
3. Payment for work is demanded (and received) always in advance.
4. The weavers are a gradually diminishing class, partly on account of the establishment of the Guild and partly because of keener competition with the stuff imported from abroad.

II.—Metal-workers' (*Tatharás*) Guild.

1. The rates for different kinds of utensils are fixed.
2. All work is stopped for seven days on the occasion of the death of a fellow artisan residing at Lahore, but one day's stoppage is observed for a *Muffassil* brother.
3. Infractions of these rules are punishable by fines amounting to Rs. 4 or 5.

III.—Utensil-Sellers' (*Kaserás*) Guild.

1. Rates are fixed with the metal-workers, as also the quality of the work turned out. Inferior work is discounted for at fixed rates.
2. Business must be stopped for one day on the occasion of the death of a brother residing at Lahore.
3. The *Ikadasi* (eleventh day of the moon) and the *Somratimavas* must be observed as holidays by all.

IV.—Ironmongers' Guild.

1. Rates are fixed for certain classes of work, but not for all.
2. The compulsory holidays are the same as for the Utensils-sellers.

4th January 1902.

NOTE ON THE PUNJAB SCIENCE INSTITUTE, LAHORE.

BY THE HONORARY SECRETARY.

1. The Society was established in May 1886. It is a registered body.
2. The accompanying statement gives the aims and objects of the Institute, as well as the means by which it is proposed to carry them out.
3. As a rule, about half-a-dozen lectures are given under the auspices of the Institute during the winter. These are mostly attended by students from the local Colleges. During the summer months, three or four short courses of systematic lessons are given on some popular scientific subjects. A fee of one anna per lesson is generally charged. Sometimes an examination is held after the course of lessons is finished and one or two prizes awarded to the best men.
4. Some members have also, from time to time, delivered lectures in *Muffassil* stations. On an average some eight or ten lectures are given in this manner. These lectures are invariably in the Vernacular. They are better attended than those at Lahore. On some occasions the audience exceeded 1,000 men. No Travelling Lecturer has been appointed. Arrangements are being made to enlist the co-operation of the Assistant Surgeons, Science Teachers and District Inspectors of Schools in the *Muffassil* stations in this good work.
5. The Society has not been able to carry out objects (c) and (g).
6. Some years ago a small workshop was established under the auspices of the Institute for the manufacture and repairs of the more simple scientific instruments and apparatus. This has been of some help in popularising the study of Science.
7. The Institute has got a collection of 60 or 70 books on technical subjects, but they are not much used by the members.
8. The Institute gives an annual prize of Rs. 20 to the student who obtains the highest number of marks in Physics or Chemistry at the B.A. Examination of the Punjab University.

9. The Institute has lost no opportunity afforded to it for the encouragement of Technical Education in every possible way.

10. It claims that it has succeeded, though to a small extent, in its efforts to popularize the study of Physical Science in the Province.

11. The following is an incomplete list of lectures which will be delivered during the next three months at Lahore :—

Dr. Beli Ram, Rai Bahadur	.	.	.	.	.	.	Water.
Lala Ruchi Ram Sabni, M.A.	.	.	.	.	.	.	Ventilation.
Lala Kirpa Ram, B.A.	.	.	.	.	.	.	Electricity.
Lala Sukh Dyal, B.A.	.	.	.	.	.	.	Eclipses.

3rd January 1902.

Proceedings of a Meeting of the Committee of Management of the Railway Technical School, Lahore, held in the School-house, on Friday, the 19th April, 1895.

Present :

COLONEL BOUGHEY, *Manager, North-Western Railway, in the Chair.*

DR. SIME, *Director of Public Instruction, Punjab.*

MR. SANDIFORD, *Loco. Superintendent, North-Western Railway.*

MR. ANDREWS, *Principal, Mayo School of Art, Lahore.*

1. The order of the Lieutenant-Governor directing that certain questions should be laid before the Committee, together with the letter to the Government of India referred to in His Honour's order, a copy of which had been previously sent to the members, was taken as read.

The questions were then considered *seriatim*.

2. *Question I.*—How far does the Railway Technical School at present fulfil the object of a technical school?

On this question the Committee desired to re-affirm what was recorded at the time of its starting as the proper object of the Railway Technical School. "The object of the Railway Technical School," it was said "is to impart a good practical education, including a knowledge of some handicraft, to boys of the artisan class. Hitherto the sons of artisans have generally held aloof from the schools; and when they have attended them, it has been with the view of enabling them to follow an occupation that their parents consider more remunerative or more likely to lead to advancement than their hereditary calling. The boy who stays at home acquires some manual skill and knowledge of his father's handicraft; but his intelligence is not systematically trained, and he does not acquire those habits of cleanliness, punctuality, order, and obedience that he would be taught at school. When he grows up, he becomes a fair workman under proper supervision; but he has received no education, has no theoretical knowledge, cannot be left to himself, and is totally incapable of controlling others." It was to give him a more hopeful start in his trade, with some knowledge of the special branches referred to by His Honour the Lieutenant-Governor, which would aid him in doing his work and in rising to the higher grades of it, that the Railway Technical School was established; and in this respect, the Committee consider *that the institution is well fulfilling its object.*

A further question was asked under this head—whether the course, which includes a certain practical knowledge of English, might not end at the Upper Primary Standard; but it was concluded, both on account of the low age of the scholars at that standard—the average being about 12 years, and 15 being the lowest age for admission to the Railway workshops—and the desirability of having a small number fairly up in English, that the maintenance of a Middle Department was necessary.

3. *Question II.*—In particular, how far does the teaching in it afford a suitable preparation for youths proposing to enter the Railway workshops as apprentices?

The Committee were of opinion that the instruction, as far as it *went*, is a suitable preparation for admission to the Railway workshops as apprentices.

The terms on which they could be admitted, and their future success in the workshops, would depend on their merits; and as the annual outturn of the Middle Department would be small, Colonel Boughey and Mr. Sandiford saw no difficulty in the way of their admission as apprentices, provided they were willing to enter at their proper market value.

4. *Question III.*—Whether any improvements are desirable in this respect.

With regard to this question, the Committee considered that the scheme of instruction is sufficiently suitable to the present stage of progress in this line.

5. *Question IV.*—Whether it would not be possible to arrange for advanced evening classes, which might, with advantage, be attended by youths who have already entered the Railway workshops.

The Committee consider it desirable that evening classes for general education, as well as for instruction in English and drawing, should be opened. Attendance on such classes, if opened, would be made compulsory by the Railway authorities for the European and Eurasian apprentices; but for Native apprentices attendance would have to be optional, and in this aspect, however advantageous the scheme appeared to be, its practicability was doubted.

6. *Question V.*—The petition lately presented by *ex*-pupils of the school complaining that they could not find suitable employment in the Railway workshops; and why three annas a day was reckoned what they were worth, as compared with the wages given to untrained European and Eurasian apprentices?

With regard to this question, it appeared to the Committee that some special obstacles had probably been put in the way of Amar Singh and Khair Din when they applied for employment last November, as Mr. Sandiford saw no reason why more similarly trained youths could not be taken in if they were willing to begin on what they were worth. Shams-ud-din was offered three annas a day, which he declined; but, although others less perfectly educated had been employed on higher rates, it could not be said, without going fully into his case, that the amount offered, which was the pay of a third year native apprentice, was really too little. Mr. Sandiford undertook to enquire into these cases, and to ensure the ready employment of youths, who may pass the Middle Standard Examination on the wages proper to their qualifications. As regards the higher wages given to European and Eurasian apprentices, it was explained that it is essential to have a number of these in the workshops, and that their manner of living required considerably higher rates of pay.

7. *Question VI.*—Is the teaching in carpentry worth the time spent on it; and, if so, whether there are not similar reasons for teaching working in metals also?

The Committee considered that the instruction given in carpentry in the school affords a suitable preparation for a career in that trade in the Railway workshops or otherwise, and that metal-work might also, with advantage, be introduced into the school. Dr. Sime explained that this had all along been intended that a special room had been provided for the purpose in the new building, and that only financial considerations had stood in the way. It was the opinion of the Committee that carpentry up to the Upper Primary Standard should be the basis of all other handicrafts, and that metal-work should be begun in the Middle Department.

8. The Committee resolved that it was desirable for the Committee to meet occasionally, and that there should be at least one meeting every year.

(Sd.) G. F. O. BOUGHEY, COLONEL,
Manager, N.-W. Railway.

TABLE OF INDUSTRIAL SCHOOLS.

Serial No.	Name of Institution.	Date of foundation.	How supported.	Average attendance.	Annual output of artisans.	Industries taught.	General subjects taught.	Reasons for the selection of present location.	REMARKS.
1	Ry. Technical School, Lahore.	Information	required has already	been	supplied.				
2	Industrial School, Amritsar.	5th January 1886	By Municipality .	120	18	Drawing, wood-work, and metal engraving (repoussé work).	All the subjects in the Scheme of studies for Industrial Schools with the exception of English.	Centre of one or more industries.	
3	Industrial School, Ludhiana.	21st September 1896	By District Board .	116	2	Wood-work, smithy-work, and drawing.	All the subjects in the Scheme of Studies for Industrial Schools.	Do.	
4	Industrial School, Delhi	1st February 1890	By Municipality .	50	...	Drawing and wood-work .	All the subjects in the Scheme of studies for Industrial Schools with the exception of English.	Do.	

N.B.—There are Industrial Schools on a small scale at Gujranwala, Ludhiana and Gurgaon, but they are all supported by Missionaries and based on eleemosynary principles.

CHIRANJI LAL,

Head Master, Railway Technical School, Lahore.

Dated 27th December 1901.

CENTRAL PROVINCES.

Proceedings of the Industrial Education Conference held in Government House, Nagpur, on the 16th January 1902.

Present :

- LIEUTENANT-COLONEL J. CLIBBORN, C.I.E., I.S.O., *President.*
 MR. H. H. CRUMP, I.C.S., *Chief Secretary to the Chief Commissioner.*
 „ F. G. SLY, I.C.S., *Commissioner of Settlements and Agriculture.*
 MAJOR BUCHANAN, *Superintendent, Central Jail.*
 MR. A. MONRO, *Director of Public Instruction.*
 „ J. RHIND, *Locomotive Superintendent, Bengal-Nagpur Railway.*
 REV. DR. F. R. FELT, *M. E. Mission, Narsinghpur.*
 „ DR. BEVIC, *U. F. C. Mission, Wardha.*
 „ FR. COPPEL, *Principal, St. Francis de Sales' School, Nagpur.*
 KHAN BAHADUR BAZONJI DADABHOY, *Empress Mills, Nagpur.*
 MR. KRISHNA BAO PHATAK, *Pleader, Nagpur, and Director, Pulgaon Mills.*
 MR. PARDHI, *Manufacturer, Nagpur.*
 „ C. A. RADICE, I.C.S.
 „ R. E. ENTHOVEN, I.C.S. } *Members of the Committee.*
 REV. FOSS WESTCOTT, M.A.

The Proceedings have been read by the Hon'ble the Chief Commissioner.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

Q. (2) Was there any special reason for the selection of the present location?

A. MR. MONRO said he imagined that the Missionaries concerned selected places in which they would be most likely to obtain famine orphans.

Q. (3) How is each school or group of schools governed?

A. MR. MONRO said that each orphanage has a local body of missionaries who manage it.

2.—Native system of Apprenticeship.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. MR. PHATAK thought that if enquiry were made in the bazar this information could be obtained; but MR. CRUMP thought that men of the same trade would not point out the best craftsman, but that the general public would know.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

A. MR. RHIND expressed a preference for both systems (Native and Industrial School) combined.

MR. MONRO agreed.

MR. SLY was entirely in favour of the Native system as far as the teaching of existing methods was concerned.

MR. BHIND remarked that the boy taught in an Industrial School by a proper craftsman would develop into a good workman; he would learn improved methods. This, he said, referred to artisans required for a Railway workshop.

MR. SLY said that the only advantage that the Industrial School had over the Native system was that the boys would have a greater chance of learning improved methods, this being the object of an Industrial School.

MR. BHIND said that it was impossible to learn a trade by mere imitation.

REV. DR. FELT remarked that in his workshop he combined the two methods. The carpenter, he said, for instance, had his class of boys and he worked with them and taught them at the same time. He found this very satisfactory.

MR. PHATAK did not think that much could be done to extend the practice of the Native system as Natives were very conservative. However, he thought that by constant advice and ocular demonstration they could ultimately be persuaded to accept outside advice. For example, if you wanted to improve the weaving industry, you would have to put up a fly-shuttle loom here (and in other places) and show the men how by its use the outturn could be nearly doubled; even then, he thought, they would be slow to adopt the method.

Q. (6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education.

A. MR. PHATAK and MR. PARDHI said that no fees were paid to teachers, but presents of small value were generally given on the apprentice being taken in.

MR. SLY remarked that this was the result of the caste system.

Q. (7) Will the craftsmen take on apprentices of all classes or only of their own class?

A. MR. PARDHI and MR. PHATAK said that apprentices of all classes were taken on, except, of course, the lowest castes, such as Mahars.

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system.

A. MR. PHATAK would give grants per pupil and prizes to the pupils themselves according to their work. He recommended, in this connection, that the District Officer might inform the teachers that if they taught their pupils thoroughly, prizes would be given the boys, and this, he thought, might be an inducement for the teachers to give better instruction and for the boys to turn out better work.

MR. MONRO would prefer to give cash: a small bonus, he said, would be valued a great deal, say about R20, and as the system spread this bonus might be dropped.

Q. 10 Are there Trade Guilds in the Province, and, if so, in what trades, and where?

A. Not known.

3.—Principal Industries of the Province.

Q. (1) Please state the principal industries of the Province.

A. MR. SLY kindly undertook to supply a list of these.*

Q. (2) Which of the above would you recommend being specially supported or encouraged?

A. MR. SLY specially recommended—

Cotton Weaving.

Silk

Leather (tanning) industry.

MR. MONRO recommended in addition to the above—

Carpentry.

Blacksmith's work, and the gold-wire work of Burhanpore.

MR. PHATAK very strongly recommended—

Cutlery.

He went on to mention that the people of Vijadur and Malwa (both in the Ratnagiri, District), made very nice and useful penknives and scissors, and they were very clever in this art, but owing to the influx of inferior German-made articles in the market, this once very promising industry has deplorably suffered.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

Q. (2) If you do not approve of the school system, how do you propose to provide a training for artisans in the future?

A. MR. MONRO said that, personally, he was very much in favour of the Naples system for the training of artisans. He mentioned that very lately when he was travelling he had a talk with some blacksmiths, carpenters and sonars about this Naples scheme, and they seemed very willing to fall in with it; the only objection they had to this scheme, was that apprentices after having learned their trade under them would be taken away and placed in workshops, but on

* See pages 85 to 91.

his having clearly put before them the great advantage that would be given them in the way of being allowed to exhibit their manufactures, they were very pleased with the idea.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. MR. MONRO recommended scholarships.

MR. PARDHI thought that scholarships would indeed be a very good thing. The Mills gave scholarships.

MR. BAZONJI said that some of their men who had learned up their work had gone to other Mills as Managers, Weaving Masters, Engineers, etc.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of Works?

A. MR. RHIND was in favour of practical work. It is not, he said, always the cleverest workman who made a good foreman. If he had to choose a foreman between one who had had a College education and the shop-brought up man, he would certainly choose the latter, as he would be a really practical man. The "College" man would do very well for office work, but the "shop" man would make a better foreman.

Q. (5) Do you think their training can be completed in a college or a school?

A. MR. RHIND thought that the foreman's training could be completed in a college, in this way that he first be made to work in a shop and after he has had a practical training there, he be sent on to a college to complete the theoretical part of it, but in no case was the College training to precede the shop training. And if, further, the man was desirous of following a higher calling in his profession, e.g., if he wanted to become a Works Manager, he should be sent on to a higher institution from the ordinary Technical College.

MR. BAZONJI remarked that in his Mills he had English foremen who had had no previous technical training, but had learned their work whilst in the factories, and they made very good foremen. Latterly, however, since the establishment of Technical Institutes in England, younger men were coming out who, he must say, are in every respect better men. He would, therefore, prefer a foreman who has been trained in a Technical College, but, of course, he must also have had a practical training.

Q. (6) Do you think a method of final training in large workshops advantageous and practicable? In this case should a fee be paid to the shop or a scholarship given to the student?

A. MR. BAZONJI said that the training he would recommend for a foreman, would be a sound theoretical training in a College, and for him to be sent to pick up practical work in the Mills.

He went on to mention that they had had two or three men direct from the Victoria Technical Institute, Bombay, but they had to train them over again; they could not put them in charge of any Department at once. These men, however, were above the average as far as intelligence went. They did not give their apprentices any lectures, or instruction, but they were left to pick up the work themselves. The heads of each of their Departments were trained in like manner in their Mills, and their Chief Engineer had started as an apprentice on ₹10 a month and was now drawing ₹500, he learned all his work from the outset in their own Mills. He thought that men trained in a factory made better Heads of Departments and Chief Engineers, etc., than those trained solely in a Technical College.

MR. RHIND said that he believed that men were worth more who had had a preliminary technical training.

Q. (7) As regards the methods employed in private schools, what measures are you prepared to take for insuring that they are conducted in conformity with Government Industrial Institutions? Would you give—

- (i) An annual grant?
- (ii) A grant to cover initial expenses?
- (iii) Free expert advice?

accompanied with conditions?

A. THE REV. DR. FELT recommended the giving of certificates to boys after an examination, say, once a year, which, he thought, would give them a standing among workmen. A money grant, approximating to the cost of a Drawing Master, would be very acceptable to them.

MR. MONRO recommended certificates accompanied by grants on results. Examine the boys, he said, individually, giving so much per boy on the work done by him. He also recommended expert advice where necessary.

2.—Proposed alterations and additions in schools and of the want of new schools.

Q. (2) Would you approve of the institution of new schools or a new school in the Province now or in the near future, and if so—

- (i) In what locality, and are premises available?
- (ii) For what trades?
- (iii) Under what system and method?
- (iv) How would you finance it? Are there any special funds available?

A. MR. SLY and MR. MONRO proposed Weaving Schools on the Naples System at Nagpur, Umrer, and Pownee; they need not be started at once under existing methods, but rather after improved methods had been satisfactorily demonstrated.

MR. SLY would also like a Silk Reeling School to be attached to each of the Weaving Schools after full and satisfactory enquiries had been made in regard to the possibility of introducing improved methods in weaving.

MR. MONRO would like the starting of Carpentry and Blacksmith's work at once in Jubbulpore and Nagpur.

MR. RHIND thoroughly approved of Mr. Monro's suggestion regarding blacksmith's work and said that he could find many little jobs for the boys to do for the Railway Workshops, such, for example, as the making of bolts and nuts, etc., for which, in the Workshops, they would have to pay their workmen a rupee a day, besides taking up all their time, whereas the same could be given to the boys to do.

He would also add tinsmith's work and watch-repairing. He would start these at once. He knew of no premises that were at present available, but he thought there would be no difficulty about securing a suitable site.

MR. SLY said that the only premises that were required were a kutcha grass shed.

MR. MONRO would start the schools under the Neapolitan System.

MR. CRUMP said that there were no special funds available for the purpose.

Q. (3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee? Are the local conditions likely to lead to success?

A. The members all approved of night schools.

MR. MONRO said that there were night schools at Itarsi for weavers which they all attended.

MR. RHIND was certain that a few men would attend. In his shops there were men who could read and write, but what they wanted was a theoretical training.

MR. PARDHI said that a few would attend.

MR. BAZONJI remarked that half-time boys would certainly like to attend.

MR. RHIND further said that the night schools would improve the ordinary artisan, particularly in drawing. He had European lads in the shops whom they were paying four annas a day, although they were not worth so much, but to lads who came with any practical education he would be prepared to pay as much as ten and twelve annas a day. There was, he thought, a great dearth of really practical lads in the Province.

Q. (4) Should such night schools be under the General Education Department or the Industrial School management?

A. MR. CRUMP was in favour of night schools being under Industrial Management as this was the only way of ensuring that the teaching would be useful to the industry.

MR. MONRO suggested the General Education Department.

MR. PARDHI recommended that they be under the Industrial School Management as the subjects to be taught therein referred more to industry than to education in the literal sense.

MR. MONRO said that his idea in suggesting the Educational Department was to try and interest the Educational Officers in Industrial Schools. He, however, thought that practically the night schools would be under both the Departments as they would have to go for advice both to the Educational and Industrial authorities.

Q. (5) Are you in favour of the establishment of Training Schools for Superintendents and Instructors, and do you propose to take steps in this direction at once?

MR. SLY was of opinion that Training Schools for Superintendents and Instructors could not be managed in this Province at present.

Q. (6) Can the necessary Instructors be provided in existing institutions?

A. MR. SLY said that there were no industrial institutions to supply such Instructors.

3.—How the Neapolitan Scheme would apply.

Q. (1) Do you approve of the method of the Naples scheme generally?

A. MR. SLY approved of the system, but thought that it did not require Government help.

MR. MONRO thoroughly approved of the system.

MR. RHIND said that the workmen themselves would be glad to have a School on the Naples System to be attached to the Workshops.

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a Superintendent?

A. The general opinion was "Not unless they had some special inducements."

MR. PHATAK remarked that once he had asked a very good man in the Cutlery trade to come and manage a workshop, which he wanted to erect, and promised to pay him Rs. 50 a month, but he said he would not care to leave his shop. He thought that even if free quarters adjoining the workshop were offered for himself and family, it would scarcely induce him to leave his own shop.

MR. PARDHI said that he would gladly take on apprentices in his shop, and would expect nothing from Government.

MR. MONRO has answered this in his "Notes."

Q. (3) Should such schools be in an enclosed private area or open freely to the public?

A. MR. PARDHI stated that, provided craftsmen agreed to come and work in Industrial Schools, they would much prefer to work in the open.

MR. PHATAK was of opinion that they would rather like being shut up, especially the *sondrs* (goldsmiths) and a few others who did not care about disclosing the methods of their

art to others. Simple, common work, of course, was done openly in the bazaars.

MR. MONRO was in favour of the Schools being open to the public under certain conditions.

Q. (4) What special inducements should be offered to craftsmen to co-operate?

A. MR. PARDHI recommended a premium on each student.

MR. MONRO has answered this in his "Notes."

MR. RHIND said that they had a regular system of apprenticeship in their shops, the boys served for about five years and were given certificates when they passed out. They had no night school. He did not object to artisans having a little general education. He would be most willing to take on boys turned out from the proposed Cawnpore Industrial School.

MR. PARDHI said that in his shop if they were not up to the full standard, he taught them himself.

MR. BAZONJI said that in his Mills he had a carpenter on Rs. 50 and one on Rs. 25, the latter was so regardless of his own welfare that when the man above him left he was not competent enough to take up the first man's post, so they were obliged to secure another man.

A.—Would you accept Experts from abroad in each Industry.

Q. (1) Generally speaking, would it be best to have a working expert, *i. e.*, a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and, if so, in what trades?

A. The meeting were of opinion that a general expert for all trades was not possible to obtain, and were in favour of specialized experts.

MR. PHATAK said that an expert for two or three trades might be secured, but not for all.

MR. MONRO said that an expert for carpentry, blacksmith's work, and weaving could possibly be found.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

A. MR. SLY proposed that the specialized expert should be under the Imperial Government, and should be temporarily deputed to serve in the different Provinces.

Q. (3) What would be the average annual cost of such an expert?

A. MR. BAZONJI said Rs. 600 a month for a Weaving Master, exclusive of quarters and travelling expenses.

MR. RHIND said Rs. 600 to Rs. 800 a month for a Cutlery expert.

Q. (5) Can you define the status and qualifications required in these experts?

A. MR. BAZONJI said the man for weaving should have had technical as well as practical instruction, or an out-and-out practical man. There were examinations held in England and when men passed these they were awarded certificates and gold medals; a man possessing these credentials should be chosen. Of these, however, he would much prefer a Foreman of weavers to a mere weaver as the latter, he thought, had not as much experience as the former; in Bombay they were called "Weaving Masters."

MR. SLY said that with respect to Silk Weaving, Sir Thomas Wardle had a proposal in hand for the improvement of this industry at home, and he would be able to specify the qualifications of such an expert, if asked to do so.

MR. RHIND, for the Cutlery Industry, would rather have a "Master Cutler" than a working Cutler, as the latter, he said, would be too specialized in his work.

Q. (6) How should the expert proceed to improve manipulation and practice?

A. MR. BAZONJI, speaking on behalf of the Weaving Industry, said that the expert would have to go round and see what sort of looms there were, what kinds of cloths were being made, and if he saw that the men were working on a wrong and defective principle he should proceed to explain to them the proper way of going about it, etc., etc., There was no use, he said, in his trying to improve the trade generally as this would be impossible, he could and should only try to improve it in the schools, thus using the latter as a focus for spreading the correct knowledge of the industry.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (1) Apart from the Superintendents in direct charge of the School, what system of local control do you think the best—

(i) For Rural Schools?

(ii) For Urban Schools?

A. MR. SLY would have a special committee appointed to look after and govern these schools.

MR. MONRO was not in favour of placing the management of these schools under the District Council. He would rather, like Mr. Sly, have a Committee formed of the chief people of the place, the same as they had in respect to their ordinary schools, composed of a number of workmen, a kind of *Panchayat* for both Rural and Urban Schools, the Local Boards having nothing to do with this Committee.

Q. (2) What should be the functions of the local control in each case?

A. MR. MONRO said that they should have power to make appointments, visit the schools, say, once a month, they should be allowed to levy and dispose of fees because this would interest local men in the industries, make recommendations and improvements, in fact, they

should be given as much power in the schools as possible.

Q. (3) The local systems of control must, it is presumed, be focussed for the Province by some Technical Officer who will be generally responsible for executive administration and management. Who should this be?

A. MR. SLY said that these schools should all be affiliated to the proposed Technical Institute for Nagpur, and the Executive Officer should be the Deputy Commissioner of the District, the Provincial Control being under the governing body of this proposed Institute. The governing body was to be composed of the Chief Commissioner, himself, Mr. Munro, and several other Trustees. It was to be a sort of industrial body which would govern the affairs of the Province, the Executive Officer being the Commissioner of Settlements.

Q. (4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this Department not having, as a general rule, special technical qualifications?

A. MR. MONRO thought that the Educational Department should certainly be relieved.

Q. (5) Is direct and special Imperial control of Industrial Education necessary for its efficient development?

A. MR. SLY remarked that control should be limited to advice and inspection on the lines of the Inspector General of Agriculture.

6.—Exhibitions and Sales, whether required.

Q. (1) Are exhibitions of any real value—

- (i) Local?
- (ii) Provincial?
- (iii) Imperial?

A. THE REV. DR. FELT thought that *melas* were very useful in the advancement of industries. He also recommended the giving of prizes by the Deputy Commissioner for the best work, which should be collected and sent to a central museum.

MR. SLY remarked that there has only been one exhibition, that he knew of, in the Province, and that was in 1866.

MR. PHATAK said that an exhibition was held at Jubbulpore, and strongly recommended periodical exhibitions.

Q. (2) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus it may be—

- (i) scrapped;
- (ii) made to order only; private or by regular agent;
- (iii) sold through agents as produced;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan System;
- (v) sold in a regular school-room.

Should prices be marked or fixed at all?

A. MR. CRUMP said there should be sale-rooms under the Naples School.

MR. RHIND said that work should be made to order.

MR. PHATAK would sell through agents as produced.

MR. BAZONJI recommended both (ii) and (iii).

REV. DR. FELT would rather have men go canvassing for orders.

MR. PHATAK said with regard to prices, that they should be fixed, and marked if sold in the school, and not marked if sold outside.

Q. (3) Regarding industries generally in India, are you aware of any financial conditions which affect—

- (i) Production,
- (ii) Price,
- (iii) Returns to workmen,

which could be removed by the reasonable action of Government?

A. MR. PHATAK said that the cause which generally affected the development of industries was the exactions of the middlemen; yet, he thought, you could not do without them; the work people generally were so poor that if money were entrusted to them they would naturally misappropriate it, whereas if Government gave the money into the hands of the middleman *without interest*, holding him responsible for the whole sum, then in that case these middlemen would have to take a less share of the profits from the workmen.

MR. SLY would not do anything to increase the power of these middlemen.

Q. (4) Can you say whether, generally speaking, the workmen get the best wage or profit return from—

- (i) Expensive fine work?
- (ii) Cheap common work?

A. MR. PHATAK thought that the workman got more profit from cheap common work as it sold readily in the market, whereas there were not many buyers for the expensive fine work.

MR. BAZONJI thought, however, that both cheap and expensive work were about on the same level.

MR. CRUMP said that the reason why the cheap common work paid the workman better was that expensive fine work required more capital, which had to be borrowed from the middleman, the workman consequently being entirely in his hands, whereas, on the other hand, he could turn out any amount of common work for himself.

(c) HOW ARE FUNDS TO BE PROVIDED.

Q. (1) Could the Provincial Funds provide the cost of starting the necessary schools? If not, how should the cost be divided between the Local Government and the Government of India?

A. MR. CRUMP said that there were no funds.

Q. (3) Would you support the present position of workers in hand industries by a system of advances on the method of State loans to agriculturists, either—

(i) for the purchase of improved implements?

(ii) to free them from the exactions of the middlemen?

A. MR. CRUMP recommended for both (i) and (ii) the group system of "taqqavi" advances, i.e., making advances to a whole community and holding the people jointly and severally responsible for the same. If they wanted the money badly, he said, they would gladly take it, but if they could get money any other way he doubted whether they would.

MR. SLY, however, thought that Mr Crump's idea could not be satisfactorily worked out, as there were not, in his opinion, sufficiently responsible bodies to whom advances could be made, nor was he in favour of individual advances, as the artisans could not be safely relied on. He, however, did not object to materials and tools being provided them.

Q. (4) Are you in favour of any scheme of Industrial Banks?

A. MR. SLY was not in favour of Industrial Banks.

B.—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

Q. (1) Name the industries to be introduced.

A. MR. MONRO recommended the manufacture of locks.

MR. PHATAK recommended several industries in his "Notes."

Q. (4) Have you any scheme for starting these new industries by securing that discharged prisoners should work on at their trade after they leave the Jail?

A. MAJOR BUCHANAN stated that nothing has yet been proposed for enabling the men to follow the trades that they had been taught in the Jail after they leave.

(b) WHAT ARTISANS ARE REQUIRED

MR. SLY said in all lines,—particularly carpenters, blacksmiths, tinsmiths, masons, plumbers.

ANSWERS TO SOME OF THE QUESTIONS OF THE INDUSTRIAL EDUCATION COMMITTEE.

BY MR. F. G. SLY, I.C.S., COMMISSIONER OF SETTLEMENTS AND AGRICULTURE.

Industrial Schools.

There are no Government Industrial Schools in the Central Provinces. Several private Existing Industrial Schools. Industrial Schools are maintained by Missions; but I have no knowledge of their methods.

2. If there is a working member of the craft in the boy's home, he is taught the craft in his own home. When this condition does not prevail, the boy usually goes to a relative's house to learn his trade, his mother often working for this relative in return for small wages. Even in cases where the teacher is not a relative of the apprentice, no sum is demanded or paid as remuneration for teaching the craft. Similarly there is no agreement or condition regarding the length of service to be rendered by the apprentice or his subsequent employment. This system is common to all trades. A son or relation is well taught, but a stranger is often neglected, being kept to rough work which he can do with profit to his master, whilst he is left to pick up his training as best he can. A sharp boy gets along well even under this system, but the stupid boy never properly learns his trade. Any special craft methods will also not be taught except to a son or close relation. The more simple crafts, such as carpentry, smith's work, etc., are freely taught without concealment, but any special methods employed in superior crafts are not taught. I may instance the case of Babu Mistri, of Nagpur, a craftsman famous for his skill in the production of cutlery. He refused an offer of very lucrative employment in which he would be required to teach apprentices. The native system of apprenticeship can hardly be improved upon for the teaching of a son, but a better training

would be given to orphans in an average Industrial School. It is difficult to influence the native system by outside suggestion or advice. The best system of exercising such influence is to teach a few craftsmen the use of any improved methods or appliances and then let them work the improvements in their own homes. The great advantage of Industrial Schools over the native system of apprenticeship is that the former gives an excellent opportunity for teaching improved methods. For teaching the existing methods of the craft the Industrial School is not so good as the home training. I have little doubt that Industrial Schools teaching improved methods would be willingly attended by boys and even grown-up workmen. No fees are paid by native apprentices. Indeed, as soon as he can make himself at all useful, the apprentice will receive small wages which are increased with an increase in his efficiency. The only advantage to the master is that he obtains help for smaller wages than the market rate, and it is a customary principle that the apprentice should continue for a year or so to work for his master at small wages, although he may have learnt all that there is to learn. In the very simple trades, such as smith, mason, carpenter, etc., the master will often take an apprentice of any class, but this is not the case in mere technical crafts, such as goldsmiths, etc. For the teaching of existing methods of craftsmanship, I do not think that the native system of apprenticeship can be much improved. It only fails in cases where the craftsman has any special trade secrets which he will refuse to teach out of his own family. In such cases Government could offer no suitable inducement to make him teach such trade secrets. So far as I am aware, there are no Trade Guilds in the Provinces; the *panchayets* deal with matters of caste and not of their craft.

3. In a separate Note I have given a short account of the principal industries of the Provinces. In this Note, I have recommended that special support and encouragement should be given to—

- (1) the weaving industries;
- (2) the tassar silk industry;
- (3) the leather industry.

Support might be usefully given to some other industries, but I have selected the three mentioned above as giving most promise of success.

4. I thoroughly approve the proposal to establish Industrial Schools in suitable centres particularly for industries in which it is possible to teach improved methods. The teaching of trades in which existing methods cannot be improved may well be left to the native system of apprenticeship, the Industrial School being started for teaching industries in which improvements can be effected. The necessary preliminary before the establishment of such a school should be a thorough examination of the industry by an expert and a decision upon his report of the practicable improvements which it is possible to make. After this stage the school system should be adopted for the teaching of the improved methods. For the higher training of foremen or managers of work, a course of instruction in a large workshop seems preferable to a training in a college or school. The training in a school should, I think, be limited to a course which can be practised by local craftsmen. For the encouragement of private Industrial Schools, I would recommend that in cases where the managers are prepared to manage them on principles approved by Government, they should be given such free expert advice as is available, and that an annual grant should be made on the results of the examination and inspection of such expert. In the more simple crafts, it should not be difficult to frame standards of examination. In my separate Note, I have recommended the localities and trades in which Government could with advantage start Industrial Schools. The instruction should be limited to the practical teaching of the craft. I very much doubt whether it would be feasible to attach to them night schools for giving a simple literary education or for teaching the theory of the trade. The masses of the artisans of these Provinces have no literary education and do not desire it. Any compulsory attendance at night schools would lessen the popularity of the Industrial day school.

5. The Naples scheme does not seem to give much hope of success. Its main object is to give boys a training in existing crafts; but in this country with the caste system the only case in which a boy has a difficulty in learning his caste trade is, perhaps, when he is an orphan. The system may then be useful for the training of orphans collected in orphanages, but even in this case there would be better chances of success for an Industrial School. The main requirement is not to provide a training in existing methods, but in improved methods; and the chances of introducing improved methods is much greater in Industrial Schools than in the Naples scheme. There is much greater chance of success by inducing craftsmen to work in an Industrial School, but I doubt if they will become masters in such schools unless they are engaged on fixed wages. They will come of themselves to learn improved methods, but they will not attend to work their existing methods unless paid to do so.

6. There would be a greater chance of success in having a specialized expert for several schools, rather than a general expert for each school. Indeed, each Industrial School should teach but few trades, and preferably one. There is more chance of success with an Industrial School teaching, say, improved methods of weaving alone rather than several trades, such as carpentry, smith's work, weaving, etc., etc. Such experts should be under Provincial and not Imperial control. In my separate Note I have recommended for these Provinces two specialized experts, one for the weaving of textile fabrics, and a second for silkworm rearing. And I have indicated the general lines upon which they should work—first, a thorough examination of existing methods to discover the

defects; second, the investigation of practicable improved methods to remedy these defects; third, the opening of Industrial Schools to teach these improved methods.

7. The Educational Department should, in my opinion, be relieved of the control of Industrial Schools. They have not the expert knowledge and their methods are not such as are likely to lead to success.

Local control.

The local control can best be obtained by placing the schools under a special Committee at each centre, the members of which are selected from leading persons interested in the trade. This Committee should have the District Officer or a selected assistant as its President, and should include a suitable member of the Municipal Committee or Local Board. I know no technical officer in these Provinces who could be responsible for Provincial control. Under such circumstances close Imperial control by such a technical officer would be of great value.

8. Exhibitions give an additional stimulus to industrial development, which often has practical results. Local exhibitions are perhaps more useful than provincial, and provincial than imperial exhibitions. But

Exhibitions.

local exhibitions, whilst confined to local industries, should have exhibits of improved methods and products from other parts. These exhibitions should be made as practical as possible by full working demonstrations of improved methods.

9. In most local industries the craftsmen are financed by middlemen who reduce them to the position of labourers on a daily wage. This is undoubtedly

Financial considerations.

a great drawback to the prosperity of local industries, but it is difficult to find a remedy. I must question the advisability of a system of State advances. The craftsmen can give no security, it is practically impossible to assure that the advance shall be properly applied, and owing to the character of the people collection would be difficult.

10. The supply of trained artisans is extremely short in almost all parts of the Provinces.

Trained artisans.

Even in the more simple trades, such as carpentry, blacksmiths' work, etc., it is difficult to get trained hands. In some districts it is impossible to get a carpenter to make simple furniture, whilst the supply is short in Nagpur. There are general complaints amongst natives of the difficulty of getting decent carpenters and masons for house-building; they often have to be imported from a distance.

LETTER FROM MR. F. G. SLY, COMMISSIONER OF SETTLEMENTS AND AGRICULTURE, TO THE CHIEF SECRETARY TO THE CHIEF COMMISSIONER.

No. C.-2 Camp, dated the 7th January 1902.

With reference to your letter No. 6279, dated the 29th November 1901, I have the honour to forward a Note on the local industries of the Central Provinces.

2. In this Note, I have endeavoured to collect the information concerning local industries contained in official records. I have not attempted to reproduce all the detailed accounts of some industries, but have given references to the more important records which contain these detailed accounts. In this way I have endeavoured to bring up to date the Industrial Survey of 1889. I have also endeavoured to point out some of the most evident defects in local industries and to suggest any means that seem practicable for the mitigation or removal of these defects.

3. Hand-weaving is by far the most important indigenous industry, and I beg to strongly recommend that attention should first be turned to its improvement. A very large number of people earn their livelihood in this industry, the bulk of them are of the lowest castes who live from hand to mouth, the industry is widespread both in towns and villages; its improvement would thus have a far-reaching effect upon the economic condition of a very numerous and impoverished section of the community. It will be a task of great difficulty to effect improvement in this industry, but for the reasons given above it is of paramount importance. The first step should be an examination of the existing methods of the manufacture of hand-made cloth by a thoroughly competent expert in the weaving of textile fabrics. This examination should result in a decision as to the practicable improvements which can be effected in the present looms and other appliances. I do not anticipate much difficulty in inducing the adoption of these improvements by the weavers, provided that they are suitable. A few Industrial Schools at important weaving centres managed upon the lines indicated by the Government of India would disseminate the knowledge of these improvements, and if the improvements are really practicable this knowledge will soon spread amongst the weaving community.

4. As another local industry to be encouraged, I would select the silk industry. In so far as the actual weaving is concerned, this branch of the industry is covered by the recommendations made in the preceding paragraph. A second branch of the industry which demands attention is the reeling of silk from the cocoons. Investigation is required to determine the best practicable method of softening the cocoons and the most suitable reeling machine, which will result in the production of good thread; the unevenness of the thread produced by the existing methods is one of the serious defects of an otherwise promising industry. The

utilization of the waste silk would also much help the industry. Further, the question of perhaps the greatest importance is the encouragement of a larger production of cocoons, the present supply being inadequate to meet the demands of the weavers. The Local Administration are doing their best to encourage this branch of the industry by placing at the disposal of the rearers suitable plots of forest land. But more is required. A trained expert should make a thorough examination of the existing methods of silkworm rearers, with a view to the introduction of improvements. In particular, he should investigate and suggest remedies for the very prevalent diseases which make this industry so uncertain of success. An expert with the necessary qualifications might possibly be supplied by the Bengal School of Sericulture.

5. If a further selection is desired, I would suggest the leather industry. It is widespread, is carried on by a number of the lowest castes, whose social condition is lower than almost any other section of the population, and there seems some chance of effecting improvement. The present methods of curing and tanning hides are of the crudest, so that they should be susceptible of improvement. An expert should enquire into the tanning materials at present used and the methods practised.

6. It has been suggested to me that the wire-drawing industry of Burhanpur could be suitably selected. But the industry is limited to one town, employs but few people, and there does not seem much possibility of effecting any improvement. For these reasons, I do not think it as important as the industries suggested above.

7. I am also asked for an expression of my opinion upon the proposals made in paragraph 6 of the Government of India's letter for the establishment of technical scholarships. I venture to entirely concur in the principles of their proposal. But so far as these Provinces are concerned, I doubt if the time has yet arrived for this Local Administration to press for the allocation of a scholarship to these Provinces. I have endeavoured to show above that the most pressing provincial need is for an expert in the hand-weaving of textile fabrics, and it should be possible to obtain the services of such an expert without having to train him as a scholarship-holder. Indeed, if funds for such a scholarship are available, they could be employed to much greater public advantage in training an expert in far more important matters connected with agriculture, such, for instance, as cotton cultivation. I do not therefore think that the Local Administration should press for the allotment to these Provinces of a Technical Scholarship.

NOTE ON THE LOCAL INDUSTRIES OF THE CENTRAL PROVINCES

By MR. F. G. SLY, I.C.S., COMMISSIONER OF SETTLEMENTS AND AGRICULTURE.

In this Note I have endeavoured to collect together the information available in official records concerning the local industries of the Central Provinces. I have not attempted to reproduce the detailed descriptions which have been prepared of some industries, but have contented myself by giving references to the more important records in which these detailed accounts occur. I have, however, tried to point out some of the most evident defects in each industry, and to suggest any means that seem practicable for the mitigation or removal of these defects.

(i) COTTON-WEAVING.

References—Note on Handicrafts of 1882.

Note on Art Manufactures of 1884.

Industrial Survey of 1889.

Monograph on Cotton Fabrics, 1898.

2. Weaving is the most important and widespread of all local industries, being carried on in a large number of villages in all districts. And the most common form of weaving is the manufacture of coarse cotton-cloth usually worn by the masses of the villagers. The Monograph of 1898 contains a full description of all the methods of manufacture. Machine-made yarn has almost completely driven out hand-spun thread, and there seems no prospect of reviving this branch of the trade; for it would appear that hand-spinning will never be able to compete with spinning mills. It only survives as a household duty in the weaver's family in the most remote villages. The weaving of coarse cotton-cloth is also a depressed industry, but it is still very largely practised by some of the lowest castes, such as Mahars, Gandas, etc. Machine-made cloth has dealt a severe blow to, but has not destroyed, this industry. Hand-woven cloth is still worn by large masses of the people and has survived because of its strength and durability, assisted by a semi-religious prejudice against machine-made cloth. A revival of this industry is undoubtedly, from an economic point of view, the most important undertaking which Government could possibly start. The industry is widespread; it is the occupation of a very large number of persons of the lowest castes, whose social condition is, perhaps, worse than any other section of the population, and there are prospects of achieving some success. The present loom is one of the most primitive forms of hand-looms, so that it should not be so impossible to introduce an improved form of hand-loom with a fly-shuttle, which need not be so complicated as one designed to weave fine cloth with intricate patterns. If the production

of coarse hand-woven cloth can be cheapened, it will hold its own much more easily against the machine-made cloth. The jail population always contains a large percentage of low-caste weavers so that if there are no strong departmental objections many of them might be taught in the jails the manipulation of the form of hand-loom which seems most suitable. Industrial Schools could also be established at some of the more important centres.

3. Next in importance to the industry of weaving coarse cotton-cloth is the industry of weaving fine cotton-cloth which is carried on by somewhat higher castes, such as Koshtis, Salewars, Bhulias, etc. Each caste generally makes a speciality of a certain class of fabric. This industry is of most importance in the Nagpur, Bhandara, and Chanda Districts, the principal centres being Nagpur, Umrer (Nagpur), and Paoni (Bhandara). These weavers produce cotton-cloth of fine quality with coloured borders of intricate patterns. These cloths of different sizes and patterns were formerly worn by all the better classes, but the manufacture has greatly declined under the competition of English and Indian piece-goods. Indeed, this branch of the industry has suffered more severely than the weaving of coarse cloth. It has deteriorated both in quantity and quality, the weavers being now everywhere a somewhat depressed community. The looms are the same in principle as those used for weaving the coarse cloth, although of a somewhat better and finer make. The best method of improving the industry is that recommended above, *viz.*, the introduction of an improved hand-loom. This industry, like practically every other local industry, also suffers much from the exactions of the middleman. It is the exception to find a weaver working independently at his trade; the weaver who has prospered neglects manual labour and himself becomes a middleman, whilst practically all the working weavers are employed on piece-work by middlemen, generally Banias, who supply them with thread and take the woven cloth.

(ii) SILK-WEAVING.

References—Note on Handicrafts of 1882.

Note on Art Manufactures of 1884.

Industrial Survey of 1889.

Monograph on Silk Fabrics, 1901.

4. The Monograph on Silk Fabrics gives a full account of the silk industry and the processes. The silk-weaving industry may be divided into two branches—

- (1) Of imported mulberry silk, and
- (2) Of indigenous tassar silk.

The imported silk is mainly used in the Nagpur, Bhandara, and Chanda Districts for borders to the fine cotton cloths referred to in the preceding paragraph. This industry, although not so lucrative as in old times, still survives. Burhanpur, in the Nimar District, is also the home of the silk-weaving industry which is connected with the manufacture of gold and silver thread which is noticed later on. It is also reported that of late years there has been no decline in this silk industry, if indeed there has not been improvement. The quality has, however, somewhat deteriorated under the competition of machine-made goods.

5. The tassar silk-weaving industry is of more importance in these Provinces than the imported silk industry. The principal homes of this industry are the Sambalpur, Chanda, and Bilaspur Districts. There is an ample demand at remunerative prices for tassar fabrics, and the Monograph shows that the great defect of the industry is an inadequate supply of the raw cocoons. This will be dealt with later on when considering the silkworm-rearing industry, which is carried on by quite different castes to weavers. Another defect is the primitive methods of reeling the silk from the raw cocoons, which result in uneven thread. The investigations of Sir Thomas Wardle have shown that this is not due to unevenness of the silk spun by the worm, nor to the breakages that occur in reeling, but more to the "loops" in which the worm spins the silk, which are cemented together by the worm so securely that it is difficult to take them out in reeling the silk. This unevenness of the thread much detracts from the merit of the woven cloth. The materials at present used in softening the cocoons are generally alum and the ashes of different varieties of wood. Investigation may find out the best material to soften the cocoon and so avoid these loops. The reeling machine is also of a very primitive description, which should be capable of much improvement. It should be possible to adapt to Indian requirements some of the reeling machines used in the cottage industries of France and Italy for reeling mulberry silk. Enquiries from Bengal, where much has been done to improve the silk industry, might also lead to some practical result. As regards the weaving, the loom is the same as that used for cotton fabrics, and here again the introduction of an improved hand-loom is greatly to be desired. The industry requires investigation by an expert to discover the most suitable forms of reeling machines and hand-looms. There should then be little difficulty in teaching their use at Industrial Schools, the most suitable centres for which would be Sambalpur and Chanda.

(iii) SILKWORM-REARING.

6. I have already remarked that the supply of raw tassar cocoons is not sufficient to meet the demands of the weavers. The tassar worms are mostly bred in the jungles of the Sambalpur

and Chanda Districts by Dhimars, Gaudas, and other lower castes. In the past the Central Provinces Administration has made several efforts to encourage this industry, but the success has been small. There seems no doubt that the supply of wild cocoons is smaller than it used to be, whilst the clearance of suitable village forests, famines, the uncertainty of success, and other reasons, have resulted in a falling-off in the number of persons employed in breeding semi-domesticated worms. Efforts are now being made to again stimulate the industry by excising from Government forests suitable patches of jungle and establishing ryotwari villages, where the people may combine silkworm-rearing with agriculture. There also seems no doubt that diseases are much more prevalent than they used to be resulting in such uncertainty in the crop of cocoons that the rearers are discouraged. This liability to disease seems to have increased since the people have been obliged to breed from domesticated worms instead of renewing their annual supply from the wild cocoons of the forests. The principal disease seems to be a form of pébrine which is so disastrous to the mulberry worm. Much has been done in the Bengal School of Sericulture for the introduction of Pasteur's methods of treatment. A trained expert from Bengal might be obtained who would investigate the principal diseases of the tassar worm in these provinces and propose measures for their eradication.

(iv) WOOL-WEAVING.

Reference—Monograph on Woollen Fabrics, 1899.

7. Although widespread, this is an industry of little importance in the Central Provinces. It is confined to the weaving of coarse blankets by shepherds, whose castes are Gadarias, Dhangars and Kurumwars. A few coarse *namdahs* are also made. The Monograph contains a full description of the methods of cleaning, spinning and weaving. It does not seem advisable to take any steps for the improvement of this unimportant industry.

(v) DYING INDUSTRY.

References—Monograph on the Dyeing Industry, 1896.

Note on Al (Morinda), No. 259, dated the 22nd January 1896.

Note on Safflower, No. 472, dated the 13th February 1896.

Note on Al Dye, by Mr. Joshi, Agricultural Ledger No. 20 of 1897.

Note on Dyes and Dyeing in the Nagpur and Chhindwara Districts, by Mr. Ratnaparkhe, dated the 30th January 1896.

8. This industry has been the subject of considerable investigation, mostly connected with the substitution of aniline for vegetable dyes. Aniline dyes have largely ousted the vegetable dyes, principally owing to their cheapness, but the results are not so good or durable. Dyeing is still the profession of a large number of people, principally of the castes of Chhipas, Bungaris, and Rangrezes, the latter being Muhammadans. Many weavers also dye their own thread, particularly workers in silk. A full account of the materials used and the processes are contained in the Monograph. I am unable to state whether improvement is possible, so that the vegetable dyes of the country could be made cheaply enough to compete with the imported aniline dyes.

(vi) CALICO-PRINTING.

9. Closely connected with the dyeing industry is the printing of patterns on calico carried out by the Chhipas of the Chanda District and in Jabulpore. These printed fabrics have considerable rough artistic merit. The process of printing from wooden blocks is explained in the Monograph, the colours used being red and black. This seems one of the few local products which might obtain a market outside the Provinces.

(vii) GOLD AND SILVER WIRE-DRAWING.

References—Note on Handicrafts, 1882.

Note on Art Manufactures, 1884.

Industrial Survey of 1889.

10. Although carried on by comparatively few people, this is a peculiar industry deserving of special notice. It is carried on at Burhanpur in the Nimar District, and owes its origin to the Muhammadan Court that formerly existed there. I reproduce the account of the industry given in the Note on Art Manufactures :—

“The wire is drawn from bars of silver called ‘passas,’ which are made of a uniform size—six inches in length and 60 tolas in weight. The ‘passas’ are made up and the wire partially drawn out under Municipal supervision and a duty of Rs. 1-8-0 is levied on each ‘passa.’ The purity of the material is ensured by this arrangement and the Burhanpur wire has maintained a reputation for quality superior to that of wire made at other places in the Bombay Presidency. On the other hand, it has rendered it impossible to meet competition by lowering the

price of the wire, and the sale of the Burhanpur manufacture is said to have been affected by the import of cheap manufactures from other places.

"Each 'passa' receives a gilding, on the thickness of which the price of the wire in great measure depends. The weight of gold used to gild a 'passa' varies from 8 to 42 'mashas.' The 'passa' is drawn out to a length of 700 yards in the Municipal enclosure and in this form is taken home by the wire-drawers. It is subsequently drawn to an astonishing fineness, the degree of which varies with the class of work to which the wire is to be applied. Thus a 'passa' from which 'kalabattu' (gold and silk twisted thread) is to be manufactured, is drawn out to the length of 72,000 yards, while if it is to be used in making flattened wire for 'gota' it is only drawn out to 48,000 yards."

"The process of wire-drawing consists in pulling the wire through a series of holes of decreasing size in an iron plate, the wire being fastened to a wheel which is turned by a winch."

In 1879 a long enquiry was made by the local authorities with the object of obtaining a suitable wire-drawing machine, but nothing came of it. Further enquiries were made in 1884 into the possibility of improving the industry by the introduction of machinery and by lowering the municipal tax. The conclusions arrived at were that the duty forms so small a part of the cost of production that it would be hardly worth while lowering it, and that labour was so cheap and withal so skilled, that there seemed little opening for improved machinery. The figures given are as follows:—

	R	a.	p.
Value of passa-silver	65	0	0
Gilding (variable)	25	0	0
Labour	15	8	0
Duty	1	8	0
TOTAL	107	0	0

When an average of 62,000 yards of wire could be drawn for so small a sum as Rs. 15-8-0 there seemed to be little to be gained from labour-saving machinery.

(viii) GOLD AND SILVER EMBROIDERY.

