

DIRECTORY

OF

Technical Institutions in India

INCLUDING

Agricultural, Industrial, Technical, Commercial and
Science Schools and Colleges.

COMPILED IN THE OFFICE OF THE GENERAL SECRETARY,
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INTRODUCTION.



HIS compilation has been prepared to meet a long felt want and to promote the advancement of scientific and technical instruction on which the economic and the moral progress of India depend in no small measure. While it is true that the great importance of technical education in industrial development has long since been recognised by Indian public opinion, it must be admitted that its supreme necessity was not adequately realized till recently either by the Government or by the people. There was what must be called only a vague idea that for the development of industries on any scale worth mentioning, it was necessary to have a supply of trained men to direct and work in factories and mills. But there was wanting the living and inspiring conviction that the well-being of the people was entwined with the permeation in all its ranks of the scientific spirit and with the creation of technical skill founded on a thorough grasp of principles. Nor was there among those who had control of the educational policy of the State or even among the leaders of public opinion any very clear conception of the principles which should regulate a scientific system of technical education at once suitable to the conditions and adequate for the requirements of the several provinces of the country. The recommendations of the Education Commission, though valuable so far as they went, were not sufficiently detailed. And the action taken on them was utterly insignificant and unsatisfactory. The subject was in 1888 taken up by Lord Dufferin, at whose instance Mr. A. P. (afterwards Sir Antony, and now Lord) MacDonnell, then Home Secretary to the Government of India, prepared an elaborate Memorandum setting forth the history, the actual condition, and the lines of future improvement of this branch of education. The memorandum* is an able document well worth study. The

* 'Papers relating to Technical Education in India, 1886-1904,' pages 1-36.

result of a survey of the state of affairs then existing was stated in the following terms :—

'The so-called Industrial Schools, modelled upon no considered plan,* never rise above mere workshops for the production of inferior articles at extravagant cost. For all purposes of practical training they are useless ; and it is no exaggeration to say that of the 45 Industrial Schools which now exist in India, hardly one serves any true educational purpose. If, therefore, anything effective is to be done in the way of Industrial training in Indian Schools, we must begin anew and construct a system of industrial education.'

Proceeding to consider the question, 'upon what principle and by what adaptation of means to ends can such a system be constructed,' Mr. MacDonnell laid it down that 'technical instruction must not be considered as something separate and apart from ordinary general education. On the contrary, he wrote, 'it should be regarded as a development of such education. The scheme of general education should therefore be so arranged as without any break of continuity to lead up to the instruction which we call technical.' And the defect of the present educational system from this point of view was laid bare in the following passage :—

'If this be the true principle on which to proceed, it is manifest that nowhere in India has our educational system given to that principle the prominence which it deserves. Leading, as it does, to university examinations and university degrees alone our educational system has always concentrated attention on literary subjects and literary training. But as Technology is the study of the practical application of science, a system of education which has for its aim the acquisition of literary knowledge only can never be a satisfactory introduction to technical instruction. As science is the foundation of every branch of technical instruction, the principles of science ought to underlie the education of those whose aim in life is the practice of the Industrial Arts.'

Among the recommendations made by that eminent administrator for such reform of the Indian educational system* were (1) 'that the study of drawing should be introduced at the earliest

* 'Preliminary education founded on the preceding principles would form the most appropriate introduction for all forms of technical instruction that could be devised, while it would help to give to the education of those not intended for Industrial pursuits that practical character which is now so wanting. Children under such a system would have their faculties of thought and observation trained, while now the only faculty that is trained is the memory.'

possible age, that it should be placed on the same footing as writing, and that it should be continued through all subsequent stages of the students' educational career'; (2) and that 'when some progress has been made in "the three R's" attention should be directed to Elementary Science.' Following on such a preliminary education, of which Reading, Arithmetic, Writing, Drawing, and Elementary Science, would form the prominent features would come, according to Mr. MacDonnell, that separation of studies which the student's proposed career in life would necessitate. Those who were intended for the learned professions, the Bar or Medicine, would follow the literary courses which lead to the existing Entrance Examination of the University. Those who looked to Art or Engineering, or Commerce or Agriculture, would pursue the 'modern' curriculum advocated by the Education Commission, and leading to an alternative Entrance Examination which the Universities should without unnecessary loss of time be invited to establish.' Those who looked to Industrial pursuits would enter the Schools of Technical training, 'if indeed they did not elect to push their preliminary education still further by going through the "modern" curriculum.' These three divergent courses 'should take off from the common stem at the end of the Middle School course, as recommended by the Madras Government. The High or Zillah Schools would thus in all cases consist of a "literary" and a "modern" side, which is in full accord with the recommendations of the Education Commission and with the declared policy of the Government of India.' The writer uttered the warning that 'if past experience proves anything it seems very clearly to prove the utter hopelessness of expecting that from isolated Industrial Schools any general good can come.'

Mr. MacDonnell said in conclusion that private enterprise alone could not be expected to do what was required 'In this matter of technical instruction' said he, 'the Government must pioneer the way, as it has pioneered the way in almost every enterprise which has changed the aspect of Indian life. If progress is to be made at once, the Government must, on fit opportunity and with due regard to local circumstances, establish in every division

or district a Technical School or a Technical Department of a school to which the instruction imparted in the "modern" side of the Middle or High School will furnish a fitting introduction.'

The Government of India dealt with the subject in the course of their Resolution of the 18th June 1888 (Home Department, Education), in which they said that 'hitherto little progress of a substantial character had been made in promoting technical education' and that 'the subject is of such extreme importance, and the insignificance of what has been attempted in India is so conspicuous, that the Governor-General in Council is deeply impressed with the necessity for action in whatever way may be practicable and sound.' They spoke of 'the need of industrial occupation for a population rapidly outgrowing the means of support supplied by a too conservative system of agriculture' and of 'the need for scientific methods to develop the material resources of India and to improve its agriculture, its products and manufactures, so that they may better hold their place in the markets of the world where competition is carried on with an intensity of purpose, which has been compared to the conditions of warfare.' Having urged that each Provincial Government should cause a survey to be made of the industries of the territory within its jurisdiction, the Government of India suggested that 'each Government and Administration should form a Committee of educational experts and professional men, who should make suggestions from time to time for the auxiliary supply of appropriate means of technical education: for such modifications of the state system of public instruction as may aid and encourage industries and industrial employment up to the full measure of such requirement at each provincial centre as may be found to exist; and, when the circumstances are opportune, for the establishment of a Technological Institute, for the enlargement of the Provincial Schools of Art and Design, and for the larger co-operation of the University in the promotion of the object in view.'

Of the two definite proposals for action made by the Government of India, industrial surveys have only lately been instituted in some provinces and *not yet* in others, while in no single

province has 'a committee of educational experts and professional men' been formed. In this resolution of 1888 the Government of India* accepted the obligation to 'support technical education as an extension of general education'; 'and, further more,' to 'promote and countenance such technical education of a special character as may be applied to the service of existing industries, which will profit by the aid of scientific research, scientific method and higher manipulative skill.' How far have these objects been accomplished in the intervening space? There is not as yet a thoroughly equipped Technological Institute anywhere in the whole country, while efforts to add a 'modern' side to high school education are in an incipient stage in one or two provinces and are non-existent in others.

The following excerpts from two official publications on the progress of education tell their own eloquent tale which needs no enforcing by additional comment:—

'The engineering colleges and schools are conducted with a general view to the recruitment of the several branches of the Public Works Department.' *Progress of Education in India, 1897-98, 1901-02. Fourth Quinquennial Review.* R. Natham, C. I. E., I. C. S. P. 246.

'The mining industry is becoming of such great importance in India that it is necessary to give it a section in this chapter (chapter VIII, Professional and Technical Education), although, from the educational point of view, there is very little to be said. * * These industries (the coal mines of Bengal, the salt mines of the Punjab, the gold mines of Mysore, the manganese ore of the Central Provinces, and the mica of Bengal and Madras) offer a fairly wide, and a growing, field for the employment of mining engineers and experts, but the more important posts are, in general, filled by persons engaged out of India. There is no school of mines in this country, and the facilities for special instruction in mining afforded in connection with the engineering colleges or otherwise are still inconsiderable.'—*Ibid*, pp. 263-4.

'There is very little commercial teaching in India of an advanced character and the subject is not recognised by any of the universities except for a school examination held by the university of the Punjab.'—*Ibid*, p. 279.

'It may be admitted at the outset that the endeavours made up to the end of the quinquennium under review to provide through state agency, or under state control, a system of technical education better than the routine training of the bazar have met with little success.'—*Ibid*, p. 286.

* 'Papers relating to Technical Education in India, 1886-1904,' p. 37.

'The account given above shows how little co-ordination there has hitherto been between the course of instruction in the industrial schools and the local industries of the provinces.'—*Ibid.* p. 299.

'The lack of trained teachers, with a knowledge both of their craft and of the manner in which it should be imparted, is recognised in most provinces to be a serious defect of the industrial school system, and there are practically no institutions from which instructors possessing the necessary qualifications can be procured.'—*Ibid.* p. 295.

'From what has already been said regarding the difficulties which stand in the way of any industrial school system in India, and regarding the character of the instruction given in such industrial schools as have already been established, the reader will be prepared to learn that these schools have in general, failed to attract boys of the artisan class, and that the ex-pupils of the schools rarely follow the trades which they were taught.'—*Ibid.* p. 296.

'The review we have now made of the existing industrial schools shows that the system has been wanting in definiteness both of methods and objects, and that its effect upon technical training and industrial development has been small. The more patent defects may be classed as follows:—

- (1) The schools have not been established in accordance with any sustained policy.
- (2) A large proportion of the pupils have no intention of pursuing an industrial career.
- (3) No clear differentiation has been made between general and technical studies.
- (4) The instruction has not been co-ordinated with local industries.
- (5) The quality of the instruction is in many cases poor * * * It is not to be expected that any wide scheme of successful industrial schools can be at once introduced, but it may be hoped that, with the adoption of better methods directed by a definite policy, it will be possible to give substantial aid to the improvement and development of local industry.'—*Ibid.* p. 297.

'In the first place it is essential to remember that engineering colleges and schools are conducted with a general view to the recruitment of the several branches of the Public Works Department.'—*Progress of Education in Bengal, 1902-03 -1906-07. Third Quinquennial Review, W. W. Hornell, Indian Educational Service. Chapter VII, Professional and Technical Education. P. 94.*

* * * No real advance is manifest. Indeed as regards existing schools.... there is still apparent that lack of definiteness both of methods and objects, that want of co-ordination with local industries or trades, and that uncertainty of initiative and support which will always prevail so long as the schools have to depend upon the volition of local bodies rather than upon any sustained

policy of Government, * * * It must, however be admitted that the effect of the existing schools on the industrial development of the province is practically negligible'—*Ibid*, p. III.

'The reason for this want of progress is not far to seek. A system of industrial schools co-ordinated to the trades and industries of the Province can never be created except on the initiative of a department or at least an officer whose business it is to study those industries. If any real and steady progress is to be made, there must be at least one officer possessed of the required capacity who, while it will be his business to be generally acquainted with the larger industries of the Province, will be available to conduct special investigations into the conditions of any particular industry which either he or others may think it desirable to develop by some such scheme as that proposed at Serampore. * * It is recognised that industrial development even in that aspect of it which is called industrial education, lies outside the proper scope of the Education Department.....It is hoped that this appointment (of a 'Superintendent of Industries and Inspector of Technical and Industrial Institutions') will lead in time to the creation of a Department of Industry to the control of which all technical and industrial institutions will be transferred.'—*Ibid*, p. III.

To the foregoing may be added Sir John Hewett's declaration at the Naini Tal Industrial Conference that 'there is probably no subject on which more has been written or said while less has been accomplished', and that though the discussions on the subject 'have travelled far and wide and been extended over nearly a quarter of a century, they have produced little tangible results in this province' (the United Provinces of Agra and Oudh).

Before leaving this part of the subject we may cite a few figures which explain the present position. We take them from the *Statistics of British India, Part VII, Educational, First Issue*, published in 1908.

There were in the whole of British India on the 31st March 1907, four Engineering Colleges, the same number as in 1902-03, and their strength was 1,243 against 923 in the former year. Of Agricultural Colleges there were three in either year, with 98 students in 1902-03 and 205 in 1906-07. There were seven Schools of Art in 1902-03 and 10 in 1906-07, with 1,469 students in the former and 1,664 in the latter year. Eleven Engineering and Surveying Schools gave education to 643 students in 1902-03, while in the year 1906-07 the former increased to 26 and the

latter to 1,120. The number of Technical and Industrial Schools increased in the same period from 84 to 147, and that of the students therein from 5,193 to 6,820. Commercial Schools increased only by one from 11 to 12, and the students therein only by 12 from 572 to 584. There was actual reduction in the number of Agricultural Schools—from 7 to 5, and of the students therein from 320 to 168. Let us next see what was the outlay on these institutions. The expenditure on Engineering Colleges was Rs. 4,66,538 in 1902-3 and Rs. 6,27,390 in 1906-07; on Agricultural Colleges, Rs. 70,535 and Rs. 67,565 respectively; on Schools of Art, Rs. 1,61,588 and Rs. 1,42,434; on Engineering and Surveying Schools, Rs. 1,05,492 and Rs. 1,37,101; on Technical and Industrial Schools, Rs. 3,30,756 and Rs. 5,91,095; on Commercial Schools, Rs. 32,434 and Rs. 25,343, and on Agricultural Schools, Rs. 28,916 and Rs. 26,747. The value of the scholarships awarded to students in Technical and Industrial Schools was Rs. 54,637 in 1902-03 and Rs. 48,171 in 1906-07. The total of these figures is Rs. 12,40,896 for 1902-03 and Rs. 16,65,846 for 1906-07, which is an increase of a little less than Rs. 4½ lakhs in five years. And no increase worth mentioning has taken place since.

The Governments of some of the Indian States have been doing notable work by the maintenance of institutions such as the Kala Bhavan of Baroda, but it cannot be pretended that the action taken by these states as a whole meets the requirements of the people of those tracts in anything like an adequate measure.

Some local bodies here and there—municipal and district boards—contribute a portion of their revenues to local schools. But ordinarily their financial condition does not permit of their performing even their more immediate and urgent duties efficiently and satisfactorily; what to say of their supporting technical education.

Nor can one turn with greater complacency to private philanthropy. Instances there undoubtedly are which it is grateful to record. There is, to start with, the Indian Institute of Science, Bangalore, which the country owes to the princely generosity, the

practical genius and the rarely selfless patriotism of Jamsetjee Nusserwanjee Tata. And the Victoria Jubilee Technical Institute, Bombay, is the outcome of the combined sagacity and philanthropy of the wealthy citizens of Bombay. There are besides, not a few institutions of local importance which owe their inception to private effort.

Much has been achieved by Christian -Missions in this as in other branches of education, and the people of India owe a debt of gratitude to these philanthropic bodies for their noble services in the cause of industrial education.

But, all said and done, what has been accomplished till now is little as compared to what has to be achieved. It is the State alone with its large resources in men and money which can effect any mighty improvement, as Lord MacDonnell wisely pointed out more than twenty years ago. And Indians of all classes and sections look to the Government of India and the several Provincial Governments to initiate measures calculated to provide the country with institutions of higher and lower grades for imparting instruction in every branch of industry for the development of which favouring conditons exist. Do they look in vain? It is hoped not, when we bear in mind the utterances and the sympathetic attitude of the statesmen and administrators who are at the helm of affairs now. Said Lord Minto in his Legislative Council on the 28th March 1906 :—

'Technical instruction in other countries is growing apace....Competition has forced it upon us. We must not lag behind, The success of modern industries and the preservation of indigenoüs industries is becoming every day more and more dependent upon scientific and technical knowledge, and if the resources of India are to be developed by the people of India, such development must depend largely upon local enterprise, upon the investment of Indian money and upon a recognition of the absolute necessity of expert training'

Of the broad progressive sympathies as well as of the special friendliness to scientific and technical education of his Excellency Sir George Clarke the country has had so many proofs that it is needless to say anything. Nor is it necessary to dwell on Sir John Hewett's zeal for the cause. As the result of the Industrial

Conference held at Naini Tal year before last he has sent up to superior authority a scheme for the establishment of a College of Technology at Cawnpore and of smaller institutions at other centres of the United Provinces which will cost about Rs. 15½ lakhs on capital outlay and about Rs. 4½ lakhs a year on recurring charges. This has been approved by the Government of India and is awaiting the sanction of the Secretary of State. Sir Arthur Lawley, Sir Edward Baker, Sir Louis Dane, Sir Lancelot Hare, Sir Herbert White and the Hon. Mr. R. H. Craddock will, it is trusted, not be less disposed to move in the desired direction than the heads of other Governments.

The awakening of the people to the necessity for technical education is not the least hopeful aspect of the situation. Of the practical turn this has taken, we have signal instances in the Bengal Technical Institute and the Technical Department of the Bengal National College. Still more cheering it is to think that the youth of the country have been stirred and show a distinct disposition to take to industrial and commercial careers instead of becoming additions to the wealth-consuming sections of the population. The bearing which this has on the future of the movement for the development of Indian industries cannot be stated better than it was by Sir Thomas Holland, the distinguished head of the Geological Survey of India, in his very interesting paper read before the Benares Industrial Conference:—

'Our poverty is not in material, but in men capable of turning the natural material into the finished product. We want more than Government provision for technical scholarships: we want a reformation in the tastes of our students; we want them to learn that the man with technical dexterity is of more use to the country than the writer of editorials or the skilful cross-examiner; that applied science now belongs to the highest caste of learning, and is a worthy field for the best ability we can obtain. * * * But until we find the chemical, metallurgical and mechanical workshops as attractive to our high-caste students as the class-rooms for law and literature now are the cry of *Swadeshi*, no matter how worthy the spirit it embodies, will remain but an empty word.'