11. A small industry existed at Jubbulpore and Saugor in embroidering cloth with gold and silver work, such as saddle-cloths for horses, elephants, etc. With the decreasing use of such heavy fabrics by native gentlemen, the industry has almost died out.

(ix) GOLD AND SILVER JEWELLERY.

References—Note on Handicrafts, 1882.
Industrial Survey of 1889.

12. There is very little distinctive work in the jewellery made in the Provinces by *soudrs*. The industry is carried on to a small extent in most towns and large villages, but there seem to be no important centres. Chanda was in former years famous for gold and silk work, but the industry seems to have perished. In the southern part of Chanda, silver belts of a peculiar pattern are still made by the Telugu craftsmen. Gold necklets of a peculiar kind are made at Sambalpur.

(x) IRON SMELTING.

Reference—Note on Handicrafts, 1882.
Industrial Survey of 1889.
The Iron Industry in the Central Provinces, Agricultural Ledger No. 17 of 1898.

13. The principal localities where iron ore is smelted are in the Jubbulpore and Chanda Districts, but smelting is also carried on in the Saugar, Damoh, Mandla, Seoni, Narsinghpur, Bhandara, and Balaghat Districts. A full account of the processes is given in the Agricultural Ledger, from which it would seem that they have deteriorated from the standard formerly maintained. Efforts have been made to help the industry by giving facilities for obtaining from Government forests both ore and fuel at low rates, whilst many families were employed in the famine. The furnaces, made of mud and sun-dried brick, which do not last through the rains, are most wasteful; much improvement could be effected by the introduction of an improved furnace suited to their requirements. It is also on record that the iron smelters of Jubbulpore turned away much trade by dishonestly supplying iron mixed with clay for refined iron. The smelters are entirely in the hands of middlemen.

(xi) IRON MANUFACTURES.

14. The regular workers in iron seldom engage in the smelting trade, for they can earn better wages as craftsmen. In this trade there are great differences in skill and intelligence. On the one hand are the village *lohárs*, who are only capable of making and repairing the rude implements required by the villagers, whilst in the larger towns are found men who have, with a wider experience, acquired more advanced methods and are capable of almost any kind of iron work which does not require heavy and expensive machinery. Something might be done to educate the village *lohár* if only the means were available. One of the great obstacles to the introduction of the simplest agricultural machines is the inability of local blacksmiths to repair them.

(xii) CUTLERY.

References—Note on Handicrafts, 1882.

Note on Art Manufactures, 1884.

Industrial Survey of 1889.

15. The manufactures of arms and armour have died out, but in its place has sprung up a small industry in cutlery, the centres of which are Nagpur and Jabera (Damoh). The principal, if not the only, craftsman at Nagpur turns out knives and scissors of European design and of good quality. Some local capitalists were prepared to start a factory, but the craftsman, in spite of an offer of high wages, refused employment and declined to teach his craft to apprentices.

(xiii) BRASS AND COPPER WORK.

References—Note on Handicrafts, 1882.

Note on Art Manufactures, 1884.

Industrial Survey of 1889.

Monograph on Brass and Copper, 1894.

16. A considerable number of people are employed as brass and copper smiths, the principal centres being Raipur, Sambalpur, Bilaspur, Nagpur, Bhandara, and Jubbulpore. Formerly large numbers were employed in smelting and hammering out brass plates, but imported machine-made plates have almost killed this branch of the industry. Some small vessels are still cast in moulds, but the bulk of the articles are made from plates, two pieces being soldered together with a composition of three parts brass and one part zinc. Bell-metal, for which the district of Mandla is famous, is made from an alloy of copper and tin. The tools and furnaces are rough, but appear to be fairly suited to the work. It might be possible to introduce an improved lathe to be worked continuously in one direction with a crank and wheel instead of being pulled in alternate directions by a strap. Brass manufacture has suffered in competition with machine-made goods. The articles never possessed great artistic merit, and the few gravers of Nagpur and Bhandara cannot compete with imported Benares ware.

(xiv) WOOD WORK.

References—Note on Handicrafts, 1882.

Industrial Survey of 1889.

17. In every village of importance there is a carpenter, generally a rude workman capable of making and repairing simple agricultural implements. Better workmen are found in some of the larger villages, where the manufacture of carts forms an important branch of the industry. Chimur (Chanda) and Chanda are noted for good carpenters, but even in large towns like Nagpur there is a dearth of good workmen. Some districts have not a single carpenter capable of making ordinary furniture, whilst the Public Works Department often experience difficulty in finding workmen. There are plenty of openings for good carpenters, who can at present with difficulty be obtained on wages of Rs. 15 a month. In these Provinces Industrial Schools turning out good carpenters would be useful institutions. Several castes, as well as *Barhais*, have commenced to take up carpentry, notably the Telis of Nagpur. Wood-carving is an art that has largely died out because the carved fronts, pillars, and doorways no longer are desired by well-to-do natives, who build houses more after European patterns.

(xv) STONE WORK.

References—Note on Handicrafts, 1882.

Note on Art Manufactures, 1884.

Industrial Survey of 1889.

18. In most districts there is a similar dearth of masons, although not so marked perhaps as is the case of carpenters. Stone-carving of merit used to be turned out by the Beldárs of Chanda, of which there are fine specimens in the temples, etc., but in the absence of demand this industry has also practically died out. A soft soap-stone is also worked at Jambalghata (Chanda) and Kanhari (Bhandara), from which household vessels are made, but this industry

is also very little practised. Mention may also be made of the pebble work of Jubbulpore which consists of small ornamental articles neatly cut from agates and other stones found in the bed of the Nerbudda River.

(xvi) LEATHER WORK.

Reference—Note on Handicrafts, 1882.

19. Little information is available concerning this industry, although it is very widespread in most villages there are low castes, who tan hides and make the shoes worn by the people and the leather straps required for agricultural implements, etc. The methods of tanning hides are very crude: the skin is removed whole, the holes at the feet, etc., are sewn up and the hide is then tanned by filling the skin with tanning materials, such as leaves and bark of certain trees, upon which water is constantly poured, the drippings falling into a pot which are again used. An examination of the industry by an expert might result in improvement of the processes and of the materials used. The only peculiar feature in the industry is the preparation at Chanda of slippers with patterns embroidered in silk and wire. This work is neat and artistic, quite equal to some of the work turned out in Northern India. It should be possible to extend it by giving to the workers patterns of different leather articles, such as bags, etc.

(xvii) POTTERY AND GLASS-MAKING.

References—Note on Handicrafts, 1882

Note on Art Manufactures, 1884.

Industrial Survey of 1889.

Monograph of 1895.

20. The potter is an artisan met with in all large villages, where he confines himself to the making of bricks, tiles and earthen vessels. Brick and tile-making have also been taken up by Mahárs, but the Kumbár alone makes pottery proper. The processes are fully described in the Monograph; the implements seem fairly suitable and incapable of much improvement. In some of the towns, toys are made, but they have little artistic merit. Glazed pottery was formerly made at Burhanpur, but the secret, which was known only to one family, has died. The glass workers are very few in number and confine themselves almost entirely to the manufacture of glass bangles. The furnace should be capable of improvement.

(xviii) BASKET WORK.

Reference—Industrial Survey of 1889.

21. Bamboo mats and baskets are made in most districts. The industry has reached its highest development in Bhandara and Chanda, where some baskets of merit are produced.

(xix) PAPER-MAKING.

References—Reports by Major Lugard, dated the 15th February 1875, and the 10th January 1876.

22. This small local industry is carried on at Panchamnagar in the Damoh District. The reports referred to above contain an interesting account of the industry. The material used consists of waste-paper, hemp fibre, and old gunny bags, which are pounded to pulp and then spread for four months in the sun and rain for bleaching. After again being reduced to pulp, the material is very cleverly manipulated on square wooden frames. The sheets so formed are placed upon walls to dry and then rubbed with a shell which gives a glaze. The paper is very rough, but is very strong, so that it is used by shop keepers for their account books.

Major Lugard took much interest in the industry, enquired into European methods, and submitted proposals for utilizing the skilled labour by starting a Government paper factory. His proposals involved the outlay of considerable capital which Government was not prepared to give. The industry is quite insignificant.

23. The above completes the list of local industries which have received notice in former records. The list is clearly not exhaustive; for it makes no mention of the trades of lime-burners, rope, twine, and canvas makers, cotton carders, tailors, oil-pressers, distillers of spirits and perfumes, rush-makers, sugar-makers and confectioners, workers in lac, fish curers, bakers, grain-purchasers, tobacco and snuff-makers, boat-makers, printers and book-binders, musical instrument-makers, rosary bead-makers, fibre matting-workers, gold-washers and miners, photographers, tattooers, etc., etc. But none of these industries seem to demand separate notice. I may, however, mention a new industry which has lately sprung up in the Nimar District, *viz.*, the distillation of a perfumed oil from "rusa" grass. The oil has a delicate perfume, and is also recommended as an embrocation. This new departure seems to have distinct possibilities of development. Another industry started in the Nimar District is the preparation of date-palm sugar, but this has not yet emerged from the experimental stage.

LETTER FROM MR. A. M. MONRO, INSPECTOR GENERAL OF EDUCATION,
TO THE SECOND SECRETARY TO THE HONOURABLE THE CHIEF
COMMISSIONER No. D-5960, DATED 19TH DECEMBER 1901.

With reference to correspondence ending with your letter No. 8953, dated the 12th December 1898, I have the honour to state that there is now in the Provinces a number of orphanages (40 in all) and other institutions in which industries are taught. I append a statement showing the principal institutions in which some form of industrial instruction is given. Some of the managers of these institutions have remarked to me on the lack of any *standards* of industrial teaching, and have suggested to me that such standards should be fixed by the Government. I think that in view of the increased attention which is now being paid to industries, the time has arrived when the Government might with advantage prescribe standards of instruction in industries. I have seen a few of the schools in which industries are being taught in these Provinces, and I was struck with the aimlessness of the instruction given. There was no attempt at arranging the boys in standards according to their proficiency in the handicrafts taught. It is, I submit, the function of Government to guide, if it is not prepared to aid, school managers in their attempts to teach industries in their schools. I would, accordingly, suggest that the standards of instruction given in my letter No. D.-4715, dated the 27th October 1898, be sanctioned and published in the *Central Provinces Gazette*. For convenience of reference, I repeat them in the enclosed annexure. I have omitted weaving as I propose to consult Mr. Chatterton, Principal of the School of Art, Madras, regarding the desirability of prescribing the use of the fly-shuttle. On receipt of his reply a supplementary standard of weaving may be published. These standards were, I may add, taken from the Madras Code, and were prepared by experts in the various trades.

2. As regards the question of aid for such institutions as may apply for it, I am of opinion that in view of the extension in these Provinces of industrial teaching and of the importance attached by the Government of India to Technical Education, this is an obligation which we shall have to face. I do not, however, think that for some years such aid as we may be asked to give will be a heavy burden on our finances. The schools in which industries are taught are still in their infancy, and it will be some time before they will be in a position to merit large grants. Government aid for industrial instruction is given in every other Province but this. As regards the system in which aid should be given, if the Honourable the Chief Commissioner approves of the grant of such, the Government of India have condemned the results system as encouraging cram. Their condemnation of it, however, applies, I take it, solely to literary subjects, and I do not think that there can be any question of cramming in the teaching of industries. I should, therefore, be disposed to recommend that the system of payment by results be adopted. It is the most convenient system of testing industrial progress and one most popular with school managers. I await the Honourable Chief Commissioner's orders on this point, and on receipt thereof will submit a scheme for his approval.

ANNEXURE A.

Principal Institutions in which Industries are taught.

Serial No.	Name of (Industrial) School.	Name of place.	REMARKS.
1	Free Church Orphanage	Nagpur.	
2	Roman Catholic do.	Thana.	
3	Do. do.	Kamptee.	
4	St. Francis de Sales' School	Nagpur.	
5	St. Joseph's Convent School	Do.	
6	Free Church Orphanage	Bhandara.	
7	Weavers' Home	Itarsi.	
8	Friends' Mission Orphanage	Hoshangabad.	
9	Do. do.	Seoni-Malwa.	
10	Do. do.	Sohagpur.	
11	American Mission Orphanage	Jubbulpore.	
12	Reformatory School	Do.	
13	Wesleyan Mission Orphanage	Do.	
14	Hindu Society Orphanage	Do.	
15	Raja Gokuldas Ballabddas Orphanage	Do.	
16	Zenana Mission	Murwara.	
17	American do.	Damoh.	
18	Do. do.	Narsingpur.	
19	Methodist Mission Orphanage (Girls)	Nimar.	
20	Swedish do. (Boys)	Sangor.	
21	Do. do. (Girls)	Do.	
22	Orphan do. (do.)	Do.	
23	Catholic do.	Do.	
24	Do. do.	Shiampur (Sangor District).	
25	Do. do.	Patpura (Mandla District).	
26	Chauta do.	Bilaspur.	
27	Mission Orphanage	Mungeli.	
28	Do. do.	Raipur.	
29	American Mission	Dhantari.	
30	Mission Orphanage	Bisrampur (Raipur District).	

ANNEXURE B.

Syllabus of Subjects taught.

Serial No.	Subjects.	Standard A.	Standard B.	Standard C.	Standard D.
1	Carpentry	<p>(a) To make from a given half-inch plank a plain box with screwed ends, such a box as entails sawing, planing, squaring, hole-making and screw-driving.</p> <p>(b) To mark out and cut a plain mortise and tenon.</p>	<p>(a) To make a square frame with mitre joints to given measurements.</p> <p>(b) To make a square frame with double mortise and tenon to given measurements.</p> <p>(c) To saw straight without a line.</p> <p>(d) To make an ordinary stool with three or four legs.</p>	<p>(a) To join two boards by grooving and slip-feathering or by rebating and doweeling.</p> <p>(b) To join two boards at right angles by ordinary or lap dove-tails.</p> <p>(c) To make from a sketch and given measurements a small box with sliding lid, the ends being lap dove-tailed, and the bottom screwed.</p>	<p>(a) To make a frame (trapezoid) with double mortise and tenon to given measurements.</p> <p>(b) To join two pieces of timber by scarfing with plug.</p> <p>(c) To join two boards by a hidden mitre compound dove-tail joint.</p> <p>(d) To make from a plan either (1) a panelled door, or (2) a drawer.</p> <p>(e) To grind and sharpen a chisel.</p> <p>(f) To sharpen and set a saw.</p>
2	Blacksmith's work.	<p>(a) To strike true with sledge-hammer.</p> <p>(b) To weld together two pieces of half-inch round or square iron.</p> <p>(c) To make clout nails, staples, right-angled corner irons with countersunk holes.</p>	<p>(a) To cut a circle from sheet iron.</p> <p>(b) To forge a half-inch bolt and nut to given length with square head, screwed complete.</p> <p>(c) To weld together two pieces of three-quarter inch round or square iron.</p> <p>(d) To make (1) a ferrule for a mamoty with brazed joint, (2) a square band with rivetted ends, (3) a hasp.</p>	<p>(a) To make simple drill bits up to three-quarter inch diameter and temper them.</p> <p>(b) To make a pair of blacksmith's pincers</p> <p>(c) To make and harden flat chisels or cross cut chisels to given sketch.</p> <p>(d) To make a horse-shoe with nails.</p> <p>(e) To make a small tire for a wheel, welded ends.</p> <p>(f) To make a three-quarter inch bolt with hexagonal head, and nut screwed complete. The head and nut to be made to standard dimensions.</p>	<p>(a) To steel-point a crowbar and harden it.</p> <p>(b) To upset a piece of iron so as to form a collar in centre.</p> <p>(c) To make (1) one foot of a three-inch link chain from an iron rod three-eighths of an inch in diameter, (2) a pair of large T hinges, (3) a three-pronged pitch-fork with hollow handle piece.</p>
3	Fitter's work.	<p>(a) To chip cast-iron smoothly with a flat or cross cut cold chisel.</p> <p>(b) To chip and file smooth a surface of cast-iron about 6 inches by 3 inches.</p> <p>(c) To grind flat chisels, cross cut chisels, and centre punches correctly.</p>	<p>(a) To chip and file a surface of cast or wrought iron and to make it as true as can be done with a straight edge.</p> <p>(b) To tap a $\frac{3}{8}$" nut and screw bolt to fit.</p> <p>(c) To make a pair of callipers, or a small steel centre punch.</p>	<p>(a) To chip and file true a cube or rectangular block of wrought iron from a piece cut off a bar or a rough forging (suitable $2\frac{1}{2}'' \times 1\frac{1}{4}'' \times 1\frac{1}{4}''$)</p> <p>(b) To cut a sunk key-way on a shaft to given dimensions.</p> <p>(c) To file a sneek-headed key to fit the above key-way, the thickness and taper to be filed to given dimensions.</p> <p>(d) To mark out simple pieces of work using a marking out table, square, compass, callipers, and scribing block.</p>	<p>(a) From rough forgings to turn and file to standard size a bolt with hexagonal head and nut, to screw and tap the same with taps and dies, and to finish completely. The shank of the bolt should not exceed one inch in diameter and the length may conveniently be 6 or 8 inches.</p> <p>(b) To fit together a simple piece of machinery, such as a small pedestal block.</p> <p>(c) To make a small pocket square.</p> <p>(d) To cut a key-way on a shaft or in a pulley.</p>

ANNEXURE B.—*contd.*

Serial No.	Subject.	Standard A.	Standard B.	Standard C.	Standard D.
4	Boot and shoe-making.	(a) To name the tools and their uses. (b) To blacken, dub and slick skin. (c) To prepare thread for the reception of bristle. (d) To stitch leather.	(a) To select a bristle and to bristle a thread. (b) To stitch uppers, to stitch on galosh and vamp and to do all other upper work. (c) To punch and fix eyelets. (d) To distinguish different kinds of leather.	(a) To close uppers. (b) To stitch on insole, welt, and heel. (c) To pare and slick the sole and heel. (d) To take out the last.	(a) To take measurements and note them. (b) To select and fit a last for the measurements taken. (c) To finish a pair of boots or shoes completely.
5	Tailoring	The use of the needle and thread. To hem, plain sew, and button hole.	To sew a pair of trousers which has been cut.	To sew completely a waistcoat which has been cut, including lining, collar, etc.	To cut out from patterns an ordinary sac-coat, waistcoat and a pair of trousers, and to sew the coat completely.
6	Rattan work	(a) To scrape and clean a bundle of rattans, removing the knobs and all other superfluities. (b) To cane-seat a chair or stool with single or double wire. (c) To make a rattan window-chick or blind to required dimensions, to cut the sides and bind them with cotton or linen tape, and affix rollers, pulleys and ropes. (d) To cane-seat a chair or stool, diamond pattern, or to make circular bottom for a soiled-linen basket.	(a) To string or cord together a bundle of dressed rattans so as to make a mat. (b) To cut a piece of corded matting to required dimensions, the sides to be perfectly straight and equi-distant. To nick and bind the edges with rattan wire. (c) To make a rattan window-chick or blind to required dimensions, to cut the sides and bind them with cotton or linen tape, and affix rollers, pulleys and ropes. (d) To cane-seat a chair or stool, diamond pattern, or to make circular bottom for a soiled-linen basket.	(a) To split a rattan equally into two or three strips. (b) To draw or square the edges of a bundle of split rattans, arranging the knives to required gauge. (c) To split and draw rattans into wire suitable for different kinds of work according to sample. (d) To make an ordinary child's chair or to make a circular basket to given measurements.	(a) To spare a bundle of drawn rattans for mat-making. (b) To make a circular soiled-linen basket of fine work, or a child's cradle of elliptical shape. (c) To make an oblong or square tiffin or other basket with tray and partitions. (d) To make ornamental baskets of very fine work for flowers, work, waste-paper, etc.
7	Printing	<i>Composition.</i> —To be thoroughly acquainted with the plan or lay of a pair of English cases and the various types, accented letters, notes of reference, etc., belonging thereto, together with their correct use. To distribute type cleanly and to compose plain matter from reprint copy, the proof showing but few errors. (About a page of small pic, royal 8vo, to be given as a test.)	<i>Composition.</i> —To know the sizes and uses of type, leads, rules and other materials employed in composing. To know the sizes and divisions of ordinary printing paper. To compose plain matter with few errors and with good and equal spacing, from fair manuscript copy. To compose a piece of simple tabular matter, print copy.	(a) <i>Composition.</i> —To set up plain matter from manuscript copy at the rate of about 400 "ens" or letters and spaces per hour. To compose from print copy any ordinary piece of tabular statement. To impose or arrange the pages for printing in folio and quarto sizes. To punctuate a page of ordinary matter. To know the sizes and divisions of writing paper, and sizes of cards. (b) <i>Presswork.</i> —To know the names of all the parts of a press and inking table and their use. To regulate the ink-duct, increase and reduce the pull or impression, to make a solid forme ready for striking off.	(a) <i>Composition.</i> —To distribute and compose, at the rate of at least 600 ens per hour, with accuracy, and punctuate from rough manuscript copy. To cast off and set up from manuscript an ordinary tabular statement. To make up and impose, and make the margins of the matter set up for ordinary book-work any size up to 8vo. To set up with neatness ordinary display matter such as half titles, etc., (b) <i>Presswork.</i> —To cover and cut out a frisket. To cover a tympan. To make ready for striking both a solid and a light forme, and regulate the impression for each.

ANNEXURE B.—*concl'd.*

Serial No.	Subject.	Standard A.	Standard B.	Standard C.	Standard D.
8	Book-binding.	To fold sheets up to 8vo. To stitch thin pamphlets. To stab thin books.	To sew books. To bind in stiff covers with cloth backs.	To know the sizes and divisions of printing paper. To bind an 8vo book in cloth case with paper label, and to cut and stain the edges.	To know the sizes and divisions of writing paper, and sizes of cards. To bind a folio book in half leather with gilt lettering.
9	Carpet-weaving.	To wind, yarn, and weave a portion of a plain woollen pile carpet with any simple border pattern of good design.	To weave, a portion of carpet with border, and any moderately difficult ground pattern of good design.	To weave from a given squared-out paper drawing a portion of carpet with a simple diaper pattern and border.	To design in squared out paper a simple diaper pattern border in four colours for a mat 6 feet × 3 feet; to set up and arrange, warp and weave and finish a portion of the design.
10	Hand-knitting.	To knit a child's sock, consisting of plain knitting with two inches ribbing at the top. <i>Materials.</i> —Ordinary stocking wool, such as Scotch fingering or coarse knitting cotton. Four knitting needles of size suitable for the wool or cotton used.	(a) To knit a man's sock and a woman's stocking having the leg shaped, and consisting of plain knitting with ribbed top. (b) To knit a baby's boot, showing at least two fancy stitches, such as purling and those required in the formation of holes and scallops. <i>Material.</i> —For (a) as in Standard A; for (b) two or four steel or bone needles, and Berlin wool.	(a) To knit a man's sock and a woman's stocking, consisting entirely of ribbing, and having the leg shaped. (b) To knit any two fancy articles, such as comforters, shawls, table-mats, children's petticoats, antimacassars, etc. <i>Materials.</i> —For (a) as in Standard A; for (b) Berlin wool, silk or cotton.	(a) To knit of fine material a man's sock and woman's stocking, plain or ribbed, and having the leg shaped. (b) To knit a woman's open-worked stocking having the leg shaped. (c) To knit a woman's and a child's mittens, and three patterns of fine lace. <i>Materials.</i> —For (a) fine wool, cotton, or silk; for (b) the same as (a); for (c) fine silk or thread.
11	Lace-making	To work one or more flowers of a simple pattern, previously learnt by the pupil, the materials and appliances having been arranged beforehand.	To work a simple pattern previously learnt, showing the plait introduced, the net stitch, the weaving stitch, and the heading which will have been learnt in the Standard A. The materials and appliances should be arranged beforehand.	To commence a pattern without assistance, introducing the various stitches, including the plait already learnt. The pattern to be one previously learnt by the pupil.	To commence and work as many flowers as possible of a pattern not previously learnt. To show a thorough knowledge of the various sorts of stitches, and also to judge the number of bobbins the pattern will require.
12	Embroidery	To embroider neatly in silk in one colour on dungaree, any simple border of good design for a table-cover 3 feet × 3 feet.	To embroider neatly in gold thread and silk of three colours on cloth, any simple border of good design for a table-cover 3 feet × 3 feet.	To make a sketch on paper or a pattern on a piece of chintz, to adapt the design for a border for a table-cloth 3 feet × 3 feet, and work it out in gold thread and silk of three colours.	To make a design for a punkah fringe, table-cloth, border for a native coat or other similar work, and embroider it in gold thread or silk, or both, on dungaree, silk, cloth, or velvet.

REPLIES TO THE QUESTIONS OF THE INDUSTRIAL EDUCATION COMMITTEE.

By MR. A. MONRO, DIRECTOR OF PUBLIC INSTRUCTION.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a.) WHAT HAS BEEN DONE SO FAR.

1.—*Description of Schools, etc.*

(1) There are no Government Industrial Schools proper in these Provinces. The only Government institution in which industries are taught is the Reformatory School, Jubbulpore. The private institutions * which teach industries are the orphanages, of which there are at present 4). The majority of these were started during the last two famine years. Industries are taught in all of them, the principal industries being carpentry, blacksmith's work, tailoring, and weaving. In some of them boot-making and book-binding are also taught. One Mission, viz., that at Dhamtari, intends to take up the making of locks in the belief that they will be able to compete with the imports of foreign locks. The institutions are of the kind described as type VI, page 19 of Sir E. Buck's Report on Practical and Technical Education. They combine literary with technical instruction. For the former they receive aid on the result-grant system from Government, but no aid for industrial instruction. The industries are taught on no definite system, as, hitherto, no standards of instruction have been prescribed by the Government. The Missions concerned simply aim at training their own converts in such trades as are likely to provide them with occupation in after-life. Some of the Missions have land on which they train their pupils in agriculture. The schools are, in fact, intended solely for the native Christian community. I append a Note on my inspections of the American Episcopal Mission Orphanage at Narsinghpur, which may be regarded as typical of a well-worked Mission Industrial School. It differs, however, from most of these schools in that work is turned out for the market. The St. Francis de Sales' Mission School, Nagpur, has a workshop attached to it. The work turned out is mainly intended for the use of the Mission itself. Some 60 boys are trained in the workshop, the primary object is not to train them as artisans, but to develop their faculties by the manual training which working at carpentry and blacksmith's work affords.

*Particulars regarding these will follow.

(2) I imagine the Missionaries concerned selected places in which they would be most likely to obtain famine orphans.

(3) Each orphanage has a local body of Missionaries who manage it.

(4) No. The Missions, as a rule, simply content themselves with supplying the wants of their own people. I am unable to give the average annual net cost of each school.

(5) The Missionaries, I take it, selected such trades as they thought likely to provide occupation for their boys and girls in after-life.

(6) & (7) Most of the orphanages have one European who has some little knowledge of mechanics. I am not aware of any special training school or source of supply.

(8) The students are simply famine orphans.

(9) There are no definite rules that I am aware of.

(10) It is impossible to answer this question, as the orphanages concerned have been too short a time in existence.

(11) The Missions generally obtain their tools from Europe or America. Ordinarily such work as is not required for the use of the Mission itself is sold, if there is a demand for it.

(12) There are no special methods of instruction employed that I am aware of.

(13) Some students are taught one trade, some another. The Missionaries, as a rule, do not attempt to follow the caste principle. The methods of instruction are mainly native, tempered by European supervision.

(14) General education is given, as a rule, up to the Upper Primary Standard.

(15) In the Weavers' Home, Itarsi, attempts were made to introduce the fly-shuttle, but they proved unsuccessful, please see my Note on the Weaver's Home, Itarsi, this Office No. D-5271, dated the 15th November 1901. Some of the orphanages are still attempting the fly-shuttle, with what success I am unable to say.

(16) I am of opinion that the industrial instruction in these orphanages would be much improved, if standards of instruction were prescribed by Government. At present they are working on no definite principles. They are, in fact, groping in the dark. I have already submitted proposals for the introduction of definite standards of instruction. Please see my letter No. D-5960, dated the 19th December 1901.

2.—*Native System of Apprenticeship.*

(1) I gather from enquiries that, as a rule, each artisan trains his own children in the hereditary trade, but in some cases, artisans take apprentices who are not their own relatives.

(2) I believe that one system prevails, but I am not certain.

(3) The objection to the native system is, I should say, that few of the artisans give their children any general education, nor do they give them any instruction on what may be regarded, as the foundation of industrial training viz., drawing. The advantage is that the child is taught the use of tools from his earliest infancy and thus gets familiarized with their use.

(4) I am unable to answer.

(5) I consider the native system superior to the average Industrial School; for the native apprentice is brought into contact with real work, made to sell in the market, whereas, in the average Industrial School, little or no attempt is made to turn out work for the market. I believe that it could be extended in this country, if the Neapolitan system be adopted. It might, I think, be improved by outside expert supervision, by the introduction of better implements, and the teaching of better methods.

(6) & (7) I am unable to answer.

(8) Not that I am aware of.

(9) I am inclined to think that a bonus might be offered to the craftsmen for each apprentice who attained a certain standard in the trade taught.

(10) and (11) I am not aware of the existence of any Trade Guilds in these Provinces.

3.—Principal Industries of the Province.

(1) As regards the principal industries of these Provinces, these are given in a general survey of the industries of the Provinces written by the Commissioner of Settlements and Agriculture and myself, please see letter No. D-123, dated the 6th January 1902.

(2) Carpentry, blacksmith's work, weaving, the silk and gold-wire work of Burhanpur, tassar silk industry of Bilaspur.

(3) My reasons are that there is always a demand for good carpenters and blacksmiths and the work of these men is bad. They employ antiquated methods and use bad tools, which might be improved. As regards weaving, I think that, with the use of the fly-shuttle, the weaver could compete with machine-made goods. As regards the Burhanpur work, I think that it might be turned out at cheaper rates, if better methods were employed, and I think that a market might be found for it in Europe and America if it were only known to the public. The same remarks apply to the tassar silk industry of Bilaspur.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—As regard (1) and (2), the existing schools being Mission institutions serve only for the training of the Christian community, and are of limited use. Regarding the training of artisans in the future, please see my suggestions in paragraph below (The Naples system).

Regarding (3), I think that specially promising students might be encouraged by the offer of scholarships to proceed to higher class Industrial Institutions, such as the Victoria Technical Institute, Bombay.

Regarding (4), I think that there should be some central institution in each of the large Provinces for the training of foremen or assistant managers of works. I do not think that we could have such institutions in these Provinces at present.

Regarding (5), I answer No.

Regarding (6), I think that the men who had been through a course of training in the central institutions referred to in paragraph 4 might be sent for a further course of training in one of the large workshops, scholarships being offered. Probably, the workshop authorities would not accept a fee.

Regarding (7), I am in favour of aiding Industrial Schools on the results-grant system as being the most simple and practicable method. A grant to cover initial expenses might be given. The inspecting officer, who should be an expert, would give his advice gratis and the managers, if in receipt of aid, would be obliged to follow such conditions as would be imposed by Government.

2.—As regards proposed alterations and additions in schools and the want of new schools:—(1) The answer to this question is given in heading 16 above.

(2) I would start schools on the Naples system in such large towns as Jubbulpore and Nagpur, and if they proved successful, open others elsewhere. I am not aware of the existence of any suitable premises. I would start with carpentry, blacksmith's work, and weaving. The schools would have to be supported from Provincial funds.

(3) I think that night schools might be started for artisans and industrial students. The Friends' Mission have such a school in the Weavers' Home, Itarsi, and it is, I believe, a success.

(4) Such night schools should, I think, be under the management of the general Education Department.

(5) I do not think that in these Provinces training schools could be established at present for the training of superintendents and instructors. We might get our superintendents and instructors from training schools in the Presidency towns. They might, after arrival in the Central Provinces, be put through a further course of training in one of the local Railway workshops.

(6) The answer is No.

3.—How the Neapolitan system would apply.

(1) The system strikes me as excellent.

(2) There would be difficulties at first, but I am inclined to think that the system is feasible. I recently assembled the carpenters, blacksmiths, and goldsmiths at two important centres and explained the scheme to them. The blacksmiths at one place refused to have anything to say to it. Each man seemed to think that he had some particular trade secret which he was unwilling to divulge to other artisans. The carpenters seemed to favour the scheme. They showed that they understood it by asking the pertinent question as to whether their boys, whilst in the apprentice stage, would receive remuneration or not. The goldsmiths were doubtful.

(3) I think that the schools should be opened to the public under certain conditions.

(4) I am inclined to think that it would be sufficient if the artisans were offered bonuses for each apprentice who reaches a certain standard.

(i) and (ii) Materials would, I take it, be supplied by the artisans themselves and the waste materials would be disposed off by them.

(iii) The Government would, I understand, have no concern with the sale of work.

(iv) The Government might, I think, hold exhibitions at its own cost.

(v) I think that impecunious apprentices might be given small scholarships until able to do remunerative work.

(vi) I think that all apprentices, after they reach an age at which they would be capable of doing remunerative work for their parents, might be given small wages.

(vii) I would allow the artisans to fix their own holidays.

(viii) For this the head of the institution would be responsible.

(ix) I would exact no fees at first except in the case of well-to-do boys.

(6) The artisan would have the advantage of seeing new and more approved methods of work which would be shown to him by the head of the institution, who would be an expert.

4.—*Would you accept Experts from abroad for each Industry.*

(1) I think that there should be a general hand for each school. He, if at head-quarter stations, such as Nagpur and Jubbulpore, might get further advice and assistance as to the various trades, such as carpentry and blacksmith's work, from the Railway workshops. I also think that experts from these workshops might be given remuneration for visiting and examining the various schools and travelling allowance if the schools are not at head-quarters. I think it is possible to obtain a general expert. There are such men in the Mission Industrial Schools.

(2) I think that the working experts should be Provincial.

(3) I am unable to say, but I think a fair salary should be offered if we are to obtain good men. They would probably be Europeans, and second class underpaid Europeans often drift into drink in this country.

(4) Carpentry, blacksmith's work, weaving, and sericulture in the first instance.

(5) I am unable to answer.

(6) By supervision of the work of the craftsmen, by teaching them new methods, and the use of better tools.

5.—*Proposed Department of Control, Central and Local, for Urban and Rural Schools.*

(1) and (2) I think that there should be an Imperial Technological Department with Provincial Departments subordinate to it. The duty of the Imperial Department should be, as suggested by Sir E. Buck, "the investigation, suggestion, and control of action" and the supply of expert inspecting officers. The Provincial Department in these Provinces might be connected with the proposed Victoria Technical Institute at Nagpur. The function of the local department would be generally to see to the working of the local institutions. There might, I think, be an expert inspecting officer for the North-West Provinces and Central Provinces, and the schools should be open to inspection by the officers of the Education Department and the Commission.

(3) I think that the Commissioner of Settlements and Agriculture should be the head of the local Technological Department.

(4) Yes. Educational Officers are, as a rule, not competent to inspect Industrial Schools. I have had some experience of the work as I examined such schools for grants in Madras. Having no knowledge whatever of industries, I worked up the meaning of the terms from text-books and did the best I could. The results, it is hardly necessary to say, cannot have been satisfactory.

(5) For the efficient development of industrial education, it is, I think, necessary that the changes and improvements made in one Province should be known in another, and this is impossible without special Imperial control.

6.—*Exhibitions and sales, whether required.*

(1) My answer is, Yes. I think that there should be in each Province an annual exhibition of the best industrial work, and prizes might be offered by the Government for the best articles exhibited. Such exhibitions might be held in conjunction with exhibitions of agricultural products. There should also, I think, be exhibitions in the principal Presidency towns every two or three years.

(2) I am not aware of any special conditions which would make exhibitions of value, except as above suggested, *viz.*, the offer of prizes and diplomas.

(3) As I am in favour of the Neapolitan system, I would recommend sale by the producer.

(4) I have no special views on this point.

(5) I understand that as regards weaving, the weaver gets the best profit from expensive, fine work, because it does not pay to manufacture this by machinery. It is in the matter of common work that the machine-made article comes in, because it can be turned out at a cheaper rate than by the hand-loom. The weaver, with his antiquated methods, cannot compete with machinery. Mr. Chatterton informs me that with the use of the fly-shuttle the weaver could produce 100 per cent. more work than he does on his own loom.

(c) HOW ARE FUNDS TO BE PROVIDED.

- (1) I think this is a question for the Comptroller.
- (2) To this I would answer "no". If the Neapolitan system were adopted, the question whether the schools are self-supporting or not would not arise. Further, the setting up in trade of pupils would involve undue Government interference with the supply of artisans; for, as observed by Mr. Chatterton, it is "just as easy to overdo the production of artisans as of literary B. A's."
- (3) After the artisans had been taught the use of improved implements, I think that advances might be made by Government for the purchase of the same. For example, most weavers have not sufficient capital to purchase the fly-shuttle, and might get advances for the purpose.
- (4) My views on this point would, I fear, be of no value.

(B)—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

(1) I know of no new industries that might at present be introduced in these Provinces, except the manufacture of locks, which, as stated above, is being carried on in the American Mission at Dhamtari.

(b) WHAT ARTISANS ARE REQUIRED.

The supply of carpenters, blacksmiths, and masons is not limited, but badly trained. When the Bengal-Nagpur Railway first started operations in these Provinces, they had to import all their workmen in these trades from the Punjab.

NOTE ON THE AMERICAN METHODIST EPISCOPAL MISSION SCHOOL,
NARSINGPUR.

BY MR. MONRO.

The school was established in the year 1895. There are 225 boys on the rolls. Of them 169 are being educated in general subjects and partly engaged in industrial training. They spend six hours daily in general subjects and two hours daily in the workshop attached to the school. Of the 169, 147 are taught the Vernacular and 22 English. The latter are mainly intended to be trained as Catechists under the Mission. Thirty-seven boys devote their whole time to working at trades in the workshop attached to the institution. The figures, therefore, work out as follows :—

1	{ Vernacular learners	: : : : : : : .	147	} Engaged also for two hours daily in the workshop.
	{ English do.	: : : : : : : .	22	
			<hr/> 169	
2	Whole-time workers at trades—37, classified as follows :—			
	Carpenters	: : : : : : : .	11	
	Blacksmiths	: : : : : : : .	3	
	Shoemakers	: : : : : : : .	9	
	Tailors	: : : : : : : .	4	
	Gardeners	: : : : : : : .	2	
	Learning compounding in Civil Hospital	: : : : : : : .	2	
	Dhobis	: : : : : : : .	4	

In addition to these, 10 boys are being trained as cooks and bearers and one boy is the school barber. All the whole-time workers are supposed to be able to read and write before they enter the workshop, but they are not required to have passed any special educational standard.

The principle of trade following the caste is not strictly followed. Of the 37 boys above mentioned 4 boys only follow their hereditary trade, *viz.*, 2 dhobis and 2 mochis.

The staff of instruction in the various trades is as follows :—

3	Carpenter-masters	on Rs. 14, Rs. 11, and Rs. 10.
1	Blacksmith	on „ 15.
2	Shoemakers	on „ 12 and Rs. 9.
1	Tailor	on „ 14.
1	Mali	on „ 6.

The workshop is worked on commercial principles, and the outturn of work since March last has amounted to Rs. 754. I consider this an admirably managed institution. The special feature of it is that it has a workshop attached to it which turns out work for the market, and that industrial teaching is distinct from general education. The boys in the workshop are thoroughly well trained under competent instructors, and do not merely play at trades, as is often the case in so-called *Industrial Schools*, as distinct from schools with workshops attached.

The accommodation and sanitation struck me as being excellent, and the boys seemed well cared for.

Dated 3rd January 1903.

TABLE OF INDUSTRIAL SCHOOLS.

District.	Name of Institution.	Date of foundation.	Industries taught.	Average number under instruction.	Remarks.
Raipur	ORPHANAGES. Mission Orphanage, Parasbader.	Not known.	Agriculture, sewing, and knitting.	145	27 boys and 73 girls.
	Mission Orphanage, Bistrampur.	Do.	Carpentry, blacksmith's work, agriculture, and printing.	120	65 boys and 55 girls.
	Mission Orphanage, Chandkhuri.	Do.	Carpentry, weaving, gardening and household work.	100	45 boys and 55 girls.
	The American Mennonite Mission Orphanage, Dhantari.	22nd November 1899.	Carpentry, blacksmith's work, sewing, gardening, mending, and cooking to boys and sewing, knitting, and cooking to girls.	472	286 boys and 186 girls.
Bilaspur	Christian Mission Orphanage, Mungeli.	Not known.	Agriculture	50	All boys.
Nagpur	The Thana Orphanage	1897	Carpentry and agriculture	395	235 boys and 160 girls.
	The United F. C. Orphanage, Nagpur.	1860	Sewing and household work.	112	All girls.
Bhandara	F. C. Mission Orphanage, Bhandara.	1897	Rope and basket making, tailoring, and tat-patti making.	223	165 boys and 58 girls.
Chhindwara	Swedish Mission Orphanage, Chhindwara.	Not known.	Agriculture, carpentry, blacksmith's work, sewing, and mason's work.	122	All boys.
Seoni	Orphanage Girls' School, Seoni.	Do.	Sewing, knitting, and nursing.	30	All girls.
Chanda	Mission Orphanage, Chanda.	Do.	Carpentry and agriculture	144	All boys.
Nimar	Methodist Episcopal Orphanage for Boys.	1895	Carpentry, gardening, washing, and tailoring.	98	Do.
	Methodist Episcopal Orphanage for Girls.	1895	Button and lace making, and sewing.	120	All girls.
Narsinghpur	Hardwicke Christian E. M. Orphanage.	1895	Carpentry, boot-making, blacksmith's work, tailoring, and cane work.	225	All boys.
Damoh	Christian Mission Orphanage.	1900	Shoe-making, carpentry, weaving, blacksmith's work, and tailoring.	343	Do.
Hoshangabad	Friends' Mission Orphanage, Seoni-Malwa.	1899	Carpentry, weaving, mochi work, tin-smith's work, tailoring, gardening, and farm work.	412	Do.
	Friends' Mission Orphanage, Hoshangabad.	1882	Spinning and weaving, brush and matting work, and fancy needle-work.	340	All girls.
	Friends' Industrial Works, Hoshangabad.	1892	Carpentry, blacksmith's work, and gardening.	28	Boys and adults.
Saugor	Roman Catholic Orphanage.	1880	Carpentry, tailoring, weaving, masonry, candle making, gardening, and agriculture.	290	205 boys and 85 girls.
	Swedish Mission Orphanage.	1898	Carpentry, blacksmith's work, book-binding, shoe-making, and sewing.	200	96 boys and 105 girls.
Jubbulpore	Methodist Episcopal Church Mission Orphanage.	1893	Needle-work, lace making, button-making, cooking, and gardening.	273	All girls.
	Gokul Das Ballabh Das Cotton Mill Orphanage.	1896	Spinning and weaving	53	17 boys and 36 girls.
	Wesleyan Mission Orphanage.	1897	Weaving, carpentry, spinning, gardening, crochet, and other fancy work.	134	63 boys and 71 girls.
Mandla	Church Mission Orphanage, Patpara.	1898	Carpentry, blacksmith's work, gardening, and farming.	123	60 boys and 63 girls.
Nagpur	OTHER INDUSTRIAL SCHOOLS. St. Francis de Sales' Industrial School.	1899	Carpentry, blacksmith's work, and printing.	70	Do.
	St. Joseph's Convent	1899	Type-writing, cookery, plain and fancy needle-work, netting, knitting, and crochet.	36	All girls.

A. MONRO,

Director of Public Instruction.

ANSWERS TO THE QUESTIONS OF THE INDUSTRIAL EDUCATION COMMITTEE.

BY MR. KRISHNA RAO PHATAK, PLEADER, NAGPUR.

IMPROVEMENT OF LOCAL INDUSTRIES.

Native System of Apprenticeship.

Q. (1) The only system that I know of is this, that when the son of an artisan attains an age (say, about 10 years) such as would permit of his handling ordinary tools of his profession or trade, he is made to sit in the shop and begin simple work. In the course of a year or two or three the candidate picks up work and improves if he is capable of improvement.

If a boy has no parents he goes to a relative of his, and, failing a relative, he goes to a stranger who allows him to learn work by becoming a candidate. Now and again the candidate is instructed by the person under whom the candidate is working.

Q. (2) So far as I can say there is only this system described in my answer to Question (1) above.

Q. (3) One great objection is that no provision exists for imparting instruction, theoretical and practical, on any systematic plan or curriculum, and to a number of students on any organized system. It only provides for a few simple students being trained.

Q. (4) The question has not been very clear to me, but so far as I understand its purport my answer to it is: that the artisan can be identified by any known speciality in his productions, or by comparing the productions with those of other similar artisans.

Q. (5) The native system has at least one advantage in my opinion. Generally speaking the teacher takes natural interest in his pupil when he is related. When the pupil is an utter stranger then it may perhaps be said less interest is taken by the teacher.

The system might perhaps be extended by inducing artisans to allow two or at the most three candidates to learn work at his shop, and making grants to them according to results. In an Industrial School classes are formed consisting of a large number of boys who are some of them good, bad, and indifferent. All have to learn together and good boys lose a good lot of time. When at stated periods transfers take place, the forward and intelligent lads have the chance of making further progress.

I think classes and workshops are necessary if industrial education is to make any progress. Inducing a few artisans to admit two or three boys in their workshop would not be sufficient to revive the old industries or raise the artisan class in status. Unless industrial classes are opened, no real or appreciable progress will, I think, be made.

Native artisans as a class are very conservative, but by constant advice and actual demonstrations they can, I think, be induced to accept outside expert suggestions or advice.

Q. (6) No fees are charged by the teachers.

After the apprentice has gained some knowledge of the trade, and after he becomes of some use to the shop where he is learning the trade, the owner or teacher sometimes gives a small wage to the candidate for his maintenance.

There is no particular limit of age. No education of any sort is expected of the pupil before he is taken up as a candidate.

Q. (7) Yes; of all classes, except the lowest, such as Mahars.

Masons, carpenters, and smiths do allow other castes.

Goldsmiths allow goldsmith boys only to be candidates.

Q. (9) Grants per pupil and prizes to the pupils themselves according to the work the pupils may be able to turn out.

Q. (10) There are none so far as my information goes.

Q. (11) None exist in these Provinces.

Principal Industries of the Province.

Q. (1) (i) Bangle making of glass in Ramtek and Kelod in the Nagpur District.

(ii) Block-printing in the Nagpur District and in the Bhandara District, at two places—Beni and Murdhada.

(iii) Brass and bronze works in Bhandara and in Mandla, also at Hatta in the Damoh District.

(iv) Carpentry all over the Provinces.

(v) Cutlery in the Nagpur City; utensils of iron in Khanasa in the Seoni District and at Tendukheda in the Narsingpur District.

(vi) Gold and silversmiths' work all over the Provinces.

(vii) Smithy all over the Provinces.

(viii) Tassar in the Sambalpur District at Remda, Barpaili and Padampur.

(ix) Weaving kosha cloth in the Sambalpur and Bilaspur Districts, at Powni and Sendurdega in the Bhandara District, and at Bhojrao Ganj in the Seoni District.

(x) Weaving cotton yarns—Nagpur, Bhandara, Burhanpur, and Chanda.

Q. (2) More or less all require assistance and encouragement, as they are all in a declining condition and some of them have died out.

Q. (3) I think support for buying tools (improved) may be given. The artisans are generally very poor.

Bronze medals, prizes, and certificates might be given by way of encouragement; and above all, if there was an assurance of their articles (prepared by them) being purchased at reasonable prices, the encouragement would be substantial.

Proposed alterations and additions in System and Methods.

Q. (1) and (2) I shall answer both the questions together.

The first question is general. It is not clear whether it refers to the system of Arts education as well, or is confined to Industrial education only.

The besetting weakness in my opinion of the present system of Arts education is the teaching of too many subjects imperfectly without regard to the aptitude or capacity of the student, or to the line of business which he intends or is likely to take up when he leaves the school. The result is that after he completes his education he finds himself, to use the popular phraseology, "Jack of all trades and master of none." His knowledge is very imperfect and superficial, and does not fit or enable him to take up any particular business or calling without further instruction or training in that Branch. My idea is that there should be only a few subjects of importance prescribed for the Entrance or the Middle examinations to enable a student to acquire sufficient knowledge to understand the subject or subjects in which he wishes to be specially instructed. Bifurcation of subjects and specialization of instruction in them should be provided for, so as to enable students to obtain degrees in special subjects which they may wish to select.

The same principle should be adopted in imparting Industrial education where I consider the principle of specialized instruction to be absolutely essential, or more important than in the Arts education system. Provision should be made for imparting education in a few special trades and arts for which students may show special aptitude, and which may be useful to them in the callings or professions which they intend or are likely to follow.

Q. (3) Yes, I think that for these Provinces there should be at least one Provincial school or college with a good workshop attached, where provision should be made for imparting a thorough and sound education—(theoretical and practical) in all or some (at any rate for the present) of the trades and industries which I have mentioned in my answer to the first question under "Principal Industries of the Provinces." In addition to this central institution I would propose the opening of local schools with workshops attached to them for instructions only in those trades for which the place or district might be famous. These schools will serve as feeders to the main school, where provision can be easily made for imparting advanced or high education to promising pupils. Small stipends or scholarships should be given to students attending the local schools as well as the central institution. This I consider absolutely necessary, at least for some time, to attract students who are generally poor.

Q. (4), (5), and (6) The training in a school or college without a training in the workshops or works is insufficient.

Payment of stipends to the students is, as I have stated above, absolutely necessary. Arrangements should be made by the Managers of the schools or institutions with the Managers of the workshops for allowing their students to work there either by payment of fee or otherwise according to circumstances. The arrangement should not be left to be made by the students themselves out of their stipends or otherwise.

Q. (7) Yes. All combined; the details as to condition, etc., being settled according to circumstances.

Proposed alterations and additions in Schools and of the wants of new Schools.

Q. (1) and (2) I will answer these together.

What I would propose is that Government should open these schools for industrial education in the first instance, and as they become popular, and private enterprise steps in, gradually withdraw.

If Government had not opened Arts schools and colleges and managed them successfully, private bodies would not have formed schools of their own accord. Government should take the initiative and the lead, or, in other words, what Government did for the Arts education they should do for the Industrial education. Where there are Municipalities having sufficient funds they may be asked to make some grants to schools in their municipal jurisdiction.

But these grants would be small and would only be supplementary to the Government contribution which must be adequate. The central institution should be at Nagpur, and the local schools in the districts mentioned in my answers before.

Q. (3) I do not think night classes would be successful. Work people after having worked at the works during the day are not likely to be fit physically to attend those classes.

Acceptance of Experts from abroad in each Industry.

Q. (1) A specialized working expert for several schools would be better.

It is in my opinion scarcely possible to get a sound general expert, except perhaps in two or three allied trades.

Q. (2) If the question means in regard to control, I think they should be Provincial.

Q. (3) It will depend upon the trade or industry for which the expert is needed.

Q. (4) If possible, for all the trades mentioned by me in my answer to Question (1) under the heading "Principal Industries of the Provinces."

Q. (5) They must be sober. They must be willing to impart their knowledge. They must not only be theoretically educated, but must possess practical knowledge of the art in which they are expert.

Q. (6) He must select artisans and then impart knowledge by actual work being done by him in their presence and getting them to do it.

Exhibitions and Sales, whether required.

Q. (1) They are very useful. Local and Provincial should be more frequent.

Imperial exhibitions should be only occasionally, say once in every 12 years.

In order to make Imperial exhibitions very useful, special workmen or artisans, whose productions are sent up as exhibits, should be induced to visit them (exhibitions) and they may be paid charges of going to and coming from the exhibitions, and should be provided with free tickets for visiting the exhibition grounds.

In the same way artisans should be induced to visit Provincial exhibitions.

Exhibits should be taken to and returned from the exhibition *pendant* at Government expense or at the expense of the persons who get up an exhibition.

Q. (2) Presents and certificates to exhibit manufactures.

Prizes in the shape of a machine that would help the manufacturer to turn out his goods more quickly.

Q. (3) I can say on this question only this much that a sale-room may be attached to the school. Also the articles should be exposed for sale in the open market in a shop, the shop-keeper being given a small commission on sale-proceeds.

The prices may be fixed.

Q. (4) The artisans are generally poor and therefore they are unable to produce their articles in large quantities. But even a rich artisan will not be able to compete with foreign articles. Workmen can get good return provided import duty is paid. Whether the Government would consider import duty as reasonable or not, it is very difficult to say.

Q. (5) The workman gets ordinary wage for cheap common work and the same is to be paid for expensive fine work.

INTRODUCTION OF NEW INDUSTRIES.

- Q. (1) (a) Iron-smelting.
 (b) Improvement of carpentry.
 (c) Drawing of all sorts.
 (d) Improvement of block printing.
 (e) Improvement of cutlery.
 (f) Extension of *Al* cultivation and improvement in the preparation of *Al* dyes.
 (g) Extension of cultivation of *Ala* plants and hemp.
 (h) Tile-making.
 (i) Extension of carpet-weaving trade.
 (k) Improvement in the old-fashioned looms of ordinary weavers.
 (l) Pottery.
 (m) Glass-making.
 (n) Dyeing.

WHAT ARTISANS ARE REQUIRED.

Trained artisans are required in all trades in my opinion.

The 14th January 1903.