It is bare justice to acknowledge that a reformation of the inclinations of India's young men in the direction eloquently

pointed out here has taken place to a remarkable extent in the last three years. Consequently the demand for technical education has increased and constant enquiries are made as to where suitable instruction in different branches of it can be obtained, to what extent and under what conditions. For some years in the beginning the favourite and fashionable idea was to go to a foreign country—England, Japan, or the United States—to acquire what eventually turned out to be very rudimentary knowledge. In the first flush of enthusiasm it was not borne in mind that before one went to a foreign country it was necessary in the first instance that all the theoretical knowledge and practical experience and training which could be obtained in this country should be acquired and that only then should one proceed abroad to supplement and complete that education. The result in but too many cases was failure and disappointment, and an unjust suspicion of the utility of the knowledge obtainable in those countries. It has to be frankly recognised that there is no material advantage to be gained by all sorts and conditions of young men spending their parents' or the public's money in going to a far off land for learning elementary things or acquiring superficial ideas. There must be not only a thorough preliminary grounding in the elements of the different sciences, but the principles of the particular art or industry which it is proposed to learn must be mastered and practical knowledge and manipulative skill acquired by working in the workshops, the laboratory, the studio, so far as this may be possible, in India itself. It is only when one has equipped oneself with the knowledge, experience and skill obtainable in India that one should be encouraged to attempt higher things in the more advanced countries.

With a view to help students and their parents and guardians in finding out what are the various departments of science, industry and art in which they can receive real education in the country, the compilation of this Directory has been taken in hand. The many and frequent enquiries addressed to the office of the Indian Industrial Conference for information of the kind

embodied in the present publication led the General Secretary to conclude that a Directory of Technical Institutions in India would meet a largely felt want, and he accordingly proceeded to collect the material for it. The following excerpt from a letter received from Mr. B. Heaton, Principal, Civil Engineering College, Sibpur, in reply to the General Secretary's circular, shows that the need for a Directory had struck other minds also and that the task was not undertaken a day too soon:—

'The idea of a Directory of Technical Schools in India has my most hearty approval. It is a project that has been very much needed for the last few years and is one that is far best developed by an association outside of Government than by Government. It could not be compiled by any provincial authority and unless undertaken by the Government of India or by a public body like the Indian Industrial Conference, could never be accomplished.

'I have felt for many years the need of some means of putting in front of the rising generation of Indians while still in their school careers and of placing in the hands of guardians reliable information as to the means of training lads for Industrial work and of letting them know where and the conditions under which training is available in India.

'In the course of the year I have many enquiries to answer to which it is impossible for me to do full justice. I cannot write long letters to every applicant and I fear that many lads are deterred from preparing themselves for industrial work by this very difficulty of getting information. In many cases they cannot know to whom to apply.

'This reacts in a serious way both upon the country and upon the development of the institutions already existing that attempt to deal with this problem.

'Likely workers in existing industries and likely pioneers in the development of new industries may be somewhat neglected and the heads of the institutions cannot properly determine the trend of the demand for technical education as it develops from time to time, there is therefore a danger of these institutions not becoming so useful as they might.

'Your Directory is likely therefore to be of the greatest benefit to India and I give it most hearty support.'

It is quite needless to add to the above.

It remains to acknowledge, which I do with the utmost thankfulness, the ready response which those who were in a position to supply information have made to the request of the General Secretary for the same. It is obvious that but for their assistance and co-operation the compilation could not have been undertaken, and to them all I tender my grateful acknowledgments.

With one last remark this brief Introduction may be concluded. I request heads of institutions and others who can render similar assistance, to freely point out any omissions and errors regarding institutions which have found a place in the Directory, as also to supply particulars of other institutions of which by inadvertence or lack of information no notice has been taken, so that the requisite alterations and additions may be made in a subsequent edition, should one be called for by the public demand for copies. To those who will so help, I beg to accord thanks in anticipation.

AMRAOTI: }
The 6th May, 1909. }

R. N. MUDHOLKAR,
*General Secretary, Indian
Industrial Conference.*

DIRECTORY OF TECHNICAL INSTITUTIONS.

INDIA.

THE INDIAN INSTITUTE OF SCIENCE, BANGALORE.

(From the Report of the Director.)

Introductory.—The Indian Institute of Science owes its inception and will stand as a lasting memorial to the generosity, patriotism and foresight of the late Mr. J. N. Tata, who endowed property of the value of over 30 lakhs of rupees. It is to be established at Bangalore as the Government of the Mysore State have afforded considerable facilities for the purpose. The realisation of the scheme is due to Mr. D.J. Tata and Mr. R.J. Tata, with whom Mr. B. J. Padshah has always been associated. The Government of India have also extended liberal support to the scheme.

Constitution.—The Institute differs from the Indian universities in that it consists of a single institution taking entire responsibility for teaching and examination, and will confer Diplomas of Associateships and Fellowships, not Degrees, on its own students only; the former on students who have followed an approved course of study, the latter on students who have carried out some piece of research.

His Excellency the Viceroy will be Patron and the heads of the Local Governments Vice-Patrons of the Institute. The executive authority is exercised by a Council, the meeting place of which will be Bangalore. In order to obviate the disadvantages arising out of the administration of the Institute by a local body the scheme confers certain powers on the members of a body called the Court of Visitors. The Standing Committee of the Court of Visitors is invested with the power to determine changes of policy or innovations suggested by the Council.

Object.—The first object of the Institute is the application of science to the improvement of Indian arts and industries. It will be an institution devoted to post-graduate study and research, particularly in science. The Institute will be in no sense a 'trade school' and cannot deal with what may be termed the minor manipulative processes of particular industries.

Admission of Students.—It is proposed to admit not more than 25 students annually for the first few years. Allowing for the demission of students at the end of the first and second years the total number working in the Institute will be about 60. It is not desired that this number should be exceeded at the outset. It is proposed to provide the students with quarters. Senior students will be paid for their services as demonstrators.

Private Work.—Private workers requiring accommodation for the purpose of investigating new products or processes, or actuated by a desire to carry out scientific research, will be welcome at the Institute. Facilities will be granted to Indian Professors to spend from time to time some months at the Institute on study leave.

Openings for Students.—There is already a certain demand for chemists in sugar works and in similar concerns, and also for analysts in connection with metallurgical and similar enterprises. The Director has already been in correspondence with men, graduates of Indian universities, wishing to take up the manufacture of glass, soap, essences, and other products on a small scale, and possessing sufficient capital for the purpose. The demand for electrical engineers is growing rapidly, and employment will probably be found for a considerable number of students from the department of Electrical Technology. It is chiefly in nascent industries that openings will mostly be found for students. And at the outset some at least of the students will have to return to the general colleges as teachers.

Subjects.—Six departments will be maintained, each with one Professor, and altogether four or more Assistant Professors. All the appointments, however, will not be made at once, but one department will be opened at a time. The study of Pure and

Applied Chemistry is of particular importance to the development of Indian industries. Dr. Morris Travers, the Director of the Institute, will occupy the chair in general and physical chemistry, while Mr. Norman S. Rudolph, M. Sc.(Victoria), F. I. C., who adds to his scientific attainments an extensive knowledge of the industries of India, will fill the chair of Applied Chemistry. Students following a course of Applied Chemistry, will be obliged to follow a course of instruction in mechanical work, which can be carried out in the workshops, and to study the elements of machine design which can be provided for without difficulty. A separate Professor of Organic Chemistry will be appointed as well. And there will be a Professor of Bacteriology as the study of fermentation processes offers ample opportunity for research and as there are many problems in applied science which demand the cooperation of the chemist and the bacteriologist. There will be a Department of Electrical Technology under Dr. Alfred Hay, M. I. E. E. The electrical plant of the Institute will be under the supervision of this department. Here experimental investigations will be conducted into the applications of electricity to industry. No decision has been arrived at as to the sixth subject that should be taken up. Among the Assistant Professors will probably be an expert in Experimental Pharmacology, a subject which is of the greatest importance in India.

The laboratories and workshops of the Institute may serve as a training ground for mechanics and for men who may serve as foremen in industrial concerns. Apprentices will be admitted to the workshops, so that they may learn the use of modern tools and machinery. The Institute would also undertake the training of scientific glass-blowers, a class of workmen for which there is already an extensive demand.

Library.—It is intended that the library of the Institute should contain complete series of all the important scientific journals, and that a large sum of money should be allotted for it.

Income and Expenditure.—The Council of the Institute will have at its disposal an income of Rs. 2,62,500 a year, of which Rs. 1,25,000 is derived from the properties left by Mr. Tata,

Rs. 87,500 from the grant of the Government of India, and Rs. 50,000 from the grant of the Government of Mysore. The estimated total annual expenditure at the commencement will be Rs. 2,48,850.

The total estimate of capital expenditure is Rs. 11,70,500. The capital available for the construction and equipment of the Institute is derived from the capital grants of the Governments of Mysore and India, which amount to Rs. 5,00,000 and Rs. 2,50,000 respectively, and from the surplus income over expenditure.

Commencement of Work.—To secure the establishment of the Institute at the earliest possible date the course which the Director proposes should be taken is stated as follows :

We have now a Director and two Additional Professors, one of whom will rejoin the Institute in October. The Mysore Government have offered the Council the use of the Laboratories of the Agricultural Chemist as soon as they become vacant, which I presume will be at the end of the year. I propose at that time to admit a few students in chemistry, but I will not at the moment, consider the details of the arrangement.

THE AGRICULTURAL RESEARCH INSTITUTE AND AGRICULTURAL COLLEGE, PUSA.

*(From the Report of the Imperial Department of Agriculture for
the years 1905-6 and 1906-7.)*

This is an institution established by Government for giving training in agricultural research and instruction in the higher branches of the agricultural sciences. All branches of the Institute except Agricultural Bacteriology, are located at Pusa and consist of Agriculture, Chemistry, Mycology, Entomology, Bacteriology and Botany. The buildings are complete; they include eight bungalows for European officers, quarters for six European probationers, a veterinary dispensary, a hostel for 70 students, quarters for thirteen teachers, the farm buildings, temporary chemical, biological, entomological and botanical laboratories, an insectary and a potculture house. Nucleus collections for the library and for other sections are being gathered. The museums of economic products, mycology and entomology, will be filled by specimens which have been collected or will be collected in

the near future. The College will provide a post-graduate course extending over two years to qualify graduates of Provincial Colleges as experts in specialised branches of Agricultural Research. Until the Provincial Agricultural Colleges are all in working order, it is proposed to teach at Pusa specially selected agricultural students who will each get a scholarship of sufficient value for support during the course of instruction. The chief object of instruction is to prepare natives of the country for practical work in scientific agriculture. Experienced, highly educated Indians are not now easily obtainable to supervise field experiments in a reliable way because practically trained men are not available. Eventually Pusa by giving a post-graduate course, will, it is hoped, produce Indian specialists in particular lines of agricultural work such as in Agricultural Chemistry, Entomology, Mycology and Agriculture.

Twenty-two probationers from various provinces were under training at Pusa. Some were found unfit and rejected. Thirteen completed their training and were qualified for Provincial Service. Three were trained in General Agriculture, two in Agricultural Chemistry, two in Mycology and six in Entomology. Two probationers are still under training in Agriculture and Mycology. Besides these, six men were trained for field work in Entomology and one in Entomological drawing. When the Provincial Agricultural Colleges are ready, arrangements will be made to give full agricultural training and the necessity of sending students to foreign countries will cease.

. Questions relating to educational qualifications necessary for admission, the scholarships, the curriculum of studies and the degree to be conferred on passed students are said to have been practically settled, but they have not yet received the sanction of the Government of India and consequently not been published.

Director and Principal, Bernard Coventry, Esq.; Agricultural Chemist, J. W. Leather, Esq., F.I.C., F.C.S.; Mycologist, E.J. Butler, Esq., F.L.S.; Entomologist, H. Maxwell-Lefroy, Esq., F. E. S., F. Z. S.; Agriculturist, E. Shearer, Esq.; Economic Botanist, A. Howard, Esq., A. R. C. S.

THE IMPERIAL FOREST COLLEGE, DEHRA DUN.

(From the Calendar of the College for 1907.)

Introduction.—The Imperial Forest School was founded by Government in 1878 and its status was raised to that of a College in 1901, the Imperial Forest Research Institute being founded at the same time. The staff includes an Imperial Silviculturist, an Imperial Superintendent of Forest Working-Plans, an Imperial Forest Zoologist, an Imperial Forest Botanist, an Imperial Forest Chemist and an Imperial Forest Economist. These officers do research work as well as deliver courses of lectures on their special subjects at the College, and take part in the training of the students ; but the educational work is mainly carried on by the Assistant Instructors, who, besides their duties in the class-room, are in personal charge of the students out of lecture-hours and during practical training excursions in the forests. These are four in number. One of the Imperial officers holds the post of Principal in addition to his other duties.

College Site and Buildings.—The College is located at Dehra Dun, in the United Provinces. The grounds comprise, in addition to the lands upon which the College and Research buildings are erected, a fruit garden and the Forest Park or Arboreum. The Hospital is in the grounds of the Survey of India Office, and there is a small plantation at Kaunli, two miles from Dehra. The buildings consist of six Lecture rooms, Library, Museum rooms, Herbarium, the Laboratory, quarters for 80 students, Hospital, the residence of the Principal and officers. The erection of additional quarters for students is contemplated, as the normal maximum admissions are now fixed at 120 students in all, including Juniors and Seniors.

Constitution.—The College is under the administrative control of the Inspector-General of Forests, who is assisted by a Board consisting, besides himself, of the Director of Public Instruction, United Provinces of Agra and Oudh, the Principal of the College, and three Conservators of Forests, with the Assistant Inspector-General of Forests as Secretary.

Course.—The ordinary College course extends over a period

of two years, but a third year's course of theoretical and practical training will be provided to fit selected students for direct appointment to the Provincial Service, or to meet the wishes of Local Governments or Native States who may desire their nominees to undergo a special course of instruction. In the first case it is necessary that the student should have obtained the Higher standard Certificate at the close of the two years' course.

The Subjects taught in this course are the following:—Forestry, including Sylviculture, Utilisation, and Forest Working-Plans, both theoretical and practical; (2) Mathematics—Elementary Algebra, Trigonometry, and Mechanics, in their application to forest questions; (3) Physical Science, including Chemistry, Physics, Physiography, Geology, Mineralogy, and Soils; (4) Botany, both theoretical and practical, including the collection and preservation of plants; (5) Zoology, the classification of animals and the study of useful and dangerous species, especially of insects, and the collection and preservation of Specimens; (6) Drawing, Surveying, and Estimating, as required for Forest Officers; (7) Forest Engineering, theoretical and practical; (8) Forest Law, the Elements of Criminal Law, and Departmental Organisation, and (9) Forest Accounts and Procedure.

Terms.—The terms of study are as follows: *First year*: Preliminary term, April 15th to June 30th, in camp or at Dehra Dun; Rains term, July 1st to October 31st, in Dehra Dun; Winter term, November 1st to December 22nd, in camp; Vacation, December 23rd to January 2nd; Spring term, January 3rd to March 31st, in camp. *Second year*: Vacation, April 1st to April 30th; Hill tour term, May 1st to 30th June; Rains term, July 1st to October 31st, in Dehra Dun; Winter term, November 1st to December 22nd, in camp; Vacation, December 23rd to January 2nd; Spring term, January 3rd to February 15th, in camp; Examinations, including survey test, February 16th to March 31st. *Third year*: The course will commence on the 1st July in each year.

Examinations.—The College Examinations are (1) Periodical, to test progress and application, (2) Final. The marks obtained at the former are counted for one-third of the aggregate at the final. The final Examinations are held in March of the

Second year, and the marks then obtained count for two-thirds of the aggregate.

Should any student be unable to appear at the Final Examinations, or having appeared fail to pass those examinations, he will not be permitted to appear at any subsequent Final Examination, unless he follows a second time the whole course of instruction at the College, or, at the discretion of the Principal, the second year's course.

Certificates.—(1) There are three certificates granted at the College after the completion of two years' training: (i) *Honors* (50 per cent. of marks given for each Subject and 75 per cent. of the total number of marks); (ii) *Higher Standard* (pass marks in obligatory Subjects and 60 per cent. of the total number of marks); (iii) *Lower Standard* (pass marks in obligatory Subjects and 45 per cent. of the total number of marks). Pass marks in obligatory subjects are 50 per cent. of the marks given in the subjects of Forestry, Botany, Surveying and Engineering. (2) A certificate may be granted by the Principal to a candidate for direct appointment to the Provincial Service who has in his opinion satisfactorily passed the third year of training prescribed for such candidates. (3) Certificates may also be granted by the Principal at his discretion to Rangers selected by their Local Governments to undergo a third year's training at the College or to students nominated by Local Governments or Native States to attend a selected portion of the College course. (4) It is left to Local Governments to attach what importance they may see fit to the certificates gained, other than the Higher standard Certificate.

Prizes.—Four Silver Medals are offered by Government for competition each year, and these may be awarded to (1) the best Second year student, (2) the best Second year student in Forestry, (3) the best Second year student in Botany, (4) the best Second year student year in Forest Engineering. Gold Medals may also be awarded to those Second year students who obtain Honors certificates as defined in the preceding rule.

Admission Rules.—The total number of students of each class who can be admitted into the College each year will be

limited to such number as the Board of Control may decide, from time to time, can be educated at the College. The number of students to be allotted each year to the respective Provinces, as well as the number of nominations to be made by the Principal, will, with due regard to the total prescribed by the Board of Control, be decided by the Principal before the 1st August after consultation with the Provincial authorities as to their requirements, and communicated to the Local Governments concerned. Candidates for admission to the Forest College as private students, *i. e.*, men who are not already in the Government Service and who are not students deputed by Native States, must be not less than 18 or more than 25 years of age, and their application must be sent to a Conservator of Forests in accordance with the conditions prescribed. Candidates must have passed B. A., F. A., B. Sc., or Licentiate of Agriculture examination, or the Matriculation or the School Final examination. Prior to the admission of a student, his parents or guardians must satisfy the Principal that they are willing and able to defray the expenses of the student, at the College. These expenses are estimated to be not less than Rs. 822½ for each student. Of this sum, parents or guardians must deposit with the Principal, before the course commences, a sum of Rs. 141 to meet the initial cost of uniform, books, instruments, stationery, and camp-equipage, and in addition, Rs. 50 as caution money. All candidates not already in the service of Government who have been accepted by the Principal for admission to the College will be required to undergo, in addition to and before the preliminary term commencing on the 15th April, a course of practical training in the forests of the Province from which they come, during at least 3½ months. During this period they will get from Government a travelling allowance of Rs. 25 per month*.

Appointments.—Passed candidates are given appointments in the Provincial or the Subordinate Forest Service, as vacancies occur, the pay of appointments in the former ranging from Rs. 200 to Rs. 600 per mensem, and in the latter from Rs. 15 to Rs. 150 per mensem.

* For full particulars of the Admission Rules the reader is referred to the Calendar of the College for 1907, pp. 6—15.

MADRAS.

THE COLLEGE OF ENGINEERING, MADRAS.

(From the Calendar of the College for 1908-09.)

Brief History.—Developed from a Surveying School which was established in May 1794, the College of Engineering is the most ancient of India's Professional Training Schools established by the British Government. It owes its inception to Mr. Michael Topping, the earliest Astronomer and Geographical and Marine Surveyor at the Presidency of Fort St. George. He had established an observatory and asked the Government that persons who proposed to follow the surveying line should be required to regularly attend the observatory for becoming eligible for employment in it. The Board of Revenue supported the proposal, and Mr. John Goldingham, Mr. Topping's Assistant, was placed in charge of the establishment. The school was closed in 1810 on account of the 'need for economy,' but it was re-opened in 1819 as the need for trained men for employment in the Tank Department was urgent. The apprentices were trained as surveyors, levellers, superintendents, draftsmen, and estimate-makers, the course of instruction occupying a year and a half and comprehending Algebra, Mensuration, Trigonometry, Building Construction, Surveying, Plan-drawing and Estimate-making.

In 1842 for the first time the proposal was put forward for the establishment of a 'College of Engineers' at Madras as a Survey School was considered inadequate for the needs of the Government Public Works Department, but it was not till the end of 1854 that the proposal was sanctioned by the Government of India and the Court of Directors. Early in 1855 the Director of Public Instruction, Mr. A. J. Arbutnot, was called on to submit arrangements for the establishment of an Engineering School or College. It may be noted that in their dispatch sanctioning the foundation of the College the Court of Directors observed 'we trust it will always be borne in mind that practical knowledge of Mechanical Engineering is essential to the perfect efficiency of a Civil Engineer.' It was not till 1859 that the discussion between the Supreme and Provincial Governments and

the officers concerned about the scope and the organization of the institution terminated. It was stated in the prospectus that 'the College is designed to prepare men for carrying out skilfully and effectively the various kinds of engineering works needed in the Madras Presidency, whether they be for Government or for private companies and individuals.' In accordance with the final orders of the Government of India the School was limited at the outset to two departments to train candidates for the grades of Assistant Overseer and Sub-Overseer respectively. In the following year a third department was added for the training of Draftsmen, Estimators and Accountants. From the 1st September 1859, the institution was designated as the Civil Engineering College. The various subjects taught were Mathematics, Surveying, Drawing, Constructive Engineering, and Mechanical Engineering. In 1861 the Government authorized the creation of a 'First department' to train commissioned officers and civilians as Engineers, the course being adopted to meet the requirements of the examination for the degree of Bachelor of Civil Engineering conferred by the University. In 1877 the College was affiliated to the University.

In the period between 1880 and 1885 several proposals for the reorganisation of the College were considered by a committee appointed for the purpose and by the Principal of the College, the Director of Public Instruction and the Chief Engineer to Government, and the new rules adopted by the Government on their recommendation came into force in 1886. These new rules virtually continue in force at present with but slight modifications. And as instruction in Mechanical Engineering was also to be imparted, the designation of the institution was changed into 'The College of Engineering.' About the same time additional building accommodation was provided for the College at a cost of nearly a lakh of rupees. An increased staff of professors was also sanctioned. The re-organisation may be said to have been completed and teaching in the new subjects to have commenced from the year 1889. It may be mentioned at this point that the Director of Public Instruction stated the object of the reorganisation to be to

enable the College to educate Mechanical Engineers, to improve the course of study in the several branches already taught, to extend the benefit of the instruction given to those who seek employment under railway and other employers of labour, to afford special means of instruction for the maistry class, and generally to adopt the College to taking a more important position than heretofore in promoting technical education in such other ways as may hereafter be found practicable.

Several further changes and developments have taken place since 1889. In 1894 the University of Madras held for the first time the examination for the degree of Bachelor of Engineering in the place of that for the degree of Bachelor of Civil Engineering. A revised Code of Rules embodying changes already authorised and introducing certain fresh ones was brought into force from the 1st January 1899. In 1900 the Secretary of State sanctioned the creation of a second professorship of Engineering and an instructorship in Mechanical Engineering. The Artisan class was abolished at the end of 1901. Tours for the inspection of irrigation and other important engineering works were initiated in 1902 and they have since been made annually. In 1904 a committee was appointed by Government to revise the curriculum, and to report whether new laboratories should be constructed, and whether the existing College buildings were capable of future extension. The orders of the Government on the report of this Committee regulate the courses at present in force. And it is contemplated to remove the College from Madras city to Saidapet and construct more extensive buildings there in view of the limited extent of the existing site.

Object.—The College, which is affiliated to the Madras University, affords theoretical and practical instruction in subjects qualifying for the professions and callings of Civil Engineer, Mechanical Engineer, Upper Subordinate Engineer, Lower Subordinate Engineer, Surveyor and Draftsman, in view of fitting persons for employment in such capacities by Government, by Local Boards and Municipalities, and by other agencies. Students of the higher course in engineering are, at the same time, prepared for the B. E. Degree examination of the Madras University.

Classes and Courses of Instruction.—The College contains the following classes:—(i) Engineer class—for the training

of (a) Civil Engineers, (b) Mechanical Engineers: (ii) Upper Subordinate class—for the training of Upper Subordinates for the Public Works Department, Revenue Department, Local Boards and Municipalities. (iii) Lower Subordinate class—for the training of Lower Subordinates, Surveyors and Draftsmen for the Public Works Department, the Survey Department, Revenue Department, Local Boards, Municipalities, Railways, etc.

The Course for the Engineering class (which is under revision) extends over four years, of which three will be spent in the College and the fourth chiefly on works. The course in the College is both theoretical and practical. Theoretical instruction will be conveyed by lectures: while the practical work will consist of surveying in the field, drawing, and work in the workshops and laboratories. Students who desire to become Civil Engineers have to spend the final year in a Public Works division: those who wish to become Mechanical Engineers will spend it in an engineering workshop.

The *subjects of study* are as follows:—(i) Mathematics and Science—Algebra, Geometry, Mensuration, Plane Trigonometry, Calculus Mechanics, Hydro-Mechanics, Heat, Chemistry; (ii) Engineering—Drawing (Geometrical and Perspective, Freehand and Model, Machine, Building, Estimating, Practical Work), Applied Mechanics, Building Materials, Building Construction, Hydraulic Engineering, Mechanical Engineering, Workshop Practice, etc., and Surveying.

No student shall be permitted to remain more than four years in the College. Students will be expected to present themselves for the first examination in engineering of the Madras University at the end of their second year of study, and for the B. E. degree examination towards the end of their practical course.

Students who are successful at the College final examination will proceed to the practical course. Those who elect to become Civil Engineers will be attached to a Public Works Division where large works are in progress, and will be regularly instructed in the preparation of materials, the practical details of cons-

truction, the management of labour, and the system of accounts. Those who elect to become Mechanical Engineers will proceed to the Public Works workshops. One mechanical engineer student will be permitted each year to join the Madras Railway Locomotive Shops, at Perambur, the concession being offered in the order of merit at the final examination. The premium will be Rs. 500, of which a half will be defrayed by the Education Department, the remainder being met by the student. The premium will cover a course of two years, of which one year is obligatory. Other mechanical engineer students may attend at Perambur on payment of the full premium.

The course of instruction for the UPPER SUBORDINATE CLASS extends over four years, of which three will be spent in the College and the fourth on works. The course in the College will be both theoretical and practical. Theoretical instruction will be conveyed by lectures, while the practical work will consist of surveying in the field, drawing, and work in the workshops.

The *subjects of study* are as follows:—I. Mathematics—Arithmetic, Algebra, Geometry, Mensuration, Plane Trigonometry; II. Engineering—Drawing (freehand and model drawing, geometrical drawing, machine drawing, building drawing and estimating), Applied Mechanics, Construction, Hydraulic Engineering, Mechanical Engineering, Surveying.

A sessional examination shall be held at the end of each year at which portions of the above subjects will be finally disposed of. All students must satisfy the Principal of the College in practical surveying. No student will be permitted to remain more than four years in the College.

Students who are successful at the final examination will be attached for one year to a Public Works Division where large works are in progress, and will be regularly instructed in the preparation of materials, the practical details of construction, the management of labour, and the system of accounts.

The course of instruction for the LOWER SUBORDINATE CLASS extends over three years. Theoretical instruction will be

conveyed by lectures, while the practical work will consist of surveying in the field, drawing, and work in the workshops. The *subjects of study* are as follows:—(1) Drawing (freehand and model drawing, geometrical drawing, machine drawing, building drawing and estimating), (2) Applied Mechanics, (3) Construction, (4) Surveying. A sessional examination will be held at the end of each year at which portions of the above subjects will be finally disposed of. All students must satisfy the Principal of the College in practical surveying. No student will be permitted to remain more than four years in the College.

Admission.—The number of students to be admitted annually will ordinarily be limited to 20 in the Engineer Class, 30 in the Upper Subordinate Class, and 60 in the Lower Subordinate Class. Admission will be once a year, on the 15th July. Withdrawals in the case of scholarship-holders will, except for good and sufficient reasons, be allowed only on completion of the course for which scholarships have been awarded.

Candidates for the *Engineer Class* must have passed the B. A. degree examination of the Madras University with mathematics or physical science as an optional subject or an examination accepted by Government as equivalent thereto, and must be under 22 years of age. The fee for registration for admission will be Rs. 5.

Candidates for the *Upper Subordinate Class* must have passed the F. A. examination of the Madras University or an examination accepted by Government as equivalent thereto, and must be under 22 years of age. The fee for registration for admission will be Rs. 4.

Candidates for the *Lower Subordinate Class* must have passed the Matriculation examination of the Madras University, or an examination accepted by Government as equivalent thereto, and must be under 22 years of age. The fee for registration for admission will be Rs. 3.

The selected candidates of all classes must deposit with the Principal a sum of money, to be drawn against for instruments and books, which will be for the Engineer Class Rs. 120, for the

Upper Subordinate Class Rs. 100, and for the Lower Subordinate Class Rs. 80.

Fees.—The fees payable in advance by students while at the College, are as follows:—Engineer Class, Rs. 360 for the full theoretical course, Rs. 130 Sessional rate, Rs. 12 monthly rate; Upper Subordinate Class, Rs. 180, Rs. 65, Rs. 6, respectively; Lower Subordinate Class, Rs. 100, Rs. 37½, Rs. 4, respectively. The riding course and other fees are in addition to the above. Students of the Engineer Class will pay a fee of Rs. 20 for the College examinations held during the course, of the Upper Subordinate Class Rs. 15, and of the Lower Subordinate Class Rs. 10.

Scholarships, Stipends and Prizes.—Two Government scholarships of the monthly value of Rs. 15 each will be annually awarded in each of the three class-divisions of the *Engineer class*. A third scholarship of the same value will be awarded annually in each class-division by the Director of Public Instruction, preference being given to a Mahomedan. One scholarship of Rs. 20 a month tenable for three years will be given to a European or a Eurasian. The Governments of Mysore, Travancore and Cochin award Engineering scholarships annually of the monthly value of Rs. 30 to students who are subjects of their respective states. A gold medal will be awarded to the student who passes highest at the final examination. Prizes will be given to students who display proficiency in special subjects. During the year of practical training subsistence allowances of Rs. 50 per mensem for Europeans and Eurasians, and Rs. 25 per mensem for Indians, will ordinarily be granted; but these amounts will be increased to Rs. 60 and Rs. 37½ per mensem respectively in the case of students posted to hill stations. Travelling allowances to students joining or on the works will be drawn at the rates sanctioned for officers of the third class under the Civil Service Regulations.

Two Government scholarships of the monthly value of Rs. 10 each will be awarded annually in each of the three class-divisions of the *Upper Subordinate class*. A third scholarship

of the monthly value of Rs. 10 will be awarded annually in each of the class-divisions, preference being given to a Mahomedan. One scholarship of Rs. 15 per mensem, tenable for three years, will be awarded annually to a European or a Eurasian student. The Walker scholarship, of the value of about Rs. 13 per mensem, is tenable for three years by a student who is a native of Malabar, South Canara, or Nilgiri District. A silver medal will be awarded to the student who passes highest at the final examination. Prizes will be given to students who display proficiency in special subjects. The 'Rogers' prize of the value of about Rs. 20 will be given annually in books to the silver medallist of the year. During the practical course subsistence allowance of Rs. 30 per mensem for Europeans and Eurasians and Rs. 20 for Indians will ordinarily be granted; but these amounts will be increased to Rs. 40 and Rs. 30 per mensem respectively in the case of students posted to hill stations. Travelling allowances to students joining or on the works will be drawn at the rates sanctioned for officers of the third class under the Civil Service Regulations.

Two scholarships of the monthly value of Rs. 8 each will be awarded annually in each of the three class-divisions of the *Lower Subordinate class*. A third scholarship of the monthly value of Rs. 8 will be awarded in each of the three class-divisions, preference being given to a Mahomedan. A bronze medal will be awarded to the student who passes first at the final examination.

Three 'Sir Madhava Rao' prizes of the value of Rs. 20 each will be given annually, under certain prescribed conditions, for proficiency in practical work. In awarding one of these prizes preference will be given to the Mahratta Brahman who displays the greatest proficiency in workshop practice, practical surveying or practical chemistry.

Four stipends of the monthly value of Rs. 6 for the first year, Rs. 7 for the second year, and Rs. 8 for the third year will be awarded annually to young men who have passed the elementary technical examination in carpentry or blacksmith's work,

and who join the College workshop to be trained as teachers in technical or industrial schools or in school workshops for manual training. The course will extend over three years during which time the students will be prepared for the highest technical examination in cabinet-making or carpentry, or fitter's work. The stipendiaries may be required to serve as teachers for two years, and to submit half-yearly reports as to how they are employed for three years after leaving the workshops.

Board of Examiners.—All sessional and final examinations will be conducted by a Board of Examiners, consisting of a President and two members appointed by Government on the recommendation of the Director of Public Instruction for a term of three years. The President and members will ordinarily be engineers. Two members of the College Professorial staff will be advisory members of the Board.

Diplomas and Certificates.—On the completion of the course in the College, a provisional certificate signed by the Principal and the President of the Board of Examiners will be issued showing that the candidate has passed the final examination. On the satisfactory completion of the practical course a diploma signed by the Principal and the Director of Public Instruction will be issued, setting forth the qualifications of the student for employment as a Civil Engineer, a Mechanical Engineer, or as an Upper Subordinate Engineer.

A student who has passed the final examination of the Upper Subordinate class, and who elects not to proceed to the practical course will be granted a certificate of qualification as a Lower Subordinate Engineer.

On the completion of the Lower Subordinate class course, a certificate signed by the Principal and the President of the Board of Examiners will be issued stating that the student has passed the final examination and is qualified for employment as a Lower Subordinate Engineer or as a Surveyor or a Draftsman.

Employment of Passed Students.—One appointment as apprentice engineer in the Public Works Department will be conferred annually on the student who passes highest at the final

examination. The apprenticeship will ordinarily extend over twelve months, when the apprentice, provided he has fulfilled the prescribed conditions, will be brought on the permanent establishment of the Public Works Department, Provincial Service, as third-grade Assistant Engineer. Other engineer students who have satisfactorily completed the practical course, will be eligible for appointment to the Upper Subordinate Establishment of the Public Works Department. Fully qualified Engineer students may also be appointed Assistant Engineers under Local Boards. Other passed students will be eligible for employment in the Upper Subordinate and Lower Subordinate establishments of the Public Works Department and as Delta Superintendent, Minor Irrigation Overseer, Overseer to District Boards and Municipalities, etc.

Strength.—Excluding the students on practical course the total number actually in the College at the end of 1907 was 315.

Finances.—The receipts of the College in 1907 amounted to Rs. 24,000, and the charges to Rs. 1,10,500, the net cost of the institution to Government being Rs. 86,500.

Staff.—Principal, W. H. James, Esq., M. I. M. E., A. M. I. C. E.; Professor of Civil Engineering, F. C. Morgan, Esq.; Professor of Mechanical Engineering, C. L. Cartwright, Esq., A. M. I. C. E.; Professor of Mathematics, B. Hanumantha Rao, Esq.; Instructor in Civil Engineering, B. O. Reynolds, Esq.; Instructor in Mechanical Engineering, J. Webster, Esq.; Instructor in Surveying, Sergeant W. C. Old; Instructor in Workshops, P. G. Williams, Esq. There are several Assistant Instructors besides.

THE AGRICULTURAL COLLEGE, COIMBATORE.

(From the Rules published in the 'Fort St. George Gazette'.)

Introductory.—The Agricultural College at Saidapet which the Madras Government maintained for many years was abolished, and the College at Coimbatore was opened on the 1st June 1903, with Mr. C. J. W. Shepperson, B. Sc., as Principal. The College is primarily intended for the practical training of those who intend to practise agriculture in after-life as their main profession. Special care is taken to impart some knowledge of theory and some scientific training to the students so that they may 'be capable of initiating improvements in agriculture' and be able to understand

and who join the College workshop to be trained as teachers in technical or industrial schools or in school workshops for manual training. The course will extend over three years during which time the students will be prepared for the highest technical examination in cabinet-making or carpentry, or fitter's work. The stipendiaries may be required to serve as teachers for two years, and to submit half-yearly reports as to how they are employed for three years after leaving the workshops.

Board of Examiners.—All sessional and final examinations will be conducted by a Board of Examiners, consisting of a President and two members appointed by Government on the recommendation of the Director of Public Instruction for a term of three years. The President and members will ordinarily be engineers. Two members of the College Professorial staff will be advisory members of the Board.

Diplomas and Certificates.—On the completion of the course in the College, a provisional certificate signed by the Principal and the President of the Board of Examiners will be issued showing that the candidate has passed the final examination. On the satisfactory completion of the practical course a diploma signed by the Principal and the Director of Public Instruction will be issued, setting forth the qualifications of the student for employment as a Civil Engineer, a Mechanical Engineer, or as an Upper Subordinate Engineer.

A student who has passed the final examination of the Upper Subordinate class, and who elects not to proceed to the practical course will be granted a certificate of qualification as a Lower Subordinate Engineer.

On the completion of the Lower Subordinate class course, a certificate signed by the Principal and the President of the Board of Examiners will be issued stating that the student has passed the final examination and is qualified for employment as a Lower Subordinate Engineer or as a Surveyor or a Draftsman.