ANSWERS TO SOME OF THE QUESTIONS OF THE INDUSTRIAL EDUCATION COMMITTEE.

BY THE REV. F. R. FELT, METHODIST EPISCOPAL MISSION.

(1) Hardwicke Christian School at Narsinghpur—Industrial portion—Opened in 1895. The following industries are taught:—Carpentry, blacksmith's work, shoemaking, tailoring, dhobi's work, cooking and house work, caning chairs. Two boys are learning compounding in the Government Hospital. Thirty-seven boys work all day in the shops, and 167 others spend half the day in school and two hours in the afternoon in the shops.

(2) The school is under the charge of the Missionary.

(3) The school is not self-supporting. We receive aid from Government for the Famine orphans under our care and also get help from friends in England and America.

(4) The above trades were selected as there seemed a prospect for a fair livelihood from them in this region.

(5) Our teachers in the regular school are men with certificates. The shop teachers are the best workmen at their several trades we have been able to procure.

(6) Our students are mostly the Famine boys and are hence from nearly every class of the community.

(7) Period of training depends on rate of progress. Our work in the shops is graded as far as we have been able to do so.

(8) Material and tools are furnished by the Mission and the articles turned out are sold. We are kept busy filling orders.

(13) Each boy is expected to learn one trade. Sometimes a boy does not show any aptitude for one trade, but gets on well at another. So far native methods of instruction are followed mostly. An invoice of tools is on the way from America. We hope soon to add other methods of instruction.

(14) The boys who spend all day in the shops attend a night class, and we aim to have them able to read and write, keep simple accounts, etc. Some of these boys are Upper Primary failed boys.

(15) With the stock of tools, etc., which we will soon receive, we hope to be able to turn out better work, for we can command a grade of work that we are not able to thoroughly do with the tools we now have.

(16) I think our present system can be improved. Would suggest that the course of instruction be graded with regular examinations and promotions, and the passing of the final test to entitle the student to a certificate which would be recognized among Industrial Schools.

NOTE ON INDUSTRIAL SCHOOLS.

By MR. P. M. GERANY, SUPERINTENDENT, REFORMATORY SCHOOL, JUBBULPORE.

The Industrial School would be divided into two sections—

- (a) For agriculture.
- (b) Crafts School.

2. I would propose to establish an Agricultural School at Jubbulpore and other centres. The schools would be open for the sons and relations of malguzars and tenants. No student should be admitted into this school unless he had passed the Upper Primary Examination in Hindi or Marathi as the case may be, the subjects to be taught being :—

- (1) Classification of soils.
- (2) Tillage.
- (3) Sowing.
- (4) Manuring.
- (5) Irrigation.
- (6) Gathering and cleaning of crops.
- (7) Feeding and care of stock.
- (8) Fruit and Vegetable growing.

Optional Subjects.

Elementary Chemistry.

Do. Geology.

Do. Botany.

Land surveying.

To each school I would attach a model farm to enable the boys to bring into practice what they have learnt in school.

3. The object of the institution would be to develop local industries capable of expansion by the application of superior methods or implements. The sons of craftsmen who have successfully passed the Primary Examination in one of the Vernacular languages may be eligible for admission. The ordinary craftsmen to be found in large towns are :—

- Carpenters.
- Blacksmiths.
- Shoemakers.
- Cane-weavers.
- Potters.
- Weavers.
- Brass and Coppersmiths.

4. The tanning of leather is very indifferently done, and large quantities of hides are exported from the districts of the Central Provinces to other places. The Chamars generally live from hand to mouth; and much could be done to improve their condition in life by teaching them the approved modes of converting raw hides of animals into leather. The ordinary shoes and boots made for Europeans and Natives are indeed clumsily and indifferently sewn, and the shapes are not at all artistic. Till very recently shoemaking was a pure handicraft, but now machinery effects almost every operation in the art. All human feet are treated alike in a factory; in the handicraft the shoemaker deals with the individual foot. This should produce a boot which, for fitness, comfort, flexibility, and strength, should surpass all products of machinery. We have thousands of Chamars in every district, and with proper training the tanning could be improved and a good article manufactured. The shoe made by an ordinary Chamar produces a small value as it is badly executed. To keep his body and soul alive he goes in for poisoning cattle for the sake of the hides.

5. The weavers are another class who have suffered considerably on account of the machine. They are the most destitute section of the population during a famine. The process of throwing the shuttle by the weaver's hand across and through the warp threads from side to side of the web, is still extant in almost every native village. The power of the fly-shuttle is not yet understood. The opinion as regards the fly-shuttle is still divided: some condemn it, and others speak highly of it. I think if it is given a fair trial, the native weaver will deal with it skil-

fully. The fly-shuttle has been introduced in the Reformatory. It takes about three months to work it satisfactorily. The output of work is about double, and the weaver's income would necessarily be increased by 50 or 75% according to the kind of work. If the sons of weavers were taught the use of the fly-shuttle—and also those of the adult class who are willing to learn—and a cheap hand-loom devised—I use the word cheap, as anything expensive would be beyond their means for the present—the weaver's work would be considerably facilitated. The looms in present use are rude and simple, and not costly. I should say, give the weaver a loom workable with a fly-shuttle and you will alleviate his suffering to a great extent.

6. There are two classes among the weavers—the mahajani, or capitalist, and the working, or artisan, class. The latter as a rule do not keep any shop for the sale of the cloth they manufacture, but they make it over to the former class.

7. The art of preparing yarn has also died out as a handicraft. As late as 1867 a piece of Chanda thread was exhibited of such fineness that a pound's weight of it would reach a distance of 117 miles.

8. Cane-weaving—This is an handicraft with which the machine has not interfered, but it can be improved. The local cane-weavers do not generally turn out delicate and ornamental articles. People who require good articles of cane furniture have to send to Calcutta, Bombay, or Poona. The Nagpur Jail turns out a fair article. Canes, on account of their lightness, strength, and flexibility, can be used for a variety of purposes. They are split into strips and from the strips baskets, chairs, couches, and other articles are manufactured. If the cane-weavers were taught their work properly they could manufacture good articles of furniture; people then would not have to go to other places for their requirements. The position of the cane-weavers would be improved as they would get all the custom. With a few exceptions all the cane-weavers make coarse articles and eke out a precarious living.

9. The industry of bell-metal can also be improved. It is an alloy of copper and tin. Bell-metal is manufactured in Chanda, Mandla, Jubbulpore, and Saugor. The following plant is used in making vessels from bell-metal:—

- (a) A crucible, which is made of clay and crushed rice.
- (b) The lathe is a simple contrivance.
- (c) The furnace is a simple construction and consists of a pit or hole in the ground about 18 inches deep.

From these rude and primitive plant bells and other articles are manufactured. Mundle was once famous for its light bell-metal tumblers. If the plant were improved the brass smith's emoluments would increase, as he would be able to turn out better and larger quantities of articles.

10. One of the chief manufactures in the district of Jubbulpore is iron. I prepared a note for the *Imperial Gazetteer* and I shall now reproduce it in this note. I am informed that with improved plant the industry would be a great success and afford occupation to a large number of people.

“The number of furnaces at work in this district is from 40 to 50, but they are subject to fluctuations. A rise in the price of imported iron increases their number. The industry is one which is considerably influenced by the European iron, which is fashioned to meet all the requirements of the market, whereas the native iron produced in the district is sold in lumps as locally prepared, and is very costly to work into shape. The number of persons employed daily from the 1st November to 31st May per furnace is 31. Each furnace is worked for 7 months. During the rains no work is done. The cost of making and maintaining a furnace is estimated at Rs. 261. Each furnace when in work consumes daily 3½ maunds of iron ore and 4 maunds of charcoal. The outturn at the end of a day's work of crude iron varies from 38 to 50 seers. The estimated outturn of crude iron in the 7 months' season per furnace is 275 maunds, which sells at about Rs. 4-0-0 per *gon*—3 maunds—Rs. 366-10-8, leaving a profit of Rs. 105-10-8. The crude iron is locally known as bloom. This bloom is then re-smelted into pig iron, locally called 'chandia.' The outturn of pig iron from 275 maunds bloom is equal to 220 maunds, which at the average market rate, *viz.*, Rs. 2-8-0 per maund, yields Rs. 550, or a profit on the whole operation of Rs. 194.”

In the calendar year 1900, there were 54 furnaces working against 48 of the previous year; and the outturn of smelted iron was 370 tons, as compared with 153 tons of the last year. The increased outturn is due to a temporary rise in the prices of imported iron, and also to a limited demand for tools for relief works. The total value of the iron produced in the district would be Rs. 25,900, of which 64 per cent. is spent on labour. The pig iron finds its way into all the local markets for all agricultural and domestic requirements; and it is even exported for similar purposes to Mirzapur, Ghazipore, Agra, Cawnpore, Lucknow, Benares, Dinapur, Nagpur, Bhusawal, and Khandwa.

BOMBAY.

Proceedings of the Industrial Education Conference, held in the Government Secretariat Buildings, Bombay, on the 20th and 21st January 1902.

Present :

- LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C., *President.*
 THE HON'BLE MR. E. GILES, *Director of Public Instruction.*
 MR. A. W. THOMSON, D. SC., C.E., *Professor of Engineering, College of Science, Poona, and Inspector of Technical Education.*
 „ CECIL BURNS, *Principal, Bombay School of Art and Reay Art Workshops.*
 „ J. WALLACE, C.E., *Editor, "Indian Textile Journal."*
 „ D. C. CHURCHILL, *Expert in Mechanical Engineering, Mission House, Ahmednagar.*
 „ HUGH MONIE, *Principal, Victoria Jubilee Technical Institute.*
 „ F. ENGEL, *Inspector of Factories.*
 „ H. W. FRY, *Director, on the London Board, of the Missionary Industrial Aids Society.*
 REV. JAMES SMITH, *Mission House, Ahmednagar.*
 „ E. S. HUME, *Ditto, Byculla.*
 „ G. W. PARK, *M. E. Mission, Nadial.*
 „ R. E. AYERS.
 „ R. WINSOR, *American Board of Commissioners for Foreign Missions, Sirur.*
 SHET VEERCHAND DEEPCHAND, C.I.E., *Sholapur.*
 RAO BAHADUR DHAKJI KASHINATHJI, *Member of the Municipal Corporation, Bombay.*
 NOWROJI HORMUSJI COOPER, B.A., *Principal, Jamsetjee Nusserwanjee Petit Orphanage.*
 P. L. NAGPURKAR, *Secretary to the Industrial Association of Western India, Sholapur.*
 MR. C. A. RADICE, I.C.S.
 „ R. E. ENTHOVEN, I.C.S. } *Members of the Committee.*
 REV. FOSS WESTCOTT, M.A. }

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

Q. (2) Was there any special reason for the selection of the present location ?

A. MR. KASHINATHJI said that the reason why he established a Technical School in Poona, was because he found that many trades belonging to the district were dying for want of a workshop, and he was pleased to say that he succeeded in fitting up this workshop with the necessary machinery and tools.

Q. (4) Are the schools self-supporting ; if not, what is the average annual net cost ?

A. DR. THOMSON thought that a school never could be self-supporting, and said that the sooner we looked upon a Technical School in the same way as an ordinary school the better it would be for technical education.

MR. BURNS agreed.

MR. AYERS was of opinion that schools could be made self-supporting if they were worked on commercial lines.

MR. MONIE said that the expenditure of the Victoria Jubilee Technical Institute was ₹70,000 annually and the income only ₹16,000.

MR. CHURCHILL kindly undertook to give some statistics concerning technical schools in America, and was strongly in favour of having factories attached to technical schools to which

the boys could be sent after passing out from the school, same as was the case with Mr. Smith's Training School.

MR. COOPER said that at the Petit Orphanage, Parel, boys were taught carpentry, cane weaving, and similar other trades, and that the workshops were self-supporting, and the boys get employment outside after passing out. One of the workshops, he said, paid its own expenses.

MR. KASHINATHJI thought that it was absolutely necessary that there should be workshops attached to schools.

MR. BURNS considered that boys of a technical school who, it was found, could earn their living should be working in a factory.

MR. GILES did not think that a school and a factory should be combined.

Q. (5) Why were the particular trades selected which were taught in the schools?

A. DR. THOMSON said that with regard to Technical Schools—distributed all over the Presidency—you would find that carpentry was taught almost universally; this, he said, was one of the very best subjects to teach a boy who was later on to become an artisan of any sort; a boy with even a small amount of ordinary education learning carpentry could, with the acquisition of this knowledge, manage any trade that he was put to. At Home, he said, they kept boys at carpentry for well nigh three years. He thought that carpentry ought to be the preliminary education for all trades. Carpentry was, therefore, selected in the Technical Schools here because they wanted to turn out good carpenters and to improve trades generally.

MR. BURNS pointed out that carpentry was taught at Home as part of general education, not as industrial education.

DR. THOMSON continuing said that in this country a boy had no chance of learning carpentry, except in a Technical School and one or two High Schools.

MR. WALLACE remarked that a weaver, if he had a knowledge of carpentry, could improve his loom and possibly even make his own looms.

Q. (7) How are the Superintendents and Instructors trained? Is there any regular training school or other source of supply?

A. MR. WALLACE said that Superintendents were generally school-masters, and Instructors workmen: the latter were chosen for their real or alleged skill as operatives, but none that he had met had been trained in the art of imparting knowledge in terms specially adapted to the comprehension of the pupils as was the case in kindergarten instruction. At the Jamsetjee Nusservanjee Petit Parsee Orphanage he found the carpenter's workshop in charge of a youth who had been trained there, but who had no experience of other workshops. There were plenty of tools and materials, but, as might have been expected, no evidence of systematic training.

MR. GILES was quite in accord with Mr. Wallace. He instanced a case he observed in Jacobabad where the carpenter and blacksmith (Instructors)—both clever men—absolutely refused to shew their boys their best processes; and he thought that it was quite probable that when it came to finishing off a piece of work in the best way, they turned their backs on the boys and did it.

MR. BURNS said that it was the same case with the Railway Workshops: they have no knowledge how to teach; they may know the work themselves but do not want to teach.

MR. GILES was not in favour of teachers who had had their training in a normal Technical School, especially in the case of Drawing Masters, and recommended that a special school be opened for the training of Superintendents and Instructors of industrial education.

Q. (8) How are students selected? From what classes of the population? Are there any tests applied? Have you attracted the classes aimed at?

A. MR. GILES said that there were no entrance tests, but, as a general rule, boys to be admitted in the schools must have had some literary education and should not be under 10 years of age. At Sukkur, he said, they won't admit a boy unless he has passed the 2nd Vernacular Standard and is 10 years of age. However, he thought, there should not be any hard-and-fast rule as regards admission; it would be quite sufficient to admit a boy who could read, write, and do arithmetic.

DR. THOMSON said that if they were to adopt this course and desired to take in boys in large numbers, it would be necessary at first to offer them pecuniary inducements in the way of scholarships.

MR. KASHINATHJI said that the reason why Brahmins did not send their boys to the schools was because they could make use of them in their homes.

MR. SMITH thought as Dr. Thomson, and said that in order to attract boys, it would be necessary to offer scholarships.

The discussion then turned on the classes aimed at. It was generally thought that the schools had not attracted quite such a number of the artisan class as would have been desirable. Mr. Smith said that he thought that the Brahmins were quite willing to take to any trade, except, of course, shoe-making and other such trades. He thought they had a great deal of the "go-ahead" type in them and was confident that they would make the best engineers, foremen, etc., unless, of course, the Parsees cut them out. At present he knew of several Brahmins who were sending their sons to mechanical workshops, saying that they provided better openings for them, and the boys themselves much preferred this line to being school-masters. He did not think that they would care about being ordinary artisans, but as they had high ambitions and likewise the stuff, he thought they deserved to become foremen, engineers, etc. Dr. Thomson, too, thought that no class of people here would learn quicker than Brahmins. Mr. Smith also said that he would prefer not to aim at any special class, but to study predilections; he had little faith in heredity. In this view Mr. Wallace concurred.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

A. MR. GILES said that he had directed the schools to keep a register, but they found it very hard to do so as it was very difficult to trace what the ex-students were doing and the latter also did not send any information to the schools. At Ratnagiri and Sukkur, however, they have managed to keep registers.

Q. (12) Are there any special methods of instruction employed; if so, have any of these showed marked promising result?

A. MR. GILES said: "I may say in all fairness to Dr. Thomson, that if you have a good system—(I assume his system is good)—and if it is under good supervision, there is a great chance of it being successful. I do not hesitate to say that the public generally has accepted this system in so far as it is educative only and not connected with any sales; but the public wish to see some commercial side to the school; if they see no commercial side, they say it is no good to us; at Sukkur they made something saleable, but since the educative system came out that something was stopped. The boys spend three years in making joints, and when they have done that, the technical school is no longer what it should be. If the course instead of being three years were two years, and as the boys advanced in knowledge they were made to make things of saleable value, and if a factory were attached to the school, there would be a much deeper interest shown by the public than at present."

The meeting were thereupon generally of opinion that a commercial test, such as proposed by Mr. Giles, would be the most advantageous to follow in the future, but Dr. Thomson dissented from this view, and said that he could keep up the standard thoroughly well without it.

A discussion here followed about the lack of interest on the part of teachers, Mr. Smith saying that their tendency was often to degenerate when they were not working. If a man, he said, was employed on a fixed salary, there was no inducement for him to keep his hand in, he would do nothing except teach, and in this way, in a few years, he will have lost all his cunning and become idle and lazy; he will sit in his chair, letting the boys do as they liked.

MR. GILES said that the way to check this tendency was by enlisting public interest, and the public will take no interest unless the school is run on commercial lines.

MR. CHURCHILL confirmed the fact that teachers did not work in a way that would enable the boys hereafter to earn a decent living.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

A. MR. GILES referred the Committee to his notes. What he meant to say by English methods was that practically all the boys of the same class and age were set to work at one job at the same time under a teacher, and this system of manual training was, practically speaking, pursued in all the schools in the Presidency for some years now.

Q. (14) What general education is given in addition to regular industrial training? (N. B.—Drawing is industrial). What is the test of the quality of the work turned out?

A. MR. GILES said that the best quality of industrial work turned out was determined after an examination by Dr. Thomson; if he was not able to set the examination, the Executive Engineer examined the work.

It was stated that under Dr. Thomson's system 60% of the time was spent in industrial training including drawing.

Q. (15) Has any attempt been made to improve the quality of work in particular industries, or the tools or machines? If so, please specify industries, and the improvements made.

A. MR. GILES said that with the exception of Mr. Smith's weaving school at Ahmednagar, he did not know of any other case. In Sind (in the Khairpur schools) they have taken up lacquer work, but he could not say exactly how it was doing. Nowhere else have improvements been made except in the School of Art workshop. Carpentry was very much improved generally.

MR. SMITH referred to his Weaving School at Ahmednagar, in which he had introduced many changes in the way of improvements, especially in the shears, an English pattern now being used; this kept a beautiful keen edge and produced a superior cloth. They were now having under consideration the introduction of a fly-shuttle loom for cotton weaving.

Q. (16) Do you consider the present system the best, or can you suggest improvements?

A. MR. SMITH said: "I have felt very strongly for a long time that we ought to have a manual training class in connection with every High School in this Presidency; it is educational, but my aim would not be educational, my aim would be industrial; for, I believe, that we shall in that way attract men of intelligence away from literary work into industrial work, who would in time become leaders of industrial work in this country. We have done this ourselves and the results have been very satisfactory. Carpentry has been one of the chief subjects in connection with this manual training we have taken up, and we have succeeded in attracting clever boys who have gone into the thing with great zeal and energy and become good men and teachers. The presence of the workshop in full view led those boys to look into it and by-and-by they became so familiar with it that they began to feel in time that there was nothing dishonourable in manual labour. I would, therefore, have a manual training class in every High School."

And there was not a day, Mr. Smith said, in which he did not see some room for improvement and he was working on those lines all the time. He would follow the same system and try to develop it if there was room for development as much as possible. He did not think that the present system was so bad; it was the want of better teachers which was most felt.

2.—*Native System of Apprenticeship.*

Q. (1), (2), and (3) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

A. MR. ENGEL said that if a craftsman had no sons to follow his trade he took on any apprentice and a verbal arrangement was come to between them, and the boy was bound down to serve his master for one year during which time he got an allowance of one rupee per month and food. At the end of that time if the boy was able to work on his own account, he did so, but if not, a further agreement was made between master and apprentice, the latter helping his master in his work for which he received a monthly wage. He thought that the Native system was the best, but that an effort should be made to induce them to adopt improved methods, especially in the weaving industry in regard to their looms. The Native system had this great advantage, he said, as far as weaving was concerned, in that the apprentice to the weaver strictly adhered to economy and that from the onset he was in touch with the market. He recommended Government adopting the following method with respect to weaving, *viz.*, that improved implements be given to the master weaver and he be subsidised on condition that he teaches his apprentices their use according to his old system.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. The general opinion was that he could be identified by the quality of his work and the price it commanded.

MR. HUME: "Four things: (i) the condition of his tools; (ii) how he handles them; (iii) the assurance with which he goes to work; (iv) the general appearance of the work when finished."

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice or interference, and how best?

A. MR. NAGPURKAR spoke at some length on the Native system of apprenticeship, and said that the best way to improve the industries of India was to send a man from here to Europe to learn better and improved methods, and on his return to teach what he has learned to others. This, in his opinion, would be preferable to getting out experts from abroad who did not know the ways and habits of the Indian people. Several persons he knew of who had gone to England to learn some special industries, had now returned and opened out in business for themselves. These people, he found, were most willing to impart their knowledge to others if they were given some pecuniary help; and many, he said, would be only too glad to receive instruction and advice from such men, as, for example, Mr. Kelker who went to England to learn weaving and now that he has come out again, is beginning to give lectures and advice to people who are glad to have such an opportunity of improving themselves.

MR. ENGEL was certain that if one weaver had an improved loom turning out a big quantity of stuff, his neighbour seeing this would soon ask to be also supplied with one.

MR. SMITH remarked that very lately he asked some weavers, potters, etc., if they would adapt themselves to improved implements if they were given them; they told him they could manage their own affairs.

Q. (6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education?

A. It was stated that no fees were paid.

MR. ENGEL said that as far as weaving was concerned, the lads lived with their masters and did all their menial work, for which in return they were given their food.

Q. (7) Will the craftsmen take in apprentices of all classes or only of their own class?

A. The majority of the meeting seemed to think that they would only take in apprentices of their own caste, but Mr. Smith and Mr. Engel were of opinion that only if they were paid they would receive apprentices of any caste.

Q. (8) Have famine sufferers been taught trades by Native agency which they would not ordinarily follow? Was such Native Agency readily procurable, and on what terms?

A. MR. GILES said that it had been tried at Sukkur to some extent.

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

A. MR. ENGEL said if Government held out prospects of a good market for the sale of his goods.

MR. GILES agreed and was not in favour of money grants.

(Here the Meeting adjourned.)

MEETING CONTINUED, 21ST JANUARY 1902.

3.—*Principal Industries of the Province.*

Q. (2) Which would you recommend being specially supported or encouraged?

A. MR. GILES would put the Textile industries first.

MR. NAGPURKAR recommended—Weaving, Dyeing, Leather-work, Iron-plate work, Oil-pressing.

MR. WALLACE recommended—Hand smithy work, Calico block printing.

Q. (3) Can you give any reasons why support or encouragement is specially required, and what direction should the support or encouragement take?

A. MR. ENGEL said that the way to encourage weaving was to get the workers out of the hands of the middlemen and find larger and more accessible markets.

MR. GILES remarked that Natives fancied the hand-woven stuff best as it was very strong and durable, besides it was cheap.

MR. ENGEL spoke of the improvements which he thought might with advantage be introduced in the weaving looms to be given to weavers to work and teach with.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—*Proposed alterations and additions in system and methods.*

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. The general opinion was that provision should certainly be made, it was very desirable. In England, Mr. Burns said, they provided £45,000 a year in the way of scholarships.

REV. R. WINSOR thought that special provision should be made for men with an inventive faculty, which was very rare in India. Government should have special establishments for taking advantage of the gifts of such men.

Q. (4), (5) and (6) Concerning foremen.

A. MR. WALLACE said that there was a certain amount of knowledge that a foreman ought to have in excess of the workman. Foremen and Managers can only be trained in the workshop of the class they are eventually to govern. The best method he would recommend was to send the apprentice first to the workshop and afterwards to the college when he could better appreciate technical instruction. He would send him to the workshop at the age of 14, and to the college at 19.

MR. BURNS was of the same opinion.

DR. THOMSON thought the other way, and said that he would first of all give him a fair general education, then pass him into a technical college, finally finishing him off in a large workshop.

2.—*Proposed alterations and additions in schools and of the want of new schools.*

Q. (1) Can you suggest any improvements to existing schools apart from changes in the methods of teaching or training?

A. REV. R. WINSOR agreed with Dr. Thomson's views about not making goods for the market.

MR. GILES said that supervision would prevent under-selling on the part of Industrial Schools.

Q. (4) Should such night schools be under the General Education Department or the Industrial School Management?

A. DR. THOMSON said that they should be under the Education Department so long as the teaching was educational.

MR. SMITH agreed.

Q. (5) Are you in favour of the establishment of Training Schools for Superintendents and Instructors, and do you propose to take steps in this direction at once?

A. It was agreed to train teachers in the industries already taught in the present schools.

3.—*How the Neapolitan Scheme would apply.*

Q. (1) and (2).

MR. WALLACE said that there could be no doubt that the instruction given by a trained teacher was far more rapid and more useful than that given by the average craftsman, and he thought that the scheme might work but only if apprentices were bound in some way or other.

MR. BURNS was of opinion that most "go-ahead" tradesmen would not approve of the system.

MR. GILES thought it might eventually be possible to introduce the Naples system, but on a modified scale. If local craft schools were established, as was suggested, divisionally, then it might be tried, but he was strongly of opinion that there would not be the slightest chance of getting outside artisans to co-operate as things stood at present.

Q. (3) Should such night schools be in an enclosed private area or open freely to the public?

A. MR. GILES said the way to do it was to have a street running from the school with its shops on each side and the school at the head of it. It should certainly be open to the public in order that they may come in and buy.

MR. BURNS agreed.

Q. (4) What special inducements should be offered to craftsmen to co-operate?

A. MR. BURNS recommended free shops.

MR. GILES, too, was of the same opinion and added that the shop should be fitted up with improved implements and machinery.

MR. ENGEL replying to questions (4) to (6), said, that on behalf of the weaver he would recommend improved looms and free labour of apprentices who might be paid a small monthly allowance by Government; and when the apprentice became competent, after about a year,

he also in turn should be treated in the same way as his master to enable him also to train other apprentices.

4.—*Would you accept Experts from abroad in each Industry.*

Q. (1) Generally speaking, would it be best to have a working expert, *i.e.*, a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and if so, in what trades?

A. MR. WALLACE thought it was possible to obtain a man with a knowledge of several trades but was rather in favour of getting such a man locally, if possible, than importing him. It took him, he said, three years to adapt his knowledge to Indian requirements. He would rather have specialized experts.

MR. BURNS said he would have specialized experts for each industry to be taught in each school.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

A. MR. BURNS said they should be Provincial, stationed at Normal Schools.

For pottery he would have a man from a local Technical School. He should be doing practical work during the day, and in order to increase his income he might take a class at the craft school in the evenings. He would only engage those experts brought out from England for five years or less if found necessary, but not more, as they will have so worked up the trades and industries in that time that there would be no further use of their services, the people whom they will have taught would be able to take up the teaching in the future.

MR. ENGEL, speaking on behalf of weaving, said that he would have improved looms put up in places where the raw material for weaving was obtainable, and this place would eventually become a centre of attraction for all outlying districts from whence he hoped men would come to see this improved loom, and he would get them to recommend the best man and put him in charge of the loom. He would have a *working weaver* for this warping department securing him locally. He would then have a Superintendent travelling from one district to another, seeing how the foreman weavers were working.

Q. (3) What would be the average annual cost of such an expert?

A. MR. ENGEL said for a weaving master the pay would be from Rs50 to Rs100.

5.—*Proposed Department of Control, Central and Local, for Urban and Rural Schools.*

Q. (1) to (5).

MR. GILES said that he would have one special officer to look after all the Industrial Schools, and would have a Committee to do the inspection.

MR. NAGPURKAR said that in towns it would be possible to find a Committee of the trade panchayat to take an interest in the schools. Their functions should be merely inspection and reporting.

MR. SMITH said they should be looked after by leading men chosen from the trades; their functions should be advisory.

Q. (3) The local systems of control must, it is presumed, be focussed for the province by some technical officer, who will be generally responsible for executive administration and management. Who should this be?

A. DR. THOMSON said the Superintendent of the Technical High Schools of the division.

MR. GILES said that we must have one special officer for industrial education; a special officer would be able to exercise special supervision over every school, whether this special officer served under the Director of Public Instruction or the Director General of Industries up at Simla. But he doubted whether there would be such a department. What was necessary for them at Bombay was to have one special officer attached to the Educational Department, or at all events attached to the Government to look after all these schools and to control them, he might be under the Director of Public Instruction simply in this way that appeals would be made to him. He thought it would not be advisable to separate this officer entirely from the Educational Department: he would be the expert adviser of the department; he would have more power than an Inspector on the whole. It, however, depended a great deal as to how the central institutions might develop. He would indent for such a man from England.

Q. (5) Is direct and special imperial control of industrial education necessary for its efficient development?

A. It was proposed that the Imperial officer should be limited to giving advice like the Director General of Agriculture.

6.—*Exhibitions and Sales, whether required.*

Q. (1) and (2).

A. MR. WALLACE quoted an example of a recent exhibition shewing the textiles required in the African markets, which excited great interest among the people.

MR. BURNS said that local craft schools should always have exhibitions, and prizes should be awarded for the best work in the same manner as was done in England.

REV. R. WINSOR gave illustrations of the great International Exhibitions of the United States of America which afforded a great stimulus to inventive power, the result being the production of new machinery and new fields of enterprise. It would do this country much good, he said, if they followed the same example.

MR. SMITH said that exhibitions would do a great deal in making known the arts turned out in certain schools and would afford facility for comparing schools which would tend to emulation.

MR. NAGPURKAR was in favour of an Imperial Central Exhibition and also temporary ones at places of pilgrimage.

MR. KASHINATHJI considered exhibitions to be of benefit for the spreading of industries to new centres.

Q. (2) Can you suggest any conditions which would make exhibitions of value to the industrial progress of India ?

A. MR. NAGPURKAR suggested the protection and registration of patents in the province itself. This, he said, was a crying necessity for those inventors who did not have money enough to take out patents in Calcutta.

Q. (3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output ? Thus it may be—

- (i) scrapped ;
- (ii) made to order only, private or by regular agent ;
- (iii) sold through agents as produced ;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan system ;
- (v) sold in a regular school sale-room.

Should prices be marked or fixed at all ?

A. MR. NAGPURKAR said that the rules of his association would not allow of their helping industries by selling goods at present, but he would put it to the members.

MR. WALLACE would dispose of the output through a local dealer as produced.

DR. THOMSON was of opinion that if prices were marked there would be great difficulty in selling.

Q. (4) Regarding industries generally in India, are you aware of any financial conditions which effect—

- (i) Production,
- (ii) Price,
- (iii) Returns to workmen ;

which could be removed by the reasonable action of Government ?

A. MR. SMITH recommended inspection and a Government stamp ; instancing that the Government of Canada helped the sale of Canadian cheese by guaranteeing its quality.

MR. ENGEL said by supplying warps to weavers and a certain amount of expert suggestion. Government would be obliged to invest in a certain quantity of yarn as the demand increased. They would recover this money by selling the yarn to weavers, perhaps, on credit. He mentioned that it was the case in the Mills in Bombay that any man of responsibility felt proud to be in debt. The sowkar made advances to the weavers by way of giving them a bundle of yarn on condition that it was brought back to him in cloth when finished, charging the weavers interest. He was, therefore, in favour of giving warps to weavers and thus helping them to get out of the hands of these men. The man who distributed the yarn to them would be one of the leading men of the community of the district.

MR. SMITH advocated the Factory system.

MR. KASHINATHJI spoke on behalf of the sowkar and said that they not only advanced the money but also supplied the weaver with work.

MR. GILES preferred the method advocated by Mr. Burns in his written replies.

Q. (5) Can you say whether, generally speaking, the workman gets the best wage or profit return from—

- (i) Expensive fine work ?
- (ii) Cheap common work ?

A. MR. ENGEL thought cheap common work paid better as the men could do this quicker.

MR. BURNS said it made no difference ; it entirely depended on the supply and demand.

MR. WALLACE said cheap common work paid better when done in any great quantity.

MR. HUME said the fine worker was paid better in carpentry.

DR. THOMSON said that fine work on the whole paid better.

(c) HOW ARE FUNDS TO BE PROVIDED.

Q. (4) Are you in favour of any scheme of Industrial Banks ?

A. MR. WALLACE seemed to think that it was a disastrous scheme.

B.—INTRODUCTION OF NEW INDUSTRIES.

(a) WHAT INDUSTRIES TO BE INTRODUCED.

Q. (1) Name the industries to be introduced.

A. MR. WALLACE suggested the working up of scrap iron for nails, bolts, nuts, etc.

MR. BURNS remarked that at Nariya in Kurhia District they started machinery for stamping out tin, copper, and brass vessels, but this had hopelessly failed.

MR. ENGEL remarked that a Bobbin Factory was started at Ahmedabad, but this, too, had failed.

MR. WALLACE said that the failure of the Bobbin and Match Factories at Ahmedabad was due to the use of improper material.

(b) WHAT ARTISANS ARE REQUIRED.

Q. (1) Are there any lines of work requiring trained artisans of which the supply is now limited or badly trained?

MR. FRASER, of the *Times of India*, says that there is a great demand for trained compositors in Bombay.

MR. WALLACE said that artisans in every trade were needed; there was very good demand for labour. Plumbers were particularly in great demand.

MR. BURNS said that there was a tremendous demand for stone-carvers.

EXTRACT FROM THE PROCEEDINGS OF THE GOVERNMENT OF BOMBAY
IN THE EDUCATIONAL DEPARTMENT.

No. 127, dated the 16th January 1902.

Read—

Joint letter from the Honourable Mr. E. Giles, Dr. A. W. Thomson, and Mr. C. Burns, dated the 13th January 1902.

RESOLUTION.—The Honourable Mr. Giles, Dr. Thomson, and Mr. Burns should be thanked for their Joint Report which has been prepared at very short notice.

2. The Governor in Council concurs generally in the proposals contained in the Report and they should be laid by the Honourable Mr. Giles before the Industrial Schools Committee on their arrival in Bombay.

[True Extract.]

H. O. QUIN,

Secretary to the Government of Bombay.

JOINT REPORT

BY THE HON'BLE MR. E. GILES, *Director of Public Instruction.*

„ DR. A. W. THOMSON, *Professor of Engineering, College of Science, Poona.*

„ C. BURNS, *Acting Principal, Sir J. J. School of Art, Bombay.*

With reference to Government Resolution No. 2128 of 16th December 1901, we have the honour to report that on receipt of the Resolution we at once met for consultation, and that it was decided by us that the preliminary enquiry ordered by Government should be made by dividing the Presidency into three portions, and allotting a portion to Dr. Thomson, Mr. Burns, and the Director of Public Instruction, respectively. It was thus determined that the Director of Public Instruction should make enquiries in Sind, Mr. Burns in the Northern Division, Bombay City, and in portions of the Central Division, and Dr. Thomson in the Southern Division and parts of the Central Division. These enquiries were completed on the 11th instant, and we have now the honour to submit a Joint Report showing generally the most important features of the industrial position in this Presidency and indicating to some extent the subjects to which it is thought that the attention of the Commission may most usefully be directed.

2. As a preliminary we obtained from the Census Office at Poona returns showing those trades and industries which give occupation to a considerable number of persons in the Presidency. It was thought desirable to consider, in this connection, every trade or industry which

* i.e., workers and those dependent upon them. gave support to at least 2,000* persons in any one collectorate of the Presidency of Bombay. The figures supplied were those of the Census of 1901.

3. It is almost unnecessary to say that for an exhaustive and thorough enquiry into the conditions of any trade or industry far more time is requisite than was at our disposal, but the result of the enquiries made tends to show that the principal industries and trades of the Presidency, which deserve further investigation and which appear likely to repay encouragement, are those which give employment to the following classes of artisans:—

- (1) Workers in hand textile industries of all kinds.
- (2) Carpenters and other workers in wood.
- (3) Workers in iron, copper, and brass.
- (4) Workers in gold and silver and jewellers.
- (5) Masons and stone-workers.
- (6) Potters and brick and tile makers.
- (7) Dyers.

- (8) Tanners and leather-workers.
- (9) Rope-makers.
- (10) Cane-workers, including bamboo-workers.

t. The reasons which led to the selection of these industries are shortly stated as follows :—

- (1) *Textile industries* are universal throughout the Presidency, are generally in a depressed condition, but in many cases appear to be capable, with improved methods, of revival and possibly of yielding an output which might compete with machine-made articles.
- (2) *Carpenters and other workers in wood.*—The demand for good carpenters exceeds the supply generally, and especially in certain localities such as Sind, Poona, etc.
- (3) *Workers in iron, copper, and brass.*—This again is a universal trade, and greatly lacks system and method such as might be introduced by simple machinery and combination of labour.
- (4) *Workers in gold and silver, and jewellers.*—In this trade there is room for great improvement, especially in design, technique, and rapidity of execution.
- (5) *Masons and stone-workers.*—There is a great lack of efficient stone masons even in Bombay and the demand for competent artisans of this kind is likely to increase largely in the Presidency generally.
- (6) *Potters and brick and tile makers.*—Here again there is great demand for good bricks and tiles. The present supply is for the most part of a very inferior quality, and large quantities of tiles are imported from abroad.
- (7) *Dyers.*—The trade is a large one, but the methods are extremely crude and unscientific and the results indefinite.
- (8) *Tanners and leather-workers.*—In some parts of the Presidency the raw material is abundant and is either wasted or exported, and, if worked up, is of inferior quality.
- (9) *Rope-makers.*—This is confined for the most part to Māngs who have neither resources nor method. There seems reason to think that this trade is capable of great development, not only by Māngs but by other classes of the population.
- (10) *Cane-workers and bamboo-workers.*—The jails of the Presidency show that good cane-work can be executed in India under proper supervision, but cane is not apparently an indigenous product. Bamboo, on the contrary, is plentiful, but is little used in fine work and in furniture, most of which is imported from Japan and China.

5. In addition to the above industries there are several smaller industries which are not unimportant, which do not at present employ any large number of persons in one locality but, in the aggregate, employ a considerable number of people throughout the Presidency. Among these may be mentioned—

- (1) Hand block printers and cutters.
- (2) Type printers and book-binders.
- (3) Embroiderers.
- (4) Turners and lac-workers.
- (5) House decorators and painters.
- (6) Glass-workers.

6. We are directed in the Government Resolution quoted in paragraph 1 to prepare the frame-work of a scheme which may be considered by the Commission in accordance with the principles laid down by the Resolutions of the Simla Conference. In this connection it appears desirable to consider shortly what has been done up to date in this Presidency to develop industrial instruction, and thereafter to point out what steps may, in our opinion, be usefully taken to improve existing methods and to create that connection between instruction and industries which is indicated in the Resolutions of the Simla Conference as essential.

7. In the Bombay Presidency, for several years past, efforts have been made to develop industrial education of various kinds. These efforts cannot be said to have been systematic or methodical, but it has been the policy of Government to encourage, as far as funds permitted, any local effort and to promote the establishment of schools not only by grants-in-aid but of late years by special supervision. Thus in the whole Presidency there are 32 Industrial or Technical Schools, of which four are in Native States and 28 in British Districts. These 28 institutions are of very varying excellence and importance, and there can be obviously no comparison between the workshops attached to the College of Science and the School of Art which are under direct European supervision, and the ordinary Industrial School as maintained by a Local or Municipal Board. Such schools are 21 in number and are distributed as follows :—

Central Division	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Northern Division	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Southern Division	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sind	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
																					21
																					21

8. These schools have usually been developed in the first instance by persons locally interested, but possessing no expert knowledge or definite ideas as to the methods to be followed or the ends to be achieved. Thus the principal feature was perhaps commercial rather than edu-

cational, and the interests of the individual pupil were too often sacrificed to the products of the school. There was, at least in the earlier days, no effort made at improvement in method as the result of instruction, and the motto of these schools may be generally stated to have been "things, not men." But of later years the Educational Department has introduced systematic methods of instruction into the schools, has required each pupil to pass through a definite

* Including a knowledge of the course* of manual training, and has devoted its attention "3 Rs." rather to the training of the individual than to the production of saleable articles.

9. It is not claimed for the Bombay system that it is in any way complete or sufficient in itself. It is not difficult to point out the reasons for deficiencies, and we would briefly summarise these as follows:—

- (1) The lack of trained teachers who understand not merely the higher methods of their craft but the way in which knowledge should be imparted. In some cases even the teachers avoid imparting to the pupils the best knowledge which they possess.
- (2) The difficulty of attracting and retaining pupils of the proper caste or castes. These obviously should be drawn from the artisan classes, but boys of these very classes, which are generally poor, will either not join a school, or, if they join, will not remain long enough to complete a definite course, because they can earn a certain amount of wages elsewhere.
- (3) The financial difficulty. To ensure the attendance of the classes referred to above, payments in the form of scholarships or wages are necessary and few, if any, of the schools can afford a sufficient outlay on this account.

10. Further, schools in the Bombay system have not been generally designed to meet the requirements of special industries of the localities in which they are placed. Thus in some cases schools have been located where no special industry exists. In others the industry of the locality is taught, but no attempt has been made to improve the methods † of that industry, while,

† Except of course by the introduction of Drawing, which is now produced in one or two cases, notably at Ahmednagar, the school has universally taught. In Ahmednagar case this has been due solely to a visionary enterprise.

11. We are of opinion that the existing system of technical instruction in Bombay, imperfect as it may be, need not be summarily abolished, and that though schools which obviously serve no very useful purpose may gradually be eliminated, others may, on the contrary, be eventually developed and systematized as craft schools, having a special relation to the industry or industries of the locality. But it is obvious that no really useful or improving influence can be exercised upon any local industry, until it is possible to provide teachers who possess a knowledge of that industry superior to that of the local craftsmen. Normal technical schools must be established as a preliminary to any development of a system of technical instruction which is intended to deal seriously with the industrial problems of the Presidency. It appears possible to attach such schools to two of our most prominent Government Institutions, and we would suggest that a normal school specially designed for the production of teachers of the mechanical crafts should be attached to the College of Science. Similarly a normal school for the training of teachers in the artistic crafts should be established in connection with the School of Art, Bombay. We do not attempt to enter on the financial details of these proposals further than to state that the establishment of thoroughly efficient normal schools will necessitate a considerable increase in establishment in both institutions, and, presumably, the employment of expert instructors specially engaged in Europe for a specific term of years.

12. It is obvious that the two normal schools indicated above would not be able to deal with more than a certain number of the crafts enumerated in paragraphs 3 and 4, but we are of opinion that they would be sufficient as a preliminary step to the formation of local craft schools in connection with special industries, and further developments may be left till experience has been gained. We would further point out that, should it be decided to form a small technological department in connection with the industries of India, it would obviously be desirable that that department should indicate the directions in which future developments should be made.

13. When a supply of really efficient teachers exists, it would appear desirable to establish craft schools in special connection with particular industries. Such schools should, in our opinion, be limited in number, perhaps one for each Division of the Presidency, but should be thoroughly equipped and their efficiency should not be sacrificed to any financial considerations. They should become the central technical schools for each division, and it is to be expected that they would exercise a beneficial influence upon the smaller technical schools which already exist, or which may hereafter be established, and which should be linked to the divisional craft school. Thus the central school might usefully supply the smaller schools with competent teachers.

14. In conclusion, we would respectfully but most emphatically record our opinion that any large and efficient development of technical and industrial education in this Presidency can only be secured by the assignment of special funds for that purpose. We do not anticipate that any adequate assistance will be forthcoming either from Local Bodies or from individuals, and we trust that it may be found possible to set apart, at least for a term of years, a sum of money which shall be amply sufficient for the inauguration and maintenance of a scheme of technical education such as may tend eventually to revive the industrial prosperity of this Presidency.

REPLIES TO THE QUESTIONS OF THE COMMITTEE,

BY THE HON'BLE MR. E. GILES, DIRECTOR OF PUBLIC INSTRUCTION.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

- (1) A complete list is printed below.
- (2) In some cases selection was due to the enterprise of individuals, *e.g.*, at Rantágiri, Pandharpur and in the Naushábro Division of the Hyderabad Collectorate in Sind. In other cases the Department advised the institution of schools. As a rule schools were not opened to meet any urgently felt industrial want.
- (3) This question is generally answered by the list given in reply to question (1). The schools are, excepting special institutions, usually maintained by District Local Boards, Municipal Boards, or Societies, and aided by Government.
- (4) The schools are not self-supporting. The average annual cost of 21 Industrial Schools on the list is R3,095, excluding fees, subscriptions, endowments, and other sources, R1,838. The *net* cost cannot be accurately ascertained without further enquiry, but in many cases the receipts from sales are very small, and they are generally expended in small wages or scholarships.
- (5) The subjects of Drawing and Carpentry are almost universal under the Bombay system of manual training. In some cases, as in Sind, trade are taught which are common to the neighbouring localities, as the lacquer trade in Khairpur.
- (6) The Victoria Jubilee Technical Institute furnishes a good many of the Superintendents on pay ranging from R60 to R120. The Superintendent at Ratnágiri is a European on R400 per mensem. In small schools there is sometimes no Superintendent, or the school-master, as at Umarkot, is responsible for the school. In the case of aided schools the Superintendent is sometimes a Missionary.
- (7) There is no regular Training School or source of supply of Superintendents, other than the Victoria Jubilee Technical Institute, the School of Art, or the College of Science Workshops. In none of these Institutions is there a normal class for training teachers or Superintendents of Industrial Schools.
- (8) Generally an attempt is made to select pupils from the artisan classes. It is customary to refuse admission to children under ten years of age, and to require that they should have some literary education. The attempt to attract the sons of artisans has not generally succeeded.
- (9) As a rule ten is the age limit for admission, no fees are charged, scholarships are generally given and vary from a few annas to R6 or 8. Dr. Thomson's course of manual training is followed, which is a three years' course, and certificates are given to those who complete it. As to character and discipline the ordinary rules of the Department apply.
- (10) The proportion of students who afterwards follow a trade learnt in the school is generally small and the figures given in the statement are approximate only.
- (11) Materials and tools are provided by the Agencies managing the schools under the advice of the Department. The tools are usually English made, but native tools are not excluded. Work turned out is sometimes sold to the public and kept on show for that purpose. Some schools execute orders. In some the process of training is educative only and here the materials are ordinarily not turned to any saleable use.
- (12) Dr. Thomson's system of manual training is perhaps the only method that can be called special. I cannot say that the results so far have been very promising. I believe they are best in the Poona Municipal Technical School, where Dr. Thomson's supervision has been available.
- (13) Usually all boys are passed through the course of Drawing and Carpentry and are then allowed to take up a special trade such as smith's work or turnery. But it must be understood that there is no absolutely hard-and-fast rule for all schools. English methods of instruction are generally used, but in many cases the instruction is given in the vernacular.
- (14) Boys are usually taught to read, write, and cipher in vernacular classes attached to the school, or attend the adjacent vernacular school for about three hours a day, till they have learnt up to Vernacular Standard IV, *i.e.*, have a competent knowledge of reading and writing. The test applied is that of the ordinary inspecting officer.
- (15) The introduction of English tools and machinery, such as lathes, etc., may be regarded as an attempt to improve the quality of work in such industries as carpentry and smith's work, and it may be held to have succeeded to some extent, but good tools and machinery are of little use without good teachers.
- (16) I do not consider that the system adopted in Bombay is the best possible. In the beginning there was no system generally. A school was instituted and articles made for sale generally by the teachers, while the education of the pupils was neglected. Under Dr. Thomson's system of manual training the pupil is educated, but the Commercial side is neglected and the school loses popularity with the public and fails to attract pupils at least of the

right sort. See also below answers to (b) 1.—(2). I have indicated in the Joint Report submitted to Government what system appears to me the best. It may be possible with good craft schools under competent teachers to exercise a real influence on industries now either decaying or hardly paying their way. I would also draw attention to the Dinsháh Petit School at Ahmednagar and the factory connected with it. The Rev. James Smith, who superintends the Industrial School, will be able to give full information as to its methods.

2.—Native system of Apprenticeship.

(1) and (2) The ordinary Native system is a caste and hereditary system. That is, each trade or art belongs to a caste or class and the son follows the father's profession. Outsiders do not usually take up the art or trade of a particular caste or class. The system is, so far as I can learn, common to all, or at least to most trades.

(3) The advantages are, briefly, hereditary skill and preservation of old designs and ideals. The objections are that the son does not improve upon his father's work, that stagnation is probable, resulting from too close adherence to a few patterns, and that the isolation of the trade tends to narrowness and forbids co-operation.

(4) The best craftsman is identified usually by his work and reputation. Special families perhaps obtain a reputation which is continued through several generations.

(5) The Native system of apprenticeship is ordinarily that of a son working as a shop boy or menial servant in his father's house and shop, or that of a boy being sent to the care of a relation or neighbour in the same trade. This is common, as it is apprehended that the boy will learn more and be less spoilt in the house of a relation or friend than in his own home. He begins by sweeping out the shop, fetching water, etc., laying out tools and materials, and gradually obtains some knowledge of the work and is entrusted with light work himself. Eventually he is employed on small wages or returns home when he can earn something tangible.

I do not think that such a system can be accurately compared with the method of an average Industrial School. If the school is worth anything the school method should be superior as being more directly educational and having scope for improvement in the trade or art.

I do not think that the Native system could be extended in practice at present, or that artisans generally would accept advice or interference in their system even from an expert. But this is a point on which it is difficult to pronounce, unless such advice or suggestion was systematically tendered and the advantages to be obtained made clear to the mind of the artisans.

(6) Fees are not usually paid. Remuneration may be given in kind and perhaps in wages when the apprentice is really efficient. There is probably no definite age at which apprenticeship begins, and almost certainly no stipulation for preliminary education.

(7) Craftsmen would almost invariably take in apprentices of their own class only.

(8) I know of no such case.

(10) In Sind there are Trade Guilds in some of the larger trades in Karáchi, such as the cloth-sellers, but so far as I could ascertain they exist as a kind of Trades Union and the objects aimed at are the agreement as to the price to be fixed for certain articles, the commission to be paid to brokers, etc. The guilds are rather those of merchants than of artisans, and could not be utilized for industrial purposes. Probably any interference would be resented by such guilds. There are also in Ahmedabad craft guilds which regulate wages, holidays, prices of articles, etc. They are perhaps to be regarded as secret unions for defence, and would probably resent interference.

3.—Principal Industries of the Province.

[For the four questions under this head I would refer to the Joint Report submitted to Government.]

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

(1) and (2) See the Joint Report alluded to above.

(3) If Central Normal Schools are instituted, and special Craft Schools linked to them, the promising student could be brought to the Central School under a scholarship system. Probably District Local Boards and Municipal Boards could provide such a system of scholarships without difficulty.

(4) I think that probably some final training in a large workshop would be very advantageous, unless the Central Normal Schools were very fully equipped.

(6) Employers of labour in Bombay would probably take pupils if these came to them already well trained and ready for practical work. In that case they might pay wages after a period of probation. The student would require a stipend for subsistence during such period.

(7) The department gives grants to meet initial expenses and also annual grants to private aided schools. Free expert advice is also given. The conditions are laid down in the Grant-in-Aid Code. They are the usual conditions that the grant depends upon the cost and efficiency of the Institution.

2.—Proposed alterations and additions in schools and of the want of new schools.

(3) As to night schools or classes I have never yet found them generally successful in India. But there are evening lecture courses at the Victoria Jubilee Technical Institute which are well attended, and, perhaps, in time classes might be developed in connection with the Central Normal Schools and special Craft Schools.

(4) If they existed in connection with any particular school, they should be managed by the management of that school, under the general supervision of the Educational Department or a special Technological Department, if hereafter created.

3.—How the Neapolitan scheme would apply.

I reply shortly to these six questions collectively. The account given in Sir E. Buck's report of the Naples school does not afford sufficient information for a complete judgment as to the system. But so far as I can gather, the system is one which is not suitable to this part of India under present conditions. The objections to it appear to be—

- (1) Its expense. I gather that it costs Rs60,000 a year and that the fee receipts are about Rs5,000.
- (2) The parents have to pay fees.
- (3) The course is a very long one and the parent loses his son's services up to the age of 15.
- (4) Artisans would not probably agree to maintain shops under the system.
- (5) If they agreed, they would do so to get a rent-free shop, and those who did so agree would probably be idlers and loafers, who hoped to make something out of the connection.
- (6) If they did agree the educational part of the scheme would be jeopardised whenever the shop got a large order. The artisans or master craftsmen would also resent the interference of the "Educators."
- (7) The restraints of the school and the absence of all holidays would not be tolerated in this country.

Possibly, if efficient craft schools are, hereafter, established in special localities, the Naples system, on a modified scale, might be tried, but it would be necessary to confine the trial to ex-students of the school and to assist such in opening and perhaps maintaining their shops in connection with the craft school.