Employment of Passed Students.—One appointment as apprentice engineer in the Public Works Department will be conferred annually on the student who passes highest at the final

examination. The apprenticeship will ordinarily extend over twelve months, when the apprentice, provided he has fulfilled the prescribed conditions, will be brought on the permanent establishment of the Public Works Department, Provincial Service, as third-grade Assistant Engineer. Other engineer students who have satisfactorily completed the practical course, will be eligible for appointment to the Upper Subordinate Establishment of the Public Works Department. Fully qualified Engineer students may also be appointed Assistant Engineers under Local Boards. Other passed students will be eligible for employment in the Upper Subordinate and Lower Subordinate establishments of the Public Works Department and as Delta Superintendent, Minor Irrigation Overseer, Overseer to District Boards and Municipalities, etc.

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and explain to the ryots the reasons for their success in some years and failure in others. Students may enter for a complete course of instruction and qualify for the Diploma in Agriculture, or they may enter for one or more separate courses of instruction in agricultural subjects. The responsibility for the discipline and management of the College is vested in the Principal under the control of the Director of Agriculture.

Subjects and Courses.—The course of instruction for all subjects prescribed for the Diploma in Agriculture shall ordinarily extend over three years. All students must combine theoretical and practical instruction in each subject they take up. All students must take the first year's course in pure science in order to have an elementary acquaintance with the sciences upon which agriculture is based. Students not wishing to take the full course may, in their second and third years, take at their option, courses in one or more subjects one of which *must* be Agriculture. Such students will spend the time not occupied with other subjects in a more detailed study of the sciences they take up. Students who aim at the diploma must not only take the first year's course but continue their studies in science as applied to Agriculture, during the second and third years. They must take courses in all the prescribed subjects. Courses in Chemistry, etc., will be arranged in the second and third years for students who wish to specialize in these subjects as applied to Agriculture.

The subjects for the full course will be studied as follows:—

FIRST YEAR—General: to be taken by all students: Practical Agriculture, Chemistry, Physics, Botany, Physical Geography, Entomology.

SECOND—Optional: Practical Agriculture, Theoretical Agriculture, Botany, Entomology, Agricultural Engineering, Elementary Zoology.

THIRD YEAR—Optional: Practical Agriculture, Theoretical Agriculture, Entomology, Veterinary Science, Agricultural Engineering, Land Records.

Admission.—Students from all parts of India are eligible for admission provided they have reached the age of 18 years and have

passed the Matriculation or Entrance examination of an Indian University. Preference will be given to those who have done well in the science subjects of that examination. Government, however, may grant exemption from the application of this rule in the case of students of the Agricultural class who intend to make agriculture their means of livelihood. The Principal has full discretion to choose from among the applicants for admission, those whom he considers most suitable. Candidates for admission must produce certificates of physical fitness, character, etc.

Fees and Scholarships.—No scholarships will be awarded by Government. No fees will be charged for tuition or lodging but students must pay for their own board.

Examinations.—All students shall appear at examinations as required by the College authorities. An examination shall be held at the end of each College year in all the subjects studied during that year.

Certificates.—On the completion of the course every student shall be furnished by the Principal with a certificate in the prescribed form. The Diploma of the College will be necessary for all who seek for employment in the Agricultural Department.

THE GOVERNMENT SCHOOL OF ART, MADRAS.

The Government School of Art, Madras, was founded in the year 1850, as a private concern by Dr. Alexander Hunter 'with the object of improving the taste of the native public as regards beauty of form and finish in the articles in daily use among them.' In the following year an industrial department was added to the school. In 1853 the Court of Directors sanctioned a grant-in-aid of the school and in 1855 it was taken under Government management. The character and the scope of the institution have varied from time to time and it is again about to be reorganised. According to the Superintendent Mr. W. S. Hadaway, the aim is to make the School of Arts 'an educational institution in which pupils with a natural inclination will be able to prepare themselves to follow some artistic craft such as wood-carving, lacquer-work, engraving, ornamental metal-work, jewellery, etc., or to study drawing with the intention of becoming drawing masters.'

There will be an intimate connection between the 'Art' and the 'Industrial' Department of the School. The general educational classes will be abolished. No general education test will be prescribed for the admission of pupils into the School, and the selection will be left to the Superintendent. Drawing classes will form part of the ordinary curriculum of the School and instruction in Drawing will be given to all pupils, primarily with the object of its being of use to the student in his own craft. There will be a special Drawing Class for a few selected pupils to satisfy the demand for drawing masters in educational institutions. Such pupils will ordinarily be holders of scholarships and will be admitted only on signing a bond, binding themselves to continue the profession after they leave school.

There will be no examinations. A certificate from the School of Arts on the completion of any course by the student will qualify him as examinations have done till now.

The training will be free. Government have sanctioned the creation of 30 Scholarships to be awarded at the discretion of the Superintendent to pupils of exceptional merit as a reward or as a means of enabling them to continue their studies. Pupils are also allowed to retain any amount which may be obtained by the sale of their workmanship after deducting as nearly as possible the cost of the raw material supplied by the School.

There will be kept in the School a representative collection of objects bearing on each craft practised in the School and the various objects will be confined to examples produced in India.

P. T. LEE CHENGALVAROYA NAICKERS TECHNICAL AND INDUSTRIAL INSTITUTE AND ORPHANAGE, MADRAS.

(From the Prospectus and the Annual Report.)

Brief Account of the Work :—More than twenty years ago, the Trustees of Pachaiyappa's Charities inaugurated a scheme of technical education and established a Commercial Class for training Hindu youths in Commercial subjects, such as Book-keeping, Commercial Correspondence, Commercial Geog-

raphy, Short-hand, and Tpye-writing and also for imparting instruction in Surveying, Levelling, Mensuration, &c. The institution met with the cordial approval and support of the Government and was maintained from P. T. Lee Chengalvaroya Naicker's endowments. In the year 1905, the purely Commercial Section was transferred to Pachaiyappah's Charities and a Technical and Industrial Institute was organized out of Chengalvaroya Naicker's funds, on the model of the Government School of Arts, Madras, and of the Victoria Jubilee Technical Institute of Bombay. The Institute in both its branches (Technical and Industrial) has been recognised by Government and the course of instruction followed is in accordance with the Syllabus of the Government Technical Examinations. There is a Technical and Industrial Section in the Institute. In the former, the boys are taught Civil and Mechanical Engineering. Civil Engineering is taught up to the Sub-Overseer's Test in its various branches, Building and Bridge Construction and Surveying and Levelling. This Section has been in existence since 1886 and formed part of what was known as Chengalvaroya Naicker's Commercial School. It was recently improved and placed under full-time Instructors. There are 30 students, viz., 20 in the Elementary, and 10 in the Intermediate Class. The Mechanical Engineering Class comprising Machine Construction, Machine Drawing, Applied Mechanics, Steam, Gas and Oil Engines and practical work in Engineering Work-shop, was formally opened in February 1906, and there are at present 35 students of whom 23 are in the Elementary, and the rest in the Intermediate Class. In the Industrial Section, Printing, Weaving, Carpentry, Fitter's work and other handicrafts are taught to boys boarding in the Orphanage and also to destitute boys who are admitted as free day-students and are given one meal at noon. Cotton Weaving on flyshuttle looms was started only in April last. The Institute is provided with a large Workshop built at a cost of Rs. 7,000, and with a 9 B H. P. Oil Engine (Hornsby), two Screw Cutting Lathes, two Drilling Machines and other accessories. In March 1907, on the recommendation of Mr. Chatterton, Govern-

ment transferred the Oil-Engine Driving Class from the School of Arts to the Institute, with three Oil Engines and have also sanctioned a grant of Rs. 2,400 a year for working this Class. Since the transfer of this class to the Institute, several trained students have been sent out as Oil Engine Drivers on salaries ranging from Rs. 15 to Rs. 20, and there are at present 18 students undergoing training. The students in this class are given stipends varying from Rs. 3 to 6, according to qualifications. The Institute is under the immediate charge of a Superintendent who is assisted by a Deputy, both of whom hold diplomas from the Victoria Jubilee Technical Institute, Bombay. There are also Instructors in Surveying and Levelling, Drawing and Estimating, Freehand Drawing, Cotton and Carpet Weaving, Carpentry, Fitter's Work, etc.

Seven of the Senior Mechanical Engineering Students have obtained employments under Mr. Alfred Chatterton on a salary of Rs. 30 rising to Rs. 50.

Technical Section :—This Section comprises *Mechanical* and *Civil* Engineering and the course extends to 2½ years or five terms. All (*Hindus, Mahomedans and Christians*) are admitted in the section. The first term is devoted to Preliminary Instruction, the next two to preparing for Examinations. Applicants for admission must have completed at least the course of the V form, and they should provide themselves with the necessary instruments, colours, &c., mentioned in the last page, or deposit with the Superintendent of the Institute not less than forty rupees for procuring the requisite articles. Any unspent balance that may remain will be returned to the student. All drawing paper and shop tools will be provided by the Institute.

There will be Terminal Examinations for all Classes (when there is no other examination) conducted by the School Staff and other competent examiners. Those who pass the Government Technical Examinations will get their certificates from Government while those who pass only the various school examinations held by the staff will be given a certificate under

the signature of the Superintendent, of their having satisfactorily completed the course of studies at the Institute.

The Institute is equipped with a number of Oil Engines with the necessary accessories and is provided with a large workshop. There is also a small library containing books of reference which are being constantly added to.

COURSE OF INSTRUCTION.

I. Mechanical Engineering:—Students in this Branch are trained for the Machine construction group of the Government Technical Examination in the following subjects.

1. Machine Construction.
2. Do. Drawing.
3. Applied Mechanics.
4. Steam, Gas and Oil Engines.
5. Practical Work in Engineering Work-shop.

Fees:—Rs. 11 *per term* payable within the first 10 days after admission, or Rs. 12 in four *monthly* instalments, the first payable within the first 10 days of opening the class, and the rest within the 15th of each of the succeeding three months of the term.

II. Civil Engineering:—Students in this branch are prepared for the Government Technical Examinations in the following groups :—

1. BUILDING CONSTRUCTION.—
 1. Building Materials and Construction.
 2. Do. Drawing and Estimating.
 3. Applied Mechanics.
 4. Carpentry.
2. BRIDGE CONSTRUCTION.—
 1. Building Materials and Construction.
 2. Do. Drawing and Estimating.
 3. Applied Mechanics.
 4. Bridge-Work.
3. SURVEYING.—
 1. Surveying and Levelling.
 2. Earth Work and Road-Making.
 3. Mensuration.

Fees :—Rs. 18 *per term* for all groups payable within the first 10 days after admission, or Rs. 20 in four *monthly* instalments, the first payable within the first 10 days of opening the class, the rest within the 15th of each of the succeeding three months of the term. For the convenience of those who do not wish to take up all the groups, it has been arranged to admit students for the first and second groups, separately at Rs. 9 each group, or jointly at Rs. 11, and the third at Rs. 11, *per term in lump*; or Rs. 10 or 12 in four *monthly* instalments according as the *term* fee is Rs. 9 or 11, the first instalment being payable within the first 10 days of opening the class and the rest payable within the 15th of each of the succeeding three months of a term.

Special Drawing Class.—A special Drawing Class is also held for paying students from 7 to 9 A.M. The rates of fee per month are as follow :—

Preliminary.	Elementary.	Intermediate.
0—6—0	0—12—0	1—0—0

Industrial Section.—The Section is intended primarily for giving a hand and eye training to orphans and poor day students, who are *caste Hindus*. The former are fed and clothed in the Orphanage which has been in existence since 1883 and is now attached to the Institute, while the latter are given free one meal during the day. All are given free education up to the 4th standard, and are taught Drawing up to the Intermediate standard and a little Gardening. Orphans and free day students each not exceeding 75 in number are admitted. They must be above 8 and below 13 years of age. These work 4 hours in the classes and 5 in the Work-shop. Paying students are also admitted in these classes at the rates for the Drawing Class of which also they become students. They are also trained in one or more of the following Industries :—

1. Wood Work.
2. Metal Work (fitting-smithy or sheet metal).
3. Cotton Weaving.
4. Printing.

Oil Engine Driving Class.—This Class was transferred from the School of Arts to the Institute in March 1907 under

Government Order No. 1165 dated 24th November 1906. It is intended to train students in Oil Engine Driving, Pumping and Fitting. Deserving students of this class are given a small stipend varying from Rs. 3 to Rs. 6 a month, according to their qualifications.

Admission.—Applications for admission in the Technical Section will be received by the Superintendent up to the 31st January 1908. They must be on printed forms, which can be obtained at the office of the Institute or from the Secretary, Pachaiyappa's Charities. Students on joining must produce their leaving certificate (without which none will be admitted) and a conduct certificate. They will have also to be certified by the Medical Officer of the Institute to be physically fit. Fresh classes open on the first Monday in February.

Applications for admission as Orphans, Free-day or Paying students in the Industrial Section or in the Oil Engine Driving Class will also be received by the undersigned on printed forms supplied as above.

Finances:—The total receipts from P. T. Lee Chengalvaraya Naicker's Charities amounted to Rs. 37,134 in 1907. The charges of the Technical Section for the same year were Rs. 5,839, of the Industrial Section Rs. 5,095, and of the Oil Engine Department Rs. 2,338.

The control of the Institute is principally in the hands of Diwan Bahadur P. Rajarathram Moodeliar, C. I. E. The Superintendent of the Institute is Mr. S. Venkatrama Iyer, L. M. E.

THE NATIONAL SCHOOL, RAJAHMUNDRY.

(From a Note by the Head Master.)

The object of the School is to impart technical along with religious and general education. The School was opened in January 1908, mainly through the efforts of Mr. N. Subbarao Pantulu. In the Primary stage, which is a three years' course, literary and elementary scientific education is combined with rudimentary, or preparatory, technical education, such as the

training of the senses, drawing, clay-modelling, etc. In the Secondary stage, which is a five years' course commencing (say) from the boy's ninth year and corresponds to the six forms of the ordinary Madras high schools Literary and Scientific education is combined with such technical education as will prepare the student for a good career in life. For this purpose arrangements have been made for imparting efficient instruction in weaving, dyeing, knitting, carpentry, short-hand, type-writing, banking, book-keeping and commercial correspondence. Further arrangements are in contemplation for adding other subjects.

In the primary stage it is sought to awaken the child's power of observation and develop its creative faculties by bringing before it objects with which it is familiar and by making instruction pleasant and stimulating. Though the boys are not to go through any particular course of technical instruction in the early years of school life, yet the education is sought to be so regulated as to draw out the boy's latent aptitude for the pursuit and prosecution of technical studies, so that this preliminary training may stand him in good stead both in the choice of a profession and in the practical acquisition of technical skill and the pursuit of useful arts and industries. Every effort is made to engraft a course of technical education on a good grounding of sound general knowledge so as to inspire the boys with an abiding love of work and to enable them to acquire skill in various trades. However technical classes will be open not only to boys who receive general education in the school, but also to others who desire to take up a study of some technical subject only. On the other hand no one can pass through a course of general education only, emphasis thus being strongly laid on the importance of technical education.

In the primary stage instruction is free and in the secondary the fees charged are rather less than one-fourth of what are charged in other schools. Arrangements have also been made for awarding free-scholarships to deserving poor boys in the secondary classes and for free instruction in weaving and other technical subjects, in the case of the children of professional weavers, carpenters and other such working classes. There are at present 148

boys receiving free primary education and 10 boys receiving free-scholarships in the secondary classes (out of 90 on the rolls).

It is hoped shortly to make hostel provision for the students.

The requirements of the school are one lakh for initial expenditure on buildings and equipment, and about Rs. 3 lakhs of funded capital to yield the ten thousand that is the approximate annual expenditure. The only source of income is public subscriptions. The proportion of the number of teachers to that of the pupils is probably very much higher in this school than in other schools.

Mr. S. S. P. V. Ramana Saraswati is the Head Master and is assisted by a staff of seventeen teachers.

THE WESLEYAN MISSION INDUSTRIAL SCHOOL, KARUR.

(From a Note by the Superintendent and Manager.)

The school was founded during the great famine of 1877 by the Rev. Henry Little. The subjects taught are *Handicrafts* (Carpentry, Cabinet-making, Turning, Black-smithing, Rattan, Weaving) and *Drawing* (Free and Model, Geometry, Design, Nature, Practical with Plan, Elevating, Section and Isometric projecting). There are four standards of one year each, or two a year according to the ability of the student. The full course—Elementary, Intermediate, Advanced—takes from five to six years. The students are prepared for the Madras Government Technical Examinations which are held in November and December. The standards promotion examinations are held once or twice yearly, and the test examinations monthly. The total number of students on the roll is 78. An average of say 10 students leaves the school annually; some go to work in their own town or village, others go to the railway or become *maistries* at other schools, and some go into missionary work. Most of the students are unable to pay any tuition free. Scholarships are also awarded by Government on results of Government examinations, and by the District Board and the Municipality. There is a hostel in connection with the school where students are boarded and lodged. The number now in residence is 59.

A candidate seeking admission must have passed the fourth standard, and a guardian or supporter must be responsible for him. The capital cost of the school is Rs. 41,741, of which Rs. 17,550 was spent on the building, Rs. 11,891 on Tools and Machinery and Rs. 14,300 on stock. The salaries of the staff exceed Rs. 5,000 annually. The sources of income are Government grant, grant from the Home Committee of the Mission, and fees paid by scholarship-students. These vary according to a variety of circumstances. The Superintendent and Manager of the school is the Rev. T. Francis Embury.

THE HEMMANSBURG G. L. MISSION INDUSTRIAL SCHOOL, NAYDUPETA (NELLORE DISTRICT).

This school was begun in 1897 by the Hemmansburg G. L. Mission Society to provide the boys of the Mission with some training which will enable them to make a decent living. It has progressed slowly, but steadily. The subjects taught are carpentry, joinery, cabinet-making, blacksmithing, box-making (packing-boxes). No text books are used. The course extends over four years, after which an examination is held. No fees are charged. The cost of boarding and of the plant and tools, is met from the sale proceeds of the work turned out. The Manager's salary is paid by the Mission. There is one hostel for 20 boys. The boys must be able to read and write their vernacular and know the elements of Arithmetic. Evening classes are held to teach arithmetic and drawing. The capital cost of the school was about Rs. 5,000. The annual expenditure comes to about Rs. 15,600 and the receipts amount to about Rs. 16,000. There are 16 students.

Mr. John H. Burmester, who holds a German Government certificate in Architecture, is the Manager. There are two teachers.

THE GOVERNMENT SCHOOL OF COMMERCE, CALICUT.

(From the *Quinquennial Report on Education in India,*
1897-8 to 1901-2.)

This school consists of an English and a Vernacular section. The English section prepares students for the diploma and group

certificates in commerce; that is, it imparts instruction in commercial correspondence, book-keeping and commercial geography (advanced standard), and banking (intermediate standard); short-hand and type-writing (intermediate standard); commercial correspondence, short-hand and commercial geography (intermediate course) and banking (elementary course); and, book-keeping, commercial correspondence and commercial geography (intermediate standard) and banking (elementary standard). In addition to the technical subjects special classes are held for English composition and hand-writing. The length of the course is one year in each class. The vernacular section is not subjected to any public examination. It is examined half-yearly by the head master, who grants certificates to the successful pupils on the combined results of the two examinations held during the year.

AMERICAN MISSION-MANUAL TRAINING SCHOOL,
PASUMALAI (MADURA DISTRICT).

In this Manual Training School boys of the American Mission High School and Training Institution, Pasumalai, Madura District, are given instruction in drawing, carpentry, and blacksmithing from the manual training standpoint, *i. e.*, with a view to an all-round, symmetrical development of the mental faculties. There is also a large school garden where vegetables, trees and flowers are grown and instruction is given in botany and agriculture. The Mission have been in this work since 1904 and have spent fully Rs. 20,000 on land, buildings and equipment. At present there are six teachers giving instruction in this department and 250 boys are enrolled for manual training. The work is supported wholly from private sources and the school is in no way under the control of or connected with the Government.

The Principal is the Rev. John N. Miller.

THE REFORMATORY SCHOOL, CHINGLEPUT.

(From a Note by the Superintendent, the Annual Report and Rules.)

Introductory.—This institution was started on the 15th October 1887, in accordance with the terms of the Reformatory Schools Act and the Government finally decided that the school should be located at Chingleput. The object of the institution is to reform and reclaim juvenile offenders. The institution was first, for about one year, under the control of the Jail department and subsequently it was transferred to the Educational department. The Director of Public Instruction is the Inspector-General of the Reformatory under the Act.

Industrial Training.—The industrial training imparted is in the subjects of drawing, cabinet-making, blacksmith's work, metal work, weaving and tailoring. Drawing receives careful attention and is taught, with a few exceptions, to all the boys. In the blacksmith's shops there are forges on the English system, furnaces, a bench drilling machine and a set of stocks and dies. The manufacture of plantain-fibre machines is carried on in this shop. Among other things excellent sets of cooking utensils are made in the Metal Work department. In the Weaving department a combined take-up and letting-off motion was introduced for one of the looms. The dobbie loom was put to manufacture Indian cloths with narrow-figured borders. The Tailoring class does elementary work and is chiefly occupied in the making up and repairing of the boy's clothing. The Mason's class is popular. All the pupils are put to gardening on admission and the pupils of the industrial classes also take their turn at gardening in the way of recreation and exercise, the stationary and sedentary trades, such as the Band and Tailoring, being given extra gardening work. Instruction in methods of cultivation, by means of object-lesson plots, has been continued and extended, as far as possible, in the very limited ground available.

Fees, etc.—No fees are charged to pupils. The boys are fed and clothed by Government.

Admission.—Juvenile offenders below 16 years who are convicted by a Magistrate are sent here for reformation. The period of detention of pupils in the school varies from 3 to 7 years and pupils above 18 are not detained in the school.

Finance.—The total expenditure of the year 1907 amounted to Rs. 33,487 against Rs. 31,879 in the previous year. Deducting the sale proceeds, the net expenditure was Rs. 28,278, or Rs. 1,495 more than that of the previous year. The sale of articles manufactured by pupils fetches about Rs. 5,000 a year.

Strength.—The number of students at present is 193 distributed as follows:—Carpentry 31, Blacksmith's work 18, Metal work 12, Weaving department 35, Tailoring 24, Band class 15, Bugle class 11, Garden class 33, Masonry class 14.

Occupation of Past Pupils.—Of the boys discharged during the three years previous to 1907, 25 per cent. are following the trade taught them, 27 per cent. in trades other than those taught them, and 6 are engaged in agriculture.

Staff.—Lt. Col. J. E. Marsden I. M. S., Superintendent, Rs. 100 local allowance; J. W. Coombes, Esq., a technical expert trained from England, Deputy Superintendent, Rs. 400; Mr. M. D. Jacobs, Head Master, Rs. 60. There are several instructors, etc. besides.

THE GOVERNMENT TECHNICAL EXAMINATIONS, MADRAS.

(From the Report on the Progress of Education in India,
1897-8 to 1901-2.)

The Madras system of technical examinations influences most branches of professional and technical education in the Presidency. The general objects of these examinations are described in the following terms in the calendar of the Commission for Government Examinations for 1901-2:—

The Government Technical Examinations, formerly known as the Examinations in Science, Art, Industries and Commerce, are intended for the encouragement of scientific and technical instruction, with special reference

to manufactures and industries, and generally to the necessities of the practical side of life, and for the purpose of testing the qualifications of persons desirous of becoming,—

- i. Teachers of science, art, or commercial, or industrial subjects.
- ii. Civil, mechanical and electrical engineers, draftsmen and telegraphists.
- iii. Designers, engravers, decorative artizans, and art workmen in any branch of artistic industry included in this notification;
- iv. Agriculturists, foresters, veterinarians;
- v. Reporters, auditors, actuaries, and commercial employees;
- vi. Managers and foremen of manufacturing, printing and other industrial establishments suitable for this Presidency;
- vii. Employes under Government, Local Boards, or Municipal Councils, in any department in which a practical knowledge of any of the subjects included in this notification is required;
- viii. Chemists and Druggists, Compounders.

The examinations are held once a year by Boards of Examiners appointed by, and under the control of, the Commissioner for Government Examinations. They are of three grades, elementary, intermediate, and advanced. The examinations are open to all persons who have completed the prescribed course of study in a recognised technical school, or who have passed the compulsory subjects of the lower secondary examination (in the case of elementary examinations), or of the upper secondary examination or the matriculation examination (in the case of intermediate or advanced examinations). The subjects in which the examinations are held are classed under the following heads:—

Civil Engineering	Music.
Mechanical Engineering.	Drawing, etc.
Electrical Engineering.	Jeweller's work
Physical Science.	Printing, book-binding, and type founding.
Geology.	Wood-work and metal-work.
Biology.	Leather-work.
Sanitary Science.	Textile fabrics.
Pharmacy.	Glass and pottery.
Agriculture.	Tailoring and dress-making.
Veterinary Science.	Cookery.
Commeſce.	

A certificate is granted to a candidate passing in any subject. To meet the requirements of candidates desirous of qualifying

for a profession requiring a knowledge of more than one subject, certain of the subjects are formed into groups. These groups are of two kinds: (1) groups of a lower standard, for passing in all the subjects of which a group certificate is awarded, and (2) groups of a higher standard, for passing in all the subjects of which a *diploma* is awarded. Diplomas are granted only for agriculture ; veterinary science, electrical engineering, drawing, commerce, and the trade of the chemist and druggist.

• SCIENCE IN THE MADRAS UNIVERSITY.

(From Lieutenant-Colonel K.R. Kirtikar's article in the 'Modern Review' for May 1907, and the University Calendar.)

There are Boards of studies in Physical Science and Natural Science, and similarly Examinations Boards.

One of the subjects at the Matriculation examination is Elementary Science, Physics and Chemistry. At the Intermediate examination two of the four optional groups are given to Science, the first comprising Mathematics, Physics and Chemistry, and the second Natural Science, Physics and Chemistry. Among the optional subjects for the B. A. degree examination are Physical Science and Natural Science, the latter including Botany, Zoology and Geology. For the degree of Master of Arts in Natural Science only one of the following subjects has to be selected:—Botany, Physiology, Zoology, Geology. In every one of these there is a searching practical examination. Besides, each candidate when he applies to be permitted to appear at the M. A. examination, must forward a dissertation on a subject selected by himself and pertaining to the optional subject selected. No marks will be awarded to any dissertation which does not give satisfactory evidence of original research and independent thought. Out of the total number of 1,400 marks assigned for each of the four selected groups, 200 marks are for the dissertation. In Botany, apart from a knowledge of general principles of Botany, and of Morphological and Systematic Botany a thorough knowledge of Economic Botany and Palæo-Botany is required. In Physiology,

besides a knowledge of the general principles Histology and Embryology (Bird and Mammal) are necessary. In Zoology, Patæontology and Embryology are required. In Geology, Petrology or Patæozoology, Mineralogy and Crystallography or Palæobotany are required. There is besides a Practical examination in Mineralogy and Palæontology. The first M. B. & C. M. examination, among other subjects, requires one course in 'General Biology, theoretical and practical.' The Madras University has a degree entitled Licentiate in Sanitary Science (L. S. Sc.)

Among First-grade Colleges the Central College, Bangalore, has Professors in Physics and Geology. In this College a special prize of Rs. 100 is awarded annually to the student who takes the highest place in the B. A. list, provided he takes Physical Science as his optional subject. In the Nizam's College, Hyderabad, there is a Lecturer in Natural Science. Science is taught in Kumbakonam College, which is a Government institution. In the Madras Christain College there are Professors in Physical Science, Biology and Zoology.

This institution is noted for having several scholarships, endowed prizes and studentships, which latter carry with them money awards of tempting worth. For Science students there is a scholarship of Rs. 40, and another of Rs. 30 per annum, tenable for two years. The Buckle prize is awarded annually to the most deserving student in the Biology branch of the Senior B. A. class. The Aberdeen prize is awarded annually to the most deserving student in the Physical Science Branch of the Senior B. A. class. Among the 'Studentships, there is the Buckle studentship tenable for four terms for the assistance of a student proceeding for his M. A. in Biology, and a further sum of Rs. 120 on his passing his M. A. The Aberdeen studentship is similarly awarded to the M. A. candidate in Physical Science or Philosophy.

In the Presidency College, Madras, there are Professors of Physics, Chemistry, Biology and Zoology. In Rajahmundry Government College there is a Professor of Physical Science. In St. Joseph's College, Trichinopoly, Physics is taught. There is a Professor of Chemistry in the Maharajah's College, Trivendrum. There is a Professor of Chemistry in the Maharajah's College, Vizianagram. In this institution the 'Kasmanda Gold Medal, is awarded to the best student of the year in Chemistry, and the 'Quinn Gold Medal' to the best student in Physiology.

In the Madras Medical College there are Professors of Bacteriology and Biology and a good number of Assistants and Demonstrators.

Among the Endowments of the Madras University are:—the Maharaja of Travancore's 'Curzon Prize' to encourage post-graduate studies in scientific subjects bearing on the material prosperity of India, worth Rs. 500, to be awarded by the Syndicate for the best essay or thesis by a graduate on any matter comprised in Physics, Chemistry, Biology, Geology, Hygiene, Bacteriology, etc.

The essay requires the result of the personal investigations of the author and must contain clear evidence of independent and original research. Essays or theses which consist only of criticisms, compilations or the history of a subject, unaccompanied by the results of personal, independent, original research, will be ineligible for the prize.

The Norton Prize will be awarded to the student who passes the B. A. examination with the highest number of marks in Physical Science, if there be no graduate who passes M. A. with the highest number of mark in Political Economy. The Jaghirdar of Arni Gold Medals of Rs. 50 each will be awarded to the two candidates who pass the B. A. examination with the highest number of marks in physics and chemistry. The V. Rama Aiyangar scholarship, tenable for two years or for such further period as may be required, will be awarded to the B. A. student of the Presidency College who takes Natural or Physical Science for his optional subject, having passed highest in F. A. from Pachaiyappa's College. The Caithness Prize consists of the present of a microscope to the candidate who passes with the highest number of marks in Zoology at the B. A. examination, in the first class. The Rao Bahadur M. A. Singarachariar Prize will be awarded, failing candidates in English and Mathematics, to the M. A. who passes first in Botany or Zoology. The Pulney Andy Medal, which is for the encouragement of the study of Botany, is awarded to the M. A., or failing this the B. A., who passes with the highest number of marks in Botany. Failing an eligible Law student, the Sir Muthuswami Aiyar Scholarship, tenable for two

years and of the monthly value of Rs. 30, is available for award to a B. A. who wishes to prosecute his studies in Physical or Natural science.

TECHNICAL INSTITUTE, MADURA.

Brief History—It was started by the President, District Board, Madura, in August 1890, the Municipal Industrial School being amalgamated with it. It has its own buildings and grounds on which several thousands of rupees have been spent. It originally consisted of an industrial section teaching carpentry and black smith's work, an agricultural section and a normal training section, the agricultural section was abolished and the normal section taken over by Government. It now consists of an industrial and drawing section only. In 1904 to improve it a mechanical Engineer was appointed, it has since then been, steadily, improving.

Course of Study—Drawing in all its branches up to the advance grade, Carpentry and Cabinet-making including wood carving up to the advanced grade. Rattan work up to standard D., Metal work up to the advanced grade, this includes working in precious metals also. Black smith's work includes fitter and machine work up to the Intermediate grade, this being the highest test at present. The courses of instruction are from 5 to 7 years which are mostly practical at present. Students of the industrial section must learn drawing also. No text books are used and the vernacular is the medium of instruction.

All students are prepared for the Madras Government Technical Examinations. For Rattan work a final examination is held by the Superintendent as there is no Government Examination.

Fees, Stipends and Scholarships—The Fees charged are 8 annas a month. At present most of the students are scholarships holders or stipendiaries. This will cease from next year and only a limited number of Scholarships be awarded.

Qualifications required for admission :—Students must not be below fourteen years, must have general knowledge up to the 3rd standard and must produce a good conduct certificate or be recommended by some well known person.

Funds :—The net cost to the District Board is on an average annually about Rs. 10,000.

By sale of articles manufactured in the Industrial Department and by fees. Sale-proceeds about 18,000 and fees about, Rs. 150.

The Industrial Department takes in orders for repairing and renewing parts of industrial machinery and trains men to drive or work oil-engines. The Institute is noted for its wood carving. It has done much to introduce aluminium to the public for all purposes and is now doing the same with chrome leather.

Under orders of Government, the Institution is to be re-organized shortly (probably) in the new official year. When the present system of working will be entirely changed.

Staff.—Mr. H. E. R. Duntrill is the Superintendent. There are six assistants under him.

BOMBAY.

THE VICTORIA JUBILEE TECHNICAL INSTITUTE, BOMBAY.

(From the Calendar of the Institute for 1908.)

Establishment.—The movement that led to the foundation of the Victoria Jubilee Technical Institute originated in the double desire to commemorate in a fitting manner the Golden Jubilee of Her late Majesty Queen-Empress Victoria and to make provision for imparting technical education connected with industries. This is the best equipped, most completely manned and efficient industrial Technical College in the country. And its establishment is due chiefly to the munificence and philanthropy of the citizens of Bombay.

The objects of the Institute are to impart instruction to persons of either sex in the principles of science and art, and their application to industrial or other purposes; and to hold examinations in technology and grant certificates of competency to those who satisfy the prescribed tests.

Management.—The management of the Institute is vested in a Board of Trustees, consisting of representatives of the Bombay Government, the Bombay Corporation, Ripon Memorial Fund, the Bombay Millowners' Association, and the Sir Jamsetji Jeejeebhoy (Second Baronet) Memorial Fund. The Board have power to add to their number as Life-Members (a) such persons as shall subscribe not less than Rs. 10,000, and (b) the representatives of such corporate bodies as shall subscribe a sum of not less than Rs. 50,000.

Maintenance.—The Institute is maintained from grants made for the purpose by the Bombay Government, the Bombay Corporation and the Bombay Millowners' Association, and from interest on investments, fees from students, proceeds of sale of students' work etc. Its capital account consists of the following among other amounts:—Endowment Fund by the

Hon. Sir Dinshaw Manockjee Petit, Rs. 3 lakhs; Sir Jamsetjee Jeejeebhoy (2nd Bart.) Memorial Fund, Rs. 50,000 (in round figures); the Marquis of Ripon Memorial Fund, Rs. 1,54,000; Messrs Platt Brother's Presents Rs. 26,000; Sir Dinshaw Manockjee Petit Testimonial Fund, Rs. 45,000; Sir Dinshaw Manockjee Petit's Grant for Enamelling Plant, Rs. 10,000; Municipal Jubilee Fund, Rs. 80,000; B. B. and C. I. Railway Apprentice Fund, Rs. 4,000; Royal Jubilee Fund, Rs. 25,000; Sir Dinshaw Manockjee Petit Entertainment Fund Committee's Present, Rs. 2,000; Sir Dinshaw Manockjee Petit's Present, Rs. 1,200; Honourable Nowrosjee N. Wadia's Present, Rs. 4,400; H. H. the Thakor Saheb of Bhowanagar's Present, Rs. 5,000; G. I. P. Ry. Co.'s Present, Rs. 4,000; B. B. and C. I. Ry.'s Present, Rs. 4,100; Revenue Invested in Securities, Rs. 63,500; Government Special Grant, Rs. 42,800; Donations during the year 1906-7, Rs. 15,600; Sir Dinshaw Manockjee Petit Free-Studentships Fund Rs. 11,300; Joshua King Scholarships Fund Rs. 12,500; Damodhar Tapidas Free-Studentship Fund Rs. 6,700; Professor Henry Fawcett Scholarship Fund Rs. 4,500; Dwarkadas Vasanji Scholarship Fund Rs. 3,100; Lord Reay Scholarship Fund Rs. 3,200; Lord Reay Gold Medal Fund Rs. 7,500; Abdoola Haji Dawood Free-Studentship Fund, Rs. 3,600; Ripon Prize Fund, Rs. 1,800; Drawing Prize Fund, Rs. 1,000; Dr. H. Cook's Prize Fund, Rs. 1,100; Nowrosji Fardoonji Testimonial Fund, Rs. 12,600; Maharao Khengarji Scholarship Fund Rs. 15,200; Govind Thackersey Mulji Scholarship Fund, Rs. 2,200. Including comparatively small amounts the total is Rs. 9,19,000 (in round figures). The main building and out-houses have cost (in round figures) Rs. 3,00,000; the Sir J. J. School Building, Rs. 6,700; the Ripon Textile School Building, Rs. 18,800; the Sir D. M. Petit Metal School Building, Rs. 27,000; Gas Fitting, Rs. 3,000; Central Power Station, Rs. 12,200; Technical Chemistry Laboratory, Rs. 19,300; Sir J. J. School Plant, Rs. 44,600; Ripon Textile School Plant, Rs. 36,800; Sir D. M. Petit Metal and Enamelling Plant, Rs. 20,600; Physical and Electrical Plant, Rs. 40,300; Technical Chemistry Apparatus, Rs. 3,600; Dormitories Plant,

Rs. 1,100 ; Drawing Class Plant, Rs. 3,900 ; Library Furniture and Books, Rs. 3,300 ; Institute General Furniture Rs. 1,300 ; Oil Paintings, Rs. 6,300 ; Her Majesty's Bust, Rs. 5,000 ; Portable Engine, Rs. 1,500 ; Central Power Station Plant, Rs. 12,500 ; New Students' Quarters, Rs. 41,300. Rupees 1,65,200 are invested in $3\frac{1}{2}$ per cent. Government Promissory Notes : Rs. 50,000 in 5 per cent. Municipal Debentures ; and Rs. 10,000 in 4 per cent. Port Trust Bonds.