4.—Would you accept Experts from abroad in each Industry.

These six questions are again answered generally. I would have experts from abroad, attached in the first place to the normal schools indicated in the Joint Report. They should be therefore Provincial, but this would not prevent the appointment of Imperial experts also as required. Perhaps experts are most required in this Presidency for textile industries—especially weaving, for dyeing, and for pottery and tiles, also for glass working. The average cost of each would be perhaps Rs500 a month, but I have no expert knowledge nor can I offer any opinion as to the status and qualifications of each expert. I should leave it to the expert after his arrival to improve manipulation and practice.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

It is almost impossible to define the limits of control when there is no systematic coherence or connection between institutions. If special local institutions hereafter become linked to central institutions, it is obvious that the central institution should exercise advisory control, but I do not think that any really effective central control can be exercised, unless (a) either a special Department is formed for all India, or (b) a special full time officer is appointed for the Presidency. Such an officer would be either subordinate to a special Department, if created, or to the Educational Department of Bombay. He would be the expert adviser of the Department, and should be a man of the requisite technical qualifications.

As regards Board schools and private aided schools I would not destroy local control, but would exercise the special departmental control on the grant-in-aid system. It would be unwise to abolish local interest in institutions and to place them all under a hard-and-fast regime. All would have to conform to recognized and defined principles, and it would be the duty of the special officer or special Department to see that they did so.

6.—Exhibitions and sales, whether required.

(1) I concur generally in the views expressed at some length by Mr. Burns in a memorandum which has been printed. Probably the engineering of exhibitions could be best organised by a special Technological Department if created hereafter.

(8) I approve of sale rooms for schools, as without a commercial element industrial schools do not appeal to the people of this country. I would allow schools to take limited orders, and would also encourage sales through Agents at prices which did not compete unfairly with local trades. The school should not undersell the local tradesman, but should, by producing articles of real excellence, show him that for such articles there was an effective demand.

(c) HOW ARE FUNDS TO BE PROVIDED.

I believe that a special assignment from Imperial funds is a necessity. The financial condition of Bombay Provincial funds is well known, but any renewal of the Provincial contract may materially alter that position. Presumably the distribution of funds, in case of a special Imperial assignment on this account, would be that the Imperial Government should assign a fixed sum to each Province to meet the expenses of all local action, and should defray Imperially the cost of any special Department created for the general benefit of all India.

The schools are not likely ever to be self-supporting and funds must be found for their maintenance. I have very great doubts as to the wisdom of a system of State advances, but if such advances were made at all I would make them to ex-students of a craft school to enable them to set up a trade.

B.—INTRODUCTION OF NEW INDUSTRIES.**(a) WHAT INDUSTRIES TO BE INTRODUCED.**

As regards questions (2), (3), and (4) under this head, the replies received from Jail Superintendents show generally that, with the exception of cane work, superior carpets, coir-matting, and cotton soles for shoes, nothing is produced in jails which is not produced also outside the jails. That jail labour being combined and intelligently directed is cheaper than individual labour, and that an individual artisan could not compete with the jail labour at any special trade. Also that discharged prisoners rarely, if ever, work at the trade learnt in the jail. It would appear to be almost impossible to collect such prisoners after discharge for any combined industrial operations, and it would certainly be almost impossible to look after individuals and encourage them to take up an industry.

(b) WHAT ARTISANS ARE REQUIRED.

See the remarks on various trades in the Joint Report submitted.

Poona, 16th January 1902.

TABLE OF INDUSTRIAL, OR TECHNICAL SCHOOLS.

No.	Name of School.	Date of foundation.	Industries taught.	Average attendance during 1900-1901.	Output of Artisans annually.*
<i>Government.</i>					
1	Reay Art Workshop, Bombay.	1891	Drawing, Architectural Drawing, Painting, Sculpture, Carpet-weaving, Pottery, and Woodwork.	101	...
2	College of Science Workshop, Poona.	1884	Carpentry, Smith's work, Moulding . . .	123	30
3	Workshop attached to the Training College, Dhárwar.	1889	Carpentry-drawing, Carpentry, Smith's work.	90	...
4	Technical School, Hyderabad (Training College).	1888	Carpentry	56	...
5	Reformatory School, Yerrowda.	1899	Carpentry, Smith's work, Carriage painting and Varnishing, Bookbinding, Gardening.	129	...
<i>Local Board.</i>					
6	School of Industry, Ratnágiri.	1879	Drawing, Carpentry, Cabinet-making, Inlaying and Carving in wood, Wood turning and polishing.	181	10
7	Technical School, Taldi, Karáchi	1899	Carpentry, Turnery, Cane-work	28	6
8	Do. Kandiaro, Hyderabad.	1897	Carpentry, Turnery, Smith's work, Carving, and Cane-work.	56	8
9	Technical School, Ubauro, Shikárpur.	1893	Carpentry	51	6
10	Technical School, Khairpur-Dharki, Shikárpur.	1893	Smith's work	27	2
<i>Municipal Board.</i>					
11	Technical School, Poona	1889	Carpentry and Drawing	27	6
12	School of Industry, Pandharpur	1878	Ditto	114	8
13	Industrial School, Dhulia	1896	Ditto	13	...
14	Parekh School of Art, Surat	1878	Carpentry, Smith's work, Drawing	38	13
15	Technical School, Hyderabad	1899	Carpentry	18	...
16	Do. Umákot—Thar and Pávkár.	1898	Carpentry and Smith's work	35	6
17	Technical School, Jacobabad, Upper Sind Frontier.	1889	Ditto ditto	32	6
<i>Native State.</i>					
18	Bhuj (Cutch)	1877	Drawing, Carpentry, Modelling, and Inlaid work.	102	10
19	Technical School, Kolhápur	1887	Carpentry, Smith's work, Brass and Iron work, Metal-turning, and Drawing.	30	6
20	Industrial School, Sávatvádi	1887	Manual Training in Carpentry; Carpentry-drawing, Drawing.	29	5
<i>Aided.</i>					
21	Khairpur State		Information not available.	166	...
22	David Sassoon Industrial Reformatory, Bombay.	1857	Carpentry, Smith's work, Painting, Embroidery, Fitting and Turning, Tailoring, and Leather work.	206	...
23	Victoria Jubilee Technical Institute, Bombay.	1887	Mechanical Engineering, Cotton Manufacture, Sheet-metal Working and Enamelling, with Aluminium working, Practical Locomotive work.	127	20
24	F. C. M. Industrial School, Poona.	1878	Printing	5	2
25	Deccan Industrial School, Sírdr.	1879	Carpentry and Drawing	35	7
26	Panch Howd Mission Industrial School, Poona.	1877	Ditto	19	4
27	Barámati Industrial School	1899	Ditto	11	...
28	S. P. G. Mission Industrial School, Nagar.	1889	Carpentry, Smith's work, Drawing	19	6
29	Sir Dinsbaw Maneckji Industrial School, Nagar.	1892	Carpentry, Drawing, Metal work, Weaving, Carpet-making.	109	100
30	Sind Madressa, Karáchi	1887	Carpentry	63	...
31	Technical School, Sukkur	1894	Carpentry, Turnery, Smith's work	46	8
<i>Unaided.</i>					
32	Párai Orphanage, Parel	1888	Carpentry, Cane-weaving, Shoe-making, Tailoring, Painting.	21	10

* Figures given in this column are approximate only.

REPLIES TO THE QUESTIONS OF THE COMMITTEE,

By Dr. W. THOMSON, D. SC., C.E., PROFESSOR OF ENGINEERING, COLLEGE OF SCIENCE.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of schools, etc.

(4) Are the schools self-supporting; if not, what is the average annual net cost?

This question suggests the possibility of a *school* being self-supporting. Such a question would never be asked about an ordinary day school; it contains a fallacy about technical education which is constantly cropping up, and which will apparently die hard. "So long as a pupil is learning, he is not earning; and so long as he is earning he is not learning" is to my mind the embodiment of a most important truth. In a *school* the product is the passed pupil; in a workshop, the product is the thing constructed. In a school we have one master to a class of twenty or thirty boys; in a workshop one workman to, it may be, three apprentices; on this score alone the method of conducting a technical school must be different from that followed in a workshop. When a pupil in an ordinary day school is learning arithmetic, he is passed through the different processes, one after another; when he understands multiplication he passes into division; and so on. In a technical *school*, a pupil is kept at one process only so long as is required for learning it; he is then passed on to an exercise a little more difficult. In this way much of the work done by the pupils will be not quite good, and probably unfit for sale, even if the thing is of some use. It is only towards the end of a course that pupils can be expected to make satisfactorily anything which presents any difficulty in its construction, and in a school it will rarely, if ever, be possible to get that dexterity and quickness which come after long practice at any one kind of work. Anything made in a technical school, by the pupils, will barely pay for the raw materials, if it is made by the teachers, the work will, in all probability, interfere with the teaching, and if it is made by workmen specially engaged, these men will have to be looked after by the authorities of the school. The time for making things for sale is after the technical school course has been completed, and the school certificate has been obtained.

(6) How are Superintendents selected, and what are their qualifications, duties, and pay?

The posts are usually advertised, and the best man is appointed. As a rule the Superintendent is a diplomate of the Poona College of Science, or of the Bombay Victoria Jubilee Institute, or a man with some special qualification; as a rule they have had some experience of actual workshop routine before being appointed.

(7) How are the Superintendents and Instructors trained? Is there any regular training school or other source of supply?

There is no training school for instructors. Practical artisans with a knowledge of drawing are usually selected.

(8) How are students selected, from what classes of the population? Are there any tests applied? Have you attracted the classes aimed at?

Students are not selected at all; the technical schools have never been so full as to require the refusal of any candidate seeking admission. As a rule, a pupil must be ten years of age or over, and have passed Vernacular Standard II before joining.

The classes aimed at have not been attracted in sufficient numbers, that is to say, the number of pupils in these schools, belonging to the artisan classes, has always been too low; and unless a school is prepared to give to each of these boys a scholarship equivalent to the wages he could earn outside, their number in school will remain small; and if they join the school, they will probably leave before completing the course.

(9) What are the rules regarding age, fees, scholarships, period of training, test of final qualifications, character, and discipline?

In nearly all our schools pupils must, as a rule, be ten years of age or over, and have passed Vernacular Standard II or higher before joining; no fees are charged; there are a few scholarships; the course is usually for three years; and at the end of each year, an examination occupying from one to three days determines whether a boy gets a scholarship for next year or gets the school certificate at the end of his course. Some pupils who have already passed Vernacular Standard V join these schools, and are able to pass through the practical course in two years.

(11) How are materials and tools provided? What is done with the work turned out?

Materials and tools are provided by the authorities of the schools free of all cost to the pupils.

Most of the work done is in the form of exercises which have no market value; but occasionally, as a special exercise, something is made which is sold for about the cost of materials.

(13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

In about half of the schools of the Presidency there is only one course; it consists of Vernacular from Standard III to Standard V, of Drawing, and of Carpentry taught by means of a series of exercises. Extra subjects, such as wood carving, wood turning, inlaying, smith's work, turning and fitting in brass and iron, brass casting, sign painting, weaving, and

embroidery are taught in some of the schools; and a pupil in his third year chooses one of these subjects, and besides doing the work of his other classes, spends about two hours a day in his optional subject. The number of these extra subjects in any one school varies from one to, say, four.

(14) What general education is given in addition to regular industrial training? (*N.B.*—Drawing is industrial.) What is the test of the quality of the work turned out?

As previously stated, pupils enter who have already passed Vernacular Standard II; they take Standards III, IV, and V while at school; the Arithmetic is more advanced than in the corresponding standards of the ordinary day schools, and History and Geography are left out of the course. Drawing is taken by every pupil in all our schools—one hour a day.

The Deputy Educational Inspector examines the vernacular work of these schools; many of the pupils appear for the Bombay School of Art examinations in Drawing; all the schools are examined by me in Drawing and practical work once a year or once in about two years; the schools in Sind are seen by me only occasionally.

(16) Do you consider the present system the best, or can you suggest improvements?

It is only since 1893 that the present system has been introduced into the schools of this Presidency. Before that time the schools were workshops in which any order for new work or repairs to old work that happened to be sent in was undertaken by the authorities of the school. The work was, for the most part, done by the masters, or by workmen specially employed; and as a rule, the pupils were allowed to look on and only permitted to do the rough processes necessary for turning out the work. The results were disastrous; a few of the smart boys learned to work, but most of them were little better than coolies. The present system is, in my opinion, a great improvement on the old one; all the pupils have an equal chance to learn, and most of the pupils become very skilful indeed at work on a small scale. Each pupil is required to draw every exercise to scale; then to do the construction; and afterwards to make a drawing to another scale. The age of pupils passing out of the schools varies from 13 to 16 years; and it is essential that they shall work for, say, two years at their trade in a good workshop before they can be considered competent artisans. By this means, boys see work on a commercial scale; this cannot be had in a school. The training in drawing and carpentry given in our schools may well be considered a general training, and it is unapproached by any other course of instruction for enabling a lad, after a little practice, to do in a first class manner with his own hands any piece of work in wood or other material that is set before him. For this reason I strongly advocate a short course of carpentry for every boy, but more especially for those who in after-life are to work with their own hands. Such a course is now given in nearly all the Board Schools in the cities and towns of Great Britain; it lasts over three years and every boy in the school attends the carpenter's shop for two or three hours a week. I strongly recommend, as a most important part of any scheme of Technical Education, that a carpenter's workshop be added to each of the High Schools and Training Colleges of the Presidency; and that Manual Training in Wood be made a compulsory subject in these institutions.

2.—Native system of Apprenticeship.

(3) Are there any special objections to or advantages in the Native system? Please specify.

It appears to me that the Native system is defective in the following points;—work is done on a small scale in dark and ill-ventilated rooms; the tools and appliances are of the crudest kind, and are huddled together so that the men have not space to do their work properly; there is very little desire for improvement.

The Native system sometimes has an advantage in the fact that all the members of a family may be engaged in the work which is frequently carried on in the living rooms.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION

1.—Proposed alterations and additions in system and methods.

(1) Do you approve of the existing methods of schools, or would you propose any other methods of training in the existing schools?

I strongly approve of the existing methods; they are on a small scale, but provide good instruction in the subjects attempted. If Government is prepared to spend largely on Technical Education, the proposals contained in paragraphs 11, 12, and 13 of the Joint Report, dated 13th January 1902, by the Director of Public Instruction, the Principal of the Sir J. J. School of Art, Bombay, and myself embody our opinions as to what may be done.

The medium of instruction in the Poona College of Science would remain as at present—English. In this college and in the School of Art, Bombay, teachers for the Technical High Schools which it is proposed to establish and managers for Commercial Companies would receive their training.

In the four Technical High Schools which it is proposed to establish, one in each Division of the Presidency, the medium of instruction should be vernacular; the pupils should know enough of English to read their text books which would have to be explained in vernacular in class. Each of these four schools should be placed on ground where there is ample room for extension. The plans should shew:—a large hall for general purposes; half a dozen class rooms with gallery in each for from 40 to 60 pupils with private rooms for the teachers; Chemical Laboratory; Physical Laboratory; Mechanical Engineering Workshop with Smithy, Engine Room, and Dynamo Room; Carpenter's Workshop; Balance Room; Microscope Room; Draw-

ing Hall ; Library ; Museum ; Principal's Room and Office ; and students' quarters for about 50 resident pupils to start with.

From these four Technical High Schools foremen of works and teachers in the smaller craft schools would be obtained.

(3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class ?

Yes ;—certainly. Scholarships should be available so that the best boys of a small technical school may pass on to a Technical High School ; and similarly from a Technical High School to the College of Science, Poona, or the School of Art, Bombay.

(4) Which do you consider the best method of training Foremen or Assistant Managers of works ?

First.—A good general education.

Second.—A course in a Technical High School or Technical College.

Third.—Training in a workshop for a few years.

(5) Do you think their training can be completed in a college or a school ?

No. The Technical School course should not exceed two, or at the most three years ; as practical experience in works is a necessity.

(6) Do you think a method of final training in large workshops advantageous and practicable ? In this case should a fee be paid to the shop or a scholarship given to the student ?

Yes. Most advantageous. Students should be provided with scholarships, and Government should arrange with the Firms, or with the Managers of their own Dockyards, Railway Workshops, and Factories for the admission and training of students who have passed through our Technical Schools. I feel that one of the weak points in our present technical school system is that pupils who complete the course are not sufficiently assisted to get proper employment so as to bridge the gap between the training they have received in the school and the practical application of that training in the Factory or workshop.

2.—Proposed alterations and additions in schools and of the want of new schools.

(3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee ? Are the local conditions likely to lead to success ?

I do not think that night schools will be successful, as the hours worked in factories in this country are usually long, and the work-people are too much exhausted for class work at night. In the Poona City Municipal Technical School, morning classes in drawing and manual training in wood have been held for many years ; the pupils pay a small fee, and either attend one of the ordinary day schools in the city or are engaged in business of some kind during the day. At times these classes have been well attended—over thirty pupils having their names on the list ; at other times the numbers have been small ; but on the whole I consider these classes have been successful. No application has ever been made, so far as I know, for evening classes in connection with the Poona City Municipal Technical School.

(4) Should such night schools be under the General Education Department or the Industrial School Management ?

I think the Managers of the individual school should control, under the Education Department, all the classes held in the school, whether held during the day or at night.

3.—How the Neapolitan Scheme would apply.

(1) Do you approve of the method of the Naples scheme generally ?

No. I think it is quite unsuited to this country.

The best craftsmen would not come to a school compound to teach any pupil ; the authorities of the school might send to him for instruction.

4.—Would you accept Experts from abroad in each Industry.

(1) Generally speaking, would it be best to have a working expert, i.e., a general hand for each school, or a specialized working expert for several schools ? Is it possible to obtain a sound general expert, and, if so, in what trades ?

For the College of Science, Poona, I am of opinion that two specialists, one for Tanning and Leather Working, the other for Technological Chemistry and Dyeing, would be required at first. For Tanning, a man who has passed through a course such as is given at the Yorkshire College, Leeds, and with some practical experience in the making and working of leather, would probably be well qualified. For Technological Chemistry and Dyeing, a man with a good college course and with practical experience in Dyeing would likewise be most suitable.

It would be most desirable to have each of the four Technical High Schools under European supervision ; and the man at the head of each should be an expert in one of the leading departments of his school, and should take his share of the teaching ; he would also be expected to visit the smaller Technical or Craft Schools in his Division, say, once a year, and report on them to Government.

(4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this Department not having, as a general rule, any special technical qualifications ?

So far as regards Technical Teaching the Educational Department is, in my opinion, the proper authority. All the work to be done by the Technical Colleges, Technical High Schools, and Technical or Craft Schools should be done under this Department. There is room, however, for a separate Technological Department, one of whose duties would be to work on

of the country; employing machinery and approved methods such as would be taught in our schools. This would give the desired connection between our technical education and the production of things on commercial lines and on a commercial scale. After a factory has been started by this new Department and has been going for a time, it will be seen whether it is commercially successful; and if it is, then presumably it might be taken over by local capitalists, and Government might start a similar factory in some other place or a factory of some other kind in the same locality. In such establishments, the pupils from our Technical Schools would be found in large numbers.

(3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus it may be—

- (i) scrapped;
- (ii) made to order only, private or by regular agent;
- (iii) sold through agents as produced;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan system;
- (v) sold in a regular school sale-room.

Should prices be marked or fixed at all?

The work made in our *schools* and which can be sold will be of small amount, and if made by the pupils will in many cases be not quite good. Much of it should, therefore, be scrapped. It is, therefore, advantageous to put as much work as possible on a given piece of material. After the pupils have gone through our Technical School courses is the time for them really to begin making things for sale. If a Technological Department is established by Government it would arrange, as a matter of business, for the sale of its products.

Poona, 18th January 1902.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

By MR. CECIL L. BURNS, PRINCIPAL OF THE SCHOOL OF ART, BOMBAY.

A. (a) 2.—*Native system of apprenticeship.*

(1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

There appears to be no universal system of keeping up the supply of artisans in any trade. Generally the sons of artisans follow their fathers' trade. Sometimes they are sent to learn it with another craftsman of the same trade, but as soon as the boy is capable of earning ordinary workman's wages, he either returns to work for his father, or marries and sets up for himself.

(2) Is one system or method common to all trades or are there several different systems or methods?

The system specified above appears to be fairly general if it can be called a system.

(3) Are there any special objections to or advantages in the Native systems? Please specify.

There is this advantage in what may be called the hereditary system; a craftsman is nearly certain to begin with a distinct facility for or leaning toward the hereditary craft of his forebears, and he begins to gain insight into its practice from his earliest years when he plays about the workroom.

The disadvantage is that the knowledge he picks up is only on a level with that of his father, and his mind becomes less open to new ideas than it would be were he taken to a school where better methods of work were in practice.

(4) How can the best craftsman in any particular trade be most easily identified?

By the work he produces and the demand there is upon his services.

(5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestion, advice, or interference, and how best?

Inferior—Partial daily attendance at a craft school might prove a success. The boy would then be brought into contact and gain experience in the industrial conditions and requirements of his trade for half his time, and gain knowledge of the newest and best methods in the other half. Attendance under these conditions would be very irregular unless a stipend or scholarship equal to the wage sacrificed by school attendance were paid.

(6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education?

No instance of fee being paid came to my notice. When a boy works away from his own home a certain small wage may be given when his work becomes useful. He usually returns to his home at this period and presumably his earnings go into the general family fund until he marries.

(7) Will the craftsmen take in apprentices of all classes or only of their own class?

Only their own class.

(8) Have famine sufferers been taught trades by Native agency which they would not ordinarily follow? Was such Native agency readily procurable, and on what terms?

The only Native agency employing famine sufferers which came to my notice was the Cotton Mills, which employed a certain number of hand-weavers.

(9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

There is little hope of inducing the present generation of craftsmen to improve their present want of system. To give a scholarship at a craft school equal to the earning wage of the son at home appears to me to offer the only hope of introducing improved methods.

(10) Are there Trade Guilds in the Province, and, if so, in what trades and where?

I met with no regular Trade Guilds of artisans. I believe traders associate together in some parts to regulate prices.

3.—Principal Industries of the Province.

Questions (1), (2), and (3) have been answered in the Joint Report of the Director-General of Education, Dr. Thompson, and myself.

(4) What are the reasons for other industries not requiring support?

The Cotton and Silk Spinning and Weaving Mill Industries and the Engineering trade are the only large industries remaining, and these are skilfully organized, equipped with modern machinery, and managed on European principles, and are consequently generally in a flourishing condition.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

(1) Do you approve of the existing methods of schools, or would you propose any other methods of training in the existing schools?

The objections to the present methods of Industrial Schools are—

- (i) That they are isolated efforts.
- (ii) That generally they do not affect the particular local industries.
- (iii) That the teaching is defective.
- (iv) That business is mixed up with education.

(3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

Yes.

(4) Which do you consider the best method of training Foremen or Assistant Managers of works?

The best method, in my opinion, is to offer scholarships to workmen and apprentices in large works, to enable those capable of, and anxious to improve their theoretical knowledge of the particular industry they are engaged in, to complete or supplement their workshop experience by a college course. The order of progression should, in my opinion, be from the workshop to the college and not from the college to the workshop. This is the principle of the Whitworth Scholarships given by the Royal College of Science, London.

(7) As regards the methods employed in private schools, what measures are you prepared to take for ensuring that they are conducted in conformity with Government Industrial Institutions? Would you give—

- (i) An annual grant?
- (ii) A grant to cover initial expenses?
- (iii) Free expert advice?

accompanied with conditions?

A grant should be given for equipment which should be approved by a Government official or expert in charge of, or responsible for, the efficiency of all Industrial Schools.

An annual grant should be given in accordance with the numbers of boys attending, and a certificate of efficiency.

2.—Proposed alterations and additions in schools and of the want of new schools.

(2) Would you approve of the institution of new schools or a new school in the province now or in the near future, and if so—

- (i) In what locality, and are premises available?
- (ii) For what trades?
- (iii) Under what system and method?
- (iv) How would you finance it? Are there any special funds available?

(i) The first step towards an efficient system of Technical Education is the foundation of a Training School for Teachers. The absence of trained teachers is one of the chief reasons why Technical Education is so backward, for the native maistries usually employed in Craft Schools have neither the training, capacity, nor in the majority of instances the desire to impart such knowledge as they possess. So far as I have observed, there is an entire absence of the ambition which animates good teachers in England to make their pupils efficient; on the contrary, the masters continually need spurring on. They have no notion of method in teaching, though some of them are very fair workmen, but, lacking the necessary education which would enable them to consult books upon their crafts, their practice is purely rule of thumb. So far therefore from being, as it should, in advance of the ordinary level of workshop practice, their knowledge is only on a par with it, and any superiority their work shows is due to the fact that they are enabled to spend a practically unlimited time upon it.

I should, therefore, suggest that a training school for teachers should be at once instituted.

I think the Reay Art Workshops in Bombay would be as suitable a locality as could be found for the following reasons :—

- (a) Bombay is the largest city in the Presidency and is a focussing point for all industries.
- (b) A Craft School is already in existence.
- (c) Drawing being one of the vital subjects in every craft, instruction can be obtained in this subject more efficiently at the School of Art than elsewhere.
- (d) Every handicraft is capable of being developed into an artistic craft, thus, a carpenter can develop into a cabinetmaker, a blacksmith or coppersmith into an artistic metal worker, a weaver of cotton, silk, or wool into a brocade and tapestry weaver, a mason into a stone-carver, a domestic potter into an artistic potter, a plasterer into a modeller and moulder, a house painter into a house decorator, sign painter, or picture painter.

A teacher trained in the Reay Art Workshops would have the opportunity, should he possess the capacity, of making himself efficient in the highest branch of any handicraft without a break in the continuity of the system of training, which would almost certainly happen were he trained in the lower branches of his work in one institution, and then transferred to the Reay Art Workshops for study in the higher.

Premises are not at present available, but ample ground space is ready for the erection of light and inexpensive workshops.

(ii) The trades I beg to recommend are—

Textiles.	Gold, Silver, and Jewellery.
Woodwork.	Stone and Marble.
Iron, Copper, and Brass.	Pottery.
House Painting and Decorating.	

(iii) The pupils in training for Craft Masters of Local or District Schools should be firstly drawn from one or both of the following classes :—

- (a) Young craftsmen who have already had a practical training in the craft they will have to teach.
- (b) The class of educated native from which the present Drawing Masters are obtained.

Class (a) will probably lack the general intelligence and knowledge of English (which carries with it the power of consulting the best works on any subject) possessed by class (b), while (b) will lack (a)'s ingrained technical training and will come from a class which considers manual labour as something beneath them.

I should suggest that for the first two or three years a certain number be recruited from each class, but that the course of instruction be varied. That class (a) be given more time at theory and class (b) be kept for a longer time at practical work. This can easily be done, as the classes will be comparatively small. According to the result during the first few years, the system can be modified, and as soon as District Craft Schools are started, candidates with both practical and theoretical training will come forward.

(iv) The Training School for Teachers will have to be founded and maintained by the State.

(3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee? Are the local conditions likely to lead to success?

Night schools have been tried, and have, I believe, not proved a great success in Bombay. Early morning classes might possibly prove more in accordance with Native habits.

Regarding fees the example of the London County Council in the schools directly under their charge might be followed. The practice is, that all *bonâ fide* workmen in a craft for which there is a class can join it without the payment of any fees whatever, if they are below a certain age, and are earning less than a certain wage. No charge is made for admission to drawing classes to "Trade" students.

(4) Should such night schools be under the General Education Department or the Industrial School Management?

All Industrial Classes should be subject to Government Inspection where a grant is given. Such night schools would, as a rule, be carried on in local craft schools, and would therefore be under the body responsible for the general management of the school. It would be necessary in order to gain a Government Equipment Grant to satisfy the responsible officer that the class is needed, and when the class is started payment should be made partly on the number of students, and partly on the result of the inspection of the work.

3.—How the Neapolitan Scheme would apply.

(1) Do you approve of the method of the Naples scheme generally?

Without further amplification of the details given in Mr. Radice's Note, it is impossible to give a decided opinion upon the Naples scheme. What appears to me to be its fundamental weakness is that education and business are mixed. It appears also to me that the interests of the master craftsman, who naturally will want to make the largest amount of profit he can from his business, will continually be at variance with those of the pupil whose object is to obtain the best education. The most successful businesses are carried on upon the principle of specialization—one workman is kept continually doing the same thing, at which he gradually becomes extremely expert. This principle is entirely antagonistic to the spirit of education, which is to develop all the faculties. It consequently seems to me that the master artisans would be continually pulling against the School principle.

(2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a Superintendent?

I certainly think that no successful tradesman would work under the system. I obtained the opinion of one of the most successful furniture-makers in Bombay upon the scheme, *viz.*, Mr. Isaac Benjamin, who designs his own furniture, and was a former pupil of the School of Art. He at once pointed out the fact that the young children would not be the slightest use to him, and would be using a certain amount of raw material to practise upon, and that when they became of use to him, they would be taken away from their work for twenty-two hours per week, possibly at a time when a large order was being executed in a limited period. He was of the opinion, as am I, that no really successful business man would be bothered with the boys, and that in India at any rate only the idle and unsuccessful would be tempted to try it.

(3) Would you attempt to improve the craftsman's practice of work, and how?

From an educational point of view, the weakness of the Naples system, as regards India, is that boys would only obtain a Technical Education equal to the general level of that of the bazar workman, even assuming that good workmen opened workshops in the school compound. This would leave the coming generation of craftsmen in no better case than the present whose depressed condition is principally due to the low level of their technical knowledge when compared with the West, and their slowness and slovenliness in comparison with the craftsmen of Japan and China. In my opinion it is in Japan rather than in Europe that useful lessons are to be learnt, for it is there that in the space of forty years a nation of purely handicraftsmen have been transformed into a nation of manufacturers capable of holding their own against the best in many of their own markets, and of competing successfully with Europe and America in many of the markets of the world. There seems to be no provision in the Naples Scheme for forcing upon the craftsman a new method of work, and my experience is that the Indian craftsman will listen to any suggestion one likes to offer, but will rarely trouble himself to put it into practice. The greater number of improvements in method entail considerable expenditure upon tools. No mention is made in the Note as to who is to bear the cost.

4.—*Would you accept Experts from abroad in each Industry.*

(1) Generally speaking, would it be best to have a working expert, *i.e.*, a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and, if so, in what trades?

A specialist for each Industry taught in every school is necessary. This would not involve a large staff for local schools, only one, two, or perhaps three subjects being taught in each. Neither special nor general experts are at present to be obtained in India except in wood work.

(A good man for each craft possessing a practical as well as a school training should be brought out from England for a period of five years to the Training School for Teachers. Such men can now be obtained easily, a result due to the numerous large Polytechnic and Technical Schools at work throughout the country. My own experience is, that men engaged during the day time in practical work, who in addition take a class at a craft school at night, are the best men, and one of such men is to be preferred to one who spends his whole time at teaching and holds certificates from the City and Guilds Technical Institute and South Kensington, the examinations for which are almost entirely theoretical.)

At the end of five years natives or Indian-born Europeans might take the places of the more expensive experts, each of whom might perhaps be placed at the head of a Divisional Craft School or become Inspectors.

Such experts might be obtained at salaries of from Rs500 to Rs400 per mensem. Certainly not for less, if competent men are to be employed. The initial cost would be somewhat heavy, but is trivial in comparison with the annual expenditure of one of the English Polytechnics. These experts should come out on the usual five years' agreement.

5.—*Proposed Department of Control, Central and Local, for Urban and Rural Schools.*

(1) Apart from the superintendent in direct charge of the school, what system of local control do you think the best—

(i) For Rural schools?

(ii) For Urban schools?

For (i) The District Officer and for (ii) the District Local Board.

(2) What should be the functions of the local control in each case?

To superintend accounts and to visit the school.

(3) The local systems of control must, it is presumed, be focussed for the Province by some technical officer who will be generally responsible for executive administration and management. Who should this be?

Local schools will only gradually be founded, and considerable time must elapse before sufficient teachers are trained. The European experts from the Central Training Institution should act as Inspectors, each of the particular industry he is responsible for.

(4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this department not having, as a general rule, any special technical qualifications?

As the scheme would be introduced gradually it would not be necessary. After a certain number of Local Craft Schools are established, a separate Department might be instituted.

(5) Is direct and special Imperial control of Industrial Education necessary for its efficient development?

Yes.

6.—Exhibitions and sales, whether required.

(1) Are exhibitions of any real value —

- (i) Local?
- (ii) Provincial?
- (iii) Imperial?

A distinction must be drawn between exhibitions of work done by Industrial Schools and General Industrial Exhibitions. In my opinion the annual exhibition of the work of an Industrial School should take the place of examination. Prizes should be awarded by a visiting expert for the best work exhibited, due consideration being given to the monthly marks earned for industry, punctual attendance, and work produced. Such an annual exhibition would bring the work of the school before the whole locality, and it should remain open for at least a week. It would afford an opportunity to local craftsmen to see what was being done in the school and local employers to discover promising boys. Once in every three or four years an exhibition of the best work done in all the Local Craft Schools in the Presidency should be held in one of the chief cities of the Province, when comparisons could be made between the local school work in different parts, a spirit of rivalry encouraged, and the best students would come to the front. The lessons learnt at one exhibition could be developed and put into practice before another recurred, while the general interest in local industries would be periodically stimulated. At longer intervals exhibitions of best work of the schools in all the Presidencies could be held in some Central City, when more extended scope for comparison of methods and development could be possible. In this manner the greatest freedom could be given to local development in certain lines, together with the highest efficiency by means of comparison.

(3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work out put? Thus it may be—

- (i) scrapped;
- (ii) made to order only, private or by regular agent;
- (iii) sold through agents as produced;
- (iv) sold directly by the producer as in the case of schools on the Neapolitan system;
- (v) sold in a regular school sale-room.

Should prices be marked or fixed at all?

(i) In my opinion all exercises, even the most elementary ones, should have a practical purpose, and should be for sale.

(ii) No orders should, however, in my opinion be taken by the school. Their acceptance will at once upset the definite course of instruction laid down for every student in each month. Should a large number of orders be reserved for a special class of objects, that particular object, if it be of educational value, might be included in the course, or a small factory for past students instituted or the orders may be passed on to past students who are working on their own account.

(iii) The manner in which the school exercises are sold is immaterial, but

(v) should similar objects be made in the bazar, the local market rate should be charged by the school.

(5) Can you say whether, generally speaking, the workman gets the best wage or profit return from—

- (i) Expensive fine work?
- (ii) Cheap common work?

Where the industry is flourishing the finer work undoubtedly gets higher pay.

(c) HOW ARE FUNDS TO BE PROVIDED.

(2) Do you propose to find funds for the schools until they are self-supporting and, in addition, for the setting up in trade of pupils taught at the schools? How would you recover such advances if made and in what period?

Funds will have to be provided, for a Technical School can never be self-supporting.

(4) Are you in favour of any scheme of Industrial Banks?

In my opinion it would be preferable and more practical for the State to guarantee a certain percentage of interest for a number of years to a capitalist to start a factory in which the boys taught in the Industrial Schools would get a living than to make advances to individual craftsmen engaged in hand industries. The enquiries I have recently made led to the conclusion that much of the falling off in the prosperity of the Indian Crafts was due to the want of organization inevitable where numbers of isolated craftsmen are carrying on one trade in separate houses where much of the work is duplicated and antiquated methods of doing it are in practice.

Except in a very few trades the factory system has proved to be the most economical, and that the Indian craftsman has no prejudice against it is to be seen in his readiness to enter the mills.

B. (a) WHAT INDUSTRIES TO BE INTRODUCED.

There is not so much necessity to introduce new industries as to apply modern methods to those already in existence.

REPLIES BY MR. J. WALLACE, C.E.

Existing Schools.

(7) Superintendents are generally schoolmasters, and instructors workmen; the latter are chosen for their real or alleged skill as operatives, but none that I have met had been trained in the art of imparting knowledge in terms specially adapted to the comprehension of the pupils, as is the case in Kindergarten instruction. At the Jamsetjee Nusserwanjee Petit Parsee Orphanage I found the carpenter's workshop in charge of a youth who had been trained there, but who had no experience of other workshops. There were plenty of tools and materials but, as might have been expected, no evidence of systematic training. I know of no school in India where instructors in handicraft are trained. A large industrial centre like Bombay appears to offer the best site for a Normal Training School for Instructors. When I took over charge of the Bombay School of Art, I found most of the mistries had been in the workshop since the opening of that part of the Institution nine years previously. It was only necessary to look at their tools and appliances to see that none of them know how to teach. Their system was to do the best work themselves, so that no pupil should become skilled enough to supersede them. I tried for a year to correct their bad habits, and although they followed my orders while under daily inspection, they fell away as soon as the inspection ceased. Their habits are crystallised. In the *Reay Art Workshops* the only advantage the boys had was a good course of drawing but that was not sufficient to justify the existence of the school. It is too expensive an institution for turning out half-trained workmen; they generally leave before learning half of what they might. The mistries ought long since to have been discharged were it not that no trained men were to be had. When serving as an examiner at the Victoria Jubilee Technical Institute, I found in the answers of the boys strong indications of imperfect teaching, and I was told by the Principal shortly before his death, that after five years of work he had at last got at the peculiar ways of thinking of his students. The English method of training did not suit them. It encouraged memorizing to a fatal degree. The other day I had an ex-engineering student of this college to do some tracing. He had never made a tracing before. His instruments were so bad that I had to lend him mine. When I complained of the irregular width of the straight lines, I discovered he had ruled them with a writing pen.

At the Kala Bhawan, Baroda, which I visited on two occasions with an interval of about eight years, I found no indication of a qualified teacher of handicraft. There were evidences of lavish outlay, but none of careful training. The condition of the tools, from the grindstone upwards, shewed the most careless supervision, and the state of the engineer's workshop was just as bad as that of the carpenter. Two looms were at work in the textile department, one driven by foot and one by hand. Both were out of order and no one of the staff appeared to be able to put them right. I attribute this state of things to a lack of experience on the part of the Principal who had come straight from the Victoria Jubilee Technical Institute without having learned or worked at any trade or profession. The Kala Bhawan is not a new venture, it has made many experiments in education and that it should be in the state I have described only 14 months ago augurs badly for the progress of technical education in the State.

(15) I know of no attempt to improve the tools or machines used in particular industries in Bombay schools except my own. They are to be seen in the School of Art Workshops, and in various schools, colleges, and military workshops throughout India; but I have not heard of a single improvement or modification made in any of them, such as an intelligent teacher would certainly make. The tendency in most workshops is rather to let them get out of order. I must make an exception for the Canadian Mission School at Ahmednagar where after a year's work I found the foot lathe in first class condition.

Native system of Apprenticeship.

(4) The best craftsman in any particular trade may be most easily identified by the good state of the tools, by his care in measurement, and by his habit of cutting to the mark.

(5) So far as I can learn there is no law in India to bind a boy to his parent or employer while he learns a trade. The period is determined by mutual inclination or by either of the parties, so there is no real apprenticeship. The chance of the master being a qualified instructor is very remote, so the boy picks up his craft in an irregular manner. The Industrial School will only be better than the craftsman when it has a trained instructor.

Proposed alterations and additions in system and methods.

(1) I do not approve of existing methods.

(2) I think that such training as boys get before they go to a trade would be best imparted by young journeyman artisan who had shewn some real ability in the trade and had then gone through a six months' course in a normal training class. These men would then be fit to take a class of boys or a post as mistry. In the latter case they would still continue to

be teachers. My project for this kind of education is in the hands of the Educational Department of Bombay.

(6) Foremen and Managers can only be trained in workshops of the class they are eventually to govern. No school or college can qualify them for the control of men and work. If the student has the making of a supervisor in him he should be able to find a subordinate's job and a living wage without much difficulty. Students have a bad name in Indian workshops. They are generally too old and too unpractical. Their education has been carried on as if all study would cease when they left college. It is not necessary for colleges to take up the training of craftsmen for railway and other engineering workshops. This instruction is best carried out in these workshops. A college workshop is only useful to illustrate the lectures and to render them more attractive. It does not turn out workmen. The technical training most urgently needed in India is that which applies to the great body of craftsmen, who have no good teachers and who perpetuate bad methods of work.

Neapolitan Scheme.

(1) I doubt if the Neapolitan scheme would succeed in India as the Indian employer has no hold on the boys. At first they would be unprofitable, and when they gained value they would quarrel with their master over wages, and leave him, even for a small rise of pay. In this their parents would support them.

The importation of Experts from abroad.

(1) Each school would need an expert instructor, knowing all that the pupils had to learn but not necessarily a man of wide education. An Inspector of Industrial Schools should be a technical expert of considerable experience. I think it possible to find a technical expert capable of judging work in wrought and cast iron, pattern making, brasswork, copper, iron, and tinplate, carpentry, masonry, smithwork, timber-sawing, and mechanical drawing, but no one who had not had several years of experience in India would be fit to organize schools in the country. No foreign experience, however good, would suffice.

What Artisans are required.

(1) Every craft is in need of more efficient men. Engineers, founders, carpenters, joiners, cabinet-makers, brass-finishers, builders all complain of the incapacity and unreliability of the bulk of their workmen. Among textiles the hand-loom weaver is receiving assistance although there does not yet seem to be a Japanese hand-loom in India. Hand block printing awaits an entire re-organisation, and the hand spinner who still uses the least productive wheel might be supplied with the type now in use in Great Britain. In the Kulu Valley I saw 16 per cent. of a supply of railway sleepers that had been rejected by the inspector for careless cutting, and on enquiry I learned that there was no one in the whole valley competent to teach the art of using and sharpening gang saws. The tiller head appeared to be quite unknown, and the Forest Officer of the district told me that sawing is not taught in schools of forestry. The tea plantation of Kangra were at the same time getting tea boxes from Japan, because the Kulu men could not cut thin boards. Although there is ample water power, there does not seem to be a saw mill in the district. I recently sent to a friend in Kulu Valley a design of a wooden saw mill of the pattern issued by the peasants in the Austrian Tyrol. Such machinery could be maintained by the village smith and carpenter.

Many of the workmen employed all over India have no vocation for their craft; they are the victims of the caste system which has no regard for personal aptitude. No amount of teaching would make good and trustworthy craftsmen of them. They are only fit for the lowest class of labour.

Conclusion.

I would in conclusion draw especial attention to the general dissatisfaction that I have often heard expressed among employers of labour regarding the ex-pupils of Science Colleges and technical schools of all kinds. It is evident that wide differences of opinion exist between the teacher and the employer indicating the absence of any consultation that would have influenced the course of instruction towards practical ends. Technical education, whether it refers to a course of engineering or of joinery, should produce a better impression on employers, who are certainly capable of appreciating useful knowledge, but it has never been my good fortune to hear a word of commendation bestowed on students either among railway or dockyard engineers or among other engineers of my acquaintance. I obtained situations in Bombay for all the available students at the Ratnagiri School of Carpentry at the outbreak of the Boer War, and was a good deal disappointed with the reports I had of them. The employer appreciates best that kind of knowledge which meets his requirements and he objects to pay for any other. The pupil who has gone through a special training to prepare him for a career, ought certainly to start in a workshop or drawing office on better terms than one who has not had any previous advantage; if he does not there must be something wrong in the training.

REPLIES BY MR. H. W. FRY, INDUSTRIAL AIDS SOCIETY, AHMEDNAGAR.

A. (b) 6.—*Exhibitions and Sales, whether required.*

(1) Are Exhibitions of any real value—(i) Local? (ii) Provincial? (iii) Imperial?

For educational purposes they are not much value, except as a stimulus; but for commercial purposes they are of value as an advertisement making a demand for the goods.

(2) Can you suggest any conditions which would make exhibitions of value to the industrial progress of India?

If Indian manufactures were systematically shewn in the more important markets of Europe and America, a demand would be made for Indian goods, and this demand would be met by private enterprise.

(3) Do you approve of sale-rooms for schools, or, if not, what method would you employ for the disposal of the work output? Thus it may be—(i) scrapped; (ii) made to order only, private or by regular agent; (iii) sold through agents as produced; (iv) sold directly by the producer as in the case of schools on the Neapolitan system; (v) sold in a regular school sale-room.

Should prices be marked or fixed at all?

The productions of learners are often too crude to sell well, or to guarantee the proper execution of orders. (iii) Yes; for what they will fetch. (v) Probably the best plan.

Prices should be judiciously marked.

(5) Can you say whether, generally speaking, the workman gets the best wage or profit return from—(i) Expensive fine work? (ii) Cheap common work?

I should say in (i) the *workman* would get best wages, because he would be skilled at his craft. The *master* may, however, make much larger profits by (ii), but not, I think, the labourer.

A. (c) HOW ARE FUNDS TO BE PROVIDED.

(2) Do you propose to find funds for the schools until they are self-supporting and, in addition, for the setting up in trade of pupils taught at the schools? How would you recover such advances if made and in what period?

Will they (meaning schools) *as schools*, ever be self-supporting? This is the crucial point.

It is no use giving a boy a good technical education unless he can utilize his art when he knows it. He may be an expert craftsman but useless without guidance. The money advanced to start pupils in trade would, I think, in most cases be lost. I think a large proportion would not be recoverable and would tend rather to demoralize than to help. Our Society would be quite willing to assist workers to carry on work in their own homes but only so long as they were supervised by reliable Europeans, but we are limited in funds.

(3) Would you support the present position of workers in hand industries by a system of advances on the method of State loans to agriculturists, either—

(i) for the purchase of improved implements?

(ii) to free them from the exactions of the middlemen?

I should certainly like to see them helped, but so many of them are so improvident and inexperienced I should look on repayment of capital as very problematical.

B. (a) WHAT INDUSTRIES TO BE INTRODUCED.

(1) Name the industries to be introduced.

(In replying to this question it may be assumed that no industry can be at once introduced—

(i) which requires preliminary research as to methods and practice;

(ii) which does not necessitate the remunerative employment of a large number of workers;

(iii) which can be better exploited in a mill or by private agency;

(iv) which cannot in the future be transferred for commercial working to private agency.)

Carpet and Dhurrie Weaving, Lace and Embroidery, Metal hammering, Carpentry, Brick-making and tiles, etc., etc.

In my opinion private agency *encouraged* by Government is the safest method, and that if the encouragement given by Government were sufficient, it would be found to answer the purposes desired. Is it proposed that a *school*, as a whole, might be transferred to private agency? If this is the suggestion, would it not be simpler to assist the private agency *first*, and to let that agency form and conduct the technical training?

(4) Have you any scheme for starting these new industries by securing that discharged prisoners should work on at their trade after they leave the Jail?

Our scheme would quite include this. We should be glad to take them, provided, of course, they were reformed. Indeed, we have already done so.

(b) WHAT ARTISANS ARE REQUIRED.

1) Are there any lines of work requiring trained artisans of which the supply is now limited or badly trained?

Yes; many. The School of Art experience in Bombay is that much money and time is expended in training boys technically who as soon as they have the opportunity throw up their craft and turn tramway conductors or something similar. A good engineer is essential in the engine-room of a steamer, but he is no good to navigate the vessel. So a man may be an excellent craftsman but entirely useless in managing a business. This is so in Europe, but vastly more so in India. A college man, until he has had much subsequent experience, will rarely be able to promote or manage a business. A man may learn the *theory* of navigation or war, but until he has practically seen the theory put in practice by others, he is usually incapable to command.

If the Government would assist us in the industries we hope to found, we could arrange to have our own workers trained, or we would train them ourselves with Government assistance. The Government could greatly assist us by—

- (i) Making a public statement that they approve our (Ahmednagar Factory and would like to see it multiplied) work and method of carrying it on. This would greatly assist us in getting capital for the establishment of industries.
- (ii) By purchasing from us such articles as we could manufacture. If we were sure and had prospects of Government patronage, it would answer our purpose to attempt the establishment of industries we cannot now even consider.
- (iii) By letting us have buildings or land on favourable terms when we establish an industry in a given neighbourhood, provided, of course, such Government land or buildings are available.
- (iv) By arranging for the efficient exhibition of Indian manufactures in the principal commercial centres of Europe and America, etc.
- (v) By paying the salaries of our experts. Government do this for Mission Schools, why not for Mission industries? The payment could be stopped when our industries paid 5 per cent. on capital *after* allowing for salary of expert.
- (vi) By guaranteeing a moderate interest of say 3 per cent. on capital invested for a period of say three years.
- (vii) What the industries of India need is, in one word, "Protection." Private enterprise would do the rest.
- (viii) By remitting the fees for any Company we may establish.

In Ahmednagar technical education can be seen side by side with the Factory in which those who have benefited by the technical education, can earn their living by their craft. The technical school could obtain very few boys to learn carpet-weaving at first, because there was no place where they could utilize their craft. But as soon as ever the Factory was suggested, more applications were received for a technical carpet-making education than could possibly be accommodated. Our Society needs some assistance from Government before they can go ahead as freely as they would like to multiply such efforts throughout the country. There are abundant openings ready, if we could take full advantage of them. I am going home almost immediately with a view to making arrangements for new capital for this purpose, but a little Government patronage would greatly assist my efforts.

REPLIES BY MR. VEERCHUND DEEPCHUND.

A. (a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

(1) In the Presidency town, there are two such institutions, the Victoria Jubilee Technical Institute, and the Sir Jamsetjee Jeejeebhoy School of Art. Besides these there is one school in the Sholapur District called Robertson's School of Industry. It is a Municipal School aided by Government. It was founded in 1878. Carpentry and smithy are taught. Average attendance being 35. The annual output of artisans is eight. There are such schools at Poona, Ratnagiri, and at Dhulia newly opened. A technical school is shortly to be opened at Ahmedabad, one lakh of rupees being given for the purpose by the late Mr. Madhablal Ruchorial to commemorate the name of his father (Runchorial Chotalal). The school is expected to teach on the lines of the Victoria Jubilee Technical Institute. The standards, though not so high, keep the turning out of the Mechanical Engineers and Spinners in view.

(2) Owing to the famine of 1877-78 there were many orphans and waifs in Sholapur District, and it was with the idea of giving them some technical education whereby they may find work for themselves in after-life that the Institution was started in Sholapur District. The preliminary object was thus to impart technical knowledge to the orphans of the Orphanage; and the secondary object was to provide carpenters to the town, and to enable the people who come from all parts of the country to see the nature of a technical school.

(3) The school in Sholapur District is governed by the Municipality as it manages other affairs.

(4) It is not and cannot be self-supporting. The net cost comes to Rs. 4,000. Government gives Rs. 1,000, and the Municipality Rs. 3,000.

(5) There was no carpentry class in the town and hence it was difficult to get carpenters. Carpentry branch is the easiest and the least expensive of all the technical branches; the smithy branch being secondary, but both of them being united together are useful for husbandry.

(6) The Superintendents are recommended by the Technical Inspector. They are passed pupils from the Victoria Jubilee Technical Institute. They give lectures to pupils and show also practical work to them and generally superintend the whole school. The pay is from R75 to R100.

(7) The Superintendents are most from the above Institute, while the Instructors are passed pupils of this school.

(8) Any one who has passed the Second Vernacular Standard is admitted into this school, there being a vernacular branch attached to it, where vernacular education up to Standard IV is given for half the time. They are selected from any class of the population. A boy above ten years of age is admitted in the school. The classes are attracted by monthly scholarships.

(9) The age must be above ten years. No fees are levied. There are monthly scholarships ranging from annas 6 to R2. The period of training is three years in Carpentry and two in Smithy. The test is the passing in the annual examination by the Technical Inspector. Character and discipline must be certified to be good.

(10) Three-fourths follow the trade.

(11) They are provided at the cost of the Municipality. In school no proper work is turned out for sale.

(12) The instruction is given according to Dr. A. W. Thomson's book of Manual Training. Yes.

(13) There is no specialized instruction for particular students; all the students are taught both the courses. The methods of instruction are generally Native, but the suggestions made in the English text book mentioned above are also carried out.

(14) Modified vernacular education is given up to Standard IV. Furniture equal to that produced in the Bombay market is prepared in the workshops attached to it.

(15) In Carpentry and Smithy, the improvements made are slight and such as do not need any particular mention.

(16) To improve such school further so as to produce best carpenters, amiths, or artisans, in any other branch, the Government or the managing body should keep scholarships for selected passed students, who should work out useful things of daily use having a demand, while the materials turned out by them should be sold. The defects of their work should be pointed out to these scholars by the Superintendent without cutting their wages, as the articles with defects bring a less value. This must be done at least for two years after the students pass the final test. This practice would not, I think, bring any burden on the Managers, except at the most a rupee or two a month, but which loss will be repaid by having an accomplished man in the branch he passes.

2.—Native System of Apprenticeship.

(1) A father hands down his craft or art to his son, and in few cases to the man of his caste.

(2) One system is common to all trades.

(3) The following are the advantages:—

From his infancy a boy sees the ways his father works, and as he speaks his mother tongue with facility, he can do the work in that branch with facility, which he cannot get in any other art just as he cannot have that in any other language except his mother tongue. If he takes a different line, he wants a longer time to see its ins and outs, which he sees every day in the art his ancestors followed, and if he is once unsuccessful, he is the master of none. This is proved by the fact that many leave off the industry they have learnt and have to follow that of their fathers. A boy having had a perfect knowledge of one branch can work very easily in other branches of a like nature. For instance, a man having had a perfect knowledge in carpentry (which is said in this case his ancestral one) can work as a fitter, a potter, a moulder, and so on by very little practice in them, and with this object in view carpentry has been chosen as a general branch in all Industrial Schools, it being less expensive and handy to be taught in schools.

The objection to this system is their abhorrence for the introduction of improvements in their crafts.

(4) The craftsman can be identified from the way in which he works and from the quality of the work turned out and from the better wages he is able to command.

(5) The Native system was superior for reasons stated in answer (3), but as Native industries have been dead and the very few left are dying away for want of encouragement and careless working of the people, it has proved to be inferior to the Industrial Schools in existence. The Native system of apprenticeship cannot be much extended; but if the workmen who teach the younger generation are made to see the superiority of better tools, etc., there may be a certain influence for good exerted on them and through them on the boys they are preparing for their trades.

(6) No fees are paid, as the knowledge is imparted amongst the relatives. No. The boy begins his training at an age after 10, and the education he may have is the vernacular education that can be had in the Government school.

(7) No. He will take boys of his own caste with very few exceptions.

(8) There being no demand for articles turned out, the Native agency did not try to teach famine sufferers the trades; nor have their caste fellows been able to teach them anything as, there being nothing to eat, they had all to follow in gangs the famine relief works, and as famines have come often the few industries left are dying.

(9) The inducement is the real price for the articles turned out by them, and not the price below the value obtained by adding material *plus* the cheapest standard labour.

10) There is a Weavers' Guild in Sholapur for Sholapur and Akalkote villages.

11) They do not exist except in the places mentioned above, but where they do exist, they can be utilised for the improvement and extension of industries.

3.—Principal Industries of the Province.

(1) Next to the cotton spinning and weaving mills, the chief industrial concerns are the cotton ginning factories in almost all the cotton growing districts in this Presidency. There are 274 of these. Flour mills come next and iron foundries. There are 3 silk mills and 10 oil mills, 6 bone crushing establishments, 3 timber factories, and 2 tanneries. The rest are small concerns of no particular importance. There is only one sugar factory and one glass factory.

(2) I would encourage factories for producing large number of chemicals, glass, soap, silk goods, sugar, and tobacco.

(3) The principal reason for offering greater encouragement to the above is to diminish the imports of the foreign goods. Take, for instance, sugar. In several parts of the Presidency sugarcane is grown to a considerable extent. But there is no large factory for the purpose of sugar manufacture. Notwithstanding the countervailing duty on foreign beet-root sugar, it is a matter of regret that the imports are growing larger, while there are no large sugar factories. The imports of this commodity in this country last year came to 5½ crores of rupees, of which Bombay's share was Rs 261,00,000. Tobacco is another industry which with good support might turn out a profitable development. Bombay Presidency grows a large quantity of tobacco which might be cured and manufactured for home use and export.

The direction and encouragement of such and other industries would lie in giving concessions. For instance, with regard to sugar, I have been informed that a factory was worked some years in Poona, but it could not compete with foreign sugar, as the waste products, specially molasses, were subjected to an excise duty. Here the State might exempt the sugar manufacturer from the duty. Again, soil capable of growing sugarcane may be lightly taxed and facilities for irrigation of cane fields might be given where necessary. The general principle should be to protect all young industries until they are capable of standing on their own legs against foreign competition.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

(1) The existing methods of schools are not quite adapted to the wants of artisans and the industrial class.

(2) The artisans may have an elementary knowledge in writing, reading, and arithmetic in the existing schools, but after that they should be provided with special classes for training them up in their own trades.

(3) Promising students from such institutions should be allowed to study free in the higher class and some of them must be given scholarships as an inducement to study further.

(4) Men having special knowledge of their own trade and craft should be specially trained in the existing technical schools for the work of foremen and assistant managers.

(5) Their training cannot be completed in an ordinary college or school.

(6) Yes. Final training in large workshops will be advantageous and practicable. It would be better to give a scholarship to the student.

(7) I would recommend Government giving an annual grant to the private schools in proportion to the quality and quantity of work done, and I would also recommend free expert advice being given to these institutions.

2.—Proposed alterations and additions in schools and of the want of new schools.

(1) The existing schools and night schools are necessary to impart the required preliminary education—reading, writing, and arithmetic.

(2) I approve of new schools being opened—

(i) Special schools for special trades in localities where these trades still flourish;

(ii) For all possible trades for which there is an opening;

(iii) The method I suggest is the English method as adapted in accordance with the existing Native method, such as would suit the requirements of the students who come for training;

(iv) Government will have to finance the same, as there are no funds available but later on small funds can be raised in support of the movement.

(3) The students will not be able to pay any fees; but some of them will attend night schools for the voluntary improvement in theory. The local conditions, if these night schools are properly managed, are favourable to success.

(4) Such night schools should be under Industrial School management.

(5) Yes, it is essential that there should be a good supply of Superintendents and Instructors, and an establishment of training schools for the purpose would be the first step in the right direction.

(6) Till the new men are turned out, it will be practicable to provide temporarily the existing institutions with necessary instructors.

4.—Would you accept Experts from abroad in each Industry.

(1) Generally speaking, it would be better to have a working expert, *i.e.*, a general hand for each school. This man will have to be imported from abroad. He must in turn train up specialized working experts for different trades. A man with a general knowledge of industries and trades can be obtained from abroad.

(2) As I do not approve of specialized working experts being brought from abroad, I have no reply to give to this query.

(3) A working expert as suggested in my reply to (1) can be had for Rs.5,000 to Rs.6,000 per year from abroad.

(4) I have replied at length to question (3) in the third sub-division of A (a) which is analogous to this question, and so I need not repeat the same here.

(5) A man who has both theoretical and practical knowledge and has had some years' experience in the line, is required for the purpose in hand.

(6) He should in the first instance study the requirements of the peoples and should see for himself what products there are in the country which can be manufactured to suit such requirements. He should then have a free hand to introduce the different lines of trades that he thinks most favourable to success.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

I recommend that the control of such schools be vested in the Industrial School Management Boards.

6.—Exhibitions and Sales, whether required.

(1) The value of exhibitions depends on the exhibits displayed, be they Local, Provincial, or Imperial. To a certain extent they have an educating value.

(2) The industrial progress of the country depends not so much on exhibitions as on education—education in applied sciences, which bear on arts, manufactures, and industries. The German system of education is highly essential for India's industrial development. Chemistry and electricity are the two potent elements. These mean education in the sciences of a specialized high character. Fully equipped colleges are the first essentials.

(3) Sale-rooms at schools is a doubtful method. The best way is to bring the producer directly in contact with the purchaser. But where this is not practicable it is advisable to sell the output through trustworthy agents, who take an interest in and are anxious to develop the particular industry they patronize.

(4) Production and price are dependent on capital. An article may be worth producing at a cheaper rate, provided sufficient capital was forthcoming. Otherwise, a foreign article may be bought which is cheaper than the home one manufactured under burdensome financial conditions or other conditions, such as skilled labour, which enhance the cost of production. Fairly cheap capital and a reasonable demand are essential.

(5) Cheap common work must in the long run prove more profitable. Profits of an adequate character on fine work entirely depend on the work produced. If it be of a kind which has liberal patrons the worker may get a better wage; but this, it is to be feared, can be said of very few fine works.

(c) HOW ARE FUNDS TO BE PROVIDED.

(1) The Provincial funds cannot provide the cost of starting the necessary schools. The Government of India should give $\frac{2}{3}$ the net expenditure, the remaining $\frac{1}{3}$ to be provided for by the Provincial Government and the Local Boards.

(2) The funds should be provided by the Government till the schools are self-supporting. When they are prosperous Government may see its way to receive the moneys advanced for the purpose.

(3) I think the Government should support the present position of workers in hand industries by advancing money both for the purchase of improved implements, and to free them from the exactions of the middle-men.

(4) Yes. Banks with a limited capital ranging from 1 to 5 lakhs in industrial centres in each district, if conducted on practical principles with a close knowledge of the wants and requirements of specific profitable industries or industries capable of successful remunerative developments by moderate financial accommodation, are a great want. Given a staff of experienced men with knowledge of the requirements, a great deal may be done.

B.—INTRODUCTION OF NEW INDUSTRIES.

The industries which can be introduced (subject to the five limitations assumed) are petroleum, iron, commercial drugs, glass, paint, matches, cement, candles, clocks, umbrellas, and many other articles included under the head of "Miscellaneous" in the annual foreign

imports. With the aid of the Industrial Banks the articles may be produced where the principal materials required are fairly abundant. Different localities will be found to have different raw products, which could be converted into manufactures. Industrial Associations would be guides, while Industrial Banks would be the helps to foster and develop industries of the kind referred to. The best plan is for Government to have a careful industrial survey of each province by a provincial committee of the province. This is essential as a preliminary.

Bombay, the 20th January 1902.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

By MESSRS. VASUDEV K. KIRLOSKAN AND MAHADEV R. BODAS, HONORARY SECRETARIES TO PROVISIONAL COMMITTEE OF THE SHOLAPUR INDUSTRIAL SCHOOL AND ORPHANAGE.

1. At a meeting of local artisans and manufacturers of Sholapur convened on the 27th December 1901 by Dr. Thomson of the Poona Science College, who was deputed by the Bombay Government to collect information required by the Industrial Schools Committee, a sub-committee was appointed to make inquiries and draft replies to the list of queries sent along with G. R. No. 2182 in the Educational Department, dated 19th ultimo. As a movement to establish an Industrial School had already been started at Sholapur with the approval of the Collector, Mr. Maconochie, and as one of the Honorary Secretaries of the Provisional Committee of the proposed school happened to be a member of the new sub-committee, it has been thought desirable to take the opportunity to submit a Memorandum embodying answers to such of the questions as we think most important and are in a position to answer. The Memorandum is submitted in the hope that the scheme of a proposed Industrial School and Orphanage at Sholapur will receive due consideration at the hands of the Industrial Committee and will eventually obtain the support of Government, both financial and otherwise, that such an object deserves.

2. The questions are divided into two parts:—

A. Improvement of Local Industries, and

B. Introduction of new industries,

each of which is again divided into sections and sub-sections, dealing with all possible questions to which it is impossible to do full justice in a short compass. The following observations are therefore jotted down to indicate only the general lines on which any effort for the industrial revival of the people ought to be made. The details of any such scheme will have to be considered by men who possess the necessary data and expert knowledge to deal with them.

3. The first part deals with three topics, (a) what has been done, (b) what is proposed to be done, and (c) how funds are to be provided. Sub-section (a) again asks information on three points: the nature of Industrial Schools, Government or Private, that already exist in the province; the Native system of apprenticeship, and the principal industries current in the province. Sholapur being pre-eminently an industrial district, it possesses some marked features which make it comparatively easy to obtain full and accurate information on all these points. The now agriculturist population largely consists of classes devoted to special industries, such as weaving, dyeing, and iron-plate work, and they are in close touch with the merchants and other leading men. Sholapur City is the seat of considerable industrial activity, and the district as a whole possesses some peculiar advantages of situation and natural resources. Its precarious rainfall and the chronic famine are in themselves potent causes to drive large numbers of people who would otherwise depend on agriculture to resort to industrial activity for maintenance. Ignorance and chronic poverty, however, prevent these classes from marching with the world, and an outside stimulus has perhaps become absolutely necessary to better their condition. This is probably the reason why so little has been done hitherto to promote industrial education. The only Industrial School in the district is the one at Pandharpur, under the supervision of an independent Board of Management, and maintained principally by grants from the Government and the Municipality. The school only provides for elementary teaching of carpentry and smithy, and provides instruction to a few boys from an adjoining orphanage and others. Want of funds has prevented its being made as useful as it could have been. The present Superintendent is an "L. M. E." of the Victoria Jubilee Technical Institute, and has got one or two mistris under him. The teaching is the most elementary and on the Native system and the boys become ordinary carpenters and smiths. Primary education is also given in a vernacular school. There is large room for improvement and the school can be very well equipped at a small extra cost.

4. The Native system of apprenticeship is mainly based on the family principle. That prevailing among the weavers is typical. When boys outside the family are engaged as apprentices, they are taken at the age of 10 or 11 and are paid 9 or 10 rupees a year for such ministerial work as they do. They learn the trade by attending on the master weaver. When they are able to handle the loom, they either become his assistants or start on their own account. This system has the advantage of teaching and transmitting hereditary art at a minimum cost. It prevents trade competition and thus discourages improvement. The various industries have consequently become stereotyped and are decaying for want of external stimulus. It is difficult to say definitely whether the Native system of apprenticeship is superior or inferior to average Industrial School method. Each system has some advantages and some disadvantages. The Native system ensures perfection and accuracy at a minimum cost and wastage of energy. It is besides well suited to the Indian family life. It, however, prevents

improvements and kills all originality. The two systems are not, however, necessarily antagonistic and can be easily combined by starting graded Industrial Schools and night classes for such as are compelled to labour for maintenance during the day. Much also can be done to improve the old Native methods by starting institutions like the Weavers' Guild recently established at Sholapur by Mr. Maconochie. What is required is sympathetic treatment and pecuniary help to the classes to enable them to adapt themselves to modern requirements. Under proper guidance the industrial classes are amenable to outside influence. There are no regular Trade Guilds in the European sense, but there are some trade castes possessing their organization.

5. The principal industries besides agriculture prevailing in the Sholapur District are weaving, cloth-dyeing, leather work, iron-plate work, and oil pressing. They all deserve support and encouragement and some of them are capable of great development. The weavers, especially, require urgent support as they form the bulk of the industrial population, and suffered heavily during the scarcity of the last 4 or 5 years. They require pecuniary relief as well as expert guidance to improve their methods. The native dyeing is fast receding before German colours, and can only be revived by the introduction of modern scientific methods. The same is the case more or less with other industries.

6. No hard and fast rule can be laid down as to methods of teaching which must be adapted to local conditions and requirements. An Industrial School with a well-equipped workshop and laboratory is a necessity. Classes for teaching theory will have to be started, as also night-classes for out-students and working men. The teaching in the existing Industrial Schools is either too theoretical, or when practical it is confined to ordinary crafts. There is no school as yet which combines advanced theory with thorough practical teaching on the model of the Polytechnic Schools of Germany. There should be a central College or institution for higher industrial teaching in the Presidency town to prepare work-shop superintendents, managers, engineers, and teachers, and the lecturers there will have to be the best available foreign or native experts and scientists. Then each district town should possess an Industrial School imparting general knowledge and advanced training in such industries as specially flourish in the district. A school in Sholapur for instance will teach hand-loom-weaving, dyeing, leather-work, and oil-pressing. It would be desirable to make it compulsory for all students of the central as well as district schools to serve a year's apprenticeship in a large workshop, and all proprietors of mills, factories, and workshops should be compelled to admit such apprentices. A training in an Industrial School or College should in all cases have a finishing in a regular factory. To ensure uniformity and high standard the curriculum may be framed under departmental guidance, sufficient latitude being allowed to facilitate adaptation to school needs in each case. It will not be difficult to frame rules that ensure both uniformity and variety in the teaching. The Central College should be a Government institution authorised to give diplomas, while the district schools should be as far as possible under the management of local committees composed of representatives of Government, municipality and the public, under of course the general supervision of an expert official. Schools can be maintained out of funds collected specially and supplemented by grants by Government and local bodies.

7. We would take this opportunity to give the outlines of an Industrial School which it is proposed to establish at Sholapur shortly with the help of Government, the Municipality and the enlightened public. A beginning has already been made and a Provisional Committee formed with the approval of the Collector, Mr. A. F. Maconochie. The school with an Orphanage attached to it will be established as soon as sufficient funds are collected. It is proposed to open the school with two branches only, one for mechanical engineering, including carpentry, smithy, fitting, and moulding, and the other for textile fabrics, the latter being specially adapted to the requirements of the large weaving population in Sholapur. Other branches for other local industries will be added as resources will increase. Primary education will be made a necessary part of the curriculum and for this purpose, one of the municipal ward schools in Sholapur can be amalgamated with it, so as to attain this object without extra cost. The instruction in each branch will be as practical as possible with just sufficient theory to ensure scientific accuracy and originality. The annual maintenance charges of the school will, it is estimated, be about Rs. 3,000 at least, half of which it is hoped will be covered by a departmental grant and the rest by special grants from Sholapur Municipality, the Local Board and the interest on a nucleus public fund which is being collected. The local mills will also, it is hoped, give material help as they will largely benefit by the establishment of such a school. The management will be under an independent local Committee, on the model of the Board of the Victoria Jubilee Technical Institute at Bombay, composed of the Collector or the Assistant Collector, the Vice-President and Secretary of the Municipality, and Deputy Educational Inspector and some leading gentlemen of the city. The rules and regulations for the appointment of the Managing Board, the curriculum of the school, and other matters are being framed and will be duly submitted for consideration, if the idea meets with approval of Government. The orphanage will provide for orphans whose number in the district is now considerable, owing to the ravages of famine and plague. These orphans will be taught small handicrafts, such as basket-weaving, rope-making, calico-printing, etc., so as to enable them to earn an honest livelihood in after-life. The leading gentlemen of Sholapur have been consulted and they are willing to cordially help and co-operate in this charitable and useful object. Night-classes for grown-up artisans and labourers who cannot attend the regular day school will also be started in connection with the School.

8. We are not at present in a position to express opinion on the Neapolitan scheme as they have not had the opportunity to peruse Sir Edward Buck's report. They do not,

however, think that craftsmen already in the trade would consent to work in the school unless they are fairly remunerated. There is a good deal of trade and caste jealousy which prevents craftsmen from imparting their special knowledge freely, but sufficient inducement and a safeguard that such knowledge will not be misused or unnecessarily scattered to their prejudice will ensure fidelity and co-operation on their part. It will be better if such schools are conducted on the basis of a regular workshop selling its work and generally ministering to all local public wants. The earnings of the workshop will be a good source of revenue, while the boys will have practice in actual work, such as they will be called on to do in after-life. The Ratnagiri School of Industry and the Pandharpur School are based on this model though their scope is limited. An apprenticeship class may be joined to such workshops for boys who do not wish or cannot go through the full regular course, and such apprentices should be paid wages for the work they do. A class of this kind started in the Baroda workshop is proving a success.

9. As regards items (3) and (4) the undersigned think that no general rule can be profitably laid down but the matter should be left as far as possible to the discretion of the local managing Board. It may be stated, however, that experts are at present badly wanted in chemical industries such as dyeing, tanning, oil-refining, but not so much in mechanical trades. The urban schools should be managed by a local mixed Committee while the rural schools should be placed under the Taluka Local Boards. The technical side of these schools may be supervised by an expert official and Inspector appointed by Government. There should be as much decentralization and adaptation to local needs as possible and any tendency to hard and fast rules should be avoided.

10. The value of exhibitions is generally admitted; but want of funds is the great difficulty. Exhibitions of indigenous products should be both local and provincial, but exhibitions of foreign products, machinery, and works of art should be mainly local to bring them to the home of the artisan classes. A permanent museum ought to be established in each District town suited to local requirements and will form a good centre for occasional exhibitions. Such a museum may be attached to the local Industrial School and can be maintained by the help of Government and local bodies. Such local museums exist in all the principal cities in the United Kingdom and the continent. They will also serve as sale-rooms for the local Industrial School and workshop. Work intended for sale should be encouraged as much as possible, as it will provide constant income and besides stimulate the boys to produce good marketable articles. The details of management should of course be left to the discretion of the local Committee.

11. As to funds (c) Government of course, both Imperial and Provincial, would generously consent to bear their proper burden of expenditure in this highly-needed effort; but local control and self-help should in the main be the guiding principle. The grant-in-aid system is well suited for the purpose, and Municipalities, Local Boards, and influential local bodies that would be profited ultimately may be called upon to give aid. The question of affording aid to start workmen in trades does not strictly belong to education; but there is a large field for work in this direction. In fact it is the chief thing that is at present needed to improve the condition of artisan classes. The Weavers' Guild recently started at Sholapur by Mr. Maconochie is a good example. The details of course will have to be arranged differently for each trade and locality. An organization like the Weavers' Guild also acts as an Industrial Bank.

12. As regards (b) the introduction of the new industries, the undersigned do not think it necessary to give detailed opinion, as the subject does not strictly come within the sphere of education; but it may be stated generally that whatever articles are sold largely in the market should form the subject of teaching. Before attempting new industries care should be taken to conserve and improve the old ones. When that is done, instruction may usefully be given for manufacturing articles in daily use and requiring a small capital. It is not desirable to introduce foreign luxuries and thereby artificially raise the simple wants of the people. The aim should be to promote industries which supply the ordinary wants of the people rather than the costly luxuries of a few rich men. There are few jail industries which are not found outside. The experience of jail work, however, does not furnish safe guidance in ordinary life, as the problems of labour, supervision, and supply are quite different. Nor is the after-conduct of released prisoners very encouraging.

13. We do, in conclusion, hope that the problem of rehabilitation of the industrial classes in India will be dealt with more in the light of their actual difficulties and needs than any preconceived and high sounding theories. The ignorance, the helplessness, and the want of energy and ambition, so characteristic of Indian masses, make all Western theories and opinions generally inapplicable to them; and all efforts based upon them prove failures. We have ventured to submit these observations both as indicating the prevailing opinion in Sholapur and also as explaining the lines on which the proposed Industrial School is to be conducted.

The 6th January 1902.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

By Mr. B. A. GUPTA, HONORARY MEMBER, BOMBAY ART SOCIETY, BOMBAY.

Existing Schools.

Of the Sir J. J. School of Art and Industry I have gained information during my official connection extending over nearly five years. It was started with an iron foundry, a modelling class, a wood-engraving class, a drawing school, and a painting class. Of these the iron works were abolished and so was the wood-engraving class; both of these branches

were very useful in their own way. Mr. Burjorji, the best of Mr. Higgins' pupils, conducted the former on his own account as long as he received support from the Public Works Department and from private individuals, building the palatial buildings which have adorned the city during the last three decades. The wood-engraving class supplied "blocks" to the Curator, Government Central Book Depot, and other publishers, under the supervision of two of Mr. Terry's pupils. It is a matter for regret that these two useful branches have ceased to exist. The "Pottery" Class was only partially useful inasmuch as the only local potter who has profited by improved training is the man employed to mix the kutch and other clays and in shaping the new 'adapted' pots introduced by Mr. Terry. The Sindh glazier scrupulously kept his secret about the pigments which his ancestors taught him to use, and the large number of pupils employed to paint the wares have derived no benefit beyond temporary employment. Mr. J. L. Kipling's best modeller, Mr. Gomes, has rendered excellent service to the *urbs prima in India* in supplying models for cornices, caps, and panels for the architectural gems of that city of which the Victoria Terminus may be taken as the masterpiece. In the Reay workshops added to this Institution in 1899, goldsmith's work, enamelling, carpet-weaving, and a few other industries have been introduced but with what result I have no definite knowledge. The Sir J. J. School of Art does not seem to have financially succeeded in recouping itself. The total amount spent would bear a very disproportionately high ratio to the total profits made up to date by all the pupils taken together. But its failure as an institution intended for the encouragement of industry is more deplorable. Students who joined the school in the latter period of its history were generally the dregs of all other schools. When parents failed to make anything out of their wayward boys they took them to the School of Art as the last resort; and even if they succeeded in making some progress they had to become sign-board painters if ever they failed in securing employments as draftsmen or drawing masters in High Schools. The proportion of ex-pupils who had to become railway or tramway servants is very high. The best of the painters, Mr. Pestonji Bomanji, who has carried gold medals and high prizes in almost all Indian Art Exhibitions, is but a poor man. The only improvement perceptible is the introduction of new shapes and the adaptation of the Ajanta frescoes in ceramic ware. As it at present stands, this school needs radical improvement, which is possible if the Reay workshops be worked on the craft or caste guild principle, to be described further on.

The Native system of Apprenticeship.

(1) The Native or Indian system of keeping up a supply of artisans for the ordinary native arts and trades is based strictly on caste guilds. Sons are trained in their fathers' workshops, in which nephews and sometimes poor relations are admitted without any fee. Almost all trades are carried on in this country on this principle. An outsider does not receive any aid nor is he willing to learn a new trade unless some special influence is brought to bear on the master artisan or himself, and even then such instances are very rare indeed. There seem to be no objections to this system except the technical violation of a theoretical cosmopolitanism which would encourage any man to prefer any trade, but Indian society is so constituted that the facility an artisan acquires by inheritance is a decided advantage where hand work has to be produced and where proverbial patience has to be practised in producing results, which have proved themselves entitled to the admiration of the outside world. The knowledge and the practice an Indian artisan acquires is truly and literally instinctive. For instance, the facility with which a Patvekari produces the several gold and silver braids and tapes with the help of his toes and fingers is simply marvellous, the clever designs a "bandhana" woman produces on a silk handkerchief by tying knots often without the help of stencils have been universally admired, and the apparent ease with which a wood-carver produces elaborate designs with a few primitive scoopers is a process very interesting to watch. If native workmanship is thrown into general or unrestricted competition with machine-made articles, India will suffer in her reputation as the home of some of the most world renowned art wares which at present adorn the palaces and mansions of the princes and peers of foreign countries.

(4) It is not difficult to identify at present the best craftsman in each branch, as he has always a local reputation of an unmistakable character. Another mark of identification would be the possession of medals and diplomas of merit granted by the several exhibitions ever since 1851.

(5) The Native system of apprenticeship is immensely superior to the average Industrial School, which admits anybody and everybody without the hereditary aptitude of the Indian artisan, and it can be extended in practice under the supervision of a qualified European Director of Art whose expert suggestions would be invaluable. He will, of course, not interfere with the time honoured designs beyond advising when and where to apply them. The modifications he will propose will have reference to the demand based on utility and suitability of the decorations to a European or American drawing-room. For instance, instead of the bridegroom's stool he will advise the adaptation of the lady's foot-stool, or the little teapoy so much in demand in the West. Instead of a *chadar* he will advise the manufacture of a square table cloth, instead of a betel-box he will requisition a lady's glove-box, and so on.

(6) The Native apprentices do not pay any fee to the master artisan, but the latter is entitled to the fruits of his labour, and he expects him to do some part of the rougher or menial work in his shop, such as cleaning the tools, sweeping the room, and 'running' messages. A boy begins to work at eight or so, or even earlier, the preliminary education

he has to receive varies according to the nature of the workmanship. A carpenter's son is given a block to plane, a goldsmith's child is given a piece of silver to hammer into a bar, a spinner's daughter has to disentangle a knotted skein, and a dyer's son to pound some of the vegetable stuffs. Preliminary education of the literary type is given to boys in indigenous vernacular schools by those only who claim to belong to the "white-dressed" or *pandhar pesha* class.

(7) No craftsman would willingly take in apprentices of other classes than his own, nor would the parents of the latter prefer a new calling to their ancestral craft.

(8) I tried my best to educate or train the famine orphans I had under my supervision from 1896 to 1899 at Indore in Central India, but signally failed. They were sent to the local Mill, but even the weavers' sons of the group ran away. They were tried in the Municipal Workshops and the only boy who showed marked aptitude and decided inclination to learn was a *lohar* (iron-smith), but the *mistri* at the workshop was a Musalman and the boy always complained of being ill-treated and insulted, and kept down as a mere coolie. Some of them were then sent to the *Mistrikhana*, another Darbar workshop. There, all excepting the *chamar* (cobbler) did not stay, but the latter found the same difficulty in obtaining help from the local men, although they belonged to his caste, the difference in the locality constituted the ground for estrangement. The Kumbhar's son was tried in a caste-man's house and he alone succeeded. It will thus be seen that identity of profession is not a sufficient pass for apprenticeship. Until one finds out the exact section to which the proposed apprentice belongs and makes arrangements with some one of the same caste division, it is difficult to succeed in enlisting an apprentice even in his hereditary trade. How difficult then would it be for a stranger to get any help from the master artisans of other trades, and how much more difficult would it be to induce a boy of one craft to take up a new line. The Kumbhar who adopted the orphan did not claim any fee. He was merely asked to pass an agreement that he would be treated kindly and would be allowed the ordinary freedom claimed by all citizens of India when they came of age. In fact he was merely protected from being converted into a slave. The only inducement that can be offered to a craftsman to accept such orphans is the prospect of free labour, or labour in exchange for the scanty food and clothing he will have to supply them with, with perhaps the prospect of securing a promising husband for his daughter when the pupil succeeds in making his own mark as an accomplished artisan.

(10) There are Trade Guilds everywhere in India, but they pass under different disguises. The funds of the guild are collected by fees from new settlers or by levying a small 'voluntary' percentage on the profits entrusted to a *panchayet* and the amount spent on temples or religious feasts. At Yeola in Nasik, for instance, every man starting a silk spinning wheel was charged Rs 350 to be spent on a guild feast, but by an order of the local Magistrate the monopoly has been broken. The *Salis* (weavers) of Indore have a fund with which they have been building a temple in Narayan Peth.

(11) These guilds can be utilized with marked advantage for the improvement and expansion of the local industries, by (1) creating honoured *Sir Panchs* (Heads) to be respected by the local Revenue officers on State occasions for the services they will render to the caste in managing the proposed guild or craft schools, by (2) creating a selective body of the local *Panch* to be similarly treated on a more modest scale, by (3) extending or improving the premises of their temples for the location of the proposed workshops, by (4) volunteering help in creating demand for their wares, by (5) advancing *tagai* at moderate interest, and above all by (6) kind, affectionate treatment from European officers. There is a great deal in that. It is difficult to describe the kindly feelings and the confidence such a treatment generates. The undersigned has personal experience in this matter and he is morally convinced that the advantages of creating a loyal and confiding feeling cannot be overrated. Artisans have the greatest dread of the native officials because if purchases are made through them a certain portion of the proceeds is appropriated, if medals or diplomas are distributed through them a certain *nasrana* has to be paid, if a peon goes to call them he takes something, and if a European dealer is taken to their house they fear the early importation of cheaper machine-made imitations which would ruin their struggling trade. If again a merchant is entrusted with the execution of the order, he makes a triple profit out of the little transaction and leaves him but a nominal margin which in many cases does not exceed the wage which even a coolie can command. The Indian artisans are a helpless set of beings, groaning under the powerful thumb of the *Bania* (dealers). They are in fact debtor-slaves without chains. Their monopolies are destroyed, their trade is gone, and their credit has dwindled to the minutest point.

Principal Industries of the Province.

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| (1). Silver <i>reposee</i> work | Kutch, Bombay, Poona. |
| Gold and silver jewellery and enamelling. | Everywhere, but Bombay supplies export trade through European jewellers. One of these firms has employed about 30 to 35 of the silversmiths of Kathiawar, under Ramji Bhagwan, the master artisan, who possesses a silver medal.
The best enamelling comes from Kutch. |
| Brass work | Nasik, Poona, Surat, Ahmedabad, Bombay for local trade, old specimens of brass work from Kathiawar and Guzarat are merely collected for collectors of curios. |
| Basket work | Poona and Savantvadi. |

<i>Repoussé</i> work in copper and brass on large pots.	A new industry introduced by Mr. Griffiths in 1886-87. The Indian <i>ranjan</i> , originally a clay or ceramic pot, has been adopted and worked in designs copied from the Ajanta frescoes, an ancient relic of over 2,000 years' standing. The first specimen was purchased at the Colonial and Indian Exhibition by His Majesty, then Prince of Wales, and ever since that time there is an increasing demand for similar work. This is an excellent instance of how purely native designs and native workmanship can by judicious application be made to create demand for Indian Art Ware.
Brass idols and castings	This work, as would be supposed, is not done by the coppersmiths or <i>kasars</i> and <i>Tambals</i> but by the <i>Panchals</i> known as <i>kalaigars</i> , a separate guild altogether. There is a considerable demand for these images and pots for idol worship, the former as paper weights and the latter as nick-nacks in a drawing-room. <u>Nasik and Poona</u> are the chief suppliers.
Gold and silver thread, lace, etc.	<u>Ahmedabad, Surat, Nasik, Poona, Bombay, and Yeola</u> are the chief centres. The "threads" and spangles prepared are used in embroidery of the heavy <i>karcholie</i> sort much in demand among the Princes and Sardars, Mahomedans in particular. Hindu and Parsi children of the wealthy families also wear them on festive occasions.
Gold and silver kinkob brocades	<u>Ahmedabad, Surat, and Poona.</u>
Gold and silver bordered or striped silk <i>saris</i> .	<u>Yeola and Poona</u> are the chief places, but Ahmedabad and Surat also produce them.
Silk and cotton <i>saris</i>	<u>Yeola, Poona, Ahmedabad, Surat, Bombay, Bhivandi in Thana, Limdi in Kathiawar, and Baroda.</u>
Gold and silk bordered <i>dhotis</i>	<u>Ahmedabad and Yeola.</u>
Silk <i>bandhana</i> work	Kutch, Kathiawar, Guzarat, Bombay.
Cotton prints (<i>saris</i>)	Kaira, Ahmedabad, Surat, Baroda, Tatta, Karachi, Hyderabad (Sind).
Jajams (carpets)	Malegav, Ahmedabad, and Bombay.
Putty printing	Kathiawar, Kutch, Guzarat.
Silk and cotton <i>lungis</i>	Hyderabad (Sind).
Maratha turbans	<u>Yeola, Poona, and Baroda.</u>
Silk and cotton or cotton quilts	Broach.
Thana silks	Thana.
Thana cloth-plaids	Thana.
Sandal-wood carving	Surat, Karwar, and Ahmedabad.
Wood-carving for house decoration	Ahmedabad, Surat, Baroda, and Bombay.
Carved and inlaid furniture	Bombay, Ahmedabad, and Ratnagiri.
Lacquer work	Savantvadi, Surat, and Sind.
Glass bangles	Chinchni in Thana and Shivadpur in Poona.
Embroidery in silk	Kutch, Kathiawar, and Bombay.
Clay figures	<u>Poona</u>

These are the chief or important art crafts. Of the minor industries supplying the daily wants of the people but capable of being developed into "home" factories (to be described further on) the following deserve special mention. They will, when properly managed, counteract the flood of imported German stuff which has overwhelmed every household, including the modest huts of the poorest of the poor. If Government can stop this excessive import and encourage local industries they will have secured *the golden key to the salvation of the Indian artisan from the present slough of despond.*

(i) *Soap*.—Country soap is prepared at Kapadvaj in Kaira, only a slight touch of the magic wand of a duly qualified European expert will convert this modest industry into a gigantic rival or self-supporting citadel against the immense import trade in cheap soaps made of questionable matter.

(ii) *Matches*.—There is ample material for matches in India. At present Japan has been supplying every house with this article.

(iii) Candles, brushes, pencils, slates, cheap paper, buttons, toys, tin boxes, tin spoons, combs, glass beads of the rough sort, glass bangles, imitation jewellery, ink-bottles, inks, cheap hand bangles, twine, thread, brass and copper wire, bottled oils (like castor oil, linseed oil, salad oil), tapes, and number of such every-day-use things can easily be prepared in India to stop the overflowing of our houses with German and Austrian stuffs. Lord Ripon's Resolutions on the purchase of local manufactures will supply a long list.

(3) The chief industries of the artistic sort which require support or encouragement in my opinion are :—

- (a) Hand-spinning—an almost extinct industry.
- (b) Weaving superior brocades for the foreign markets.
- (c) Dyeing, which has died out before its great enemy the “aniline dye.”
- (d) Wood-carving, which is capable of immense development and incapable of ever being successfully beaten by machine-made articles.
- (e) Brass, copper, gold, and silver *repoussé* work for export trade.
- (f) Brass and copper castings, idols, etc., ever in demand as curios.
- (g) Silk embroidery, much appreciated for decorative purposes.
- (h) *Jajams*, and curtains in *di*, and putty printing.
- (i) Curtains in block printing.
- (j) Work boxes in inlaid work.
- (k) Panels in carving, inlaying, or lacquer work, for decorative uses in foreign countries.
- (l) Brackets, flower stands, ink bottle stands, photo frames in carved or inlaid work.
- (m) Cheap silver and gold jewellery consisting of bangles, bracelets, brooches, hair pins, necklaces, etc., etc.
- (n) Silver plate, consisting of tea sets, coffee sets, milk jugs, card trays, buckles, watch chains, and the like. Indian shapes such as those found in “Swami” jewellery will be much appreciated all over the world.

(3) Support and encouragement are both specially required because competition is hard, the workman or artisan is a “helpless being” without capital, he does not know the markets, he is unable to find out the places where there is likely to be a demand, he has been reduced to serfdom by the merciless middleman (the *sowkar*) and yet his hereditary skill deserves to be saved from the certain destruction that hangs over it. No country can boast of such patient and exquisite work in certain branches, machinery cannot compete in some of its branches, such as wood-carving, and if Government, the *ma bap* of the unfavourably placed artisan, does not step forward the “historical Indian arts” will be an “extinct species.”

The directions which encouragement should take are three in number :—

- I. Relief from the clutches of the *sowkar*, who makes a triple profit (i) on the raw material supplied, (ii) interest on the capital advanced for food, etc., and (iii) on the finished article which he buys himself. This can be done by making advances like the Revenue *tagai* on easy terms.
- II. By organizing trade centres where Indian curios can always be had for sale in this country, under commercial management, on trade principles, as distinguished from Government workshops. Government agency will necessitate the existence of another middleman, the native official, who will prove worse than the much hated *sowkar*. Native firms under respectable management and with a Government “by appointment” *samad* would be quite sufficient. Any interference through a European firm will be misrepresented and made a “grievance-handle” by worthless agitators supported by the interested banias, and instead of appreciation of the sincere efforts of Government positively intended for the good of the artisan class, Government will make itself universally unpopular. The finished article should be declared the sole property of the artisan, who should have sole power to sell it to whomsoever and for whatsoever he likes, with the usual prior claim of the *Tagai* Department to recover its due from the sale proceeds and nothing more.
- III. By organizing advertising agencies throughout the world. The Indian artisan does not know the art of advertising. Those traders who would willingly offer the best specimens of Indian art for the purpose of “advertising-sale” may be induced to hand them over to an European expert who will, like a travelling agent, go round the world and organize “travelling” or “roving” exhibitions in all important cities under the protection of the British flag or the British plenipotentiaries. This system will create new demands without throwing on Government any financial responsibility and without exposing them to the reproach of “Free Trade principles.” The minor industries of the Bombay Presidency, such as Jallapur horn work, Swantvadi lacquer work, Broach agate work, Kapadvanj glass work, are not likely to command great sale either in India or abroad.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations in system.

(1) The existing methods of the Industrial School are too Europeanized to be of any use in improving the really indigenous art or in educating “hereditary” craftsmen on their own lines. Drawing is useful everywhere, but Poynter’s plates or foreign examples vitiate the taste of the pupil, and in the midst of his conventional, totemistic, symbolic, or Paganic designs he puts in scraps from Gothic arches, French scrolls, or Corinthian foliage to produce an incongruous hybrid too repulsive to command any sale. Under Mr. Griffiths’ supervision the undersigned has made a collection of old carved wood-work from Nasik which forms part of the Sir J. J. School of Art Museum. He has also taken paper moulds from the celebrated Hingnes Wada and Bayaji Thakore’s house. These examples are chaste in their design and perfect in workmanship. Plates prepared from such models would be the right thing to place before Indian

artisans as examples for training their eye to purely Indian ornament. The European expert and the master-artisan may be entrusted with the duty of selecting examples. Students should always be selected for scholarships or Government aid from the artisan caste and *not* from the priestly or writing classes, who form the dregs of other schools and whose only aim is to get a living in the shape of school scholarships until they are able to shift into some service, it does not matter which. Any help given to these refugees is wasted and lost to the Industrial School. Master-artisans should be induced to accept apprentices of their own, preference being given to their own relations.

(3) Specially promising students should be advanced by being selected for service in decorating Government buildings, or by being marked out for master-artisanships in their own branches. They may further be encouraged by being entrusted with the sale-yards or local exhibitions to be started. Certificates for Foremanship or Managership will be much appreciated as they will lead to increased confidence in being entrusted with special "orders" for Museums and exhibitions abroad. No college or school of the European type need be opened, but the management of large workshops for supply to European firms with commercial capital will be sufficient inducement. Ramji Bhagvan, the European Jeweller's Agent in Bombay, is an instance in point. It will not be necessary in every case to pay a fee to such export trade suppliers. They will, by selection, be too glad to avail themselves of the services of a qualified man.

(7) An annual grant, a gift of useful instruments as prizes, or a "by appointment" *Sanad* would be a sufficient inducement for conducting a workshop in conformity with rules for subsidized Government Industrial Institutions.

2.—Proposed alterations in schools.

(1) The existing schools of industry require changes in the methods of teaching and training by (i) selection of chaste native designs for examples, (ii) selection of master artisans as teachers, (iii) selection of localities representing reputed seats of different crafts, (iv) production of purely Indian specimens even in the junior class, (v) non-interference with the sale proceeds, (vi) advances as *Tagai* to the master artisans, and (vii) purchase of specimens for Government Departments.

(2) I am strongly of opinion that a school or workshop should be opened at Ahmedabad for wood-carving on the lines of the one conducted some years ago by Shet Maganbhai Hattising on behalf of Mr. Lockwood De Forrest, of America, and carried on on the same financial principle. A School of sandal wood-work boxes should be started at Surat and one at Karwar, and another at Surat for weaving the silk kinkob brocades so much admired by Lady Ripon that she specially obtained through the undersigned a piece for a dress during the Calcutta Exhibition (1883-84). A workshop for cotton printing at Kaira. One for glass bangles at Kahadvang or Chinchni. The village of Kahadvang exports three to four lakhs (₹4,00,000) worth of crude glass to Europe. There is no reason why this material should *not* be locally manufactured into bangles and beads so much in demand among Hindu, Mahomedan, and Parsi women, not to mention the "natural" races who are so remarkably fond of beads of all sorts. The Thana silks were once much in demand for ladies' gowns in Europe, but English education has turned the heads of the Christian weavers and they have become railway clerks or compounders in Chemists' shops, have changed their women's *saris* into gowns, and have claimed a position among the "East Indians" of the Census classifications. This most useful and highly skilled industry of the Konkan has thus been ruined. A workshop for silk weaving at Thana under the supervision of the Head Master, Roman Catholic School, Thana, would be desirable. Gold and Silver thread making deserves encouragement. A school or a special class attached to the Reay workshops would be very useful. Daudbhai Musabhai of the Kalbadevi Road has a large establishment. He may be induced to take a few apprentices. The Lord Reay workshops in Bombay would be the best place for gold and silver plate, enamelling, *repoussé* work and the like. Kutch, Bhuj, would be the best place for a workshop for silk embroidery conducted under the supervision of a lady specialist, as Native girls and women alone do that kind of work. The system most suited would be to entrust master-artisans to train their own relations and castemen under the general supervision of a European expert, and in consultation with expert dealers who know what articles command sale abroad. These workshops or caste-schools may be financed by *tagai* advances or advances from intending purchasers. Funds can be either borrowed from the Government Savings Banks on the usual terms or from the export dealers.

(3) Night-schools will not be of much use, artisans are practical men and do not much care for theory and such institutions are not likely to succeed in India. No special training schools need be started for intending Superintendents and Instructors, the best men can always be picked up from families of repute, and easily brought up to the standard by their "eyes" being trained in the work of selection of designs for particular markets.

3.—The Naples scheme.

(1) The Naples scheme may be tried, Mayanbhai Hattising of Ahmedabad and Daudbhai of Bombay employ a large number of artisans to produce saleable articles. Capitalists may be induced to do the same by offering locations and expert advice gratis. The only difference would be that the artisans will have full power to dispose of their ware on their own account, and the chief of the establishment who provides cash in advance will get a fixed profit.

(3) It would not be advisable to open these yards or schools for the unrestricted free visits of the gaping crowd. *Bonâ fide* purchasers may be allowed to visit them by permission.

(4) The prospect of increased gain and the approved position as a *Sir Panch* will induce master artisans to co-operate.

(5) The material will be supplied by the master artisan from funds belonging to the proposed Tagai Department, or to the intending exporters. There is no great waste, and the work made will always command a sale even if it should not be up to the mark, in the periodical roving exhibitions. Impecunious apprentices will be supported by the Manager while they are unable to do any remunerative work and will get a share in the profit of his pupils' saleable productions until they are in a position to work independently. The proportion or division of the profits may be regulated according to circumstances, workmanship and demand playing an important part. Hindus will take usual holidays. They do not work on the "dark night" (*Amavasi*) of the lunar month, on eclipse days and days following an eclipse, the day following the winter solstice (*Sankrat*) and so forth; and the Musalmans will take theirs. No change is possible except that of granting Sundays and additional Christian or Political holidays. Discipline of the moderate type can be enforced, but any radical change will produce discontent. As an example, the instance the undersigned knows is worth recording. A Brahmin widow of a respectable family (he was told) asked permission to work in the "lying-in ward" of a hospital to train herself as a midwife and the Physician in charge insisted on the "regulation" white dress. She naturally could not make up her mind to dress herself as a Pariah Madras Aya and gave up the thought. The Physician sincerely believed in the "elegant" look of the white dress without the *kachha* (or central fold), but to a Brahmin woman to appear in such a costume was "losing her caste," and thus Lady Curzon's philanthropic scheme has lost a willing volunteer,—a rare acquisition! As books and slates were distributed gratis even in literary schools in the early "Forties," and as the Grant Medical College was free up to 1871, the proposed Industrial Institutions had better be exempted from any fees, in consideration of the general abject poverty of the hereditary artisans. Improvement in the practice of work of the draftsman is very necessary and may be introduced slowly and cautiously through travelling experts just as the dairy products are improved by an imported specialist.

4.—*Experts.*

(1) Experts from abroad would be very useful. Any improvement in the method of working, in the tools in use, in the material selected, in the preparation of the materials, in seasoning the wood, in sizing the warp, in fixing the dye with cheaper mordants, in shortening the lengthy period of mordanting, in joinery, and so forth would be valuable; but the general character of the workmanship must be retained, the designs left chaste, and shapes kept in strict conformity to indigenous conception of the "motive." Like the dairy expert, the silk expert, or the agricultural expert imported by Government, one expert should be imported for one craft, and asked to travel all over India. One or two industries at a time may be selected for the operation. A sound practical actual worker is the one needed and not a theoretical diplomatist or an erudite writer.

(2) The cost will depend on the nature of the craft and on its commercial importance, and it is difficult to form an estimate of such charges.

(3) In the Bombay Presidency a good silversmith, an enameller, and a bronze statue caster may be tried in advising country craftsmen in their own line, as well as in introducing a new feature of the progressive type in "Modern School," to be described further on.

(4) He should visit the caste or craft or guild workshops with the local Head Master of the High School and suggest little improvements, noting them down in his diary for a future reference to ascertain what has actually been done.

6.—*Exhibitions.*

(1) Exhibitions are useful only in creating an occasional demand for high class workmanship which at present commands no patronage owing to the importation of more gaudy, more showy, and less costly materials from abroad. They have in a way proved to be the only "pick-me-ups" in the last stage of the existence of high indigenous art. But they are not an unmixed blessing. Exhibitions will be of great value to India if instead of exposing *her* trade-secrets to the machinations of accomplished imitators, *their* cheap wares are exhibited in India with working models of the machinery and the tools they use; or better still it would be advisable to purchase hand machines for hire or "monthly payment sale" among the advanced communities, such as Parsis, Bhoras, Memons, Musalmans, Native Christians, and Eurasians. Singer's Sewing Machine is an excellent instance in point. There is at present hardly a tailor in urban bazars who does not use this machine. The facilities afforded by this firm are worthy of commendation. Small lathes, spinning machines (Home spinning is nearly an extinct industry in India), looms, brass foundries, soap-making hand-machines, candle hand-machines, and a host of such modern improved mechanisms will be a blessing to India.

(2) The exorbitant demands of the creditors affect the production inasmuch as the finished article does not command a ready sale, on account of the high prices which must rule in such circumstances. *Tagai* advances will remove these obstructions.

(3) The workman as a general rule does not get the best wage, the profits going to the middleman with capital, in cases of fine expensive work. Cheap common work, which he can produce without borrowing and which ordinary travellers buy as common presents to friends at home, does yield a better profit.

INTRODUCTION OF NEW INDUSTRIES.

Many of the new industries which may be introduced in India through advanced classes have already been mentioned above. Jail industries are of no use, because, as is asserted above, no convict will follow a new line which will brand him as a "gaol bird." Discharged prisoners would be ashamed to work at their adopted trade after they leave the jail.

WHAT (MODEEN) ARTISANS ARE REQUIRED.

Trained artisans are scarce in every important branch of industry, and yet a soap-maker, a match-maker, a candle-maker, a glass-blower, a tanner, a brazier, a pencil-maker, a brush-maker, an oil-presser, a sugar-refiner, a hand-loom weaver, a hand-mill spinner, a calico-hand-working roller printer, and an inexhaustible list of experts will be required by-and-by.

CONCLUSION.

The questions have been answered *seriatim*, but to avoid misunderstanding it may be added that industrial education may be divided into two classes—(1) The production of special Indian high-class Art Ware, such as shawls and other embroidery, brocades, wood-carving, enamelling, inlaying, ceramic work, etc., etc., and (2) Modern industries to counteract the influx of foreign imports, such as soap-making, button-making, match-making, tin work, leather-work, paper, thread, candles, etc., including mechanics, railway drivers, Mill managers, watch-makers, and many other machine workers. The first to be confined to caste guilds and the second to be thrown open to sons of "advanced races" The first requires no regular schools, but the second wants institutions like the Victoria Jubilee Industrial School of Bombay.

NOTE ON INDUSTRIAL EDUCATION IN INDIA, BY MR. B. A. GUPTE.

1. The training given to prisoners in the Government Jails has not proved productive of any appreciable result, because men who learn a new profession are ashamed to practise it for fear of being marked out as "jail birds." The carpet weavers of the Agra Jail who were taken to London for the Colonial and Indian Exhibition were seen by the undersigned hiding their faces at his approach by turning them aside.

2. The education imparted in the Bombay School of Art attracted pupils of all classes only as long as Mr. Griffiths could employ them as drawing masters in High Schools, when the scheme was newly started by Sir Richard Temple. They are now mostly employed as "sign-board painters" and "House Decorators," with the exception of those who attended the "modelling" and the "Architectural drawing classes." The Public Works Department of Government mostly supports them.

3. Education imparted in the Schools of Industry at Ratnagiri and Poona does not deserve much notice as a glance at the results will show.

What then can Government do to educate the "Pānchāls" or industrial classes is a question which can be solved in three ways:—

- (a) It is impossible for Hindu artisans to change their profession without some very inconvenient results as to their position in the caste, and authorities like Sir George Birdwood have decided that by imitating European arts the special industries of India have suffered. Educating Indian artisans in their own hereditary crafts alone therefore will save them.
- (b) But even Indian arts, when taught in Industrial Schools to the sons of artisans, deteriorate in quality by the introduction of foreign designs in the details of the work. This can only be avoided by establishing caste or craft schools under the direct management of the best local artisans, and the general supervision of European officers duly qualified. There are but very few such officers who can spare time to supervise these caste-schools and therefore one or two specialists may be appointed *visitors* to such institutions.
- (c) The chief difficulty is the supply of funds to manage these institutions, and the undersigned begs to suggest that a systematic *tagai* system resembling that followed in the Revenue Department, will meet the want. Advances may be made to individual artisans of approved ability on low interest, and they may be allowed to sell their ware to anybody they like. The real secret of the poverty of the artisans is the fact that the sowkars who advance them money, charge (1) very heavy interest, (2) compel their victims to buy the raw material through themselves, and (3) buy themselves the finished article. They thus make large profit in three ways on one article and leave a very slender margin for the helpless debtor with which to feed himself and his family; marriage expenses, clothes, and other outlays overweigh these struggling wretches to such an extent as to make them practically the purchased slaves of the Banias. When he finds it impossible to do without him, his previous debt ruins his credit with any other sowkar, while his creditor becomes more and more exacting under the firm belief that he has become an indispensable man. The *tagai* advances may with advantage be made through the caste panchayats, who may be asked simply to see that the man does not misappropriate the sums when he sells his ware. Small sums thus advanced will produce

great results—(1) the slave debtors will feel the freedom of action absolutely necessary for the development of healthy competition. (2) They will realize for themselves better profits and when well-fed (3) produce superior stuff which is sure to command a better sale. (4) The caste-system so baneful in other spheres will prove a blessing in acquiring for the artisan class that hereditary facility for handling their tools which alone can produce the wonderful results specially admired in ancient times. For instance the way the Thana silk spinner uses her toes is simply marvellous, the one-sided development of the muscles of the copper, silver and gold-smiths is well known, and the clever scoopers of carved-wood work have a world-wide reputation for the facility they acquire, by inheritance, in manipulating their fingers.

- (d) Caste-crafts-guilds therefore (2) managed by Government, with (3) *tagai* advances on the usual terms, and (4) unrestrained liberty to sell the ware to the highest bidder in the market, with (5) permission to appropriate the regular or fair profit to themselves and (6) stoppage of the triple drain of the Bania, will not only encourage home-education but will protect these wretches in times of drought. If cultivators are given advances there is no reason why an artisan who is equally helpless in India should not. Government debt will of course have a prior claim on the sale-proceeds and the concocted decrees of the sowkars will not affect the proposed *tagai* system. By thus checking the over-powerful Shylocks, Government will confer a lasting boon on the artisans, will protect their caste, their families, and their great heritage, the acquisition of certain traits obtained through a long line of restricted parentage and early education or training received at home during childhood.