The Government make an annual grant of Rs. 30,000 ; the Bombay Corporation, Rs. 10,000 ; the Millowner's Association gives an annual donation of Rs. 3,000 ; the Interest on Investments amounts (in round figures) to Rs. 10,700 ; Income from Fees amounts to Rs. 15,400 ; Examination Fees to Rs. 2,400 ; Dormitories and Drawing Boards' Rent amounts to Rs. 1,150 ; Sir D. M. Petit Metal School and Enamelling Sales fetch Rs. 2,600. On the Expenditure side there are Rs. 12,000 to Principal's Establishment Salaries, etc. : Sir J. J. School Establishment, Rs. 20,750 ; Ripon Textile School Establishment, Rs. 6,200 ; Ditto, Technical Chemistry School, Rs. 6,500 ; Physical Laboratory and Electrical Establishment Salaries, Rs. 13,375 ; Ditto, Sir D. M. Petit Metal School, Rs. 2,800 ; Ditto, Sir D. M. Petit Enamelling School, Rs. 2,800 ; Dormitories and Building, Rs. 2,300 ; Honorary Secretary's Establishment, Rs. 3,000 ; Examination Expenses, Rs. 3,350 ; General Charges, Taxes, etc., Rs. 9,100.

Courses of Instruction.—The courses of instruction qualifying for the Diplomas and Certificates of the Institute are Mechanical Engineering, Electrical Engineering, Textile Manufacture (Spinning and Weaving), and Technical Chemistry. First, Second and Third Class Technological Certificates and Diplomas are given in each Department, on the results of the Examinations. Those who have been awarded the Diplomas are called Licentiates in any of the above four courses as the case may be. A course of instruction in Sheet-Metal Working and Enamelling on Iron extends over one year, and First Second and Third Class Certificates are given on the results of the annual examination.

The Mechanical Engineering Course extends to four years (= 8 terms) and comprises instruction in Machine Drawing, Applied Mechanics, Steam and the Steam Engine, Physics (Heat, Electricity and Magnetism), Practical Mathematics, Chemistry, Machine Design and practical work in the workshops, in Pattern-making, Foundry, Smithy, Machine Tools, Lathes and Fittings, etc., and the working of engines and boilers. *

The Electrical Engineering Course extends to four years and comprises instruction in Machine Drawing, Applied Mechanics, Steam Chemistry, Physics (Heat, Electricity and Magnetism), Practical Mathematics, and practical work in the Mechanical Engineering Workshops and in the Electrical Laboratories in testing of materials, instruments, lamps, motors, dynamos, wiring, etc. †

The Textile Manufactures Diploma Course extends to four years and comprises instruction in Machine Drawing, Applied Mechanics, Steam and the Steam Engine, Physics, Chemistry, Practical Mathematics, Textile Manufacture and practical work in Ginning, Mixing, Opening and Scutching, Carding, Beaming Ring, Mule Spinning, Weaving, Sizing, Bleaching and Finishing. ‡

The Technical Chemistry course extends to four years and comprises instruction in Machine Drawing, Applied Mechanics, Steam and the Steam Engine, Physics (Heat, Electricity and Magnetism), Physics, Laboratory Practice, Cotton, Chemistry, General and Organic, and Chemistry of Bleaching, sizing and Finishing. Dyeing, Laboratory and-Workshop Practice. §

The Sheet Metal working and Enamelling Course extends to one year and comprises instruction in Drawing, Stencil-cutting, Chemistry, Chemistry of Enamels, the mixing and applying of Enamels, Fusing Enamels on iron plates and Hollow ware, Stamping, Drawing, Punching, Cutting, Burnishing and Polishing Sheet Metal, etc.

* For details *vide* Calendar of the Institute for 1908, pp. 13-19.

† For details *vide* Calendar of the Institute for 1908, pp. 19-32.

‡ For details *vide* Calendar of the Institute for 1908, pp. 23-26.

§ For details *vide* Calendar of the Institute for 1908, pp. 26-29.

For details *vide* Calendar of the Institute for 1908, pp. 29-30.

A student who has successfully completed his course in Mechanical Engineering or Electrical Engineering or Textile Manufacture may qualify himself further by going through a four terms' course in another of these departments on payment of the usual fees. He will not be entitled to any scholarship, prize, medal, or other awards.

A special course of Evening Lectures is given during each year, dealing with technical subjects, outside the usual course of instruction. Admission to these lectures is free.

Rules of Admission:—The approximate number of students that can be admitted to the different courses is as follows:—Mechanical Engineering, 60; Electrical Engineering, 30; Textile Manufacture, 30; Technical Chemistry, 20; Sheet Metal Working and Enamelling, 20.

Applications for admission must be made on or before the 2nd January in the prescribed form. The application must be accompanied in each case by a certificate that the candidate is above the age of 16 years and is constitutionally sound, and a second certificate that he possesses the required pecuniary ability to go through the course. Candidates shall have to sit for an Entrance examination in English Composition, Mathematics, Drawing and Science (Chemistry as at the University Matriculation). Candidates who have obtained at least 25 per cent. of the marks obtainable in each subject, and at least 33 per cent. on the whole, shall be considered to have passed. But of these only those who stand highest in the list up to the number of available vacancies shall only be selected for admission. Candidates who may have failed to secure admission to the courses named in their applications, may be admitted to other courses in which vacancies are available.

Fees.—The fees, which include the Gymkhana, are as follows:—Mechanical Engineering Course, Rs. 25 for each of eight terms; Electrical Engineering Course, Rs. 25 for each of eight terms; Textile Manufacture course, Rs. 25 for each of eight terms; Technical Chemistry course, Rs. 30 for each of eight terms; Enamelling and Metal-Working course, Rs. 30 for each

of two terms. The latest date for the payment of fees of the first term is January 15th and for the second term June, 20th.

Cost of Study.—The approximate cost of each course exclusive of Boarding and Lodging is as follows:—Mechanical Engineering, 4 years, Rs. 15 per month; Electrical Engineering, 4 years, Rs. 15 per month; Textile Manufacture, 4 years (2, spinning, 2 weaving), Rs. 8 per month; Technical Chemistry, 4 years, Rs. 15 per month; Enamelling and Metal-Working, 1 year, Rs. 8 per month.

Session and Terms.—The Session or year commences in the second week of January, and consists of two terms, the first term commences on the opening day of the Session, and ends on the 30th June; the second term begins on the 1st July, and ends in the third week of December.

Vacations and Holidays.—There are two vacations: one from April 20th to June 1st, and the other from October 7th to November 10th. Besides, there are holidays on twenty days in the year.

Rules for Students re Attendance etc.—All students must provide themselves with books and instruments as directed by the Principal from time to time. Every student wishing to resign must give a term's written notice or pay the fee. Full discretion rests with the Board to remove, on the recommendation of the Principal, any student who appears to be unlikely to profit by the training. A removal under this rule will imply no reflection on the student's character.

Examinations.—At the end of each year students are examined in the different subjects of study. No student shall be admitted to any annual examination unless (a) he has put in during the year at least 75 per cent. of attendance at the lectures given in each subject and in the Workshop and Laboratory; (b) he produces a certificate from the head of his department showing that he has given full satisfaction at the practical exercises given him during the year; and (c) he has paid an Examination Fee of Rs. 10.

There will be a Written Examination in Steam Machines, Heat, Electricity and Magnetism, Machine Tools Lectures, Electrical Lectures, General Chemistry Lectures, Technical Chemistry Lectures, Enamelling Lectures, Metal Working Lectures, Drawing, Textile Lectures, Laboratory Practice, Mathematics, Internal Combustion Engines, and Machine Design, the Marks allotted to each being 100.

There will be a Practical Examination in Pattern-making, Foundry, Smithy, Lathes, Fitting, Tools, Electrical Engineering, Scutching, Carding, Framing, Ring Spinning, Mule Spinning, Weaving, Practical Chemistry, Chemical Analysis, Metal Working Practice, and Enamelling Practice, the marks allotted to each being 100.

To pass the annual examination the candidate must obtain at least 33 per cent. of the marks obtainable in all the science subjects taken collectively, and at least 40 per cent. of the marks obtainable in all the practice subjects taken collectively, and at least 40 per cent. on the whole, *i.e.*, of all the science and practical subjects taken together. Those who obtain at least 40 per cent. of the marks obtainable in science subjects taken collectively, at least 50 per cent. of the marks obtainable in practice subjects taken collectively and at least 50 per cent. on the whole will be placed in the Second Class, and those who obtain at least 45 per cent. of marks obtainable in science subjects taken collectively, at least 66 per cent. of the marks obtainable in practice subjects taken collectively, and at least 66 per cent. on the whole will be placed in the First Class; but no student will be declared to have passed his annual examination unless, in addition to the percentages for passing, he has been successful in the following specified subjects:—*Mechanical Engineering*—Drawing and Steam; *Electrical Engineering*—Electrical Lectures and Steam; *Textile Manufacture*—Cotton Lectures and Steam; *Technical Chemistry*—Technical Chemistry Lectures and Practice: and *Metal Working and Enamelling*—Metal Working and Enamelling.

Those only who pass the First Session Examination will be promoted to the Second Session Classes: those only who pass

the Second Session Examination shall be promoted to the Third Session Classes : those only who pass the Third Session Examination will be promoted to the Fourth Session Classes ; and those only who pass the Final Examination shall be granted a Diploma. Such only of the Final Session Students who obtain 40 per cent. of the marks obtainable throughout the course in Science and Practical subjects taken collectively shall be entitled to a certificate of the Pass Classes ; those who obtain 50 per cent., the Diploma of the Second Class, and those who obtain 66 per cent., the Diploma (Honours) of the First Class.

A student who has failed in any of the annual examinations in any Technology may, on payment of a fresh fee, appear for the same examination in any future year, with or without repeating attendance at the Institute, but such student will not be entitled to any scholarship, prize or other award.

Studentships and Scholarships.—There are four Sir Dinshaw Manockji Petit Free-Studentships for Parsee students, each of the value of Students' Annual Fees, Books and Instruments and each tenable for three years, to be awarded to four Parsee students who are selected by Mr. Bomonji Dinshaw Petit ; three Joshua King Scholarships of the value of about Rs. 105 per annum each usually tenable for three years, and open to all persons whose fathers are (or were) *bona fide* handicraftsmen residing in the districts of Ahmadabad or Kaira, Ahmednagar, and Satara ; Tapidas Free-Studentship for Hindus of the value of the annual fees and open to students in the Mechanical Engineering and Cotton Spinning branches ; one Abdula Haji Dawood Free-Studentship, of the value of the Students' Annual fees, with necessary books and instruments, tenable for three years, to be awarded to a Mahomedan candidate only ; one Maharao Khengarji Free-Studentship of the value of about Rs. 100 per annum, to be awarded once in every three years or whenever vacant, to candidates who are subjects of His Highness the Rao of Cutch ; one Mani Bhai Cutch Scholarship of the value of Rs. 20 per mensem tenable for two years, awarded by the University of Bombay, and the Amir Ali Murad Scholarships of the annual value of Rs. 360, open to all Mahomedans born or

domiciled in Sind. Besides the above, there are three Nowrozji Furdunjee Fee Prizes, the Ripon Prize, the Lord Reay Scholarship, the Professor Henry Fawcett Scholarship, the Govindji Thackersy Mulji Scholarship, the Vurjdas Atmaram Prize, the Mechanical Drawing Prize, the Dr. H. Cook Prize, the Dwarkadas VasANJI Scholarship, the Maharao Khengarji First Scholarship and the Lord Reay Gold Medal.*

Boiler Act Examinations.—Under the rules of the Bombay Boiler Inspection Act, students of this Institute, who have completed a course of *three years* in the Workshops of the Mechanical Engineering Department are allowed to sit for the Third Class Examination, and those who have gained full Technological Certificates in Mechanical Engineering and have obtained one additional year's outside practical experience are entitled to sit for the Second Class Examination.

Workshops Certificate.—The three years' workshops certificate mentioned above will only be granted to the student who holds a full Technological Certificate in Mechanical Engineering.

City and Guilds Examinations.—The Institute conducts the City and Guilds of London Institute Examinations each year on behalf of that Institute. The examinations are held every year in May, and Certificates and Prizes awarded to successful candidates. The Fee for each Examination is Rs. 5. Candidates desirous of being examined must send in their application with the Fee of Rs. 5 on or before February 12th. The Subjects of Examination, open to all candidates, whether students of the Victoria Jubilee Technical Institute or not, are as follows:—

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| 1. Salt Manufacture. | 7. Coal Tar Products. |
| 2. Alkali Manufacture. | 8. Sugar Manufacture. |
| 3. Soap Manufacture. | 9. Paint, Oil Colours, and Varnishes. |
| 4. Bread Making and Flour Confectionery. | 10. Oils and Fats, including Candle Manufacture. |
| 5. Brewing. | 11. Gas Manufacture. |
| 6. Spirit Manufacture. | |

* For particulars *vide* Calendar of the Institute for 1908, pp. 57-58.

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| 12. Iron Steel Manufactures.
13. Paper Manufacture.
14. Photography.
15. Pottery and Porcelain.
16. Glass Making
17. Dressing of Skins.
18. Leather Tanning.
19. Boot and Shoe Manufacture.
20. Silk Dyeing.
21. Wool Dyeing
22. Cotton Dyeing.
23. Cotton and Linen Bleaching.
24. Calico and Linen Printing.
25. Wool and Worsted Spinning.
26. Wool and Worsted Weaving and
Designing.
27. Cotton Spinning.
28. Cotton Weaving.
29. Flax Spinning.
30. Linen Weaving.
31. Silk Throwing and Spinning.
32. Silk Weaving.
33. Jute Spinning.
34. Jute Weaving.
35. Lace Manufacture.
36. Frame Work, Knitting, and
Hosiery.
37. Hat Manufacture.
38. Telegraphy and Telephony.
39. Electric Lightning and Power
Transmission.
40. Electro Metallurgy, etc.
41. Metal Plate Works.
42. Plumber's Work. | 43. Silversmith's Work.
44. Goldsmith's Work.
45. Watch and Clock Making.
46. Mechanical Engineering.
47. Road Carriage Building.
48. Rail Carriage Building.
49. Typography.
50. Lithography.
51. Raising and preparation of Ores.
52. Mine Surveying.
53. Slate Quarrying.
54. Carpentry and Joinery.
55. Ship Builders' Work.
56. Boiler Makers' Work.
57. Brickwork.
58. Masonry.
59. Plasterers' Work.
60. Painters' and Decorators' Work.
61. Milling (Flour Manufacture.)
62. Cabinet-Making.
63. Book-binding.
64. Dress-Making.
65. Millinery.
66. Plain Needle Work. For
 women.
67. Plain Cookery.
68. Basket Work.
69. Builders' Quantities.
70. Wheel Wrights' Work and Van
Cart Building.
71. Leather Dyeing.
72. Principles of Art in Pattern
Designing.
73. Tailors' Cutting.
74. Motor Car Engines and Machinery |
|---|---|

PROSPECTS OF TRAINED STUDENTS.

The Principal writes in a Note.—'This Institution is the only one of its kind in this City and probably is of a different and much more practical character than that of any other Institution in India. The diploma students have no difficulty whatever in obtaining remunerative employments and many of the Engineers, Managers, Assistant Managers, Assistant Engineers,

Carding, Spinning and Weaving Masters in the various Mills and Workshops in this Presidency are passed students of this Institute. A great majority of the students come from Presidencies outside Bombay and after completing their education, return to their native places and take up employment there. Many have started businesses of their own on various lines and are carrying them on successfully. It is difficult for us to tell exactly the average wages which these men obtain, but it will be somewhere between Rs. 80 to 100 per month. The prospects of trained students are brighter than they have ever been previously and every year there is a better opportunity of employment for technically trained men and also for Teachers in the many small Technical Schools which are rapidly springing up in the various parts of the country. The line on which the training is carried out, is that of providing men to suit the present and future industrial requirements of the country and who are capable of filling many of the positions, which had been in the past held by Europeans'.

Staff.—Principal, and Head of the Mechanical Engineering Department, T. S. Dawsons Esq. ; Vice-Principal and Head of the Physics and Electrical Engineering Department, L. Du B. Hugs, Esq. ; Deputy Head of the Textile Manufactures Department, V. A. Fernandez, Esq. ; Head Assistant, Technical Industry Department and Head of the Enamelling Department, J. C. Mody Esq. ; Lecturer in Sheet-Metal Working, D. J. Gair, Esq. ; Head of the Motor Car Mechanics Department, William Horper, Esq. There are besides, three Head Assistants, six Assistants, one Superintendent, and seven Fellows in the several Departments.

THE COLLEGE OF SCIENCE, POONA.

(From the Calendar of the College for 1907-08.)

Historical Sketch.—In 1854 the Government of India had under consideration a scheme for the establishment of an Engineering College in the Bombay Presidency. The scheme was brought before the Government of Bombay in 1855 and certain decisions were taken. The scheme, however, was not carried out. In 1857 a fresh proposal was considered by the Government of Bombay and submitted to the Government of India. They said in the course of it: 'It is our wish that the best

means should be adopted for providing an education for the various grades of officers to be employed in the Department of Public Works.' 'This agency we look for chiefly in the youth of India, whether of native, of European, or of mixed origin. Their introduction into a branch of the public service, for which they will probably be found very well fitted, is likely to give a healthy stimulus to education generally, by the prospect of future employment thus opened up to those who, after passing through a course of general instruction, may apply themselves to the special study and practice of engineering or surveying.'