Poona, the 5th February 1902.

NOTE ON INDUSTRIES BY MR. D. PUDUMJEE.

I regret my inability to give any information in detail about technical education in the manner required, but I may say that technical schools are appreciated and deserve much larger grants-in-aid from Government than they are getting. For instance, excellent primary technical education is given in the Jubilee Technical School of the Poona Municipality, but higher training in several arts such as furniture and cabinet-making and polishing, wood-carving, metal work, including silver chasing and embossing, electroplating and gilding, plumbers' and tinman's work, moulding and foundry work, dyeing, type-foundry work, and printing, book binding, hand-loom work, and similar minor trades could be introduced, if funds were forthcoming for plant to start with and for annual recurring charges for teaching staff and contingencies.

2. I hold in the greatest respect possible everything emanating from such a high authority in matters relating to technical education, as Professor Dr. A. W. Thomson, and I admit that his theory that, in a school, professions, arts, and manufactures must be taught simply and purely for the sake of education only, without expectation of returns or profits, is correct but correct only where education is prized for education's sake or where the value of such education in after-life is appreciated by the learners or their parents. If I advance any views to the contrary, I do so with diffidence, but I think the principle advocated by Dr. Thomson is doubtless applicable in Europe where the thirst for such education is keen; but in India, if, along with education, pecuniary returns from workshops attached to schools, in which the young learners may be permitted to participate be allowed, it will render the institutions not only much more popular but partially self-supporting. Youths, with such remuneration, however small it may be, could then afford to continue to be trained methodically and practically for a longer period than, in their generally poor circumstances, they are now able to do. This system is practically in vogue amongst artisans in this country such as carpenters, blacksmiths, workers in metal, weavers, etc., who admit lads in apprenticeship (this word bears no analogy to the meaning it carries in Europe, for apprentices here join and leave without the restrictions implied in written bonds) and who pay such learners small salaries, from Rs 2 to Rs 4, according to the progress made by the boys in their respective professions or trades.

3. The above remarks referring to minor crafts of the nature indicated are applicable to large Mofussil towns, where technical education with expanded scope may be most advantageously introduced. For Mechanical training of a higher order such as that necessary for the management of steam engines, cotton, silk, woollen, and paper manufactures, and oil and flour mills, one central institution at Bombay may be considered to be sufficient: perhaps more than sufficient, because with two exceptions, steam engines and cotton industry, the demand for specially trained hands for all the rest of the other larger industries, which may be counted on the fingers of one hand, is so small that it is extremely doubtful if it would pay to have an educational staff of experts out from Europe for turning out, say, one or two qualified men per annum to meet the present very limited requirements. The only schools, not by any means the best, for the training of hands for such industries, are the factories themselves.

4. To train specialists, before factories for such industries are started on a large scale and in large numbers, is sure to end in disappointment to the learners and waste of public money. Chapter B of the Memorandum of points for investigations and enquiries drawn up by the Commission, deals with the subject of industries that may be started in India for the utilization of Indian resources and for profitable Indian investments. A list of such industries can

be very easily prepared (in fact for every raw material that India produces in abundance—and their number, as is well known, is very large—a new industry is possible). But investors and capitalists have so often come to grief mixing themselves up with new industries and manufactures, small or large, that the very name of one is a signal now-a-days for people to keep aloof. This is no exaggeration. An enumeration of such unsuccessful ventures will not prove a difficult matter. I give below a list of such as have been started to my knowledge and which have failed wholly or partially :—

Soap.
Oil-pressing.
Lead pencils.
Lucifer matches.
Acid manufacture.
Rhea fibre extraction.

Sugar.
Brass vessel stamping.
Brass wire drawing.
Fire clay manufacture.
Bricks.
Cotton seed oil.

Dye works.

5. Not being intimately connected with some of the above, it is difficult for me to assign the causes of their complete or partial failure. But I may take the instance of stamping of brass sheets into vessels, an industry that I think may be considered to fall in the category of those indicated in Chapter B of the Commission's list of questions. There are two such factories in existence at Poona. Besides using some machines for punching sheets into discs and stamping them into vessels, the managers employ a large number of men for the processes of turning over the edges of vessels and turning and polishing them. One of the factories (a joint stock concern) went into liquidation, was sold for less than one-fourth its price, and has now come into the hands of private individuals. And both the factories are lingering. Brass wire-drawing, which was an adjunct to the factory that went into liquidation, failed entirely. Oil-pressing, black lead pencil manufacture, and corn milling failed in Poona. An excellent and well-paying trade was carried on in the lithographic line by the "Chitra-Shala Press" of Poona who sold oleographs, printed in very high and glowing colours (mostly Hindu Mythological subjects) by the thousand. German imports of such lithographs, with the same subjects, the same loud colours, and the same defective drawing have (the Germans were wise enough not to introduce any improvements in colours and drawing which they could have easily done) crushed the Poona industry. The failure of some commenced upon a small scale by individual capitalists can be accounted for by the fact that their very smallness precluded the importation of highly paid expensive experts from Europe to conduct them. But those started on a sufficiently large scale have not fared better. There are some that have only proved partial successes and some that are dragging along a lingering existence. The cause of failure and the dread of others in launching into new industries is not far to seek. It lies in *European competition*. Even the largest factories in India (or rather what are considered to be such in this country with limited wealth and more limited enterprise) are but pigmies compared with the gigantic factories in Europe in existence for ages and worked with skilled labour. And yet these pigmies of India of but yesterday's birth are expected to fight giants, some of them at least a hundred years old. Wherein lies the remedy? At the risk of being laughed at for such heretical doctrines, there is but one reply to give; it lies in efficient and solid *State help*, in heavy protective duties or liberal bounties. To those inclined to meet these views with ridicule, one has only to request to look at the position manufacturing industries are holding in Australia, Canada, and America. Not only have they made themselves independent of foreign manufactures but in many instances eclipsed European industries. If these countries had not imposed from 15 to 20 per cent. duties on all articles of foreign manufacture, one can well imagine where these industries would have been this day. In England with her immense wealth with the indomitable enterprise of her sons who could force their way through all difficulties, free-trade may be good. But it is far from being good to a country lacking both in wealth and energy.

6. Although the illustrations which I am going to give do not come under the scope of the enquiries now being conducted, they are so apposite and cognate to the subject in hand, that I take this opportunity of referring to two industries which I am intimate with, the remarks regarding which are almost equally applicable to most of the industries that can come under Chapter B of the Commission's enquiries. Of three Paper Mills started on this side of India only a few years ago, established on a fairly large scale with the latest machinery possible and worked by the best European experts that could be got out, namely at Poona, Gwalior, and Travancore, the two last named, after a severe struggle for existence, succumbed. The Gwalior Mill when it went into liquidation was managed by one of the wealthiest and most enterprising firms in India, Messrs. Finlay, Muir & Co., who spared neither energy nor money to render it a success. The Gwalior Mill Company lost some lakhs over it. The Travancore Mill, which was established under the direct patronage of the Travancore Government, hardly survived two or three years. The Reay Paper Mills Company at Poona, with eight lakhs for its subscribed and borrowed capital, and who paid nearly ₹2,000 per month salaries to experts brought out from England to run the Mills in the beginning, has only managed to keep its head above water. Lest it is presumed that the quality of the produce may be inferior, the agents and directors are prepared to challenge the best experts to show any difference in texture, colour, and strength between the Poona-made and European machine-made papers. Let Government put on 15 per cent. duty on paper and the Deccan Reay Paper Mills Company, or for the matter of that any of the four Calcutta Mills, will not only buy up the Travancore and Gwalior Mills (which can to-day be purchased for the cost of the metal in them), but the Poona Company will find capital to double its machinery, and would promise that in five years Austria and Germany may not be found to

export to India pounds of paper where they are sending out tons. While on this subject I must not omit to mention the collapse of a paper mill established by a Bombay Joint Stock Company at Khadakvasla, near Poona, notwithstanding that it enjoyed the benefit of Water Power.

7. The writer has dwelt on paper trade at this length and has taken it especially for illustration, as nobody is better qualified this side of India than himself to write on the subject with some authority than he is. It would be unjust and ungrateful to say that Government, whose hands are tied down by the rigorous laws of English political economy and English opinion, notwithstanding any opinion to the contrary that they may or may not hold of their own, do not give their support to new industries. It is their proclaimed policy, emphatically urged again on Local Governments by His Excellency the Viceroy only a fortnight ago (*vide* telegrams from Calcutta) to the effect that Governments should buy in India articles manufactured in India, *provided* that they are equal in quality to and not higher in price than, imported articles. Local Governments have hitherto acted loyally to this policy and the Government of Bombay have extended their patronage in this direction to the Poona Paper Mills. This concession, where Government demand for an article is fairly large, is of some value, namely, it ensures fairly prompt payments and absence of bad debts, two desirable factors in trade. But, does the concession confer any palpable advantage to a manufacturer against foreign competition.

8. Notwithstanding that Sulphuric Acid works were started on a large scale in Bombay some years ago by intelligent and wealthy gentlemen like Dr. Blaney, Sir Mungaldass Nathubhoy, Mr. Byramji Jijibhoy, and it is believed the late well-known scientist Dr. Bhow Dajee, they proved as usual a complete failure. The writer of this and his brother Mr. N. Pudumjee began experimenting in the same direction about 4 years ago; these experiments in the hands of the writer's son Mr. Furdunjee have ended in the erection of Sulphuric Acid and Nitric Acid works on an experimental scale, but on the latest scientific principles. The experiment which has resulted in a yield of about 150 lbs. Sulphuric Acid *per diem* (or about the same quantity of Nitric Acid if the Sulphuric Acid be utilized in making Nitric Acid) has so far proved a notable success. The writer was on the point of erecting extensive Acid Works in Bombay (the demand for Acids being limited in Poona and the cost of transit heavy for such a dangerous commodity) when fortunately for him a timely discovery was made that although acid could be made profitably, the want of stoneware jars for holding the acid for export into the Mofussil would prove an insurmountable difficulty. Enquiries ended in the result that the best stoneware manufacturers in India, Messrs. Burn & Co., of Howrah and Jabbalpur, could not make jars which would resist the action of acids, and getting out empty jars from Europe would so increase the cost of the acid as to make the venture unremunerative. Such difficulties as this arising in quite unexpected quarters, which sometimes ruin new industries started on the nicest possible calculations, damp the ardour of investors. Investors in new industries must always have very large margins of profit assured, to be drawn upon in cases of obstacles cropping up in unexpected directions, and such margin only a high protective duty gives. It is a well-known fact that of all chemicals used in large quantities in commerce, Sulphuric Acid is one of the most difficult articles to produce if unnecessary waste of raw materials is to be avoided, owing to the complex chemical reactions in the lead chambers (some of which yet remain to be satisfactorily explained by experts) which require to be carefully watched. After bringing the yield of acid as compared with the raw materials employed to as high a proportion as is reached by most of the largest acid factories in Europe, after years of experimenting on scientific lines and bringing the manufacture to the very door of success, it is disheartening that a trivial difficulty, which for the present appears to be insurmountable, should compel the abandonment of the manufacture of an article which is capable of an extensive development, because Sulphuric Acid is the basis of the production of a number of other chemicals largely used in commerce. It remains to be seen how far reduction of the size of the factory to suit the local requirements of the Island of Bombay alone (where jars travelling between the factory and the consumers is possible) will be consistent with economy of manufacture. The small quantity of acid made in Poona does thus find a ready sale; empty jars being returned by the makers of soda water to the factory to be refilled. This acid was also supplied to the Agricultural Department, some time ago, for turning bones into superphosphates.

9. Now supposing Government were inclined, as they always are, to help new industries, to support the acid industry, it is impossible for them to do so; for not being users of acids on an extensive scale, they cannot extend their patronage by entering into contracts for a certain number of years to buy Indian-made Acids, even though they be *as good and as cheap* as the imported acids.

10. I have taken the liberty to dwell at such length on these two industries, paper and acids, as better illustrations cannot be found of very promising manufactures which can take a deep root in this country if they were supported by protective duties in their infancy. These are fair samples of many other industries that have been tried and that have failed either completely or partially.

11. Doubtless some excellent suggestions will be made to the Commission as regards industries that may be profitably established in this country. In the Appendix attached, I have mentioned some, which will occur to any casual observer.

12. If there had been protection or bounties, there is no reason why India, as America has, should not have possessed by this time her private ship-building yards, factories for the manufacture of steam engines, locomotives, turbines, and other machinery of a hundred kinds.

Perhaps the industries would have taken such a deep and firm root in this country that by this, the time might have arrived for them to live without protective duties. A nation that had for years paid higher prices for its articles of consumption, simply to start and foster industries in their infancy, would justly be entitled to all benefits that legitimate internal competition could give after they had reached a stage where adventitious aid was no longer needed.

13. In conclusion, I would respectfully beg permission to suggest a systematic industrial survey of India, under the direction of well-paid experts imported from Europe, who may issue practical bulletins on manufactures in India, similar to the bulletins issued periodically by Government on Agricultural and Economic Products.

14. In my humble opinion the regeneration of India depends more on the establishment and support of large factories that can turn to use the vast mineral and vegetable resources of the country and that can employ work-people by the thousand, than on the revival of ancient trades such as hand-weaving of carpets, shawls, silks, silver and gold chasing and enamelling, ivory carving, lacquer work, damascene work, artistic pottery and metalware, marble inlaid work, etc., trades which certainly deserve every encouragement that a benign Government can give, but which are calculated to help units and not the nation.

APPENDIX TO MR. PUDUMJEE'S NOTE.

List of industries that may profitably be worked in India aided with improved machinery.

- | | |
|--|--|
| 1. Leather Curing. | 20. Needles and pins. |
| 2. Morocco Leather. | 21. Steel pens. |
| 3. Umbrellas. | 22. Screws. |
| 4. Leather articles. | 23. Envelopes. |
| 5. Soap. | 24. Lucifer matches. |
| 6. Rope walks. | 25. Black lead pencils. |
| 7. Candles. | 26. Brass vessel stamping. |
| 8. Cane and bamboo works. | 27. Rolling machines for rolling scrap-iron into bars or sheets. |
| 9. Hardware. | 28. Chemical works. |
| 10. Improved hand-looms, etc., accessories for cotton, silk and woollen fabrics. | 29. Glass. |
| 11. Hand-made paper. | 30. Flour Mills. |
| 12. Carpet weaving. | 31. Biscuit making. |
| 13. Hosiery (with hand machines). | 32. Sugar. |
| 14. China clay. | 33. Dye works. |
| 15. Hydraulic cements. | |
| 16. Fire clay. | |
| 17. Slates. | |
| 18. Bricks and tiles. | |
| 19. Type-making. | |

In the above list I have put such manufactures as may come in Category B of the Commission's Memorandum of enquiries in the first column, and such industries as require expensive machinery or plant in the second column. Items 1 to 9 are so well known that they need no remarks. Hand-made paper (item No. 11) deserves consideration. This was a regular trade in Poona some thirty years ago, as it is now in Junnar, in the Poona District. In Poona it has almost died out; European paper having driven it out. The native hand-made paper is coarse both in appearance and texture, the processes of pulping and paper-making being both good and primitive. With the English processes, papers very nearly like European hand-made papers can be made by hand. Much manual labour enters in this process. The Reay Paper Mills Company may give it a trial. For a year or two, it will be absolutely necessary to have a European to teach the *modus operandi* which is in many essentials different from the one followed by the natives. Improved hand-looms and accessories (a very clever country-made machine costing about Rs250 is used in Bombay for "beaming" warp threads) will revolutionise the hand-weaving industry in India which is, for obvious reasons, in the decline. Rich premiums may be offered by the Government to machine-makers in Europe and America to invent simple hand-machines to take the place of the rude processes followed from generation to generation in this conservative country. I remember having seen a number of carpet-loom (item No. 12) working in the City of Poona some thirty years ago. There is now, I believe, not one in existence here. European power-loom woven carpets have pushed out of this city, at least, the unprotected indigenous article. Hand-machine for Hosiery work (item No. 13) may be advantageously introduced in this country, but can never gain an extensive use. For items Nos. 14, 15, 16, and 17, raw materials are handy in India. China clay is procurable in abundance in South India, near Castle Rock. Specimens of slate were sent by me for opinions of experts; they were pronounced to be wanting in splitting quality, what is essential for writing slates; sawing (implying heavy machinery) would be necessary for cutting them into slabs for other purposes. Bricks and tiles (item No. 18) have a good opening. Mangalore tiles are well known and largely used; brick manufacture failed, I believe, at Kallyan near Bombay. Perhaps the clays are not suitable. Lucifer matches (item No. 24) and black lead pencils failed; the former at Bombay and the latter at Poona. Difficulty was experienced in getting good soft wood. Indian and Ceylon plumbago was found to be hard and gritty.

Perhaps the grinding and mixing processes were at fault. It is rather difficult to determine in what column item Nos. 20, 21, 22 and 23 should be placed. Twenty years ago the employment of very large numbers of hands for carrying out the processes in their different stages was necessary. Machinery with rapid strides is displacing manual labour. For instance in steel-pen manufacture in those days every woman had her fly-press to do the cutting, rounding, slitting, and embossing processes. I hear all the processes now are conducted with the aid of machines driven by steam power. It was, and perhaps still is, just the industry for India where labour is exceedingly cheap. Hand labour in India in such industries as steel-pens, needles, pins, envelopes, and wood-screws manufactures may yet compete successfully with steam power in Europe. About items Nos. 24, 25, and 26 I have made some passing remarks in the body of my letter. Lucifer matches and black lead pencils are likely industries if a soft wood can be discovered in India. Stamped brass vessel manufacture, even if the industry succeeds well, runs a great risk (under the free-trade doctrine) of meeting the same fate that "Chitra Shala's" oleographs have met; the Germans, if the consumption is large, can as easily export prepared vessels as send brass sheets out to India. Rolling scrap-iron into bars or sheets (item No. 27) ought to pay well in India where numbers of tons of scrap-iron go to waste at present. There is a good future for chemical works for the manufacture of caustic soda, bleaching powder, ether, ammonia both by the chemical and electrolytical processes. Waldie's chemical works, it is said, are doing well at Calcutta. Glass (item No. 29) deserves consideration; I hear the manufacture failed in Bengal. Flour mills, biscuit, sugar, and dye manufactures (items Nos. 30, 31, 32, and 33) are too well known to require any remarks.

The 5th January 1902.

MADRAS.

Proceedings of the Industrial Education Conference held in the Senate House, Madras, on the 29th January 1902.

Present :

LIEUT.-COL. J. CLIBBORN, C.I.E., I.C.S., *President.*

THE HON'BLE MR. JAMES THOMSON, I.C.S., *Member of Council.*

” ” ” H. A. SIM, C.I.E., I.C.S., *Member of the Board of Revenue.*

” ” ” G. H. STUART, M.A., BARRISTER-AT-LAW, *Director of Public Instruction.*

MR. C. J. WEIR, I.C.S., *Secretary to Government, Education Department.*

LIEUT.-COL. H. D. LOVE, R.E., *Principal, Engineering College.*

MR. A. CHATTERTON, *Superintendent, School of Art.*

” E. H. GADSDEN, *Superintendent, Central Jail, Coimbatore.*

” J. ADAM, BARRISTER-AT-LAW, *Secretary, Victoria Technical Institute.*

” G. L. CHAMBERS, *of Messrs. Binny & Co.*

” C. A. RADICE, I.C.S.

” R. E. ENTHOVEN, I.C.S.

REV. FOSS WESTCOTT, M.A.

} *Members of the Committee.*

Mr. Chatterton's written replies, which will be found on following pages, were laid on the table; many of the questions were accordingly passed over.

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—Description of Schools, Government and Private, with methods of Instruction.

Q. (10) What proportion of students afterwards follow the trades they are taught in the school?

A. MR. CHATTERTON said that as regards schools other than the School of Arts, about half of those who left Mission Schools followed the trade they were taught, but he did not think 5 per cent. followed the trades taught in schools such as the District Board School at Bezwada. What attracted these boys to the District Board Schools was the giving of scholarships, and as soon as these expired, the students went back to agricultural pursuits.

Q. (12) Are there any special methods of instruction employed; if so, have any of these showed marked promising results?

A. MR. CHATTERTON said that generally in this Presidency if a man wanted to get on, he must have a knowledge of English, and so this accounted for the compulsory teaching of English in the School of Arts.

Q. (13) Is the instruction specialized for particular students, or are the students run through all the classes of trades taught in the school? Are English or Native methods of instruction used?

MR. CHATTERTON said that wood-work and blacksmith's work were taught at Bezwada. The Bezwada School was not conducted on the same lines as the School of Arts. There was no regular system of indentures at the School of Arts. When a boy came to be admitted to any particular department, it was the custom to first of all put him on to drawing, for which he was charged a fee, and in the meanwhile enquiries were made about him, and if it was found that the lad had any promising qualifications, he was passed on to the particular industrial department he wished to go to; he was kept there learning for about a year or eighteen months, without any scholarship, having, however, to pay a fee, and at the end of that time he got a stipend of R3 for the first year, R4 for the second, R5 for the third, R7 for the fourth, and R10 for the fifth year. Some of the boys who showed greater skill got

bigger stipends, i.e., those equal to the work they did, the idea being to give them the wage they earned instead of the ordinary scholarship. Some were put at piece-work rate and got the full value for the work they did.

In the Mission Schools the students were mostly orphans belonging to the Mission, or were the sons of people connected with the Mission. Formerly they were taught trades by a *mistri*, who gave out a certain amount of work and set the boys at exercises on the same; but in the last two or three years that system has died out, and they were now working on the system adopted by the School of Arts. This system was in no way like Dr. Thomson's system of Manual Training. They frequently had applications to be allowed to adopt Dr. Thomson's system, *viz.*, from Madura and from the Harrison High School, and in both these cases the application for grants was refused, on the ground that if manual training schools were started, they should be connected with general education.

MR. ADAM remarked that up to a very short time ago they had an elaborate system of scholarships for some years at the Victoria Technical Institute, but they had to abandon it owing to the heavy expenditure and no good coming out of it, as only those boys, generally, who had failed to pass the literary examinations took advantage of those scholarships. They had thus failed to attract the proper classes.

MR. CHATTERTON said that what they were doing at present was to keep the scholarships or stipends as low as possible in the earlier stages, in order that there may be some check to attracting the wrong class of people. He would not object to pay a man ₹50 a month if he thought he was worth it.

(6) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—*Proposed alterations and additions in system and methods.*

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. COL. LOVE, after having read Mr. Chatterton's reply, agreed with him generally in his remarks.

Q. (4) Which do you consider the best method of training Foremen or Assistant Managers of Works?

A. MR. CHAMBERS said that the night school was the best system for giving general education to these men. He would prefer them to go on as workmen first and then be trained by a night school. He said that, except for the higher appointments, he would prefer those men who have been at work and who have received a little instruction in the night school. He thought that a knowledge of English for these men was particularly necessary, in order that they may have influence with the work people and also be able to communicate with the senior Europeans who in Madras never learned the Native language. If they had no knowledge of English, they would not command respect from the other artisans. He would prefer having Native Foremen to Europeans, as the latter were somewhat expensive.

COL. LOVE, on being asked his opinion, read Mr. Chatterton's reply and thought it was not quite in accord with Mr. Chambers' views just expressed; but he was not in a position at the present moment to give his views on the point. All he could say was that the resources of the Engineering College were quite equal to the strain, and things could be arranged so as to meet the requirements.

Q. (5) and (6) Final training of Foremen.

A. MR. CHAMBERS recommended the final training of Foremen in a Factory.

2.—*Proposed alterations and additions in schools and of the want of new schools.*

Q. (2) Would you approve of the institution of new schools, etc.?

A. MR. CHAMBERS was asked as to what he thought about the establishing of a Central Industrial School doing work on commercial lines, and he said that he would take serious objection if he saw that this school was competing with the trades; he thought it very unfair if Government was going to help in this project. He also did not approve of the Aluminium Department of the School of Arts. However, he did not object to such schools being started if this was only with the object of giving instruction, but as soon as it was found that they were competing against trade, they should be shut up. He would rather forego the chance of obtaining trained workmen—of which there was a great scarcity at the present moment, he admitted—than see a permanent factory system injuring private enterprise.

N. B.—Mr. Eardley Norton, a Director of the Indian Aluminium Factory, in a communication received after the meeting, strongly objected to the continuance of work at the School of Art.

MR. GADSDEN proposed that Government should help the weaving industry in its preparatory processes.

Q. (3) Do you approve of night schools for the voluntary improvement in theory of artisans and industrial students who are willing to attend and pay a small fee? Are the local conditions likely to lead to success?

A. MR. CHAMBERS having been asked if he was in favour of night schools, said that not only was he in favour of such institutions, but that thousands of work people ("half-timers") in Perambore were only too anxious to attend them. He was prepared, in this connection, to give his men leave to go away early, and he was certain that the Perambore Workshops would do the same. The first thing he would teach them was Reading, Writing, Arithmetic, and English. These men did not know English, which he thought was a great drawback not only with their dealings with the European Superintendents who could not make them understand what they wanted them to do, as a great many of them, if not all, did not know the language of these men, but also they were completely at the mercy of all sorts of agitators. He gave an instance here of what the lack of English led to among his men. He increased their pay 15% all round and immediately they all struck work: they could not understand how their pay was increased 15%. They had no night schools at present.

MR. CHATTERTON said that they had a night school at the School of Arts, which was principally for the purpose of imparting a general education in drawing.

MR. ADAM recommended night commercial classes as being very useful.

MR. CHATTERTON remarked that there had been a night class at the College of Engineering, but it had to be closed at the end of last year, as they did not attract the proper classes. It was originally designed to give special instruction to the sons of artisans, but all sorts of students came to be admitted, the "draw" being the certificate which used to be given them at the end of their term headed "College of Engineering."

The Consulting Architect here is going to establish a class for the improvement of Public Works Department *mistris*.

Q. (4) Should such night schools be under the General Education Department or the Industrial School management?

A. THE HON'BLE MR. THOMSON said that if the night schools were going to teach general subjects, they should be under the General Education Department, but if technical subjects, under industrial management.

3.—How the Neapolitan scheme would apply.

Q. (1) Do you approve of the method of the Naples scheme generally?

A. THE HON'BLE MR. SIM said that he approved of the method of the Naples scheme.

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a Superintendent.

A. THE HON'BLE MR. SIM thought that craftsmen would not consent to work, unless they were engaged as paid workmen, and that they would not communicate their trade secrets, unless their future employment was guaranteed.

4.—Would you accept Experts from abroad in each Industry.

Q. (1) Generally speaking, would it be best to have a working expert, *i. e.*, a general hand for each school, or a specialized working expert for several schools? Is it possible to obtain a sound general expert, and if so, in what trades?

A. MR. CHAMBERS said that although it was possible to obtain a man having a general knowledge of several trades, yet he would not be a practical man.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

A. MR. CHAMBERS would have specialized experts—one man for each trade.

Q. (3) What would be the average annual cost of such an expert?

A. MR. CHAMBERS said you could get experts for R300 and he would give him free quarters. The securing of experts, he said, was a lottery: sometimes a man on R250 turned out to be better than one on R500. They sent home seven Engineers last year as being incompetent.

Q. (4) For what trades at present do you consider specialized working experts are required in this Province?

A. MR. CHAMBERS said manufacturing chemists were very badly needed at the present moment.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (5) Is direct and special Imperial control of Industrial Education necessary for its efficient development?

A. THE HON'BLE MR. STUART does not think that Imperial control is at present necessary.

6.—Exhibitions and sales, whether required.

Q. (4) Regarding industries generally in India, are you aware of any financial conditions which affect—

- (i) Production,
- (ii) Price,

(iii) Returns to workmen,

which could be removed by the reasonable action of Government ?

A. MR. CHAMBERS said he did not know of anything else except Excise Duty on Piece goods. There was also another factor he thought which greatly affected the financial condition of Raw Cotton and Woollen Goods, *viz.*, freights. The charges were very high on these goods on the Madras Railway and complaints were rife. Bombay, he said, seemed to be favoured in this line, whilst Madras was suffering very much from these high rates. Things were so bad here that they could not get a through rate from Madras to, say, Lahore, and very often the Railways from whom quotations had to be obtained did not even care to answer their letters.

MR. CHATTERTON confirmed this statement, and said that it was impossible to develop Madras industries and compete with other parts of India if the Railway charges were going to be so exorbitant.

(c) HOW ARE FUNDS TO BE PROVIDED.

Q. (1) Could the Provincial Funds provide the cost of starting the necessary schools ? If not, how should the cost be divided between the Local Government and the Government of India ?

A. THE HON'BLE MR. THOMSON said that there were no funds available, but any funds given by the Government of India would be utilized. There were no proposals regarding new schools in Madras from Government at present, and they would prefer not to make any such proposals until the question of the Aluminium Factory had been finally disposed of.

B.—INTRODUCTION OF NEW INDUSTRIES.

JAIL INDUSTRIES.

MR. GADSDEN said that very few discharged prisoners follow the trades taught them in the jail, presumably because they earned a fair living in other employment outside. He added that comparatively few *artisans* come into jail. He was asked if the jail could be utilized as a place where Government could carry on experiments in the commercial possibilities of trades, such as chick-making, and other simple hand industries, to which he said that it would be possible, but an expert would have to be engaged for its management.

WHAT ARTISANS ARE REQUIRED.

Q. Are there any lines of work requiring trained artisans of which the supply is now limited or badly trained ?

A. MR. CHAMBERS said that they had never been able to get any chemists—alkaline chemists. Indeed, they could not get any sort of trained artisans: they had to import them from England in connection with dyeing, sugar works, soap works, etc., etc. They wanted men with some chemical knowledge for the alkaline manufactures. Dyeing, he said, was the principal line that men were wanted in, at present they were being got from the Yorkshire College.

GOVERNMENT OF MADRAS.

E D U C A T I O N A L D E P A R T M E N T .

READ—the following paper :—

From the Hon'ble Mr. G. H. STUART, M.A., Barrister-at-Law, Director of Public Instruction, Madras, to the Secretary to Government, Educational Department, dated 18th January 1902, R.C. No. 9425.

With reference to paragraph 3 of Lieutenant-Colonel Clibborn's letter communicated with G.O., No. 768, Educational, dated 20th December 1901, I have the honour to submit herewith in original Mr. Chatterton's letter, No. 509, dated 15th instant, which furnishes the information required. As regards paragraph 4 of the former letter, I beg to invite the attention of Government to my telephone message of the 14th instant stating that the Committee may visit the Technical Institute, Madura, and the Wesleyan Mission Industrial School, Karur.

2. I request that I may be furnished with a few spare copies of Mr. Chatterton's letter and appendices, if it is printed.

ENCLOSURE.

From A. CHATTERTON, Esq., B.Sc., Inspector of Technical Schools, Madras, to the Director of Public Instruction, Madras, dated 15th January 1902, No. 509.

In reference to your endorsement No. 9425 of 1901, dated 23rd December 1901, I have the honour to forward herewith replies to the questions raised by the Industrial Commission. The papers referred to in the answers will be sent to-morrow.

INDUSTRIAL SCHOOLS.

IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

1.—*Description of Schools, Government and Private, with methods of Instruction.*

(1) The list of Industrial Schools, Government and private, in the Madras Presidency, with date of foundation, industries taught, average attendance, and output of artisans annually is given overleaf. The list is nominally not complete, inasmuch as a number of petty schools and industrial classes have been omitted.

Number.	Name of School.	Date of found-ing.	On 1st April.		Industries taught.		Receipts.		
			Year.	Num-ber of pupils	Average attend-ance.	Name.	Standard.	Provincial funds.	Other public sources.
							R a. p.	R a. p.	
<i>Government Schools.</i>									
1	School of Arts, Madras.	1850	1897	633	411	Metal work	Advanced	...	...
			1893	546	368	Silversmith	Intermediate	...	...
			1899	525	329	Jewellers' work	Do.	...	...
			1900	568	398	Cabinet-making	Advanced	...	...
			1901	461	374	Carpet-weaving	Intermediate	...	...
2	Reformatory School, Chingleput.	1887	1897	153	152	Cotton-weaving	Do.	...	...
			1898	151	153	Pottery	Do.	...	...
			1899	149	148	Engraving	Advanced	...	...
			1900	156	149	Modelling	Do.	...	...
			1901	154	153	Carpentry	Intermediate	...	...
<i>Board Schools.</i>									
3	Board Technical Institute, Madras.	1890	1897	125	94	Blacksmithy	Do.	...	...
			1893	117	115	Metal work	Do.	3,492 1 6	1,000 0 0
			1899	112	115	Blacksmithy	Intermediate	3,212 2 3	1,000 0 0
			1900	160	142	Rattan	D	3,068 2 0	1,000 0 0
			1901	167	135	...	...	4,095 5 3	1,000 0 0
4	Board Technical Institute, Tinnevely.	1895	1897	38	29	...	...	...	...
			1898	46	42	Carpentry	Elementary	210 14 0	...
			1899	47	42	Blacksmithy	Do.	940 14 6	...
			1900	60	46	Rattan work	D	381 12 0	...
			1901	52	46	...	...	2,464 2 7	...
5	Board Industrial School, Beswada.	1890	1897	32	26	...	...	...	...
			1893	33	33	Carpentry	E	862 8 0	...
			1899	37	33	Blacksmithy	E	810 0 0	400 0 0
			1900	38	35	...	...	1,150 0 0	...
			1901	31	32	...	...	550 0 0	200 0 0
<i>Schools under private management.</i>									
6	Anjumani-Muffi-Ahli Islam, Madras.	1884	1897	156	107	Carpentry	Elementary	1,930 10 8	3,755 4 10
			1898	178	109	Embroidery	D	1,348 4 0	3,255 0 5
			1899	100	87	Tambour	D	1,330 3 0	3,203 2 8
			1900	100	90	...	...	1,067 15 8	2,728 7 0
			1901	100	93	...	...	979 2 3	2,928 13 3
7	Wesleyan Mission Industrial School, Karur.	1888	1897	87	81	Cabinet-making	Advanced	3,956 8 1	...
			1898	88	88	Blacksmithy	Do.	4,485 12 8	72 0 0
			1899	71	94	Weaving	Intermediate	5,499 7 0	88 8 0
			1900	71	75	Rattan work	D	4,017 7 7	81 0 0
			1901	63	64	Band	D	4,423 14 5	103 8 9
8	Art Industrial School, Nazareth,	1878	1897	158	150	Carpentry	Intermediate	4,571 6 2	390 0 0
			1898	178	173	Cabinet-making	Do.	5,721 0 0	390 0 0
			1899	192	180	Blacksmithy	Do.	4,618 13 9	390 0 0
			1900	159	151	Fitter's work	Do.	3,166 15 0	390 0 0
			1901	147	140	Weaving	Do.	2,163 8 0	390 0 0
9	American Mission Industrial School, Manamedura.	July 1897	1898	4	6	Lace-making	Do.	...	...
			1899	17	9	Indian embroi- dery.	D	...	...
			1900	43	30	Carpentry	Elementary	84 0 0	...
			1901	65	59	Blacksmithy	A	84 0 0	...
			1901	65	59	...	...	96 0 0	...
10	American Aroot Mission Industrial School, Arni.	1887	1897	64	57	Carpentry	Intermediate	3,958 8 0	...
			1898	67	65	Tailoring	Do.	1,159 8 0	...
			1899	74	48	Printing	Elementary	...	...
			1900	86	70	Blacksmithy	Intermediate	2,045 14 0	...
			1901	71	68	Masonry	Abolished 1899.	2,193 15 0	...
							1,800 0 0	...	
St. Patrick's orphanage, Adyar						Carpentry	Aided.	...	...
S. P. G. Boys' School, Puttur						Do.	Do.	...	...
Metur Technical School, Tuticorin						Do.	Do.	...	...
Danish Lutheran Mission School, Mee Tekan, South Arcot.						Do.	Unaided.	...	...
Beripet Industrial School, Nellore						Do.	Do.	...	...
A. I. A. H. Industrial School, Vellore						Do.	Do.	...	...
Carpentry class, Vaniyambadi						Do.	Salem Board.	...	...
Ootacamund Lawrence Asylum						Do.	Govt.	...	...
Madras Industrial School						Do.	Aided	...	...

(2) The schools included in the list are—

The School of Arts, Madras, which was started in 1850 by the late Dr. Hunter as a private concern. In 1855 the school was taken over by Government, and since then has been attached to the Educational Department. It is now difficult to say why the present location was selected as the school was started in Popham's Broadway and was moved to the present site in 1857. A brief history of the school, written by the head clerk, Mr. S. J. Daniel, is appended to these replies.

The Reformatory School at Chingleput was started in 1887. The site selected was an old native fort within a reasonable distance from Madras and at the head-quarters of a district where there are the necessary European officers for proper supervision.

The Anjmani Mufidi Ahlai Islam, Madras, was started in 1884 with a view to encourage poor Mubammadans to earn their livelihood as artisans. For a long time it was located in very suitable premises in the middle of Triplicane, but quite recently it has purchased much less suitable premises on the Mount Road. The only reason I can imagine for the change in site was the desire on the part of the Muhammadan community to place the institution in a more conspicuous position in Madras, where it is hoped that it will attract more attention from the public and command a greater degree of support in consequence.

Of the other schools, those at Madura, Tinnevely, and Bezwada are maintained by the District Boards. The first two are situated at the head-quarters of the districts and the third at the most important commercial centre in the district.

The remaining schools on the list all belong to various Christian Missions and they have been started at the head-quarters of the Missions.

(3) In the Madras Presidency there has been an Inspector of Technical Schools since April 1900, and the policy pursued in all Industrial Schools, whether maintained by Government, District Boards, or Missions, is practically determined by that officer subject to the approval of the Director of Public Instruction. The School of Arts is a Government institution, which was formerly under an officer of the Indian Educational Service; but since February 1901 the school has been placed under me during the period I am on special duty. At the present time the Art department is under Mr. M. Velayuda Asari, who is responsible for all the art teaching. The Industrial section is directly under me and I have two Industrial assistants—Sub-Conductor G. K. Brand, whose services have been borrowed from the Public Works Department, and Mr. J. W. Coombes, who has lately returned from a course of technical study in England. The former devotes most of his time to the metal work department, and the latter has been specially appointed to assist in the development of the weaving industry.

The Chingleput Reformatory is in the charge of the medical officer of Chingleput District, assisted by a Deputy Superintendent, who lives on the spot. There is a board of visitors, appointed by Government; but the control of the institution is practically in the hands of the Educational Department. The District Board schools are under the management of the Presidents of the District Boards. Each school has a Superintendent appointed by the District Board; but his powers are very limited, and as the Inspector of Technical Schools is only an advising officer, the responsibility for the efficiency of the school rests almost entirely with the President of the District Board.

The Mission schools are usually managed by the senior Missionary of the circle in which they are situated. He is invariably an European and generally a man with some mechanical knowledge. At Nazareth there is a Native Christian Superintendent, at Karur an European mechanic is the Superintendent, whilst at Arni he is an American. At Salem and Manamadura the Missionary Manager is also the superintendent of the school. Grants-in-aid to these schools are given from Provincial funds and they are visited once a year by the Inspector of Technical Schools, who reports upon their efficiency and advises the managers as to their control and working.

(4) None of the schools are self-supporting. The nearest approach to this is in the industrial side of the School of Arts, the aluminium department of which is quite self-supporting and the other branches are nearly so. The following table shows first the total number of apprentices in the school, the total expenditure on industrial operations and office establishment, the total sale receipts, and the net annual cost of each apprentice.

Name of Institution.	Year.	Number of apprentices on 1st April.	Receipts.			Expenditure.			Net cost.	Cost of educating each apprentice.
			Sale-proceeds	Industrial operations.	Office establishment.	Total.				
School of Arts	1897	300	₹ 7,377 15 3	₹ 18,128 2 1	₹ 11,472 12 7	₹ 29,600 14 8	₹ 22,223 15 5	₹ 111 1 10		
	1898	190	₹ 5,137 8 5	₹ 18,661 13 10	₹ 12,041 8 7	₹ 30,703 6 8	₹ 25,565 14 0	₹ 184 8 10		
	1899	200	₹ 9,439 6 9	₹ 21,922 5 0	₹ 11,464 4 3	₹ 33,286 9 3	₹ 28,847 2 6	₹ 119 3 9		
	1900	239	₹ 9,384 14 9	₹ 35,384 11 4	₹ 12,771 12 0	₹ 48,156 7 4	₹ 38,771 8 7	₹ 162 3 7		
	1901	222	₹ 17,322 10 11	₹ 30,922 13 8	₹ 12,137 8 10	₹ 48,060 6 6	₹ 25,737 11 7	₹ 115 15 0		

(5) Industrial Schools in this Presidency owe their origin to the necessity which the Christian Missions experienced for finding employment for the children brought up in Mission Schools. As Christians the boys could obtain no instruction in the bazaars and it was

doubtless felt desirable to keep them as much as possible within the sphere of Christian influence. The establishment of Industrial Schools was the obvious solution of the difficulty. Carpentry, blacksmith's work, rattan work, and weaving were the trades which it was thought it would be most desirable to teach. The first two were trades, about which the Missionaries generally knew something themselves; and for the outturn from their workshops they were certain of a limited demand from the Europeans and officials in the district. Rattan work was started, partly from reminiscences of the Industrial Schools in England and partly because it was convenient to keep a rattan mistry in the school to cane chairs and make baskets. The weaving was undoubtedly started through seeing the great commercial success which has been achieved by the Basel Mission on the West Coast. Till quite recently no attempt was made to teach anything in Industrial Schools beyond these four industries; but of late the Education Department has advocated a bolder policy and the managers of Industrial Schools are beginning to follow it.

(6) The Superintendents of District Board schools were originally the Superintendents of the District Board normal training schools, and as may be imagined their qualifications were of the slightest possible character and their pay correspondingly small. At the present time the Superintendent of the Madura Industrial School has developed into a good business manager and he devotes the whole of his time to the Industrial School. His pay is Rs. 200 a month and he is worth it. The Superintendent of the Tinnevely school has also been relieved of his normal school work, but he shows no aptitude for industrial work and he will shortly be transferred from the post. His pay is Rs. 90 a month. At Bezwada, there is no permanent Superintendent and the District Board apparently cannot make up their minds to allow sufficient pay for a suitable man. The Anjuman usually employs a pensioned artificer from the Gun Carriage Factory as Superintendent and his pay, Rs. 50 a month, is generally rather more than he is worth. As the school is in an unsatisfactory condition, as Inspector of Technical Schools I have suggested to the Director of Public Instruction that a competent European Superintendent on a salary not exceeding Rs. 500 a month should be appointed, in the hope that he will be able to place the school in an efficient state and thus render it capable of being a real help to the Muhammadan community in Madras. In the Mission schools, the appointment of superintendents and managers entirely rests with authorities of the Mission and the results are on the whole much more satisfactory than in the District Board schools. At Karur and Arni the Superintendents are practical workmen and though I cannot say much for the efficiency of the latter institution, I have no hesitation in saying that Karur is the best carpentry and weaving school in the Presidency.

(7) With reference to Superintendents it will be seen from the replies to No. (6) that no regular arrangements have been made for turning out a suitable class of men. The College of Engineering is the only place in the Presidency where the necessary theoretical and practical instruction can be readily given; but the pay which has hitherto been offered to Superintendents of Industrial Schools has not been sufficient to attract students from that institution. As Inspector of Technical Schools, I find great difficulty in getting suitable men and I lately proposed that the students of the Engineer class in the College of Engineering should be allowed to undergo their practical course under my supervision in the workshops of the School of Arts, with a view to future employment in Industrial Schools, but the proposal was negatived by Government. It is to be hoped, however, that, when the workshops of the School of Arts are in a more thoroughly equipped condition, Government will consider them sufficiently satisfactory to allow a certain number of Engineer students to attend them for practical training. The instructors in the Industrial Schools were in almost all cases workmen drawn from the bazaars or from engineering establishments managed by Europeans. Lately, a certain number of them have been trained in Industrial Schools; but owing to the unsatisfactory instruction given in these schools, they have not proved to be much better than the untrained men. The necessity for central training schools is greatly felt, and it is hoped that the Industrial side of the School of Arts will be able to undertake this work for some industries.

(8) In Mission schools the pupils are all Native Christians and the majority of them are probably orphans who have been received into and brought up in homes supported by the Missions. With regard to the School of Arts and the District Board schools it cannot be said that hitherto there has been any particularly definite object. It was considered desirable to have Industrial Schools and to afford instruction in certain industries. It was lately felt that a fair proportion of the students should be drawn from the artisan classes; but so long as the rolls of the school showed a sufficient number of pupils, no particular effort was made to attract one class more than another and the preponderance of the artisan class in certain schools is probably due to the influence of the artisan mistries and not to any definite attempt on the part of the school authorities to influence the artisan class. It is the scholarships and stipends offered by the school that attract pupils and without these there would be at the present time no pupils. I am strongly of opinion that in institutions supported by public funds, the majority of the stipends and scholarships should be awarded to pupils belonging to the artisan classes. In the first place they prove much more apt pupils and secondly the artisan classes are suffering so much from the competition of Indian mills and factories and imported goods that I think it is undesirable to add to the numbers by the indiscriminate training of outsiders.

(9) There are no generally adopted rules regulating the points referred to in this question. The most satisfactory reply will probably be to state the practice of the School of Arts.

Boys who wish to join in the industrial classes should be over 14 years of age and have undergone preliminary training in drawing. If satisfactory they are admitted as probationary apprentices for one year, during which time they get instruction in drawing and attend the workshops. If at the end of one year their progress and conduct have been satisfactory, they are enrolled as apprentices for five years. During the first year they receive three rupees a month, during the second, four rupees, third, five rupees, fourth, seven rupees, and fifth, ten rupees, and it is within the power of the Superintendent to grant additional stipends to specially deserving apprentices in their fourth and fifth years. All but the sanctioned holidays have to be taken on loss of pay and one-eighth of the stipend is placed in the Post Office Savings Bank, where it is retained till the pupil completes his term of apprenticeship. It may be forfeited for misconduct, irregular attendance, or non-completion of the full term of apprenticeship. The system gives us a hold on the boys and provides those who leave the school on the completion of their full course with a sufficient sum of money to enable them to purchase a good outfit of tools if they wish to set up in business for themselves. At the end of each year the apprentices are examined by the school staff to ascertain their fitness for promotion. Each boy is supplied with a service book and in this book a complete record of the work done is entered every month, and once a year the nature of the progress he has made as tested by the school examination is recorded. At the end of the period of apprenticeship a certificate as to his qualifications and fitness for industrial work will be entered by the Superintendent and the service book handed over to the boy. By this plan there is a complete account of the boy's training and any one wishing to employ him will be able to very easily ascertain what his previous experience has been and what opinion has been formed of him by the school authorities. For the maintenance of discipline among the apprentices of the School of Arts, occasional thrashing of the younger boys is found very efficacious, among the older boys the only practical form of punishment is fining; but latterly the system has been adopted of paying the fines into the boy's Savings Bank account. This does away with most of the objections to the system of fining as a punishment and automatically increases the hold on those boys over whom it is necessary to have some kind of tangible power.

(10) Hitherto the majority of the students in the School of Arts have learnt a trade in order that they might get free instruction in drawing; but the regulations now in force practically prevent this occurring in the future. No accurate record is available regarding the after careers of students who have left the Industrial Schools in this Presidency. Attempts have been made to keep such records, but in practice it has not been found possible to do so and I should think that probably no more than 25 per cent. of the pupils follow the trade they have been taught in the schools. A considerable number become drawing-masters and I have not the least doubt that more boys would follow the trade if it were possible for them to get remunerative employment. The fact, I think, must be confessed that judged from this the most crucial test that can be applied to the efficiency of Industrial Schools, the system of industrial education has been but a very partial success. The new policy which we have adopted and which is best exemplified in the School of Arts and the Madura Industrial School will, it is hoped, lead to more satisfactory results.

(11) In all Industrial Schools the materials and tools are provided by the school authorities, and it is only in the Aluminium department of the School of Arts that the piece-workers are required to supply their own tools. In all Industrial Schools the useful work turned out is sold and the sale-proceeds help to defray the working expenses of the institution. One of the greatest difficulties which the managers of the Industrial Schools have hitherto experienced, has been to find a ready market for the school products. It has never been considered that the disposal of articles manufactured in the school is a matter of vital importance, and of late, in my capacity as Inspector of Technical Schools, I have very strongly urged the necessity for making Industrial Schools more business like in their methods of working. The value of time is an item which is generally regarded of no importance and boys trained in Industrial Schools are seldom smart or efficient workmen. They may be able to turn out work of good quality; but they are nearly always very slow and the result is that their labour is extremely costly. In consequence, the work turned out in Industrial Schools is always sold at a loss; and so long as this continues it is pretty evident that whatever the schools may be doing for the benefit of the pupils, they are doing very little to advance industry.

(12) It is only in the School of Arts that any methods of special instruction have been applied and these have met with great success. A few cases will exemplify the method of procedure adopted. For a long time there was a demand for sepoy's water bottles which we were unable to get our workmen to turn out. It seemed likely that there would be a big trade in them if we could teach the men how to make them. I accordingly kept the best mistry I have got at this special work for three months, at the end of which time he had succeeded in making what was wanted and he was then told to teach each piece-worker mistry the way to hammer up these bottles; and they were required to produce a certain number. I then took an order for a hundred bottles and executed it at a considerable loss. Further orders were taken and as the men increased in skill the rates were reduced till at the present time we turn out at a fair profit about 1,500 water bottles every month and there are at least 150 men and boys in Madras who are capable of making them. In all, more than twenty thousand of these bottles have been made and about a quarter of a lakh of rupees has been disbursed by the School of Arts as wages. Another example may perhaps be taken from the weaving department, where the principal work at the present time is the manufac-

ture of Madras handkerchiefs by the European hand-loom, in which a fly shuttle is employed. Weavers who already know the native trade are employed on piece-work and are first put through a preliminary course of dungaree weaving and when they have acquired sufficient skill in the mechanical manipulation of the loom they are set to weave the finer handkerchief and their piece-work rates are fixed at a high level to induce them to turn out the best result they can. The old methods of teaching are satisfactory enough and the main thing at the present time is to get the artisans to adopt new processes of working and to familiarize themselves with the use of better tools. In consequence in the School of Arts we pay more attention to the training of the workmen than to the training of the apprentices. Till the former have been dealt with properly, it is useless to attempt to do much with the latter. We have plenty of good metal workers now and the metal work apprentices are put to work with these men, who spend a good deal of time in teaching them so that they may reap the benefit of their services. Broadly speaking the most efficacious way of teaching is to make a visible pecuniary result the reward of diligence and application.

(13) In all Industrial Schools in the Madras Presidency, each apprentice is supposed to learn only one trade, but the rule is not rigidly adhered to in some schools. There is no objection to a carpenter learning a little blacksmith's work or a metal worker fitting, since these are allied trades but it is not much good teaching metal workers weaving or carpenters rattan work.

(14) Most of the Industrial Schools in the Madras Presidency devote a certain amount of time to general education and the boys are in some cases prepared for such recognized examinations as the Primary and Lower Secondary. The conditions in Madras as compared with the rest of India are quite exceptional; and it is, I think, on the whole, advisable that artisans should acquire a colloquial knowledge of English. Europeans in this Presidency do not speak the vernacular languages with facility and it is therefore desirable that the better class of workmen should be able to talk to them and receive instructions from them without the intervention of a third party.

(15) It is now the accepted policy of the Madras Educational Department that the only *raison d'être* for the existence of Industrial Schools is that the work turned out should be an improvement upon anything that can be obtained locally or that the industry should offer prospects of material improvement. The establishment of the Aluminium industry by the Madras School of Arts is the best known example of work done in this direction in recent years; but I would also draw attention to the pottery industry which is well established in this Presidency owing to the initiative of the School of Arts. It will therefore be no longer carried on by us as a commercial industry as has been the case for the last 50 years. The schools at Madura and Karúr are the only efficient institutions in the districts, and in both of them the work turned out and the methods of working are very much superior to anything previously in existence in those localities. The wood-carving and the metal work at Madura are excellent, and I have already mentioned that the wood-work and weaving at Karúr are the best in the Presidency.

(16) From the replies to the previous question it will be seen that the system of industrial education in the Madras Presidency is now passing through a period of transition. I am convinced that the methods we have adopted in the Madras School of Arts are the best that can be devised to meet our local circumstances and the only improvements that can be expected lie in the direction of extending the sphere of operations. A thoroughly satisfactory industrial training can only be given in a workshop, where the best work is turned out in sufficient quantities to render it practicable to employ the best methods of manufacture and thus turn out work at the least possible price. This can only be done when operations are carried on as in a commercial factory and the same attention must be paid to the development of business as is done in private firms. The artisan classes are in an extremely backward state; not only do they want a much better education in their trade but their trade itself wants developing and it is the development of the indigenous trades of India that is the crux of the whole problem. It is quite useless to turn out good workmen unless there is work for them to do, and at the present time it is difficult for good workmen to get good work and receive adequate remuneration for their labour.

2.—Native system of Apprenticeship.

(1) In the south of India there are few workshops or factories in which native arts and trades are carried on. Most of the work is done by petty groups of artisans who work in their own houses and in the bazars. The artisans all belong to certain castes or sub-divisions of castes and practically outsiders have no chance of learning those trades. The native master workman usually employs a certain number of his relatives and a certain number of hired men belonging to the same caste. If he has sons, they are brought up in the workshop from early childhood and much in the same way as they learn their mother tongue they pick up a knowledge of their father's craft. The workmen also bring their children and, without any elaborate system of apprenticeship being enforced, the same results are obtained as in countries where such exists. The great bulk of artisans are very poor; and it is necessary that their children should commence to earn their livelihood at as early an age as possible and it is the practice in the bazar to give all the children, whose work in the workshops is worth anything at all, small wages which gradually increase as the boys get older and become more useful.

(2) So far as I am aware the supply of artisans for all trades is by the methods described above.

(3) The native system was well adapted to the industrial condition of India till the time when manufactured goods were imported from abroad and artisans were first subjected to the stress of foreign competition. The native system is in practice that of a rigidly closed Trade Guild. It prevents the number of artisans in any one trade becoming unduly large and protects the members of the caste from the pressure of the competition in India itself. This advantage, however, is more than counterbalanced by the fact that the artisans are cut off from the rest of the industrial world and continue to pursue the most antiquated methods of working notwithstanding the fact that they have long been superseded everywhere else.

(4) Good workmen generally obtain a local reputation in the neighbourhood where they live ; and in certain localities where a particular trade flourishes there are often a considerable number of skilled men. Native artisans pursue very primitive methods of conducting business. They only work to order and have seldom anything in stock which would enable one to ascertain the possession of unusual skill. A certain number of artisans are well known to dealers in Indian art wares, but the bulk of the work done for them is cheap and very shoddy. When one sees a particularly good specimen of native work of any kind, inquiries may lead to finding out who executed it and in this way the majority of the good artisans have been discovered. In the School of Arts and in some Industrial Schools a number of first-class workmen have gradually been collected or trained and not the least important part of the work which has been done by these institutions in the past is providing continuous work for these men.

(5) The native system of apprenticeship is distinctly inferior to that of the typical Industrial School in the Madras Presidency. It is unsuited to the times and it would be impracticable for the Educational Department to interfere with it in any way. The Native artisan is very conservative, very ignorant, and very prejudiced, and is not likely to allow himself to become subject to outside influence except when employed as a workman in a workshop or a factory.

(6) Native apprentices never pay any fees but, as before stated, they are usually paid according to the value of the work they can do. Some of the sons of the better class artisans go to vernacular schools, where they learn to read and write ; but very few, and only under exceptional circumstances, ever get more than a very elementary education.

(7) Craftsmen never, or at any rate very rarely, take as apprentices boys belonging to other castes than their own.

(8) I have never heard of any native agency whereby famine sufferers have been induced to take up any trade other than that of their hereditary calling.

(9) I think it would be useless to attempt to devise any system to offer inducements to native artisans to extend or improve their method of teaching. Hitherto Industrial Schools have had no influence whatever on the great bulk of the artisan community and it is to obtain this influence that I advocate so strongly the employment of large numbers of artisans in all Industrial Schools.

(10) and (11) I am not aware of the existence of any Trade Guilds in this Presidency, except at Madura, where the weavers who belong to the Sourashtra community have started an association with the avowed object of improving the conditions of their trade. They have recognized the evils from which they suffer but so far they have been unable to do anything to improve the condition of affairs and on several occasions they have appealed to me for assistance, but hitherto I have not been in a position to do anything for them. If the weaving experiments I am now carrying out result in any material improvement of the hand-loom industry, I have no doubt that the Sourashtras of Madura will be very glad to avail themselves of our experience. It must be remembered, however, that the artisan community have very little capital, and as the introduction of improved methods invariably entails expense and as it is impossible that any material changes can be effected without it, the supply of capital must be obtained from some source. In the first instance Industrial Schools find this capital and if they succeed in demonstrating the commercial success of their improvements, there will probably not be much difficulty in inducing the flow of capital into the industry. The only example that I can give of this at present is the establishment of the two Aluminium Companies which are now working in Madras and which are the direct offshoots of the metal work department of the School of Arts.

3.—*The principal Industries of the Province.*

(1) There are no important industries in this Presidency such as exist in Bombay, Cawnpore, and Calcutta. There are a few cotton mills, weaving sheds, cotton presses, and ginning factories, several large railway workshops, two or three small iron works, one Portland cement works, one or two oil presses and a number of important tanneries, all of which are carried on by joint stock companies with European or native capital. The other industries of the Presidency are practically unorganised and in the hands of the artisans. They may be sub-divided as follows :—

(a) Building trades, including brick-making, carpentry, stone mason's work.

(b) Metal-work trades, including goldsmiths, silversmiths, coppersmiths, brass and bell metal workers, tinsmiths, and a great variety of minor sub-divisions.

(c) Textile trades, including cotton-weaving and printing by hand blocks, silk-weaving, and the manufacture of carpets.

(d) Wood-working such as cabinet-making, coach and carriage building, boat building, and ornamental wood work of various kinds.

(e) Tanning and the preparation of hides and skins for export trade.

(f) A variety of miscellaneous industries such as glass manufacture, fire-works, paper and mat-making.

(2) and (3) I am not prepared to make any special recommendations at the present moment as, without detailed investigation and probably experiments, it is impossible to say what can or cannot be done to improve the prospects of any branch of industry. By accident I was forced to pay attention to the metal trade in this Presidency, and as my experience extends so it seems to me to do the possibilities of the trade. The quantity of metal work imported into India is very large and I see no reason why the greater part of it should not be profitably manufactured in well-equipped factories in this country. Excluding from consideration the engineering trades, there is a sufficient market in India for several factories making locks, hinges, buttons, lamps, and miscellaneous Birmingham brass work. The native methods of smelting iron are certainly worth investigating and could probably be greatly improved, and it seems to me not impossible that a trade in cutlery and light Sheffield goods might be successfully established if funds were available for the preliminary work. Native metal workers are very clever and, if properly organised and trained, could turn out a great variety of ornamental work such as is now made in Paris and other continental cities. The weaving trade is by far the most important in this Presidency and the weavers are in a very impoverished condition through the competition of piece-goods. For some time past we have been experimenting with this industry; and though no conclusive results have yet been obtained, I am hopeful that improvements in native methods of weaving can be effected which will increase both the quality and the rate of output. Experiments are now in progress at Madras, Chingleput, and Karnr, and it will be possible for the Commissioners if they so desire to investigate the methods of procedure for themselves. In the School of Arts, a good deal has been done to develop an export business in high class cabinet work and every year a good many thousand rupees worth are sold, but the business is not one capable of any great expansion. I think it is probable that, if works were set up in a suitable locality, glass of sufficiently good quality could be manufactured to compete with the very extensive imports of glass bangles and beads from China; and if success were obtained, other developments might follow. This, however, is hardly the work which should be done in an Industrial School.

In a paper presented by Dr. Watt to the Educational Conference at Simla, of which copies have, I presume, been furnished to the Commissioners, he discusses the question of applying chemical knowledge to the improvement of the processes of preparing for the market many of the agricultural productions of the country; and although I am not quite so sanguine as is the Economic Reporter to Government regarding the improvements which would follow, yet I fully endorse his views as to the necessity for the establishment of a chemical research laboratory, and I would strongly urge the desirability of extending the sphere of operations of the industrial side of the School of Arts so as to include technical chemistry.

(4) I think it is probable that every industry would be the better for a complete examination of its process by a technical expert, and I have not the least doubt that in some cases important improvements could be effected. It is purely a matter of expediency which should be dealt with first, and I think it is quite likely that a great deal could be done for industries which are now very insignificant.

(b) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—*Proposed alterations and additions in system and methods.*

(1) and (2) The methods adopted in the School of Arts, Madras, when fully developed are the best that I had been able to devise, and I think they are to some extent adequate to the needs of the Presidency. Our greatest deficiency at the present time lies in the absence of competent experts to train the workmen and generally to supervise the manufacturing processes. Personally I am not an expert in any trade or industry, and the improvements that I have introduced are only such as any scientific engineer would devise, and my work is constantly hampered by lack of experience and consequent inability to introduce any radical changes in industrial operations. If my assistants and foremen had been trained in European shops, where the same class of articles are manufactured, we should doubtless have been able to make much more rapid progress.

(3) I do not consider it desirable to make any special provision for advancing specially promising students from an industrial institution to one of a higher class. Very exceptional merit can always be dealt with by exceptional methods, but the great bulk of the artisan community are very slightly-educated, and by the time any unusual ability is likely to be discovered in an Industrial School it would be too late to remedy the defects of early education

sufficiently to enable the pupil to take advantage of courses of instruction in technical schools.

(4) Up to the present time men engaged in industrial education have picked up their knowledge and experience as best they could, with the exception of the Superintendents of the Industrial Schools at Karur and Arni. Very rarely men belonging to the artisan class are sufficiently well educated for the posts of foremen or assistant managers. I have, however, come across one or two such and in every way I think they were better than the average man who comes out from England. I think it is essential that boys destined for employment in the higher posts in works and manufactories should be well educated, and in this Presidency that means that they should receive a university education up to at least the F.A. standard. Their special training should be given in the Engineering College. Unfortunately, there is no special course of instruction arranged which is exactly suitable. The subjects of study should include mechanical drawing, mathematics, applied mechanics, and elementary science and the student should spend from one-third to one-half of his time in the workshops. The course might last two years and the pupil should then be transferred to the Industrial department of the School of Arts, or to some large workshop, where he would get a wider range of practical experience.

(5) I am of opinion that the only way in which indigenous industries can be placed on a better footing is by the introduction of the factory system. Capitalists will have to set up the works and employ the artisans and the managers or foremen will have to be men not only with technical knowledge of the trade but with business experience also. It is, therefore, impossible that their training should be completed in either a College or an Industrial School, unless, indeed, the latter be run on commercial lines as I have already advocated.

(6) Presuming that the boys have undergone a course of training in an Engineering College, I do not think that the final training should be given in large workshops, where the operations are minutely sub-divided and the chain of responsibility for the management of the works extended to people to whom the boy would not ordinarily have access. A much more generally useful experience is likely to be acquired in a small workshop doing a miscellaneous but good class of business. I do not think that in any case a fee should be paid to the workshop for training boys who have already some acquaintance with the work. Personally I should much prefer to pay such boys and recoup myself by employing them on useful work. The system of pupilage has almost died out in England, and I know no adequate reason why it should be more successful here.

(7) Private Industrial Schools do not and are never likely to exist in this Presidency. The schools not under the management of Government will be under the management of Missionary bodies, District Boards, or Municipalities, and as they are certain to apply to the local Government for grants-in-aid from Provincial funds, I do not think there will be any difficulty in making them conform to any general policy that may be adopted. Subject to such restrictions as conformity with this policy necessarily entails, I should allow all these schools as free a hand as possible and should simply inspect them from time to time to see that they were maintained at a high standard of efficiency. The present system of grants-in-aid is unnecessarily elaborate and it would be much better if simplified to an annual lump sum grant for maintenance and to grants on account of capital outlay. Such expert advice as Government may be in a position to place at the disposal of the managers of Industrial Schools should be given gratuitously, and it should be part of the duty of the Inspector to see that such advice was followed as far as circumstances would allow.

2.—*Proposed alterations and additions in schools and of the want of new schools.*

(1) Even the best of the Industrial Schools in the Madras Presidency are very imperfectly equipped in the matter of tools and plant and their teaching staff is far from as good as is necessary. Much work is done by hand which could be much more efficiently performed by machinery, and every Industrial School should be supplied with an oil engine or small steam engine so as to get rid of the crowds of coolies who now furnish the motive power. If Indian industries are to be improved it is no use going in for half measures in Industrial Schools. Each school should be well ahead of the workshops in the neighbourhood and should be in a position to assist private enterprise by undertaking machine work, specially when the machines are expensive and the saving obtained by using them is of material importance. To give examples of these would necessitate going into considerable details, but when the Commissioners are in Madras I shall be glad to show them several instances in which we have been able to carry out the ideas I have just formulated.

(2) I am not in favour of the institution of a large number of Industrial Schools at the present time as I think we have yet much to learn before we begin to teach. I am strongly of opinion that India, and not merely one province, requires one for each of the more important trades. There should be at least one school which might be termed a Central Technical or Industrial School which should possess a thoroughly competent staff of experienced men in the trade, a complete equipment of tools and machinery for carrying on the trade with the highest degree of excellence possible, and such a school should be allowed to turn out sufficient work, which would be disposed of by commercial methods, to give full employment to both staff and machinery. I have already formulated proposals for developing the metal-work department of the School of Arts into such a school, and I have suggested that it would be

possible to do all that is required with an output of about four lakhs of rupees a year. It is not a matter of much importance whether these schools are under Imperial or Provincial control so long as they are well known throughout India and arrangements are made so that students from all parts of India can freely take advantage of the facilities they offer. I think it is much more important to start half a dozen such schools each dealing with only one trade than it is to fritter away our resources over a large number of Industrial Schools of the type which have so far been established. I am not in a position to propose any definite scheme for the establishment of these schools, but tentatively I would suggest that the following trades might be dealt with :

(a) *A school of metal-work* in Madras dealing with all kinds of work—brass, copper, aluminium, silver, tin, lead, and zinc.

(b) *A school of weaving* for the location of which any number of localities appear to be suitable. In this Presidency, Madras, Madura, or Salem appear to be the most favourably situated towns. In this school instruction would be given in the preparation of yarn for dyeing, in the operations of the dye house, in warping, sizing, and in hand weaving. Probably both silk and cotton might be advantageously dealt with in the same place ; but it is possible that it would be desirable to treat these two materials as the basis of two distinct industries.

(c) *A school of wood-work* which should be located in some situation where a great variety of timbers are readily available. In this Presidency the best site would be either in Madras, Coimbatore, or Calicut, but probably the best site in India would be either in Bombay or in Calcutta, where there would be a large local market for the productions. In such a school high class carpentry would be taught and a specialty would be made of the production of art furniture suitable for foreign markets. There is a fair amount of such work done in Madras, and I believe that if proper steps were taken to develop the business a large export trade would spring up with countries where labour is expensive. Already China and Japan have done a great deal in this way, and there seems to me no reason why India should not participate in the advantages which these countries are reaping.

(d) *A leather trade school.*—For this Cawnpore obviously possesses unequalled advantages, but Madras and Bombay are both of them ports from which immense quantities of hides and skins are exported, and speaking for Madras I have not the least doubt that such a school would go a long way towards arresting the decay of our local tanneries.

(e) *Iron workers' school.*—By this I do not mean an engineer's shop, but a school for the training of native iron workers. The work would be mainly what is generally classified as light blacksmiths' work, which would include the manufacture of agricultural implements, ornamental iron work, and light fitter's work. A good deal might be done to improve native cutlery, and if such a school were established in one of the old iron-working centres, it would be a proper place in which to endeavour to improve native methods of iron smelting. It is practically certain that the production of cast-iron is an operation which can only be profitably carried on in a large blast furnace ; but as regards the production of pure iron or high class cutlery steel there is still room for experiment. For instance, it is a well-known fact that a small percentage of aluminium will reduce the melting point of wrought iron by about 700 degrees and that if added to cast-iron at its exit from the cupola it greatly improves the quality of the metal. The application of these two facts to the native smelting process might result in improvements of great importance.

(f) *A school of sericulture.*—An experimental farm has been established in Bangalore by Mr. Tata, and I am inclined to think that the plan he has adopted there is capable of very great expansion, and I would strongly recommend the establishment of a properly organised farm in any one of the silk districts of India.

Detailed inquiries might lead to the discovery of a number of other trades which would be greatly benefited by the establishment of Central Industrial Schools. The principal functions of these schools would be the training of men for the posts of foremen or managers, the training of a limited number of first-class artisans who would become mistries, piece-workers, or gangers, the improvement of native processes of working, and the introduction of new materials, new appliances, and new systems of working. The officers and staff of such schools will in the first instance have to be recruited from other parts of the world and the trained students would supply the staff for local schools and provide private enterprise with as good a technical skill as it could now import from Europe. Each of these schools would necessarily be a manufacturing concern, but if its operations were managed with discretion and tact it does not necessarily follow that it would in any way compete with private enterprise. I have already submitted a scheme for the establishment of new schools to the Director of Public Instruction and modified as he may think fit it will probably be submitted to the Commissioners. I would only add that I am strongly of opinion that the improvement of existing schools is of very much greater importance than the opening out of new ones. It may be well to mention here that there exists in Madras a body of trustees in charge of certain funds amounting to about 2½ lakhs of rupees which have been subscribed for the promotion of industrial education to commemorate the first jubilee of the late Queen-Empress and as a memorial to her long and glorious reign. The first fund was subscribed fourteen years ago and the latter one last year. Both are invested in Government paper and practically nothing has ever been done either with principal or interest, and nothing seems likely to be done in the immediate future as the committee have always studiously avoided obtaining any expert advice and have invariably ignored any

practical suggestions that have been made to them. The fund would provide sufficient capital to establish one of these Central Industrial Schools, but the maintenance would inevitably become a charge on the provincial revenues.

(3) We have a drawing class from 6 P.M. to 8 P.M. three nights a week in the School of Arts. It is moderately successful, and the students who attend pay fees, but I am not in favour of evening schools in this Presidency though possibly in the north of India, where the climatic conditions are materially different in the cold weather, they might be started with advantage.

(4) If night schools are started in any place they should be managed by the general Educational Department. I am entirely in favour of the complete separation of general education from industrial education, and I see no reason why night schools should be an exception. This matter was discussed at the Simla Conference and the conclusion then come to received the unanimous support of all the Directors of Public Instruction.

(5) This question has been answered in my reply to No. (a)-1-(7).

(6) In Madras we have three special institutions devoted to technical or industrial work—the College of Engineering, the School of Arts, and the Agricultural College. To a certain extent, the three institutions overlap one another, and if the three were more intimately connected more use might be made of the expert staff available and in consequence better instruction given. The College of Engineering is at present too much an appanage of the Public Works Department and in my opinion it does not sufficiently provide for the general engineering requirements of the Presidency. They are comparatively small, it is true, but if anything is to be done for their development it would be preferable to utilize the by no means insignificant resources of that institution. To some extent I did this for a period of three years—1898, 1899, 1900—during which time I was connected with both the institutions, and my experience so far as it went was distinctly favourable to an extension of the principle. If this is done it would be quite possible to provide all the necessary scientific and technical instruction in existing institutions and it would only be necessary to obtain special experts for instruction in particular trades and industries.

3.—How the Neapolitan scheme would apply.

(1) to (5) The account of the Casanova boys' artisan school at Naples, by Mr. Radice, published as Appendix 3 to Sir Edward Buck's Report on Practical and Technical Education does not give sufficient details to enable one to express any definite opinion. I should very much like to see a school started on this system under the most favourable conditions that could possibly be obtained in India, and I understand that the experiment is to be tried in Lucknow, where the conditions are as favourable as are likely to be obtained anywhere. It appears that at Naples the boys enter the school at the age of seven years and leave it, after an eight years' course, at fifteen. During the first three years the boys receive a general education, and during the last five, an industrial education. The Simla Conference decided that both these should not be undertaken by the same management and that provision should be made for general education in Industrial Schools. I presume therefore that if the Neapolitan system were introduced into this country it would be modified so far as to omit the first three years of the course. So far as my experience in Madras goes I do not think that much good is done by admitting boys into Industrial Schools before the age of 14. But there is no doubt that in the bazars boys often learn a good deal of their fathers' trade long before that age. Industrial conditions in Italy are so extremely different from those which prevail in India that the Neapolitan system by itself would, I think, effect very little. If, however, there were a number of Central Industrial Schools for the training of mistries and foremen, I think it might be possible to adopt the Neapolitan system as a means of extending the work and improving these industries all over the country. I do not think that craftsmen working at their trades and financing them will come to work in an Industrial School under the control of a superintendent. But I think that many of the passed pupils of our Industrial Schools would be able to take advantage of this system as a means of getting a start in life. Assuming that an attempt must be made to start such a school in Madras, I think it would be necessary to construct a double row of shops, something like the Burlington Arcade, to which the public could have free access. Behind these shops on either side would be the workshops of the school. Each master craftsman would be allowed a certain amount of space and a certain number of workmen and pupils. It is quite impossible to say without any experience how the details should be arranged. Some kind of start would have to be made and gradually as experience was accumulated a practical system of working would be evolved. At the outset at any rate the most important function of the school would be to secure a sufficient number of orders for good work to keep the artisans employed and I am almost certain that it will be necessary to supply each artisan with all the capital that he would require for carrying on business. It will be difficult to get any security for advances of capital from workmen and it will be necessary to a large extent to trust to their honesty. Probably the school will have to supply each master-artisan with an outfit of tools with which to carry on his work; and these tools will be kept in the school buildings and remain the property of the school till such time as the master-artisan is in a position to repay their original cost to the school by a system of monthly instalments. Certain materials might be advantageously supplied by the school where the school could purchase them in bulk on more favourable terms than the artisans would be able to obtain, e.g., metal-workers might be supplied with sheet brass, copper, or aluminium;

wood carvers with timber ; chocklers with leather ; weavers with yarn ; but it would be impracticable for the school to supply all the odds and ends required in a workshop for the execution of orders.

Under a system of working like this, there would probably be very little waste of material as it is not likely that the artisans would allow their apprentices opportunities of wasting much material. Work, when finished, would be exposed for sale in shops and it would not be possible for the school to take any responsibility regarding its disposal. There will be no necessity to have any special exhibition ; but if the school were in a position to do so, it would be desirable to establish one central show-room in which might be kept for sale specially fine pieces of work executed in the school by the master craftsmen under the orders of the Principal and paid for when finished from a capital sum at the Principal's disposal for the purchase of such works. By making a small profit on the resale of such works to the public, it would be possible to keep the capital sum intact and pay the expense of maintaining the show-room.

Under this system, if it succeeded, the bulk of the apprentices would be the sons of artisans, and, as they are very poor, it would be necessary to pay small stipends and the school authorities would have to maintain a very close system of inspection over the methods pursued in each workshop to ensure that the boys who received stipends were adequately taught by the master-artisans. It would be difficult to ascertain what profits were made by the master-artisans and I think it would be probably necessary to leave the question of division of profits entirely in the hands of the master-artisans. If this system were a success and the master-artisans found it profitable to work in the school, their relations to their apprentices would adjust themselves automatically. The boys would not work for them if they did not get an adequate reward for their labour and the master-artisans would have to be ejected from the school if they did not keep a sufficient number of apprentices at work.

As regards holidays I should close the school on Sundays and on all the more important native festivals. At all other times the school would be open from 7 A.M. to 6 P.M. I should only insist upon the attendance of apprentices within certain specified hours of the day. The fewer the regulations the more the likelihood of success. I should not allow boys in the shops down the central arcade and I should enclose the whole of the premises behind each side of the central arcade and allow no one inside them except the apprentices, the master-artisans, and their recognised employés. It would of course rest with the Principal to admit visitors at his discretion. It would probably be desirable for the school to provide instruction in drawing, English, and possibly in elementary technical subjects connected with the scientific principles underlying the trade. It would also be desirable for the Principal from time to time to give simple lectures to the artisans on general commercial matters connected with the trades and to introduce to their notice new inventions or improved processes. At the outset it would be impracticable to charge fees. But it is possible that if once a system were established and made a success, fees might be charged ; and in such cases it would be better to make the fees take the form of rent charge paid by each master-craftsman rather than a fee paid by each individual apprentice. For the protection of the master-craftsmen as well as boys, each apprentice or rather the guardian of each apprentice would have to enter into some simple legal agreement with the school authorities by which boys would be bound to remain a certain number of years in the school as apprentices and the school would undertake to provide proper instruction in the trade during the whole of that period. It will also be necessary for the school to obtain some legal hold over the master-craftsmen and their property within the school premises, to provide for all sorts of contingencies such as might arise from causes under the control of the artisans or from causes beyond their control.

(6) I should certainly attempt to improve the craftsmen's practice of work or else the *raison d'être* of the school would cease. But the question to decide how this could best be done is a difficult one to answer. The school might purchase expensive tools, and after demonstrating their value might lend them to the artisans under special conditions. The school should certainly set up an engine and machinery, which the artisans might avail themselves of. But the terms would have to be left to the discretion of the Principal. The efficiency of the school as a means for improving the practice of the artisans would largely depend upon the tact and discretion of the Principal and upon the personal influence which he would be able to exert over the master-artisans. Profitable work is what the artisans would want and if the Principal was able to arrange for a continuous supply of orders he would have little difficulty in getting the artisans to adopt the best and cheapest methods of production.

In concluding my remarks on the Neapolitan system of Industrial Schools, I should like to say that I do not think that the system is suited to many of the trades practised in India and that it will not prove a very important factor in the general development of indigenous industries. For bazar trades which must always remain in the condition of petty industries it seems admirably adapted and might probably be suitable. But in dealing with this question of the improvement of indigenous industries, I have in mind the undertaking of methods and processes which can only be carried on in what may be termed "factories." For this more ambitious programme the Casanova school does not seem to me to be suitable.

4.—Would you accept Experts from abroad in each Industry.

(1) to (5) As from my previous replies it will be seen that I advocate in the first instance the establishment of one Central Industrial School for each trade and as I think that the greatest

amount of good work can be done by making each of these institutions thoroughly efficient in every respect, it naturally follows that such experts as are engaged will place the whole of their services at the disposal of a single school.

I think it is quite possible to obtain a sound general expert for each school and such a man should, I think, occupy the position of Superintendent or Principal, but as I contemplate that each of the Industrial Schools should carry on operations on a fairly extensive scale I think it will be necessary to engage other experts to control the working of the various departments. For instance, supposing that we established a school of metal work in Madras, I should place at the head of that institution a man who had a thorough knowledge of mechanical engineering and a fair acquaintance with physics and chemistry. Under him it would be desirable to employ a number of departmental managers, each a special expert in that particular branch of the trade which he would have to look after. Most of these men will have to be obtained from Europe and their pay can only be justified by working on such a scale as it would be sufficient to fully employ them. In a metal work school there would be a number of departments, and these men would be the managers or foremen and they would be required to have a thorough practical knowledge of every detail of their trade. The list of such experts as it is desirable to employ might be a very large one, but I think it would be sufficient to get (1) a general machinist to look after the drawing presses, lathes, and polishing machinery; (2) a general brass finisher to superintend the various polishing processes and lacquering, bronzing, enamelling, and so forth; (3) a coppersmith, to superintend the hammering department and all work connected with the construction of vessels and plant made out of sheet metal, and under him would be all the hammermen, braziers, and riveters; (4) a foundry man to look after the pattern shop and metal foundry; and (5) a first-class fitter to superintend that very important branch of metal-working establishment. These men would occupy in England similar positions, and if brought out here, they require to be paid from Rs500 to Rs600 a month, depending upon their qualifications. Whether they are engaged by the Provincial or by the Imperial Government is not a matter of great importance and would be determined by the status of the school itself. The balance of advantages would probably be in favour of putting both school and staff under the Imperial authorities and of having, as suggested by Sir Edward Buck, an Imperial officer to control them.

(6) The methods by which these experts would proceed to improve the manipulation practice would be to apply a special knowledge and skill to the devising of tools and methods for manufacturing articles for sale. In some cases the work would be the execution of orders, and it would be the business of the experts to show their workmen the simplest and best way to carry out the orders, but in the majority of cases new articles would be made as an experiment, after considering the probability of finding a market for them at the price at which the school could turn them out. It has been my practice in the School of Arts, whenever we were short of work, to hold consultations with my assistants, and they nearly always resulted in suggestions being put forward for the manufacture of new articles which have subsequently been readily disposed of in large quantities. The methods that I have used in the School of Arts on a small scale might be generally applicable to most of the schools. In the weaving industry we are dealing with a different class of problems. For everything we manufacture it is easy enough to get a market at a price, and the whole of our exertions have to be concentrated on devising methods for producing a certain article of a certain quality at a certain cost. We are now making Madras handkerchiefs, and enquiries have placed us in possession of the main items which go to make up the cost of manufacture, so much for raw material, so much for preparing warps, so much for weaving, so much for waste, and so much for miscellaneous expenses and management. Each of these items can be sub-divided, and each of these sub-divisions has to be carefully scrutinised to see if it is possible to reduce it by any means. The two main items in the cost of manufacture are warping and weaving. To reduce the first of these we are trying to use warping mills instead of hand-warping, and to reduce the second we are using European hand-loom instead of Native hand-loom. Should we succeed, either the cost of production would be decreased, or the wages of the workmen increased, without adding to the selling price of the handkerchiefs. The introduction of new processes will only be a benefit to the working class where it necessitates an increased skill and experience on the part of the operators.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

(1) Schools must either be under the control of local authorities, or under the control of the Provincial agency. My own experience of District Boards and Municipalities is not favourable, and I think that if any extensive development of industrial education takes place, it will be absolutely necessary to place all the schools under the control of officers appointed by the Provincial Government. As the local authorities are constantly changing, and as they possess no special qualifications which will enable them to effectively superintend the working of such schools where they are desirous of spending part of the public funds under their control on industrial education, the most efficient system will be for them to make such provision as they can for the object in question and appoint a small committee to negotiate with the Provincial authorities. A proper scheme can then be prepared and submitted for approval to the Local authorities, and when the preliminaries are settled, a superintendent can be appointed and the schools started, leaving inspection and control of the working of the school to the Provincial authorities.

(2) The local control in this case would be confined to receiving an annual report on the working of the institution and the power to withdraw support from it should they be dissatisfied with the results obtained.

(3) and (4) If technical and industrial education is to be developed, I think it would be best to create either a separate department for the work, or to divide the Education Department into two main branches. This is a matter, however, on which I have no data necessary for forming a decisive opinion, and it seems to me that it must rest with the Government and the head of the Education Department to say whether the present system is satisfactory or whether from their point of view some change is desirable.

(5) I am inclined to think that industrial education would be most satisfactorily managed under a system of Imperial control. If these central mono-industrial schools, which I am in favour of, were established, their sphere of operations would not be limited to any one province or sub-division of the Empire, and it would therefore be distinctly desirable that since they are working for the whole of the country they should be under the Imperial Government. So far as my own experience goes I do not think it would have made any difference to my work during the past three years if I had been under the Imperial instead of the Madras Government, but if there are a number of these schools, some in one Presidency and some in another, each under a different Government, it is obvious that many difficulties will arise which would be avoided if they were all under one central controlling authority. The difference between industrial education and general education lies in the fact that each province is able to maintain a perfectly complete and efficient system of general education, whilst at the present time it is hopeless to expect that every province in India can maintain in efficient working order a complete system of Industrial Schools. Probably a working compromise could be arranged on the basis of the Imperial Government maintaining and supervising the working of all the Central Industrial Schools whilst each local Government look after the much more numerous secondary schools.

6.—Exhibitions and sales, whether required.

(1) As a means of advancing the industrial condition of the country the part played by exhibitions in India must always be a comparatively secondary one. They are useful for bringing to the notice of the people new products and new manufactures, but there are other means of doing this which are generally much more effective. An exhibition in this country is a success only when it is arranged as a *tamasha*, and I am doubtful if the trouble and expense which exhibitions entail are repaid by the results achieved. I do not think that Industrial exhibitions, whether local or provincial, should be organised by the authorities concerned with the development of Industrial education. Both provincial and local exhibitions have been held in Madras for many years past, and since I have been engaged in opening out a market for aluminium in India I have freely availed myself of the opportunities they have offered, but although they have certainly proved useful, I do not think they have materially advanced the work. The time and expense which they have entailed might have been equally profitably used in other ways. Of the value of Imperial exhibitions I do not feel competent to express any opinion, as I have had no opportunities of judging what results have followed them. The last one was held in Calcutta about 18 years ago, and I do not know what good may be expected to follow if another be held in the immediate future. I am inclined to think that exhibitions in this country are more likely to benefit the importers of European and American manufactures than they are to encourage or assist the progress of Indian manufactures. Personally, I am not inclined to take any active part in the organization of exhibitions, but when such exhibitions are held, I think it is wise to take advantage of them.

(2) My remarks in reply to the above question apply only to the purely industrial products, and the case is different with the art industries. I think that provincial exhibitions are of some value, but what I think would be of much greater value is the institution of permanent exhibitions of the products of artistic industries in the three great capital cities of India. I have suggested the establishment of such an exhibition in Madras as a suitable way of utilizing the funds of the Victoria Jubilee and the Victoria Memorial Committees, and the details will be found in some papers which I append to this Report. (*Vide* paper on "Industrial Education.")

(3) The procedure which I have adopted in the School of Arts would perhaps best explain the methods that I find in practice most suitable for the disposal of the work of an Industrial School. In the Weaving department I have a contract with the local firm of piece-goods dealers, and to them I consign the whole of the outturn of our Weaving department and they ship the handkerchiefs to London, where they are sold by auction for re-shipment to the West Indies, to the West Coast of Africa, and the Southern States of America. Wood-work and wood-carving have so far only been made to order, but I now propose to extend the business by keeping a certain stock in hand, as I find by experience that people much prefer to buy ready-made furniture, partly because they see what it is like and partly because they object to waiting for it to be made. The Pottery department mainly supply Government Institutions such as the Medical Stores Department and the Commissariat. Occasionally large contracts for terra-cotta have been taken and small quantities of ornamental pottery and various domestic articles were made and kept in stock for sale in the school sale-room. The bulk of the work done in the carpet-weaving department is previously ordered, but

when there are no orders, stock carpets are made and they can generally be disposed of without much difficulty. If it were worth while to extend the scale of operation, I should make a large number of carpets of standard market sizes and ship them to England for sale at the quarterly carpet auctions in London. These are the ways in which we dispose of all the outturn of the departments which have not been specially pushed for commercial reasons. In the Aluminium department, where the sales average 18 thousand rupees a month, a great number of methods for effecting sales have been tried. In the school sale-room about 500 rupees worth a month is sold to casual visitors. I employ three agents at Calicut, Coimbatore, and Salem, and I pay them a small fixed salary and a commission on the sales they effect. This system in some instances has worked extremely well; in others it has been a failure. In nearly every large town in the north of India we have a firm who act as our agents. We sell them goods at favourable rates of discount. The business we do in this way is very considerable. About one-third of the regiments in the British and Native army have obtained large quantities of equipment direct from us, and we sometimes get large Government orders. Since the opening of the Aluminium department we have sent out thirty or forty thousand illustrated price lists, and the orders which the recipients of these price lists send to us are the most profitable part of our business, as we charge the usual retailed rates and I have no commissions to pay. A similar case to the Aluminium department is not likely to arise in other Industrial Schools, and I have only detailed our methods at length because it is my opinion that an Industrial School may use any legitimate method for disposing of the outturn. To avoid interference with private trade Industrial Schools will have to pay much more attention to what they manufacture than to how they sell, and the only recommendation I would make is that as far as possible full use should be made of such recognized commercial channels as are available for the disposal of productions, and that established trade practices should be strictly observed. With reference to the question of prices being marked or fixed, my own experience covering transactions, amounting to at least six lakhs of rupees, is that it is quite impracticable to do business on at all a large scale with fixed prices. The cost of selling articles varies enormously in different districts, and allowance has to be made for this and for many other circumstances.

(4) The cost of production is in some cases unduly high through excessive railway rates, and I am quite certain that a more liberal treatment of Indian industries by the railway companies will in the long run lead to a permanent and important increase in traffic receipts. Cheap production can only be effectually achieved by the concentration of industries in a few centres and heavy railway rates militate against this.

At present to a main extent, and possibly in the future to a considerable extent, the export business of the Aluminium department has been affected by the fact that we pay 5 per cent. duty on aluminium coming into the country and are allowed no rebate of duty on aluminium exported. I applied for this rebate to the Board of Revenue in Madras but was refused. So long as aluminium is not manufactured in the country, any that is exported must have paid import duty, and I therefore see no reason why there should be any difficulty in granting the rebate. Our trade with Ceylon is greatly handicapped in consequence of the fact that duty has to be paid on the metal coming into Madras and again on its reaching Colombo.

(5) Within the range of my own experience, I have not the least hesitation in saying that expensive fine work is far more profitable than cheap common work. Wealthy people will pay very high prices for extremely good work and with anything less they are not satisfied, but poor people who are content with inferior work want it turned out at the lowest possible rate, and the margin of profit is therefore very small. The great difficulty which the best Indian artisans experience is in the disposal of their work. They are not able to place it on the market and middlemen receive an undue share of the price paid by the purchaser. The establishment of the permanent exhibitions that were mentioned in my reply to question (1) seems to be the most promising way of bringing native art craftsmen into immediate contact with those who would be their patrons.

(c) HOW ARE FUNDS TO BE PROVIDED.

(1) This is a matter for Government to reply to.

(2) Industrial Schools will never be self-supporting. The most that can be hoped is that industrial education should not cost more than any other form of education. To make Industrial Schools absolutely self-supporting would necessitate running them absolutely and entirely for the sake of profit. A school for a time may, under exceptional circumstances, secure a large amount of profitable business but that very fact will engender outside competition and the percentage of profit will rapidly dwindle. This has been the case with the Aluminium department and it will be so with any other industry or material. I do not think that any scheme of supplying capital to pupils who have been taught at Industrial Schools is likely to be a success. If the schools succeeded in establishing new industries or improving old ones, the necessary capital would be readily supplied from private sources.

(3) and (4) I think Government can render material assistance to the artisan community by some scheme which will admit of financial assistance being rendered to pioneer enterprises. In the case of the aluminium industry, I have greatly assisted private enterprises by keeping the supply of metal under my control, whereby I have been able to purchase it on the most

favourable terms and sell it to manufacturers in India at very slightly enhanced rates, allowing them from three to six months' credit. This has enabled them to carry on their business on a comparatively small capital and thus obtain a much larger profit. Practically, at the present time, the aluminium industry is being run with Government capital to the extent of at least two-thirds of the total employed in the trade. This way of rendering assistance has proved in practice very easy to work and involves comparatively little risk. It is useless to attempt to propose a scheme for assistance to industrial workers without complete details. But I am quite certain that it would not be difficult to devise means of rendering them effective help whenever occasions arise, provided sufficient funds are available.

A BRIEF HISTORY OF THE MADRAS SCHOOL OF ARTS.

Succession list of Superintendents.

	From	To
Alexander Hunter, Esq., M.D. (Founder)	1850	1858.
Dr. Charles Murray Duff, Acting	1858	1859.
Alexander Hunter, Esq., M.D.	1859	1873.
Major W. S. Hunt, M.N.C.	1873	1877.
R. F. Chisholm, Esq., F.R.L. B.A., Officiating	1877	1883.
Captain C. H. Simpson, Officiating	1883	1884.
E. B. Havell, Esq.	1884	Jan. 1886.
Captain C. H. Simpson, Acting	Jan. 1886	April 1886.
E. B. Havell, Esq.	April 1886	March 1889.
Alfred Chatterton, Esq., B.Sc. (In charge)	March 1889	June 1889.
E. B. Havell, Esq.	June 1889	April 1892.
E. Holder, Esq., Acting	April 1892	June 1897.
J. P. Lewis, Esq., Acting	June 1897	Sept. 1897.
E. Holder, Esq., Acting	Sept. 1897	Dec. 1897.
Alfred Chatterton, Esq., B.Sc. (In charge)	Dec. 1897	Sept. 1898.
W. D. Porterfield, Esq.	Sept. 1898	Feb. 1901.
Alfred Chatterton, Esq., B.Sc. (In charge)	Feb. 1901.	

The Madras School of Arts owes its origin entirely to the active and disinterested exertions of the late Dr. Alexander Hunter. Soon after his appointment as Surgeon of the Black Town district, Dr. Hunter opened a School of Arts in Popham's Broadway on the 1st May 1850, at his own expense, "with the object of improving the taste of the Native public and making them familiar with beauty of form and finish in the articles in daily use among them." The school was located in his own house and he set apart a portion of his pay and the proceeds of his private practice in Black Town for its upkeep. He also gave up his library and marching sketches with regiments for the use of the pupils, from whom a fee of one rupee per month was levied for instruction. The number on the rolls at the end of the first year was 180 and the subjects taught were drawing, painting, modelling, lithography, wood-engraving, and etching on copper.

The success which attended the School of Arts led Dr. Hunter to enlarge his plans in the following year, by establishing in connection with it a "School of Industry" for giving instruction in the various branches of useful arts. This school of industry was opened on the 1st June 1851, "the object of its establishment being to afford to the rising generation of the country the opportunity and the means of acquiring useful handicrafts to improve the manufacture of various articles of domestic and daily use, now largely made in the country, but rudely and uncouthly, and also, by developing the latent natural resources of the country, to create a local supply of several articles in general demand which hitherto have been almost entirely imported." The cost of maintaining this institution was also undertaken by Dr. Hunter. But after some time, he found that, for equipping the school with the necessary apparatus, he should resort to extraneous help and accordingly he appealed to the public and obtained a small contribution in aid of its funds. At the same time he induced the following gentlemen to form themselves into a Committee to assist him in its management:—

J. D. Bourdillon, Esq.	Major G. Balfour.
Reverend A. R. Symonds.	Edward Elliot, Esq.
Major J. F. Smith.	Edward Balfour, Esq.
„ F. C. Cotton.	

This Committee brought the school to the favourable notice of Government in March 1852, and in doing so they pointed out what they conceived to be the chief wants of the institution and submitted, among others, the following recommendations:—

(1) That Dr. Hunter should be relieved from medical duty and be placed in charge of the school, so that he may devote his whole time and attention to its management.

(2) That Government should give a grant of Rs. 6,000 to be laid out in procuring from England such machinery, models, casts, and studies as would place the school on a satisfactory footing.

The Government approved of the proposals of the Committee in general, and the Court of Directors not only sanctioned the grant of Rs. 6,000 recommended by the Committee, but also expressed their readiness to sanction a moderate monthly contribution for a limited time on being furnished with complete information as to the expenses of the institution and as to the prospects of its eventually becoming independent of Government assistance, this latter point

being one which they thought indispensable. The Court, however, refused to relieve Dr. Hunter from medical duty, though he was left free to give to the institution the benefit of his supervision and control.

In 1853 miscellaneous experiments were conducted in the manufacture of paper, fibres, and cordage. Some good papers were made for sketching purposes from mixtures of aloe, plantain, and gunny fibres. There were, however, several defects in the native process, which were pointed out to the leading native paper-makers in Madras. It may be interesting to note here that the rope and string were made chiefly by blind paupers in the Monegar Choultry and idiots in the Lunatic Asylum. The manufacture of pottery which was first introduced in the Male Orphan Asylum was now transferred to the School of Industrial Arts.

In 1854 a further representation was made by the local Government to the Court of Directors and they assigned a monthly grant of Rs600 towards the working expenses of the institution and sanctioned Dr. Hunter's withdrawal from medical duties in order that his whole time might be devoted to the supervision and control of the school. The school had now become, to all intents and purposes, a Government Institution and early in 1855 its supervision passed from the Committee to the Director of Public Instruction who was just then appointed under the great Educational Despatch of 1854. In the same year Dr. Hunter, who was relieved from medical duties, became the full-time Superintendent of the school, which had now its location in the spacious Old College buildings at Nungambakam.

In the early part of 1856, Mr. Cole, who was selected and sent out by the Court of Directors as Professor of Fine Arts, arrived from England and took charge of the Arts department. He introduced the system of class teaching and gave regular instruction in practical geometry, freehand drawing, machine and plan drawing, and flower painting. A few got instruction in wood and copper plate engraving also; most of the pupils in this department sought the education with the object of getting employment as draughtsmen in the Public Works or other departments of the Public Service.

The industrial department dealt with the manufacture of bricks, firebricks, paving and roofing tiles, pottery and water-pipes, etc., blacksmith's work being also taught to a certain extent.

In 1857 the school was removed to its present site on the Poonamalles Road.

In 1858-59 Dr. Hunter went home on sick leave and during his absence the institution was under the charge of Dr. Charles Murray Duff.

In the course of the next year 1859-60 the school was deprived of the services of Mr. Cole, who was compelled by ill-health to proceed home on leave where he died subsequently.

Different opinions having been expressed as to how far the school was realizing the ends of its existence, the Director of Public Instruction in his Report for 1859-60 suggested the appointment of a Committee of practical men to report whether it should be continued or abolished. Such a Committee was appointed by Government in April 1860, with the Honourable W. E. Maltby, a member of Government, as President. The Committee recommended the continuance of the school and made several important suggestions for the successful working of the two departments—artistic and industrial. Among other things it laid stress on two important points (1) that the school should be a place of instruction rather than of manufacture, and (2) that the two departments should be brought into as close a connection as practicable. The Committee also thought that Dr. Hunter should be retained at the head of both departments on a salary of Rs1,000 per mensem. In passing orders on the Committee's Report, Government accepted the principle that the business of the school should be to furnish the means of instruction, but considered it necessary that orders for manufacture should continue to be received in the Industrial department. Dr. Hunter, as suggested by the Committee, was retained at the head of both the departments on a salary of Rs1,000 per mensem.

In 1862-63 photography was added to the list of subjects taught and some stereoscopic views were taken of ancient buildings and other striking objects. In 1863-64 there were 266 pupils under instruction and a photographic and sketching tour was undertaken with success by some of the students. During this tour photographs were taken of scenery about Coonoor and of the antiquities of Humpi and Tadpatri. In 1866-67 several photographs and casts were sent to the Paris and other exhibitions and to some of the important Schools of Art. Lessons on this subject were continued till 1876.

A course of lectures was commenced to be delivered in 1868-64 to the students of the College of Engineering attending the school on the composition, qualities, and modes of testing clays, rocks, limes, and cements and they were taught to make bricks, pipes, tiles, and cements. This course was continued till 1868-69.

During the next five years the school seems to have made little progress and nothing of importance occurred.

In 1875 Dr. Hunter retired from service and was succeeded by Major W. S. Hunt.

W. Robinson, Esq.
M. E. Ry. V. Ramaiyengar.
Col. A. Stewart, R. A.
Surgeon-Major G. Bidie, M.D.
Major H. Rogers, R. E.
R. F. Chisholm, Esq.
Major W. S. Hunt, M.S.C.

The condition of the school again attracted the attention of Government and a strong Committee composed of the gentlemen named in the margin was appointed to enquire into and report (1) on the result already obtained by the establishment of the school, (2) on the course best calculated to secure in future the greatest advantage to the public from

its maintenance as a means of improving and developing the industrial arts in the Presidency.

As regards No. (1) the Committee thought that while the artistic department had succeeded in sending out a large number of good draughtsmen, no tangible evidence was to be found of what the Committee deemed to be a far greater and a higher object, the dissemination of artistic taste among the people through the direct instrumentality or indirect influence of the school. At the same time they acknowledged that one branch of useful art, *viz.*, wood engraving, was unknown in Madras before the establishment of the school and that etching, engraving on copper, and photography were other useful arts the knowledge of which the school had greatly helped to diffuse among the natives. The Committee brought to the special notice of Government the disadvantages under which the school had laboured and suggested several remedial measures. Among these the following are the most important: (1) the appointment of a thoroughly efficient Superintendent for the whole institution; (2) the employment of an artistic instructor with a British reputation; (3) the gradual expansion of the school into a central industrial college on the model of the German industrial colleges; (4) the formation of a moderate gallery of paintings, engravings, sculpture, and other works of art as a necessary adjunct to the institution; (5) the organization of a museum to contain a well arranged collection of the raw materials of the country; (6) the introduction of a proper system of inspection and examination from a technical and educational point of view; and (7) the appointment of a special Committee to manage and control the work of the institution along with the Superintendent.

These proposals were generally approved and in its order No. 187, Educational, dated 26th May 1874, Government sanctioned the employment of a Superintendent on R500, of an instructor in the artistic department on R350, and of an instructor in the industrial department on R300, but the services of a full-time Superintendent were not secured till 1884. The post of an instructor in the artistic department was filled only for a short time and then suspended, while that of instructor in the industrial department was never filled.

In 1876 the despatch received from the Secretary of State raised some important questions

President.
The Hon'ble Sir W. Robinson, K.C.S.I.

Members.
The Hon'ble P. Macfadyen.
V. Ramaiyengar, C.S.I.
Dr. G. Bidie.
Mr. E. F. Chisholm.
Mr. E. Orr.
Mr. J. Deschamps.

regarding the ultimate constitution of the school and an executive Committee of management consisting of the gentlemen noted in the margin was appointed to report on the questions raised therein. This Committee suggested certain reforms, both in the artistic and industrial branches, which were subsequently introduced.

In September 1877, Mr. R. F. Chisholm relieved Major Hunt of the charge of the institution. During this year a girls' branch was opened in the artistic department and the course of study reorganized on the model of the South Kensington course. Two new branches of industry, *viz.*, enamelling glass and decorating in oil colour, were also introduced, and two others, metal work and wood carving, were revived.

The Fine Arts gallery was completed in 1881 at a cost of R7,948 and the museum attached to the school was rebuilt in 1882 at a cost of about R1,400.

Mr. Chisholm, who officiated as Superintendent, proceeded to Europe on furlough in April 1883, and Captain Simpson had charge of the institution till 21st January 1884, when Mr. E. B. Havell, the first Superintendent appointed by the Secretary of State, assumed charge of the school. Mr. Rea of the Archaeological Department was temporarily employed after Mr. Chisholm's departure for Europe to assist in supplying architectural and art designs to the school for works in connection with the public buildings of the Presidency and for private orders.

At the suggestion of Mr. Havell, the Director of Public Instruction recommended in July 1884 a revised establishment, in which he proposed to abolish the post of instructor in the industrial department, to fix the salary of the instructor in the artistic department at R400, and to appoint an assistant in the pottery branch on R100. His proposals received the approval of Government, and the services of an art instructor in the person of the late Mr. E. Holder were secured in 1886. The Government technical examination scheme which was sanctioned in March 1886 necessitated certain changes in the course of instruction, and a code of regulations in conformity with these changes was drawn up towards the close of that year.

For the benefit of the apprentices a general education branch was started in November 1886. Lacquer work painting was introduced in 1887 and two looms for carpet weaving were set up in 1888. A night class to teach elementary drawing to those who cannot attend in the morning was also started in July 1887.

For about 3 months in 1886, when Mr. Havell was placed on special duty as Reporter to Government on Arts, Captain Simpson was officiating as Superintendent and during Mr. Havell's absence on leave from March to June 1888, Mr. Alfred Chatterton of the College of Engineering was in charge.

In December 1889 Mr. Havell submitted certain proposals for the reorganization of the school. He proposed among other things (1) the abolition of the post of art instructor on R400, (2) the employment of four teachers of drawing on salaries ranging from R40 to R50, and (3) the employment of an overseer for the industrial department on R100—5—125. Mr. Grigg, the then Director of Public Instruction, did not express any opinion on the above proposals. Probably it seemed to him, as it seemed to his successor Dr. Duncan, that to abolish the art instructorship would be a retrograde and suicidal step.

Towards the end of April 1892, Mr. Havell proceeded to England on 15 months' furlough and Mr. E. Holder, the Assistant Superintendent, was put in charge of the school, Mr. M. Velayuda Asari, a former student of the school, succeeding him as Assistant Superintendent. Mr. Havell on the expiration of his furlough resigned his appointment and the above arrangements continued till the end of 1897, when Mr. Holder retired on account of ill-health and subsequently died.

In the beginning of 1894 a despatch was received from the Secretary of State questioning the expediency of continuing the Schools of Arts in India as Government Institutions. In January 1895 the Director of Public Instruction recommended to Government that the Madras School of Arts should continue as a Government institution and submitted certain proposals for its reorganization.

The Government in its Order No. 471, dated 7th June 1895, decided that the school should continue as a Government institution, but thought it advisable that the question of reorganization should be referred to a Committee, and the marginally-noted gentlemen were accordingly requested to form themselves into a Committee and submit proposals for its reorganization.

The Hon'ble Dr. Duncan (President).
 " Mr. C. S. Crook.
 " G. L. Chambers.
 Mr. E. G. Orr.
 " John Adam.
 " C. E. Phipps.
 " Edgar Thurston (Secretary).

This Committee, however, was not unanimous in its views and no definite orders were passed on its Report.

In November 1897, the aluminium industry was started on a small scale in the metal working class by Mr. Chatterton who brought with him on his return from furlough from England about 100 lb. of this valuable white metal. Since then it has gradually grown into a big department doing a great deal of business and providing situations of a remunerative kind for about a thousand workmen.

From the date of Mr. Holder's retirement till 4th September 1898, Mr. A. Chatterton was in charge of the school in addition to his duties as Professor of Engineering and Officer in charge of the Aluminium department. Mr. W. D. Porterfield, who was appointed Superintendent by the Secretary of State, entered on his duties on the 5th September 1898 and continued to hold the office till 7th February 1901. Since then Mr. Alfred Chatterton, who has been placed on special duty for the development of technical education, has been in charge of the school. After he took charge several changes were introduced in the organization of the school. The following are the most important :—

- (1) An industrial assistant on Rs 400 was appointed in the person of Sub-Conductor Mr. G. E. Brand whose services were borrowed from the Public Works Department for the purpose.
- (2) Cotton-weaving was introduced and Mr. J. W. Coombes who returned from England from a course of training in technical subjects was appointed to look after that branch.

NOTE ON THE SYSTEM OF TRAINING APPRENTICES,

BY M. R. M. VELAYUDA ASARI.