The Poona Engineering Class and Mechanical School was opened in July 1854; its aim was to provide suitable instruction for subordinate officers in the Public Works Department. The School was extended very considerably in the year 1857; 'no fees were charged, many of the students received scholarships, and all who passed the examinations were given appointments under Government.' In the year 1859 the Director of Public Instruction urged on Government the great necessity of having a University Degree in Engineering within the reach of the students. At the beginning of 1866 the College was affiliated to the University of Bombay; the Degree of Licentiate in Civil Engineering was instituted for Matriculated students; and the College entered on a new and extended course of usefulness. In 1868 the College moved into a new building for which Sir Cowasjee Jehangir Readymoney presented to Government the large sum of Rs. 50,000. Early in 1870 fees were levied for the first time without in any way checking the growth of the College. In 1871 was held the first of the annual geological excursions which have been successfully continued ever since. In 1872 the University course for L. C. E. was remodelled and rendered more comprehensive; and the number of optional subjects was increased by the addition of Architecture and Mechanical Engineering. In the same year also the erection of a workshop in connection with the College was completed, and this added largely to the usefulness of the College. In 1879 two new classes, an Agricultural Class and a Forest Class, were added to the College, and the next year its name was changed from the

'Poona Civil Engineering College' to the 'College of Science.' Scholarships on a liberal scale were offered in both the new departments. In 1886 the course required by the Bombay University for the Degree of L. C. E. was revised, and pupils intending to go up for that Degree were required to pass the Previous Examination of the University before joining the College. The erection of an Astronomical Observatory was commenced in the year 1888, and buildings for a Bacteriological Laboratory were erected in 1890. In 1898 residential quarters for students were built on a small scale. The system of paying wages to Workshop students was abolished in 1899, when the prospectus of the Mechanical Branch was revised. In order to improve the standard of instruction in electricity a Professor of Electrical Engineering and Physics was appointed by Government in 1900. Owing to the great increase in numbers it was found necessary in January, 1901, to institute a Competitive Entrance Examination, the number of admissions being limited to 40. In 1902 a new scheme for Workshop pupils was adopted by Government, the standard of entrance being raised and the length of the Sub-Overseer course being reduced from four to three years. An advanced Mechanical Engineering Class and also an Electrical Engineering Class were established. During this year an extra optional subject, Sanitary Engineering, was added by the University. The erection of residential quarters for 76 students was completed during the year 1907, and the quarters were occupied by the students in June of the same year. The Entrance examination, which was commenced in 1901, was abolished, selection being made in accordance with the results of the University examinations and at the discretion of the Principal. The number of L. C. E. students, who have passed out of the College since the year in which the Degree was first instituted, is 630. The average number of students in the College during the past five years has been—Engineering Classes, 146; Agricultural Classes, 48; Sub-Overseer and Workshop Classes, 136. In accordance with the decision of Government in 1905, the Agricultural Classes have been removed from this College, and a separate Agricultural College has been established.

The Civil Engineering Branch.—Candidates for the Civil Engineering Branch must have passed the Previous Examination of the University of Bombay, the First Examination in Arts of the Universities of Calcutta or Madras, the Intermediate Examination, Allahabad, or the Intermediate Examination with classical second language, the Punjab. The duration of the course of study is three years. Scholarships varying in value from Rs. 12 to Rs. 5 are annually awarded as the result of competition. These scholarships are awarded to those only who have passed their qualifying examination at the Bombay University. The College fee is Rs. 120 for Graduates and Under-Graduates of the Bombay University and Rs. 150 for Graduates and Under-Graduates of other Universities annually, payable half-yearly in advance at the commencement of each Term. There are residential quarters for a limited number of students.

The Science Branch.—Candidates for the Science Branch must have passed the Previous Examination of the University of Bombay or an Examination recognised by it as equivalent thereto. Approved candidates are qualified to appear for the Intermediate Examination of the University after two years' attendance and for the B. Sc. on the completion of another year's attendance subsequent to passing the Intermediate Examination. The fee is the same as that for students in the Civil Engineering Branch.

The Mechanical Branch.—In the Mechanical Branch candidates for admission to the Sub-Overseer Class must have passed the School Final or Matriculation Examination. Candidates for admission to other classes should be above 15 years of age, and must have (at least) passed a Standard equivalent to the Educational Department 6th Standard for Anglo-Vernacular Schools. An Entrance Examination will be held to determine the admissions for subjects, etc. Candidates are required to apply to the Principal of the College of Science on or before 15th December in each year, and their applications should state age and the standard passed. Certain scholarships are annually open to competition.

Special Scholarships.—There are five special scholarships in the Civil Engineering Branch, the McDougall Scholarship, the Frere Scholarship of Rs. 21-14-0 per mensem, the Rustomji Sorabji Woonwalla Scholarship, and two Watt Scholarships.

Degree of Licentiate of Civil Engineering.—A candidate for the Degree of Licentiate in Civil Engineering will be required to pass the Examination in Art-Drawing, and three other Examinations, *viz.*, the First Examination in Civil Engineering, the Second Examination in Civil Engineering, and the Examination for the Degree. The Examination in Art Drawing includes (1) the use of Drawing Instruments and simple problems in Plane Geometry: (2) Model Drawing in outline from solid objects; (3) Isometric Projection; and (4) Elementary Perspective with definition of terms, and drawing of a simple object in perspective. Candidates for the First Examination in Civil Engineering will be examined in the following subjects:—* (1) Mathematics (two papers), (2) Experimental Physics (one paper and a practical examination), and (3) Engineering (two papers). Candidates for the second Examination in Civil Engineering will be examined in the following subjects:—† (1) Mathematics (three papers), (2) Inorganic Chemistry (two papers and a practical examination) and (3) Engineering (three papers). This last comprises Foundations and Masonry, Water-supply, Irrigation and Harbours, Earth-work and Roads, Practical works and Engineering Drawing. Candidates for the Degree of L. C. E. will be examined in the following subjects:—‡ (1) Experimental and Natural Science; (2) Civil Engineering and (3) one of the following to be selected by the candidate, (3) Conic Sections and differential and Integral Calculus, (b) Optics and Astronomy, (c) Mining and Metallurgy, (d) Architecture, (e) Mechanical Engineering, (f) Botany and Forestry, (g) Sanitary Engineering. There are two papers in Experimental and Natural Science—one paper and a Practical Examination in Light,

* For details, *vide* Calendar for 1907-08. (pp. 6-11).

† For details, *vide* Calendar for 1907-08. (pp. 12-16).

‡ For details, *vide* Calendar for 1907-08. (pp. 18-27).

Electricity and Magnetism, and one paper on Geology. In Engineering there are five papers and a *viva voce* on Engineering and Project. One paper is on Surveying, one on Bridges, one on Carpentry and Strength of Materials, one on Railways, and one on Specification and Estimating. In Conic Sections and Differential and Integral Calculus there are two papers, two in Optics and Astronomy, two on Mining and Metallurgy, two in Architecture, two in Botany and Forestry, and two in Sanitary Engineering.

Degree of Master of Civil Engineering.—There is besides, an Examination for the Degree of Master of Civil Engineering, which is held annually at Bombay. Each candidate must have obtained the Degree at least of Bachelor of Arts or Bachelor of Science in the University of Bombay, or some University recognised by it, and must have practised as a Civil Engineer for at least three years after receiving the Degree of Licentiate of Civil Engineering in the University of Bombay or some University recognised by it. Each candidate must pay to the Registrar a fee of Rs. 50. In the Examination, each candidate will be required to submit the working drawings and specifications of such Engineering works as may have been designed and executed by himself during the two previous years.

Degree of Bachelor of Science.—The course of study occupies three years, and examinations are held annually at Bombay. The fee is the same as that for students in the Civil Engineering Branch. Candidates for the Degree of Bachelor of Science must have passed the previous Examination, and will be required to pass two subsequent Examination, the one to be called the Intermediate Examination for the Degree of Bachelor of Science, and the other the Examination for the Degree. Certain exemptions are made in the case of M. A.'s and B. A.'s wishing to take this Degree. Candidates for the Intermediate Examination will be examined in (1) English, with composition (two papers); (2) Mathematics (two papers); (3) Chemistry (two papers and a practical Examination); (4) Physics (two papers and a practical

* *Ed. Calendar for 1907-08* (p. 28).

examination) and (5) General Biology (one paper and two practical examinations).^{*} Candidates for the Degree examination will have to bring up two of the following seven subjects:— (1) Mathematics (four papers) (a) Conic Sections, (b) Differential and Integral Calculus, (c) Elementary Statics and Dynamics, (d) Elementary Hydrostatics and Elementary Geometrical Optics; (2) Experimental Physics (two papers and a practical examination): Mechanics, Acoustics, Heat, Light, Electricity and Magnetism, (3) Chemistry (two papers and a practical examination): Inorganic Chemistry and Organic Chemistry; (4) Botany (two papers and a practical examination): Histology, Morphology, the Classification of Plants, and Physiology; (5) Zoology (two papers and a practical examination): The principal facts of Structure and Development in the Animal kingdom with special reference to certain stated groups; (6) Animal Physiology (two papers and a practical examination); (7) Physical Geography and Geology.

Classes for Sub-oversers, Mechanical Engineers, and Electrical Engineers.—The course for each of these classes extends over three years; the first two years are taken up with the general course for all the students, and the third year is devoted to special work and study in the Department, selected by each student. Each year is divided into two terms: the first term extends from the beginning of January to the middle of April; the second from early in June to about the end of December with a break of about five weeks in October. The Workshops attached to the College comprise a Carpenter's Shop, Fitting Shop, Iron and Brass Foundry, Smithy and Store Rooms: they contain a considerable number of machine and hand tools. A twenty horse power steam engine and an eight horse power oil engine are used for driving the Machinery, and for teaching purposes.

The Electrical laboratory and Workshops are equipped with the machinery, appliances and instruments required for instruction in the usual methods of distribution of Electric Light and Powers and in other commercial applications of electricity.

^{*}For details *vide* Calendar for 1927-28 (pp. 29-35).

About half the time of the students is occupied in practical work in the Workshop, the other half being devoted to lectures and laboratory work. In the selection of candidates the following order will be observed:—*first* Candidates who have passed the School Final Examination of the Bombay Educational Department with Manual Training, Drawing Mathematics, Physics, or Chemistry will be admitted. *Second*.—Candidates, who have passed the School Final Examination, with any of the optional subjects not appearing in the above list, will be admitted. *Third*.—Candidates who have passed the Matriculation Examination of the Bombay University in the order of merit as shown by the total number of marks gained at that examination will be admitted so far as accommodation in the class will allow. An entrance examination will be instituted later on when it is found that the number of candidates who have passed the School Final Examination is greater than the number that can be admitted to the class. A limited number of candidates from other provinces, not exceeding twenty per cent. of the whole class, may be admitted and will be selected by the Principal of the College. Candidates for admission to the Mechanical Engineering or to the Electrical Engineering class must be above fifteen years of age, and have passed the Sixth Anglo-Vernacular Standard of the Educational Department. About 20 candidates will be admitted annually to the class. Each candidate must provide his own books, drawing instruments, and carpenter's tools. At the end of every year an examination is held in Workshop Practice, Mathematics, Drawing, and other subjects. The fee for these classes is Rs. 30 per annum for students of the Presidency of Bombay and Rs. 40 for students of other Presidencies. A fairly large number of Scholarships and free studentships is awarded to Scholars.[†] In the first two years students receive instruction and practical training in the following subjects:—Drawing, Mathematics, Steam, Physics, Mechanics, Chemistry; and Practical Work in the workshop in carpentry, pattern-making, wood turning and wood carving; chipping and filing in metal; iron and brass casting; lead work; smithery.

[†] For details *vide* Calendar for 1907-8 (pp. 56-7).

The course of study in the third year is in the following subjects for the Sub-Overseer Class:—(1) Carpentry, (2) Materials used in construction, (3) Building, construction and Lining out, (4) Drawing and Estimating, (5) Chain and Theodolite Surveying, Levelling and Lining out, (6) Road construction and Earthwork, (7) Book-keeping and Accounts, (8) Mathematics; Trigonometry; use of Logarithms, (9) Graphic Methods. Government guarantee some appointments annually in the Lower Subordinate Branch of the Public Works Department to the best Students in order of merit at the Final Examination of this class. Students who show special aptitude in Drawing are prepared for the Second and Third Grade Certificates in Art and Drawing Teacher's Certificate of the Sir Jamsetji Jijibhai School of Art, Bombay.

At the end of the second year, each student of the Engineering Classes, will as far as possible, be allowed to select either Mechanical Engineering or Electrical Engineering for his third year course. The course of study for the former embraces the following subjects:—Lecture courses in (1) Steam Engine and other Prime Movers, (2) Workshop appliances, (3) Applied Mechanics, (4) Mathematics; Trigonometry; use of Logarithms, (5) Graphic Methods Workshop practice in (1) Metal Turning, Fitting, and Drilling, (2) Smithery, (3) Carpentry, Pattern-making, and Wood Carving, (4) Machine Drawing and Sketching, (5) Indicator Diagrams. Students are prepared for the examinations for certificates under the Bombay Boiler Inspection Act. Students who show special aptitude in Drawing are prepared for the Third Grade Certificate in Art and Drawing Teacher's Certificate of the Sir Jamsetji Jijibhai School of Art, Bombay; and a student who thus qualifies himself and who has obtained the Certificate in Mechanical Engineering will receive the Technical School Teacher's Certificate. The authorities of His Majesty's Royal Indian Marine Dockyard, Bombay, the G. I. P. Railway and the Port Trust, Bombay, have expressed their willingness to take some students who have passed through the Mechanical Engineering course as Apprentice Engineers for one year on small pay. Similarly the Kolar Gold Field Elec.

tricity Department are willing to employ one or two passed Electrical Engineering Students as apprentices on small pay.

The course of study for the Electrical Engineering Class (Third Year) embraces the following:—Lecture courses in (1) Electricity, (2) Steam Engine, (3) Applied Mechanics, (4) Mathematics; Trigonometry; use of Logarithms, (5) Graphic Methods. Workshop Practice in (1) Electrical Laboratory, (2) Electrical Machinery in Workshop, (3) Metal Turning, (4) Machine Drawing and Sketching.

[For information about Text-books and Materials required, the reader is referred to the College Calendar for 1907-8, pp. 60-8].

Examination for the Accounts Branch of the Public Works Department.—An Examination for the Accounts Branch of the Public Works Department is held annually at the College. The following are the subjects of examination:—Writing, Dictation, Arithmetic, Mensuration, and Book-keeping. The College of Science acts solely as an examining body in reference to admission to the 4th Grade of Accountants, Public Works Department.

Proposed Normal Class.—With a view to train those who have passed through the College to be teachers in general technical schools, a Normal Class is to be opened. It is part of the Scheme that the pupils should pass a year in a large factory before receiving final certificates.

Staff—Principal and Professor of Civil Engineering, Major W. V. Scudamore, R. E.; Professor of Engineering, Dr. A. W. Thomson, C. E., D. Sc.; Professor of Physics and Electrical Engineering, H. N. Allen Esq., B. Sc.; Ph. D.; Professor of Chemistry and Geology, H. M. Page Esq., F. I. C., F. G. S., F. C. S.; there are besides, an Agricultural Chemist, a Superintendent of Workshop, several Lecturers, Assistants, Demonstrators, etc. †

† The Government of Bombay have addressed the University on the subject of Science Teaching in Bombay, and with reference to the College of Science they say: "It is proposed to concentrate the higher teaching of Science in the College of Science at Poona, which will be thoroughly equipped for the purpose. Steps have already been taken to obtain a full staff of highly qualified Professors; and when the College is brought into full working order, it will afford facilities for the study of Science such as have hitherto been unattainable in this Presidency; and will provide instructors fully qualified to undertake science teaching in local educational institutions."

THE AGRICULTURAL COLLEGE, KIRKEE, POONA.

(*From the Poona Agricultural College Calendar for the year 1908—9.*)

Historical Sketch—The initiation of higher agricultural education in the Bombay Presidency dates from the year 1878, when classes were founded at the College of Science, Poona, or rather at the Poona Civil Engineering College, as it was called until a year or two later. As a result of improvements effected therein at intervals and of better prospects in the matter of employment in the public service held out to those who received instruction in agriculture, there was an increase in the size of the classes causing a congestion at the College of Science. Consequently the Government decided, during the year 1905, to establish a separate Agricultural Collège. A fine site for a College and farm of nearly 150 acres was secured near Poona, and plans for a first class College and Research Institute were drawn up. The buildings required are now in course of construction. The smaller block, intended for Chemistry and Physics, are to be completed this year, the larger block, containing large College Hall, Museum, Herbarium, and Adequate Facilities for teaching and research, in Agriculture, Botany, Mycology and Entomology, will be finished next year.

The College.—Meanwhile, the College is located in a series of houses at Kirkee which have been adopted for College purposes and the final separation from the College of Science took place on January 1st, 1908. The College, as now constituted, is under the final control of the Director of Agriculture, Bombay, in consultation with the Director of Public Instruction. The executive charge is vested in a Principal, who is supplied with a staff of two Professors, and a sufficient number of Assistant Professors, Lecturers and Demonstrators. The accommodation in the temporary buildings is limited and it is not intended, in any case, to admit more than fifty new students in any one year until the permanent buildings are completed.

The Examinations.—The College prepares the students for the Degree of Bachelor of Agriculture of the University of Bombay.

A candidate for it must have passed the previous examination of this University, or have passed an Examination in some University recognised by the University of Bombay, which will, in the judgment of the Syndicate, be at least equivalent to the previous examination of the University of Bombay. The examinations now recognised as so equivalent are :— F.A., or B. A., of the Calcutta University, provided this has been passed with a classical Language and History; F.A., or B.A., of the Madras University, provided this has been passed with a classical Language; Intermediate Examination in Arts of the Allahabad and the Punjab Universities, provided this has been passed with History. A candidate will be required to pass three examinations, *viz.*, the First and Second Examination in Agriculture and the Examination for the degree of Bachelor of Agriculture, the course of each of which runs to one year. Candidates for the First Examination will be examined in the following subjects* :—

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|------------------------------|--------------------------|
| I. Agriculture. | V. Botany. |
| II. Geology and Climatology. | VI. Zoology. |
| III. Physics. | VII. Veterinary Science. |
| IV. General Chemistry. | VIII. Mathematics. |

There is a practical examination, besides a paper, in all subjects except VIII. Candidates for the Second Examination will be examined in the following subjects† :—

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|----------------|-------------------------------|
| I. Agriculture | IV. Agricultural Entomology |
| II. Chemistry | V. Veterinary Science |
| III. Botany | VI. Agricultural Engineering. |

There are two papers in I and II and one paper in the rest, besides a practical examination.