(1) In the many different varieties of industries each native workman is acquainted with only one, or a branch of one of the industries. The best men of such works are generally called mistries. This name is generally applied to men who have long experience in work and who are generally considered to possess a better knowledge than the others around him. Such mistries generally get more orders from the public. To execute them all in time, he takes the assistance of his men whom he engages on daily wages, sometimes on monthly payment. The wages generally are from As. 3 to Rs 8-0 a day. Annas 12 is generally paid to all ordinary good workmen and As. 14 and more to the best workmen according to their merit and the nature of the work they will have to do.

These mistries, with a few workmen of their kind, have their working places called shops or bazars in some public places along the road-side. They generally seek verandahs of houses, empty stables, etc., as their suitable places for work. They have no sign-board of any kind. They will supply tools, etc., for the workmen under them. To attend to other business in the shop such as cleaning, etc., he engages the sons of poor artisans aged about twelve or more. Boys so engaged are what are called apprentices. Every mistry who conducts business independently has a few such apprentices.

There will be no working place, however small it may be, without at least one apprentice. All mistries who are known to be skilful will be voluntarily offered by the other workmen to admit their sons as apprentices in their shops.

In the beginning apprentices are admitted free and no fee is charged; neither the boys demand anything from the mistries; but some of the ordinary workmen who conduct an independent business will be in need of a few apprentices and they will even offer at the beginning a small amount as monthly stipend to each of the boys. The sons of very poor artisans and helpless artisan boys who are in need of some pecuniary help generally seek admission in such places where they can get a greater amount of stipend in these cases.

The apprentices or their guardians care very little for the knowledge of the mysteries in their work—all that they want is some income for livelihood. The first business the apprentices are made to learn is the cleaning of their tools, etc., and to supply workmen the tools required while they are at work. By so serving them for a certain number of days they come to understand the names of tools and their use. If they find small intervals they even try to use some of the tools in the same manner as they had seen the mistry and other workmen using them. Thus gradually and by constantly observing different workmen while at work, they gain the power of imitating some of the simple works. At this stage the apprentices are given a small stipend of R2 or R3 according to their taste in work and thus the mistry makes use of them for all simple orders.

In this manner their knowledge is mostly cultivated by their frequent observation and constant practice with almost no teaching whatever. These apprentices after some practice like this come out as workmen with merit in proportion to their taste.

This is the common system of teaching apprentices; everything they are made to learn by themselves, but the advantage they gain by being apprentices is that they are indirectly compelled to observe all that is being done by the workmen in course of assisting them. "What eyes see the hands will do" is frequently repeated to apprentices as a sort of proverb to them.

It is all by the apprentice's own endeavour and perseverance *plus* the knowledge gained by observing his master at work that they are capable of becoming good workmen—sometimes better to a certain extent than their own masters if they are possessed of greater talent than their master.

(2) So far as I have seen, all traders adopt one common system of training apprentices. They do not know whether there are any other system; even if they know any, they won't adopt if it is in any way interfering with their other works.

(3) There is that very great advantage of the apprentices carefully observing all that is being done by their mistries and thus gaining the power of imitating their style of work.

The disadvantages are—

1st.—That the apprentices are treated more or less like servants by making them do all their masters' private works which do not concern them, thus wasting a good lot of time required for their practice in work especially in the early ages.

2nd.—That they don't give them general education, neither so advise them to seek a means of refining their knowledge.

3rd.—That the native boys by being apprentices under a native workman, whether good or bad, learn only as much as their masters and very scarcely more. If these apprentices were to be educated, they will understand what is required for the market here and what to markets outside; ignorance in this keeps them in darkness in every way. If an attempt is made to remove this by giving them general education, I am sure that a beginning for the progress of industry will soon start among the artisans of all castes. It is very scarce to find educated men among them. This is specially due to the fault of their own parents who themselves are ignorant of education and who are unable to appreciate the value of it.

Some artisans who really understand the value of education are so poor that they cannot get their sons educated and some of the very few middle class people educate their sons not with any interest to develop their own trade. Even if they come out successful by passing an examination in general education, they try to seek appointments as clerks and entirely forget about industry—the trade of their fathers and grandfathers. They sometimes think that it is beneath their dignity to sit with workmen and do work. Thus all class of people, both sons of handicraftsmen and others, if they are a little educated think low of industry. If educated people were to be common among the artisan classes, I am sure that industry will be respected—and it is want of such respect that is degenerating it.

(4) Native workmen whenever they do any new work prepare no regular working design of the work they are to do. They are accustomed entirely to do from memory—it does not mean that the native workmen are unable to prepare designs in paper, but they have so crammed up the business that they think it unnecessary and waste of time. There are some workmen who generally make sketches on walls either in charcoal or white chalk, if they are to begin any elaborate work. All workmen cannot be able to design—but there are some who cannot express in drawings their ability in work and yet do very good work; there are some who are able to design and not able to produce originality, and those who are able to produce original designs suitable to the purpose for which they are meant and execute them accordingly carrying out the meaning of the design, are said to be best craftsmen. I think there will be no other means of identifying the best crafts except by their work.

The different divisions of caste are not according to the ability of workmen—as knowledge is common to all castes—but the majority of best craftsmen belong to artisan class.

(5) Native system of apprenticeship is superior at present to a very little extent—apprentices under a native mistry though they work under many great disadvantages, are capable of becoming good workmen suitable to the public taste, while earlier than the

apprentices in a school of method. They understand what sort of works their masters are ordered to do by the public and they also watch carefully how they are executed. But after a long training in a school of method it is very difficult for the very clever boys to fetch a place outside on a daily wage of As. 8 at least. Their services have no demand in the market here and their work however superior it may be to that of native apprentices, when it has no market in India is valued to be useless—and considered much inferior. In all other respects, I think, the training in Industrial School of method is far superior. Manufactures of other places have changed the taste of Indian public and they don't value trained artisans who can produce good Indian art work.

Say, for instance, Stapathy's work which was spoken so highly in other places is not in the least valued here. Such are the tastes of the native public, and further a very few apprentices who come out of such a school of method has proved to be useful to the public. This may be due to such schools not being sufficiently advanced in working. I don't think that will work satisfactorily, however good the method or arrangements of teaching be, unless a very large amount is spent freely on materials, teaching, and stipend—of course there will be a great loss in the beginning—which will gradually get less. Such schools of method, I think, must have two sections—one to revive the industry of the country, and the other to produce all kinds of works suitable to the public taste in India. The former will create a market outside India and the latter within India.

For the revival of Indian art, encouragements are wanted in the way of orders from different places. Its system of working is not imperfect and it can be encouraged and developed in its own way—no interference is necessary except the management of an expert who can distinguish the beauty of Indian art apart from other arts that are gradually being mixed up.

(6) No fee is paid by native apprentices: they are taken free in the beginning for about six months or one year, then they are paid a small stipend rising from Re. 1 to Rs. 10 according to their ability in work. They are admitted when they are about 10 or 12 years old and they remain as apprentices until their eighteenth or nineteenth year. Artisan boys very rarely go to schools; their first education after their attaining a suitable age is to seek a place in some workshop and become an apprentice.

(7) Each caste has its own industry; very rarely one caste man takes up the industry of the other; workmen always prefer their own caste apprentices as they find them useful as servants for their private affairs also.

(8) I never have heard famine sufferers having been taught any industry, but I know that they are made to do some cooly business. I do not know whether it is any industry or simply digging the earth.

(9) There should be some sort of grant-in-aid system. Some of the shops or bazars described in my answer to question No. 1 should be recognized as fit to train up boys as apprentices and the mistries should be paid grants according to the number of apprentices and in proportion to the work they turn out. There should be a supervising officer, under an Inspector, who should inspect at least once in three months all the recognized shops, collect works of boys and submit a report to his immediate superior. The work of apprentices should be in the possession of the Inspector and they should become the property of Government after the grant and the cost of raw materials, out of which they have prepared the work, are paid. Such collection of works may be put in any public place for sale and the amount realized may be credited to the Government. All shops need not be recognized, but only such shops or bazars managed by a clever mistry with at least three apprentices working under him in his own style leaving his own work need be recognized.

This system will, I think, very well stimulate all best craftsmen to develop their own knowledge and to bring the system of teaching apprentices to some refinement. If the number applying for recognition were to increase in number, it is only then the rules for recognition, rules for training mistries, and rules for improved system of teaching apprentices, etc., that can be well introduced, which will bring all men of industry to a common centre. This will surely bring success so far as the development of the industry of this country is concerned.

(10) There are no Trade Guilds among any class of workmen except copper and brass smiths who have a sort of union so far as their work is concerned. They have their caste headman as the head of the union. Each town will have a separate headman. The duty of these headmen is to levy a small tax and to collect it for the management of their own Kali temple. They somehow or other compel all workmen in copper and brass to pay tax to the temple. I think this arrangement is for their temple management and not for the progress of their trade.

REPLIES TO THE QUESTIONS OF THE COMMITTEE,

BY MR. J. P. LEWIS, DEPUTY SUPERINTENDENT, REFORMATORY SCHOOL, CHINGLEPUT.

(a) 3.—*Principal Industries of the Province.*

(1) I consider weaving for home consumption an important industry in this Presidency. Madras Presidency ranks next to Bombay as regards the number of Cotton Mills working within its limits. There are 17 mills in this Presidency against 9 in Bengal, besides 12 cotton pressing companies against none in Bengal. These mills generally spin twist, weave cloths, and press cotton for export; but most cotton mills in this Presidency are not paying concerns for the simple reason that they have highly paid skilled management and supervision and expensive machinery which, though intended for spinning and weaving fine counts, are employed only for spinning and weaving coarse counts up to 30's, because the cotton grown in this Presidency is inferior in colour and quality. If a portion of the money spent in establishing a mill had been spent in improving the culture of cotton the mill would decidedly pay. A successful experiment has been recently made at Nellikupam in South Arcot to cultivate a good species of American cotton on a large scale for commercial purposes. The experiment has been so successful that samples of this cotton sent to cotton firms in India and Manchester have been testified to as superior in quality, in length of staples, and in its adaptability to spin yarns of very high counts. This experiment has been so encouraging that a new cotton mill with a capital of 25 lakhs will soon start work to grow cotton and to spin yarns of high counts, and to weave cloths, mulls, muslins, etc. This new enterprise has to be carefully watched, for, while it renders the prospect of power-loom weaving cheerful and encouraging, it will, I am afraid, be the death blow to hand-loom weaving in this country as it has been in England. In the face of this new turn of affairs in weaving, whether it would be worth while to take up hand-loom weaving and work it on a large scale, is a matter which I submit for the consideration of the Committee.

To the list of industries in the Province as enumerated by Mr. Chatterton the following should be added:—

Cigar-making.
Tile-making.
Tailoring.

Cigar-making is another important industry in this Presidency, and Madras takes the lead in it. Madras-made cigars have found their way to all parts of the world. Madras, Cocanada, Dindigul, and Trichinopoly are important centres for this industry which is a well organized one.

Tile-making is another rising and well organized industry in this Province, and much of it is made under European supervision. Mangalore tiles have found their way to various parts of India. Henke's Tile Works at Feroke, Malabar, manufacture all classes of tiles from roofing to ornamental and fancy for ceiling, wall, and flooring. This firm, illustrative of German enterprise, has agencies all over India and in Japan, Melbourne, Penang, Rangoon, China, Singapore, and Sydney.

Tailoring and Dress-making are also important industries in this Province, and tailoring is a caste trade, although a large number of Mahomedans find their living by it. *Cutting*, which is closely allied to tailoring, is a paying profession. Cutters are well paid in this country, and they are generally imported from England. A school where Eurasians, Mahomedans, and people of the tailor caste can be taught cutting on scientific principles is a desideratum. There are some other industries also to which a reference may be made, but as I have to hasten with these notes, I let them slide for the present.

In "printing by hand blocks," to which Mr. Chatterton refers, there is room for considerable improvement. The Native dyers and printers continue to use their old wretched models, or printing blocks. They cannot get better ones, nor can they afford to make new ones. In a weaving school, new patterns or blocks will have to be made and the printers taught to work up to new ideas. I would like to make running comments like these on each of the industries named by Mr. Chatterton, but time does not permit me to do so now.

(b) 1.—*Proposed alterations and additions in schools and of the want of new schools.*

(2) If it be considered necessary to resort to local taxation for the purpose of raising funds for industrial education, then there should be an Industrial School for each district or for a group of districts to improve the industries belonging to that district or group, and to work up the natural resources there.

In addition to the new schools recommended by Mr. Chatterton there should be a School of Electrical Engineering. Civil Engineering and Mechanical Engineering are well provided for. The medicinal properties of the numerous trees and plants which abound in the Indian forests, fields, and gardens, suggests the necessity for a School of Chemistry. India possesses all manner of diseases—plague was wanted to complete the list, and we have plague now—and so also under a benevolent Providence agencies for alleviating or curing such disease. These agencies await to be discovered and utilized to take the place of the large quantities of

medicines and drugs now imported from elsewhere for the use of our numerous hospitals, dispensaries, and doctors.

Calicut is too damp a climate for the best portion of the year to make it suitable for the School of Wood-work suggested by Mr. Chatterton. Coimbatore is decidedly the best site for it, for various reasons. I cannot understand how a School of Wood-work located in Bombay or Calcutta, as recommended by Mr. Chatterton, will benefit the artisans and people of the Madras Presidency.

Madras is a good locality for a Leather Trade School. The possibilities for developing the leather trade in Madras, including boot, shoe, harness, and saddle-making, are very great. There is a good deal to be said on this subject, but I have no time to do so now.

If the object of a weaving school is to improve the trade and status of the weavers, a school in the Ceded Districts is to my mind a pressing necessity. The weavers there are the first to suffer during a drought, and the wages they ordinarily earn only enable them to live from hand to mouth. The weavers in Madura and Salem are, comparatively speaking, a well-to-do community. I cannot get a weaver from Madura to come to Chingleput and work even for eight annas a day. The weavers there have set up a school of their own for general education, and they may be given a grant-in-aid to set up a weaving school of their own. Their general education school will serve as an evening school for those who have to work during the day.

In conclusion, I wish to add that this country is not yet ripe enough to admit of industrial education making any rapid progress in the near future. A good deal has yet to be done in the matter of primary and secondary education. It is by means of secondary education that the intellect and the intelligence of the people in general will be sufficiently developed to enable them to adjust themselves to the new conditions and methods needed in the development of industrial education. At present only an infinitesimally small portion of the people are able to read books, journals, and newspapers to understand the great changes that are taking place in the markets of the world. The intelligence of the people, as remarked by Lord Playfair at an Annual Meeting of the National Association for the promotion of Technical and Secondary Education in England, must be very greatly improved and heightened in order to understand the competition which was going on around, and to adapt themselves to that competition. If this is necessary in enlightened England, much more is it so in "benighted" Madras.

As regards the Central Industrial School recommended by Mr. Chatterton, it should be, as the Presidency College is to General Education, the Presidency Technical School for Industrial Education, and be maintained entirely from Provincial or Imperial funds. It should be a model school to a great extent for the Industrial Schools in the mofussil, and should, like the Teachers' College, undertake to train Superintendents, Industrial Instructors, Foremen, and Mistri for the schools in the mofussil. It should, among other things, provide instruction in the principles of those sciences which bear directly or indirectly upon the industries which have to be improved, and show by experiments how those principles may be applied. Science should be taught in this School with a view to its industrial and commercial application. While providing instruction and workshop practice for apprentices in the scientific principles underlying their respective industries, it should also bring to their knowledge newly discovered processes and methods of improving any special trade, or of introducing new branches of industry. Apprentices who qualify from the Presidency Industrial School for appointments specified above, should be able to pass an examination according to the following tests :—

- (a) Ability to draw a diagram or a sketch on the black-board, or to cut or to draft to measurements given.
- (b) Ability to give instruction to, and to start a class with work set by the examiner.
- (c) Ability to supervise the class work, detect faults, and to remedy them.
- (d) Knowledge of the principles which underlie the candidate's trade or industry.

I have been for some years past appointed as an Examiner for Technical Teachers' Certificates under the orders of the Director of Public Instruction, and the tests I employed for examining the candidates are, to a great extent, those specified above.

(4) I shall now make a few remarks on some of the other points touched upon by Mr. Chatterton. As regards his opinion that Karur is the best weaving school in the Presidency, I beg to state with due deference to that opinion, that the weaving department of this school is quite as good as, if not better than that at Karur. Karur has not yet sent out any trained instructor in weaving, whereas the weaver instructors in the Art Industrial School at Nazareth and the American Mission Industrial School at Arni are pupils educated and trained in the school. Even the School of Arts for some time employed as a weaver mistri an ex-pupil of this school. It was this youth who introduced the fly-shuttle and the European hand-loom for the first time into Madura. The design of attaching the fly-shuttle to the native hand-loom proceeded from this school, and was copied by the School of Arts. The models for the hand-looms at work in that school were sent by me; and this is the only school in the Presidency which has had awarded to it a bronze medal by the Fine Arts Society of Madras (1901) for excellence in textile fabrics. Even the weaver instructor at Karur attended this school for a few days to take notes for weaving the Madras

handkerchiefs, and the first supply of such handkerchiefs for export was woven in this school. As regards the nature of textile fabrics woven in this school and the extensive area over which they are sold, I beg to invite the attention of the Committee to Table II on page 23 of the accompanying Report of the Chingleput Reformatory School for 1900. The outturn at present is limited by the accommodation and the funds placed at my disposal for the weaving industry.

(c) HOW ARE FUNDS TO BE PROVIDED.

As Mr. Chatterton has left this question unanswered, and as I considered it an important one, I wish to offer a few remarks on it. It seems to me that the whole question of Industrial Education lies in a nutshell. It centres on the question, how funds are to be provided. If sufficient funds are available, the question of Industrial Education is easily solved. All that remains to be done then is to open and equip Technical Schools on the lines of those in England or Germany, but adapted to the special conditions and needs of this country. The Educational Department has already done a great deal to maintain and foster a system of industrial education in this Presidency so far as funds placed at its disposal have permitted. The system it has had in view is clearly set forth in the well considered syllabuses it has in force for the various Government Technical Examinations. Judging from the past, we cannot expect from Provincial funds much more than is now granted for Industrial Education; and I doubt whether the Government of India will be able to render any substantial pecuniary help in the matter. The question therefore is, where the funds are to come from. As the advance of Industrial Education will be intimately connected with the prosperity of the people in the relationship of cause and effect, it would, I think, be reasonable to look to the people themselves for a share of the expenditure in Industrial Education. If funds cannot be found without resorting to taxation, a local taxation is the only resource. Government should be able to find some source yet untapped to impose a light cess on. Some of the luxuries which people in general enjoy might be taxed. What is wanted is an enactment on the lines of the Technical Instruction Act of England. To local taxation may be added grants from Provincial funds to the extent they are now given, and local donations and subscriptions.

2. As regards the question whether Industrial Schools will be self-supporting, I am of opinion that every Industrial School should have two sides, namely, the teaching side and the commercial side. The teaching side will be a source of expenditure, all the skill employed and the materials used in teaching apprentices will result, not in money outturn, but in trained artisans, who, after passing, say, the Elementary Technical Examination in their trades, should be drafted into the commercial side—if they do not find employment elsewhere or wish to set up their own business—and be placed on suitable wages. The commercial side, if properly managed, and worked as a commercial factory, should be self-supporting; and in the hands of an energetic and experienced Superintendent it should not only support itself, but it should also be able to make a profit to cover a portion of the expenditure on the teaching side. An extensive home market, large supplies of raw materials at hand, and cheap labour are factors which should make the commercial side of an Industrial School not only a paying concern, but also help it to hold its own against foreign competition. I have not here taken into consideration the possibility of a Cabinet-making School or of a Carpet-weaving School turning out goods for export to foreign countries.

WHAT INDUSTRIES TO BE INTRODUCED.

The methods adopted which led to the great success of the Aluminium industry in the School of Arts, can only be applied to new industries. I have a few such industries in view. The Aluminium industry, it must be remembered, has had the whole field to itself; there was no local industry of the kind to impede its progress, or to limit its scope. It would not be safe, in my opinion, to adopt those methods for the improvement and development of old industries. If new industries are to be introduced, they should be such as can turn out articles for which there is an extensive local demand in the first instance. *Paper-making* and manufacture of *matches* are two such industries. I see no reason why local enterprise should not provide the immense quantities of paper and matches which are now imported from Italy, Austria, Belgium, Germany, Japan, and Sweden.

BURMA.

Proceedings of the Industrial Education Conference held in the Council Chamber, Government House, Rangoon, on the 11th February 1902.

Present :

- HIS HONOUR SIR FREDRICK FREYER, K.C.S.I.,** *Lieutenant-Governor,*
Presiding.
- MR. J. B. WINGATE, I.C.S.,** *Secretary to Government.*
- LIEUT.-COL. J. THOMAS, I.M.S.,** *Inspector-General of Prisons.*
- MR. A. E. RIGG, I.C.S.,** *Deputy Commissioner, Rangoon Town.*
- „ **JOHN V. POPE, M.A.,** *Director of Public Instruction.*
- „ **HARRY L. TILLY, Chief Collector of Customs.**
- „ **A. GAITSKELL, I.C.S.,** *Director of Land Records and Agriculture.*
- „ **C. E. CARDEW, Locomotive and Carriage Superintendent,**
Burma Railways.
- „ **JAS. ROBERTSON, Superintendent, Dalla Dockyard.**
- „ **J. SHOOT, Secretary, Rangoon Municipality.**
- „ **S. OPPENHEIMER, Merchant and Manufacturer of Leather Goods.**
- „ **J. F. FINDLAY, Manager, I. F. Co., Ltd.**
- „ **F. H. MITCHELL, Head Master, Government School of**
Engineering, Insein.
- „ **S. W. COCKS, Inspector of Schools.**
- „ **J. T. BEST, Principal, St. John's College, S.P.G.**
- REV. F. B. PRICE, Officiating Wesleyan Chaplain.**
- „ **CHARLES B. HILL, M. E. Mission.**
- MR. IYOHNE JHINE, Honorary Magistrate.**
- LIEUT.-COL. J. CLIBBORN, C.I.E., I.S.C. }**
- MR. C. A. RADICE, I.C.S. }**
- „ **R. E. ENTHOVEN, I.C.S. }**
- REV. FOSS WESTCOTT, M.A. }**
- Members of the Committee.*

A.—IMPROVEMENT OF LOCAL INDUSTRIES.

(a) WHAT HAS BEEN DONE SO FAR.

2.—*Native System of Apprenticeship.*

Q. (1) What is the Native system of keeping up a supply of artisans for the ordinary Native arts and trades?

A. MR. TILLY said that the master workman secures pupils and teaches and feeds them and when they know something of the work and are of help to him he pays them. The apprentices are not bound, although they did try binding down some time ago, but it had to be given up. He tried himself to bind apprentices on behalf of Government to some of the leading artisans in their own shops and even tried to get them an allowance from their masters, but nothing came of it. The master workmen complained to him that directly the pupils began to know their work they left and set up on their own account, selling very bad work and underselling them; they thought this very unfair. He believed however that binding down of apprentices for four or five years could be managed if scholarships were given. This referred only to art industries.

MR. OPPENHEIMER said that he also tried binding down. He advertised in the papers for apprentices and had two applications—one from a Burman, and another from an Eurasian.

Articles of agreement were drawn up and signed, but the Burman who came at seven in the morning went away at 12 and never turned up any more, the Eurasian stayed a few days, and he also disappeared.

MR. CARDEW said that they had a system of apprenticeship for five years, the boys beginning first on probation for six months. They were paid from the very beginning, R13 for the first year, R16 for the second, R25 for the third, R28 for the fourth, and R40 for the fifth. If they became of age during the term of their apprenticeship, under the Apprentices' Act, they were free men; they could go if they liked, but they got no certificate unless they worked out their full term. They did not take in any Natives of India but only Burmans, as he found the former were always wanting leave to go to their country under some pretext or other. Barracks were found for the apprentices on the premises. They had a great number of boys and it was a good thing, he said, to see the bulk of the population following the profession of their ancestors. R15 a month was allowed by Government for orphan Europeans and Eurasians. Many of the apprentices became good workmen, and the best of them rose to be chergemen.

MR. TILLY was sanguine that the system of indentures could very well be carried out.

Q. (2) Is one system or method common to all trades, or are there several different systems or methods?

A. MR. TILLY said that as far as he knew the one system was common to all trades—at least amongst the Burmans.

MR. IYOHNE JHINE endorsed this statement.

Q. (3) Are there any special objections to or advantages in the Native systems? Please specify.

A. MR. TILLY was of opinion that the Native system was superior in its method of training apprentices to the ordinary Industrial School inasmuch as it was to the advantage of the teacher to teach his apprentices all he knew.

Q. (4) How can the best craftsman in any particular trade be most easily identified?

A. MR. TILLY said that it was no easy matter identifying the best craftsman—opinions differed locally.

Q. (5) Do you think that the Native system of apprenticeship is superior or inferior to the average Industrial School in method? Can it be extended in practice? Can it be influenced by outside expert suggestions, advice, or interference, and how best?

A. MR. TILLY said that if scholarships were given to the apprentices, craftsmen would be ready to adopt suggestions for increasing the number of their apprentices. He once went round to some of the workmen's shops and tried to improve their designs by giving them advice, and found they were very willing to listen to him.

MR. OPPENHEIMER was of opinion that the giving of better tools than the craftsmen already possessed would be a sufficient inducement, as they liked and believed in good tools.

Q. (6) Are any fees paid by Native apprentices? Do they receive any remuneration for work? Can you give any information regarding ages and preliminary education?

A. MR. TILLY said that they generally began learning at about the age of 13 or 14. The Burman generally liked to give his child a certain amount of education.

HIS HONOUR called in a Chinaman (the carpenter of the place) and had him questioned as to when, how, and where he got his training. In answer he said that a contractor by name of Kwong Wein taught him in China, he was 12 years of age when he began learning; his father was not a carpenter; he chose carpentry because he thought there was abundant work of this kind in Rangoon, although he had no previous intention of coming to Rangoon. He did not have to pay anything when apprenticed, previously he had no previous knowledge of carpentry, he had to pay a fee of R50.

Q. (9) What particular inducements would you offer craftsmen to induce them to improve and extend their system of training?

A. MR. TILLY said that the best plan would be for Government to arrange to dispose of the best work by sending it out to those shops which deal in such articles, on commission sale. By this way, the men being continually supplied with work, would see their way to employ a number of apprentices. He would have prices marked. There would be one great advantage in this method in that it would at once be made known if any particular articles had no sale and thereafter its manufacture could be stopped. He would send these articles not only to the Rangoon shops but also to Mandalay and other places; he would even go as far as Calcutta if he found there was a demand for Burman work. He would have a Provincial Officer who would look after all this, and he would visit all the towns of Burma and keep a list of all the artisans. What these workmen wanted was a large, steady sale. He would not advance them money but would give them orders instead. However, a little advance, he thought, might be given them at first as a start.

HIS HONOUR remarked that experiments were tried a little time back in wood-carving. A man was engaged on R40 a month to sell the goods, but there was a loss and he had consequently to close the undertaking.

MR. TILLY put the reason down for the failure to this man not being familiar with the wood-carving industry; he was a merchant. It was for this reason that he recommended above the sale of these things through the trades people, who knew their work in that particular line. Prices need not be fixed, he said, when these articles were sent to big, reliable firms, but in the case of small firms they should be.

MR. SHOOT was of opinion that firms like "Orr's" would not undertake to sell on commission sale.

MR. TILLY remarked that Government should keep prices down.

HIS HONOUR thought that if prices were marked by Government it would be very advantageous.

MR. TILLY said that as far as art industries were concerned Government should ensure the sale of work by putting their mark on it, guaranteeing it to be of good workmanship.

Q. (10) and (11) No Trade Guilds in the Province.

3.—Principal Industries of the Province.

Q. (2) Which of the above would you recommend being specially supported or encouraged?

A. MR. OPPENHEIMER said that there were three or four industries that were already flourishing in Burma, *viz.*, wood-carving, silver-work, iron-work of sorts, lacquer-work, and silk weaving, but these needed improvement by way of better materials, better tools, better machinery, etc. They had imported better tools for wood-carving and found it improved the art considerably. As for weaving, not being a practical man he could offer no suggestions, yet he thought it was a very important industry and ought to be investigated: all their silks were imported.

MR. TILLY did not think that there would be any very great sale for glass or lacquer work and therefore did not think Government would be justified in taking these up.

MR. OPPENHEIMER further recommended the manufacture of artificial cloth flowers and glass ear ornaments. These have made rapid strides in Mandalay, but were capable of improvement and expansion; they could be exported.

Another industry was the printing of silks, which, in his opinion, needed immediate encouragement because the Burmans could not hold out much longer against Indian competition, and no article was so much in demand locally as printed silk, being the Burman's wearing apparel and head dress. He could not answer the question as to whether there was any possibility of the stuff being made here instead of being imported.

MR. TILLY recommended the adoption of improved methods with respect to sericulture.

(6) WHAT IS PROPOSED TO BE DONE TO CARRY OUT THE EDUCATIONAL CONFERENCE RESOLUTION.

1.—Proposed alterations and additions in system and methods.

Q. (3) Do you consider any provision should be made for advancing specially promising students from an industrial institution to a higher class?

A. MR. CARDEW remarked that workmen could not be manufactured in a school; that 90 out of 100 turned out failures.

MR. ROBERTSON agreed.

MR. OPPENHEIMER said that admitting this to be the case, the object of such an Industrial School would have been attained; as these ten would go abroad and spread their knowledge in fresh fields.

Q. (4) Which do you consider the best method of training Foremen or Assistant-Managers of Works?

A. MR. CARDEW said as workmen first, as no amount of school training would make a Foreman: it was the handy man, in his workshops, that was pushed up and became Foreman.

HIS HONOUR agreed.

MR. CARDEW gave an instance of one of his Foremen—a Bohemian—who, the man told him, had learned his work from his father and then went to a technical college to finish his training. He would therefore recommend that they first be made to put in their time in the workshops and then be sent to a college for a theoretical training.

2.—Proposed alterations and additions in schools and of the want of new schools.

Q. (2) Would you approve of the institution of new schools or a new school in the province now or in the near future, and if so—

(i) In what locality, and are premises available?

(ii) For what trades?

(iii) Under what system and method?

(iv) How would you finance it? Are there any special funds available?

A. MR. POPE was in favour of a training school (by training school he meant that which would produce workmen and teachers) in blacksmith's work, tinsmith's work, carpentry, weaving, mat and cane work. One school would be enough under a competent Superintendent. There used to be such a school in Bassein some time back which did very good work, but it had to be closed as they wanted the ground for other purposes. They would not have closed the school if another site could have been secured. The proposed school could be under the management of a Superintendent and instructors.

HIS HONOUR doubted whether this school would turn out as good workmen as those outside. He was of opinion that all these trades proposed by Mr. Pope could be better taught by apprenticing the boys to outside craftsmen and giving them scholarships.

If the school should be started, however, he did not think there would be much difficulty about the money.

MR. JHINE was of the same opinion as His Honour and said that the Burman lads could

more easily be induced to work as apprentices under craftsmen (provided they received scholarships) than be made to go to a school; besides the craftsmen were willing to take in apprentices and wanted nothing for teaching them.

Q. (3) Night Schools

A. MR. CARDEW strongly approved of night schools.

MR. ROBERTSON said that the men would attend from the Dockyard.

HIS HONOUR thought them to be very excellent things.

MR. OPPENHEIMER did not think that they would meet with much success, but it could be tried.

Q. (4) Should such night schools be under the General Education Department or the Industrial School Management?

A. MR. POPE was in favour of their being under the Industrial School Management.

HIS HONOUR was of the same opinion.

Q. (5) Are you in favour of the establishment of Training Schools for Superintendents and Instructors, and do you propose to take steps in this direction at once?

A. The general opinion was that the Province was not big enough for this undertaking, but His Honour proposed that an Industrial School might be started on a small scale at first and if it was found to be doing well they could then open a Training School for Superintendents and Instructors, with which opinion the majority of the Committee agreed.

MR. CARDEW asked whether it would not be better to establish a small Industrial School as a branch of the Engineering School at Insein.

MR. MITCHELL was willing to undertake such a school.

3.—How the Neapolitan Scheme would apply.

Q. (1) Do you approve of the method of the Naples scheme generally?

A. MR. TILLY said that this was about the same system that he had already proposed.

Q. (2) Do you think craftsmen working at their trades and financing them will consent to work in an Industrial School under the control of a Superintendent?

A. HIS HONOUR did not think that craftsmen here would come to the school.

MR. JHINE remarked that they might come into different shops but not all in one shop. They would have no objection to Superintendents coming into their shops and giving advice.

HIS HONOUR was of the same opinion.

Q. (3) Should such schools be in an enclosed private area or open freely to the public?

A. HIS HONOUR was in favour of their being open freely to the public.

4.—Would you accept Experts from abroad in each Industry.

A. (1) MR. CARDEW said you could not get a sound general expert.

Q. (2) If you approve of specialized working experts, should they be Provincial or Imperial?

A. HIS HONOUR was in favour of the experts being Provincial.

Q. (3) What would be the average annual cost of such an expert?

A. MR. CARDEW and MR. TILLY said not under Rs 300 a month.

Q. (4) For what trades at present do you consider specialized working experts are required in this Province?

Q. MR. TILLY:—A silver expert for one year.

MR. CARDEW:—Weaving expert.

MR. OPPENHEIMER said that he had tried to reproduce silks made by hand on machinery without any success.

MR. CARDEW was in favour of having a native workman who had already been trained in European methods.

Q. (5) Can you define the status and qualifications required in these experts?

A. MR. CARDEW remarked that a good man could not be got unless he was personally selected.

Q. (6) How should the expert proceed to improve manipulation and practice?

A. HIS HONOUR remarked that he would put them in different shops to teach. Or let there be an assembly of craftsmen in a central place where the expert could deliver lectures.

5.—Proposed Department of Control, Central and Local, for Urban and Rural Schools.

Q. (1) Apart from the Superintendent in direct charge of the school, what system of local control do you think the best—

(i) For Rural schools?

(ii) For Urban schools?

A. MR. POPE would have a special Committee for both Rural and Urban Schools.

Q. (2) What should be the functions of the Local control in each case?

A. MR. POPE would give them inspection rights but not financial control.

Q. (3) The local systems of control must, it is presumed, be focussed for the Province by some technical officer who will be generally responsible for executive administration and management. Who should this be?

A. MR. POPE was in favour of the appointment of a special Inspector of Schools.

Q. (4) Would it not be best to relieve the Educational Department of the extra burden that Industrial Schools must constitute owing to this Department not having, as a general rule, any special technical qualifications?

A. HIS HONOUR would relieve the Educational Department and organize a special Department with Mr. Tilly in charge.

Q. (5) Is direct and special Imperial control of Industrial Education necessary for its efficient development?

A. HIS HONOUR said that Imperial control was necessary to secure uniformity in practice.

6.—Exhibitions and sales, whether required.

Q. (1) Are exhibitions of any real value—

- (i) Local?
- (ii) Provincial?
- (iii) Imperial?

A. HIS HONOUR and MR. TILLY said that exhibitions were valuable; they were doing a lot of good.

HIS HONOUR did not think that Local exhibitions were needed. Provincial and Imperial were useful.

MR. TILLY said that Provincial were the most useful of the two.

Q. (2) Can you suggest any conditions which would make exhibitions of value to the industrial progress of India?

A. MR. TILLY said that as far as Provincial exhibitions went, they did workmen a great deal of good.

HIS HONOUR agreed.

Q. (5) Can you say whether, generally speaking, the workman gets the best wage or profit return from—

- (i) Expensive fine work?
- (ii) Cheap common work?

A. MR. TILLY thought that cheap common work paid better. It was being experienced in Burma, he said, at the present moment.

MR. JHINE remarked that in silver common work paid better.

(c) HOW ARE FUNDS TO BE PROVIDED.

It was proposed to ask the Government of India for a special grant to start the proposed apprenticeships.

B.—NEW INDUSTRIES.

MR. OPPENHEIMER would like to recommend tanning but that climatic influences in Burma were against it. Firms had tried chrome tanning but without success.

MR. TILLY recommended enamel work.

WHAT ARTISANS ARE REQUIRED.

MR. SHOOT said Plumbers.

MR. TILLY said Burman carpenters and cabinet makers were very scarce; more or less all the carpenters here were Chinamen.

SCHEME OF INDUSTRIAL EDUCATION,

BY THE DIRECTOR OF PUBLIC INSTRUCTION.

From JOHN VAN SOMERSEN POPE, Esq., Director of Public Instruction, Burma, to the Secretary to the Government of Burma,—No. 5852-63E., dated the 20th December 1901.

In reply to your General Department No. 366-4E.—4, dated the 13th December 1901, I have the honour to submit a rough scheme as requested.

2. I have read all the papers including Sir E. C. Buck's Report on Practical and Technical Education and other papers on this subject that I have received from time to time.

I shall be glad to have the scheme for Bengal, which Sir E. C. Buck, in paragraph 6, page ii of his Report, characterizes as "a clear and definite working plan."

3. The object of the whole enquiry and of the action that the Government proposes to take is—

(a) to counteract the purely theoretical tend of education as now given and provide for the practical as well; to train pupils for productive occupations, instead of entirely, as hitherto, for the work of "writers, office clerks, and minor posts in Government offices;"

(b) to improve existing industries, and to develop new ones.

4. The Government is faced at the very start by the fact that this will need considerable financial outlay. If, as is universally acknowledged, it is a matter of vital, social, and political importance, it is worth paying for. In time, help may come from private sources; but now, and for some time to come, the cost will have to be borne by the Government, and much patience will have to be exercised before visible and paying results are seen. This should be clearly borne in mind.

5. To make the scheme a success we shall have to begin with our schools, and give them a chance of taking up those studies that lead to and are essential to the "practical" side of education. This sort of training is to a certain extent taken up in our schools; but we have been met by two difficulties in carrying it out fully. In the first place, such training has up to the present led to nothing; it has no outlet; and *secondly*, our schools, with five exceptions, are all under Municipal, Educational Syndicate, or Missionary management. We shall have to come to some definite terms with these. [The Government Schools are the High and Normal Schools, Moulmein, the Normal School at Mandalay, the Normal School at Toungoo, the Anglo-Chinese School at Bhamo, and the High School at Minbu.]

The general conclusions arrived at by the Irish Commissioners, point to the necessity for including kindergarten, educational, hand-work, drawing, elementary science, cookery, laundry-work and domestic science, needle-work, singing, drill and physical exercises, in the educational system of Primary schools. In Burma, kindergarten methods and object-lessons and kindergarten schools have received special attention: they form part of the curriculum in both Anglo-Vernacular and Vernacular schools. Slöjd work is done in the Government High and Normal School, Moulmein, and forms part of the training, as kindergarten does of the teachers trained in that school.

Drawing is compulsory up to Standard VII in all Government and Municipal schools, and is largely taken up by aided schools. It is a part of the training of teachers.

Elementary Science is an optional subject only, though compulsory for teachers; cookery, laundry-work, domestic science, and needle-work are taken in many girls' schools, but they are optional; singing is popular, and is steadily extending. Drill and physical exercises for boys and girls are largely adopted.

To remedy the first difficulty I have referred to, we shall have to draw up an alternative scheme, that shall include such subjects as are required for entrance into our Industrial Schools, and we shall have to arrange for examinations in these and for the necessary subsidies, as are given for literary education by Government. We are in this matter, to a large extent, dependent upon the Calcutta University, which at present recognizes only the literary side, and draws students to it.

To meet the second difficulty, we must make a technical side compulsory in all Government and Municipal schools, and offer sufficient inducement in grants to aided schools to adopt the same.

6. Higher technical education, we have not in the province; but it would be worth while enquiring whether an Engineering school, teaching civil and mechanical engineering, and a Medical school, might not be taken in hand.

The Engineering school we have teaches no further than the upper and lower subordinate classes; and the medical students are, greatly to their detriment, sent to Madras and Calcutta for training, which is very expensive, and gives by no means a full return.

In addition to the above, each year a certain number of lads are apprenticed to the Railways and other workshops to be trained as fitters; the Railways train lads in telegraphy; and our Survey schools are training lads for survey and land-revenue work.

7. The School of Art I consider may wait.

8. What we have to deal with is the opening of Industrial Schools, country and urban. We are faced at the very outset by the complete want of trained teachers. We might open, at certain district centres, Industrial Schools for the study and development of single indigenous products; but they would be under no control or supervision; the educational value would be very little; and the improvement in methods and design that the scheme aims at would not be achieved.

9. I urge that we begin with a central urban school for the province, or if thought necessary with two, one for Upper and one for Lower Burma. This school should be placed under a well-trained superintendent, who will have under him expert workers in several industries, all collected in a single building, giving instruction in diverse branches of industry or manufacture. What these industries or manufactures will be can be decided, when the survey referred to in paragraph 2 of your letter is received.

The school so established will have to be for some time the training school in which boys may be taught and fitted to go out as teachers to the country schools which we hope in time to open.

A training school, or two schools of this kind might be opened somewhat on the lines suggested by Mr. Radice in his paper on the Casanova Boy-artisan schools at Naples. I think we shall have to put the age for admission somewhat higher, and that we shall have to give the artisans a monthly salary to make it worth their while to teach.

I doubt whether they will come and set up with merely the inducement of a shop rent-free, labour provided at cheap rates, and the advertisement gained by the school being frequently visited.

10. If two schools are opened, two experts capable of suggesting improvements in design, pattern, tools, and methods, to the master-artisans will be necessary.

The industries I would suggest for a beginning are—

- (a) wood-carving.
- (b) carpentering;
- (c) silver work;
- (d) cane, basket, and straw work,
- (e) weaving, cotton, and silk,
- (f) carpet-making.

The two experts will have to be brought out on the same terms as educational officers are ; and the master-artisans will have to be paid at least R10 a month each. We have then to consider the cost of a suitable building, servants, and equipment, contingencies, and cost of material and tools, as we should have to supply tools to both artisans and pupils.

I take it that the initial cost per each school will roughly be—

	R
(a) Building	40,000
(c) Equipment	3,000
(d) Staff of artisans	7,200
(e) Servants	1,440
(f) Tools and materials	5,000
(g) Superintendent	6,000
(h) Contingencies	300
(k) A Slöjd and drawing master	3,000
(l) A teacher for other subjects named below	3,000

or a total of R68,940, and about R30,000 a year, when the building has been provided.

The cost may seem high, but we have to deal with experts, and the return will be long in coming, but this is what the Government must be prepared for.

11. From the very commencement I propose to charge fees, the amount of which can be settled hereafter.

I have included a drawing and Slöjd master, and a master for such subjects as elementary science, arithmetic, and practical geometry, which are essential.

In other respects I make no provision for any literary instruction, which, as suggested, will have to be obtained in night schools, the necessary preliminary training having been obtained in the practical as opposed to the literary side of existing schools.

I have made no provision for the present for a singing master, or for a gymnastic instructor.

MEMORANDUM ON TECHNICAL EDUCATION IN BURMA.

BY MR. JOHN VANSOMBERN POPE, M.A., DIRECTOR OF PUBLIC INSTRUCTION.

Practically nothing in this direction has been attempted in the province beyond the opening of a Government School of Engineering for Upper and Lower Subordinates ; apprenticing students every year to the railway and other workshops ; and encouraging, such occupations as carpentry, blacksmith's and tinsmith's work, cane-work, lace-making, and weaving in schools. We have an Industrial School attached to the Insein Reformatory and a Slöjd class attached to the Government High and Normal School, Moulmein.

2. There was for some years an Industrial School worked by the Roman Catholic Mission at Bassein ; but it was closed partly because the Mission wanted the buildings and grounds for other purposes, but chiefly because the system of education in the province was not calculated to develop such schools, and such schools led to very little.

3. To make technical education a success, we must begin by introducing a course in our scheme of education, that will lead up to this branch, just as it provides now for the purely literary one. Arrangements are being made for this. This is the basis of any reform in the direction of technical education. Up to a certain point all students, whether for the literary or the technical side, will work together ; after this a divergence will have to be made that will prepare students for the respective sides.

4. The next matter we have to keep steadily in view is that, if we wish technical education to be sound and to spread, we must not rush off and start schools broadcast all over the country ; but wait till we have trained and fitted teachers for this work. We must begin by opening a good central school in Rangoon, Insein, Moulmein, or other town that shall be a training school for technical education. This school should be well equipped and well staffed, and be an object lesson for technical education throughout the province. No money and no pains should be spared in making it thoroughly efficient. We should provide for the training of teachers in all forms of practical, industrial, and commercial work, including agriculture and farming.

5. In Burma, fortunately, we have but few prejudices such as caste raises ; these few will have to be considered. For instance, Burmans will not take to work on a dairy farm ; and sericulture is confined to the Yabeins on the Pegu Yomas, between Prome and Toungoo. I presume that the training school will primarily be for the people of the province, that is Burmans, Karens, and domiciled Europeans and Eurasians, and that we shall not allow it to be swamped by natives of India.

6. The school will need a thoroughly trained, practical man at the head, with qualified teachers under him for the various industries, which would comprise carpentry, wood-carving, ivory-carving, weaving, lace-making, silver work, blacksmith's work, cane and basket work, agriculture, and other industries it is thought ought to be encouraged and developed.

7. It ought to have a good boarding establishment attached, and both boys and girls should be admitted as students.

8. It should have a science and chemistry laboratory. On the agricultural and farming side, gardening (vegetables and flowers), a dairy farm, poultry-rearing, and stock-breeding might be provided for, a sufficiently large piece of ground being acquired for the purpose. To give agriculture a practical side, students after they have learnt the general principles in the

laboratory, could learn the practical application, such as a knowledge of manures, and rotation of crops in the fields attached, where they will be shown the laws at work by experiments on soil and seed.

9. In a well-known institution in England the following plan is followed :—

A large field is divided into three parts :—

- (1) Consists of seventy plots, each about one square rod in area. These are devoted to the culture of various agricultural grasses.
- (2) Consists of a quarter of an acre, on which are grown wheat, oats, barley, potatoes, and other cereal and root crops. The soil of these fields is subjected to various treatment in order to teach the boys practical lessons.
- (3) Is laid out as a miniature farm and is divided into four divisions, to demonstrate the principle of rotation in crops.

10. To lead up to all this, and to adapt the pupils to the career that they may wish to take up, an elementary course should be given them, which shall comprise elementary and practical mathematics, including mensuration, drawing, freehand and geometrical, elementary chemistry, elementary physics, and botany, and English or Burmese, taught with a view to reading, writing, and composition only, to be taught "not by means of blackboard and books only, but by practical work in the laboratories and fields."

11. To provide for the girl students, I recommend that gardening, cooking, needlework, household-management, and cutting-out be included in the curriculum. The dairy should be their special department, and, to make this effective, it should be supplied with the most modern machinery, such as cream-separators, churns, and milk-testing appliances.

12. The dairy workers will also be taught the business-side of the work, such as packing and preparing for the market, and keeping of dairy accounts.

13. The poultry-side will need incubators. Girls will be taught also keeping of accounts, repairing, and mending, and in fact all that is useful to a good housewife.

14. This may seem an ambitious scheme; but it is possible, if a good woman teacher, trained in this, is added to the staff.

15. I should put the agricultural students through a course of "carpentering and work in the engineering workshop, which will be fitted with a screw-cutting lathe, drilling-machine, and all other necessary tools. It gives them a practical knowledge of welding, rivetting, fitting, and soldering, knowledge of the greatest importance to farmers in the villages, who have often to mend a broken plough, a damaged bolt, or some injury to machinery, if they wish to be saved considerable expense."

16. As to admission of pupils, preliminary qualifications, fees, and scholarships I suggest that no pupil be admitted who has not passed Standard VII on the technical side of the schools of the province, and is at least 15 years old. On the vernacular side, an ordinary Seventh Standard pass will have to suffice for the present. Our object is to train teachers in the urban school, to go out and open rural schools hereafter, and this should be clearly borne in mind.

17. Fees should be charged from the beginning and a certain number of scholarships be offered for competition. The fees for purely vernacular students should be lower than those of the Anglo-Vernacular ones, and might in some cases be remitted.

18. The course should be one that will ensure thorough training, and not to be rushed through and turn out ill-trained men. We should be in no hurry to open rural schools.

REPLIES TO THE QUESTIONS OF THE COMMITTEE.

BY MR. HARRY L. TILLY, CHIEF COLLECTOR OF CUSTOMS.

Exhibitions and Sales, whether required.

Exhibitions appear to be of value first to the exhibitors and secondly to the purchasers.

It must be premised that the judges know their work, that their taste is good, that they are impartial and desire the development of the trade of art handicraft on sound lines.

An exhibitor values very greatly any certificate that he wins; besides giving him honour before his fellow craftsmen it is of the utmost use to him in obtaining orders. The standard of taste and workmanship of those who do not gain prizes is raised, they see actually before them some of the possibilities of their craft, and having seen the kind of work for which a prize is awarded, they have generally sufficient self-confidence to resolve to try again next year. The judges also arrange competitions to suit all degrees of skill and different classes of workmen.

2. I prefer Provincial exhibitions to either Local or Imperial, because the exhibitors can as a rule attend a Provincial centre and there is greater competition than at a local affair. I do not think an exhibition is of any use unless the majority of the competitors attend.

In the trades it is possible that an Imperial exhibition would be useful, but in the case of the art handicrafts an Imperial exhibition is of little value to the workmen, because it is the object of Government to keep the art of a province pure and any copying of the designs of other provinces is greatly to be deprecated.

Exhibitions are of value to purchasers, because they are able to correct their standard of taste and to become personally acquainted with the workmen from whom they can order what they require without the baneful influence of a middleman.

3. To make an exhibition of value to industrial progress, I think it is necessary, first, to appoint sound and capable judges; secondly, to appoint a Secretary, who will receive orders for workmen and register them and be responsible that the orders are properly carried out. The only difference between this man and the middleman would be that the Secretary having no pecuniary interest in the work would not be inclined to lower the standards and so turn the art of trade into a manufacture. It is exceedingly difficult to avoid such a result, for purchasers naturally desire replicas of an exhibit that attracts their fancy. Thirdly, I think that the best work should be photographed and copies sent to the leading workmen; such a practice would tend to raise the general level of work and design, whereas constant competition would prevent sameness, for the exhibitors will always find it necessary to beat the previous record.

4. I find considerable difficulty in answering the questions about sale-rooms attached to schools.

Upon the whole the least objectionable plan appears to be that the ordinary stock work of the school should be sent on commission sale to regular dealers, one for each branch of industry. For example, that the various firms in Rangoon which deal in wood-carving should be invited to become agents of the school for that handicraft, and that out of those willing, one be accepted, and the work sent there as it is finished. Orders for work, however, to be received either by the manager of the school or by the commission agent, in the particular branch. Deed-boxes, for example, might be sold by another agent, and carpets by a third. Many of the difficulties arising out of the alleged interference with private trade would be overcome by this means, and the mere fact of having to deal with an ordinary man of business, would keep the manager of the school informed of the wants of the public. A sale-room attached to a Government institution is seldom a success, it is generally filled with things that no one requires. These ought to be got rid of by clearance sales.

5. My experience has been confined to the art industries. I have never known any master-workman become rich or even well-to-do, and those who are most keen on turning out the best possible work, often suffer most. The chief reason for this is, that the best journeymen demand and obtain very high wages. If a shop has a continuous flow of orders, it is possible to keep a good set of men regularly engaged, but when orders are intermittent, the master workman often spends his profits in retaining his best journeyman, doing nothing until fresh orders come in. Master-workmen also suffer loss by the desertions of apprentices and inferior workmen, who set up for themselves and sell inferior work at low rates. Owing to the ignorance of purchasers and the cupidity of middlemen, inferior work finds a ready sale, and orders which would keep a good shop steadily at work, are sent to tyros and bunglers. The consequence is that it is impossible to obtain good work unless it is especially ordered, and many travellers of taste and large means never see, much less do they obtain, specimens of the best work.

The remedy is to appoint a Provincial Art Officer in each province, his duties being—

First.—To visit all the best workmen in the province, to instruct them in the principles of good work, to give them drawings or photographs of pure types. In other words, he should endeavour to preserve the provincial types, and prevent deterioration in design and workmanship.

Secondly.—He would form the medium between the handicraftsmen and those purchasers who require really good work, taking the orders and distributing them and collecting the money.

Thirdly.—He should be empowered by Government and by Municipalities to place apprentices with the best workmen binding them down by legal agreement.

Fourthly.—He should conduct the provincial exhibitions and should classify all the workmen in the province.

Fifthly.—He should maintain a record of the best work in permanent photographs in drawings, and by purchasing for the local museum specimens of good work which is likely to become obsolete.

I prefer this system to that of establishing a School of Art, because it preserves the individuality of the workmen and influences all the workmen in the province, and not only those who come to the school.

I have myself performed many of the abovenamed duties, fitfully it is true, but in the intervals of my regular work, and I should like to discuss the scheme with the Commissioners.

6. I think the prices of work ought to be regulated so that the master-workman gets equal profit from fine expensive work as from cheap common work. If a shop is to be successful both kinds of work ought to be carried on at once, the cheap work by the pupils and lower grade workmen. As a pupil progresses, he would take up more difficult work.

Speaking generally, I believe cheap common work pays better than fine expensive work. This is chiefly due to the ignorance of rich travellers, who pay curio-dealers enormous prices for the worst work.