Candidates for the Degree Examination will be examined in the following subjects :—

- | | |
|------------------------------|-----------------------------|
| I Agriculture. | IV Agricultural Entomology. |
| II Chemistry of Agriculture. | V Veterinary Science. |
| III Botany. | |

* For details of courses, *vide* the Calendar, (pp. 10-17).

† Do. (pp. 18-21).

‡ Do. (pp. 22-28).

There are three papers in I, two in II, and one in the rest, besides a practical examination.

Fees, etc.—The annual fee for tuition at the College is Rs. 50, of which Rs. 25 must be paid in advance at the commencement of each term. All students admitted are expected to follow the course laid down by the University of Bombay for the degree of Bachelor of Agriculture, but the Principal may, at his discretion, admit students not studying for the F. Ag., S. Ag., and B. Ag., examinations. Besides the textbooks prescribed, all students are expected to provide themselves with the dissecting instruments required for work in Zoology and Entomology.

The College Sessions.—The College Session runs from June to January, so that the attendance at the College now covers the most important agricultural months of the year in the Bombay Presidency.

Scholarships.—Eight Government Scholarships are annually awarded tenable at the Poona Agricultural College on the following conditions:—The candidate must belong to the Bombay Presidency, excluding Sind; he must have passed the Previous Examination of the Bombay University, or an examination of another University recognized as equivalent; he must be prepared to take the whole course, and work for the B. Ag. examination of the Bombay University; he must be of good physique. Candidates must make applications to the Collector of the district in which they reside, on whose recommendation the scholars are selected by the Director of Agriculture, in consultation with the Principal of the Agricultural College. Preference will be given in the allotment of scholarships to the sons of agriculturists. The scholarships will be of the value of Rs. 15 per mensem, during the whole year, and will also include free attendance at the College during the tenure of the scholarship but not free quarters.

Four Government scholarships are annually awarded to students from Sind tenable at the College. The candidates

are required to enter into an agreement with the Commissioner in Sind, and to follow the courses prescribed for the B. Ag. degree. The scholars are selected by the Commissioner in Sind, and the scholarships are of the value of Rs. 25 or Rs. 35 per month according to circumstances. The other terms are the same as in the case of the other scholarships, except that the Commissioner may sometimes select candidates as scholars who have not passed the Previous Examination. Such students cannot of course appear for the B. Ag. degree. The 'Gulabdas Bhaidas Vakil King-Emperor Edward VII Scholarship' is annually awarded to the student belonging to the Anavla Brahman caste who obtains the highest marks in the First year's examination in Agriculture of the University of Bombay. The award is made by the trustees of the scholarship fund on the recommendation of the Principal of the Poona Agricultural College.

Quarters.—Quarters for 28 students are provided on a convenient and healthy site near the College. The charge per students for the accommodation is fixed at Re. 1, per month. Accommodation is obtained for as many other students as possible in the neighbourhood of the College. Students are, at present, at liberty to make their own arrangements as to residence when quarters are not provided.

Prospects.—The Bombay Government grant to men who have obtained the B. Ag. degree the same privileges as to other graduates in the matter of admission to, and promotion in the Revenue Department. A holder of the agricultural degree, if otherwise qualified, will have the preferential claim to posts in the Agricultural Department and also to the posts of District Inspector of Land Records and Agriculture.

Staff.—Principal and Professor of Chemistry.—Dr. Harold H. Mann, D. Sc., M. Sc., F. I. C.; Professor of Agriculture.—J. B. Knight Esq., M. Sc.; Professor of Botany—G. A. Gammie, Esq., F. L. S. Besides these there are three Assistant Professors, three Lecturers, three Demonstrators and one Herbarium Keeper.

THE SIR JAMSETJI JIJIBHAI SCHOOL OF ART, BOMBAY.

Introductory.—The Bombay School of Art began with a drawing class in the year 1857, and other classes were from time to time added to it. Attached to the School are the Reay art workshops which were opened in 1891. The School is a Government institution. Various alterations and extensions have been made to it from time to time, and it is about to be further re-organised. In the year 1906-7 the Government made to it a non-recurring grant of Rs. 1,20,000 and a recurring grant of Rs. 99,000. These sums were for expenditure on the addition of a Laboratory and Pottery building, a Textile School, Metal workers' class, wood-working class, Kilns and Students' quarters, and on the appointment of a Superintendent of Pottery, an Instructor of Textiles, and Instructors in Metal-working and Wood-work.

Subjects.—The School provides instruction in (1) Drawing, Painting and Design—Elementary and Advanced courses, (2) Modelling, and (3) Sculpture. The Building Construction and Architectural School has classes in Elementary Building Construction (first year's course), Advanced Building, Construction Materials (second year's course), Architecture (third year's course), and the styles arising from the Roman Byzantine Architecture (fourth year's course). A separate course of lectures is given during each Session on Solid Geometry, Perspective and Artistic Anatomy.

The Reay Art Workshops.—The following crafts are taught in the Reay Art Workshops:—(1) House decoration, (2) Enamelling, (3) Embossing on copper, brass, etc., (4) Carpet-weaving, (5) Cabinet-making and Wood-carving—Carpentry, (6) Pottery, (7) Jewellery and Silver-Smith's work, (8) Ornamental Iron work.

Fees.—An entrance fee of Rs. 3 is charged. A monthly fee of Re. 1, payable in advance is charged for the elementary course in Painting and Modelling class and Drawing Teacher's class. The monthly fee for the Draftsman's class is Rs. 2. No fee is charged in the Reay Art Workshops.

Scholarships, Prizes and Medals.—The following is a list of Open and Closed Scholarships tenable at the School of Art :—

OPEN SCHOLARSHIPS.

Tenable for two years .. One Entrance scholarship of Rs. 10.

ELEMENTARY COURSE.

Tenable for two years .. Eight scholarships ranging from Rs. 5 to Rs. 7 per mensem.

ADVANCED COURSE.

Tenable for one year .. One scholarship of Rs. 25 per mensem.

Tenable for two years .. Three scholarships ranging from Rs. 7 to Rs. 10 per mensem.

MODELLING.

Tenable for two years .. Two scholarships of Rs. 10 and Rs. 7 per mensem.

DRAFTSMAN'S CLASS.

Tenable for two years .. Four scholarships ranging from Rs. 5 to Rs. 10 per mensem.

CLOSED SCHOLARSHIPS.

For representatives of special nationalities or districts, or for special kinds of work.

Tenable for two years .. Six scholarships ranging from Rs. 18 to Rs. 8-12 per mensem.

REAL ART WORKSHOPS.

Several scholarships varying from 2 to Rs. 20 are open to competition.

Three medals and four prizes of the annual value of Rs. 135 are awarded to students of the School of Art, besides the Departmental Prizes given at the Annual Examination.

Strength.—There are 400 students on the roll. Of these some 250 attend the elementary drawing classes. The number attending the Workshops is about 150.

Principal—Cecil L. Burns, Esq.

THE TECHNO-CHEMICAL LABORATORY, BOMBAY.
(From the Body of Regulations.)

This Laboratory was established in the year 1900 by Professor T. K. Gajjar, F. C. S. It is a proprietary institution, situated at Girgaum, Bombay, and maintained by Professor Gajjar from his private resources. The object of the institution

is to impart to young men a thorough instruction in the Science of Chemistry both as a main and an auxiliary study, and to make them acquainted with its application in practical life to Manufactures, Pharmacy, Mining, Metallurgy, Agriculture, Trades, Professions, etc. ; The main object being the promotion of chemical studies and research with a view to develop chemical industries in this country. It is modelled on the well-known Fresenius Laboratory of Wiesbaden, Germany. It is equipped with up-to-date apparatus both for experimental and analytical work. The Library is a choice collection of all standard works on all branches of science, together with a set of reference works, for higher research work. And additions are continually made to it to keep it up to date.

The Committee that was appointed by the University of Bombay to inspect the different colleges in the Bombay Presidency and to report on them, especially with regard to the equipment of the laboratories, visited this Laboratory and were completely satisfied with its equipment and the facilities afforded to students, for the study of Chemistry, Elementary as well as advanced. And on the recommendation of the Committee the Senate of the University, in 1907, recognised the Laboratory for post-graduate study in Chemistry (M. A. examination). Ever before it was so recognised, most of the students going up for this examination in Chemistry studied and worked in this Laboratory.

2. In order to attain this object every student has to do by himself practical work in the Laboratory, independently of the other students and under the guidance of the heads of the different departments of the Laboratory and their assistants. This arrangement enables young men of unequal acquirements and different vocations (chemists, manufacturers, miners, agriculturists, pharmacutists, tradesmen, &c.), to be employed side by side without any disadvantage, and each to devote himself undisturbed to that special branch which has a bearing upon his profession.

The instruction is imparted in English, if desired it may be in vernacular under special circumstances only.

In accordance with the plan of instruction generally pursued the students, after acquiring a thorough knowledge of Qualitative Inorganic Analysis, as well as of the Reactions of the more important Organic bodies, proceed to Quantitative Analysis (including the gravimetric and volumetric methods), to the Testing of the most important raw-materials and products used in the arts both as regards their composition and commercial value, to Ultimate Organic Analysis and to the preparations of Inorganic and Organic Chemicals. When the student has made sufficient progress in the general elements of Practical Chemistry, more important labours can be begun, and those, of course, are chosen with due regard to his later calling in life.

It needs scarcely to be mentioned that the practical instruction is always combined with the necessary theoretical teaching. To this end, special courses of lectures are delivered. Students thus have an opportunity of acquiring a knowledge of the branches of science auxiliary to Chemistry. The time at which these lectures are given is so arranged that the working time is as little as possible shortened and never interrupted.

There is a Library belonging to the Laboratory for the purpose of facilitating the advancement of study. Every student has a right to make use of it (subject to the rules) on payment of the sum of Rs. 4 per term as Library Fee.

The first term begins on the 3rd of January (1st week) and ends on the 15th of April. The 2nd term begins on the 10th June and ends on the 15th October. The hours of working are from 11-30 A. M. to 2 P. M. and from 2-30 to 5-30 P. M. standard time. On Saturday afternoon the Laboratory is closed at 2 o'clock for the purpose of cleaning.

The regular students generally work six days weekly, but other casual students are at liberty to frequent the Laboratory 5, 4, 3 or 2 days weekly according to the arrangements made.

The student by entering the Laboratory binds himself to stay one term, if no other agreement has previously been made. Entrance into the Laboratory during the course of the term or for a shorter period than half a year can only be made by special agreements.

The fees for the practical course per term are as follows:—
 For students going up only for M. A. Examination of the Bombay University with Chemistry are Rs. 50 per term. For students either graduates, under-graduates or non-matriculantes who take up the full course of the laboratory are: Rs. 100 per term for the 1st year, Rs. 200 per term for the 2nd year, Rs. 300 per term for the 3rd year, or Rs. 1,000 if paid in lump sum for 3 years. For special short courses the student will be charged at the rate of Rs. 200 to 300 per term. No extra fees are charged for the lectures. The respective fees are payable in advance to the Treasurer of the Laboratory. Every student is required to pay a deposit-fee of Rs. 15 in advance.

The payment of the fee for the practical course secures to each student the following:—

- (a.) Instruction and guidance in the whole of practical Chemistry as well as the necessary theoretical teaching in the Laboratory.
- (b.) A working bench furnished with a lock-up cup-board and a shelf containing ordinary reagents.
- (c.) Heating and fuel, as well as hot water-baths and sand-baths, gas being included. In case of special courses where large quantity of gas is required the gas will be charged extra. (e. g. Metallurgical operations.)
- (d.) Use of general reagents, for qualitative and quantitative analysis, organic preparations, &c.
- (e.) All needful apparatus for doing the work prescribed in the courses.

[All breakages are charged at the current rates. The payment for any articles which may have been broken is to be made at the close of each month to the Treasurer of the Laboratory.]

- (f.) Special pieces of apparatus required in a particular line as well as the large quantities of materials required for working out an industrial project will be charged for extra.

Every student desiring to take up some industry has to undergo a course at this Laboratory for three years of which he has to devote the first two years to a complete course of higher Chemistry, Inorganic and Organic, Theoretical and Practical including Analytical, together with instruction in Mathematics

(Calculus) Physics, Machine-Drawing, Elementary Chemical-Engineering, German, &c. The third year the student has to devote to any one of the Technological subjects.

As a rule graduates only are admitted in this Laboratory but any undergraduate of extraordinary ability or a capitalist may be admitted with the director's special sanction. The object of the Laboratory is not to impart instruction in various industrial processes in an empirical and haphazard manner thus degrading it to the level of a purely mechanical and often quite unintelligible series of rule-of-thumb operations. The Laboratory does not wish to encourage students of "do copper" type, who simply aim at starting Chemical Industries without undergoing a regular and a complete course involving the knowledge of the principles underlying them.

15. There are at present 36 students, studying for M. A. and B. Sc., and in the Technological Class. Past Students number 23. Of these some are teaching in the Techno-Chemical Laboratory itself and others are holding high positions in other institutions.

Staff.—Professor T. K. Gajjar, M. A., B. Sc., F. C. S., Proprietor and Director; Dr. M. G. Deshmakh, M. D., B. Sc., and S. N. Pandit, Esq., Advisers; Professor V. P. Dalal, Professor D. D. Kanga, Mr. M. J. Gajjar, Mr. B. J. Shastri, and Mr. V. S. Ghurve, Professors and Lecturers; Messrs. S. Venkatram, A. S. Katibhaskar and S. R. Talwalkar, Demonstrator and Assistants; Mr. M. V. Naik, Secretary and Treasurer; M. C. V. Desai, Librarian; Mr. A. G. Cheulkar Steward and Accountant.

THE PAREKH TECHNICAL INSTITUTE, SURAT.

This institute was founded in 1878 by a philanthropic gentleman, Mr. Cursetji Fardunji Parekh, who gave a donation of about half a lakh of rupees, the interest only to be utilised. The School was called till recently the Parekh School of Art and Industry, but as its scope has been enlarged with the aid of grants made by the Government of Bombay it has since last year been designated as the Parekh Technical Institute. There are in the Institute well-equipped Filling and Metal Turning Shops, a Carpentry Shop, a Foundry, etc. It is managed by the Municipality.

The subjects taught in the School are Theoretical Instruction in Elementary Steam and Mechanics, Drawing, Carpentry including *Pattern-making and Carving, Moulding, Casting in brass and iron, and Turning and Fitting. The students are sent up for the Art Drawing Examinations, Mechanical Engineer's, examinations, and the examination under the Boiler Inspection Act.

Candidates seeking admission must have passed the Vernacular Sixth Standard or the Anglo-Vernacular Second Standard. But preference is given to boys with higher qualifications. The strength of the School is 15 in the Manual Training Class and 83 in the Mechanical Engineering Class. It is under contemplation to build a hostel for the students. Instruction is free and a number of students receive stipends.

The capital cost is about Rs. 75,000 and the maintenance charges come about Rs. 8,000 a year. The sources of income are the interest on the funded capital (Rs. 1,695), contribution from Government (Rs. 2,580), Municipal grant (Rs. 1,000) Local Board grant (Rs. 1,260) and sale proceeds of articles.

The passed students have obtained employment as weaving masters, moulders, carpenters, pattern-makers, fitters, turners, etc. There is evidence of increasing appreciation of the benefits of technical education on the part of parents.

Mr. C. R. Desai, L. M. E. Superintendent. The staff consists of 13 other teachers in different subjects.

THE SIR D. M. PETIT SCHOOL OF INDUSTRIAL ARTS, AHMEDNAGAR.

Introductory.—This school is a department of the Mission High School, Ahmednagar, founded by the late Sir D. M. Petit, Bart., of Bombay, and formally opened by the Honourable Mr. E. Giles, Director of Public Instruction, on November 3rd, 1898. Year by year additional buildings have been put up, until at the present time the plant consists of a hostel, with accommodation for 200 boys, and three large workshops, with 7,200 square feet of floor space. The cost of the equipment has been met entirely from donations and Government grants. The

current expenditure on the school, with a staff of 19 teachers, is met in the same way.

Subjects, Courses, etc.—There are five courses of instruction attended by more than 400 pupils. These embrace: I, Wood-work—(a) Joinery and Carpentry, (b) Wood-carving; II, Metal-work—(a) Coppersmithing, (b) Silversmithing, (c) Repousse in silver, copper, brass, aluminium; III, Rug and Carpet-making; IV, Fitting and General Metal-work; V, Weaving. In Wood-work and Metal-work the courses are of four years' duration, and in Rug and Carpet-making, three years'. In the Weaving Department instruction is given in the following subjects:—(1) Winding, (2) Warping, (3) Sizing, (4) Weaving, (5) Designing, and (6) Heald-making.

Pupils in all departments spend half the day in an ordinary school and the other half in the workshop, and as there are two divisions of all classes, those who are in the workshops in the forenoon are in the school rooms in the afternoon and *vice versa*.

There are no fees for tuition, but a charge of Rs. 3 a month is made for board and lodging.

Intending students must have passed the second or third vernacular standard.

The Weaving Department.—Mr. D. C. Churchill has carefully studied the Native methods and appliances for spinning, warping, and weaving, and has made great improvements on them. The new buildings will be supplied with the best hand appliances available, and it is hoped (says Dr. A. Thomson) that the pupils, who will be carefully trained, will be able to produce cloth many times finer than the hand-loom weavers of the district. It is intended also to have a factory for making fly-shuttle looms and other appliances, and it is expected that there will be a large demand for these looms.

General.—The Principal says in one of his reports: 'Several of our most successful workmen have been boys who had no genius for the ordinary High School course, and who but for manual training would have been "failures" in life without aim or character.'

The Rev. E. Fairbank is the Principal.

THE J. N. PETIT PARSEE ORPHANAGE, BOMBAY.

(*Note by Jeejeebhoy P. Mistri, Esq., Secretary.*)

1. This institution, which is the largest and most important branch of the Nusserwanjee Manockjee Petit Charity Fund, was founded by the late Mr. Nusserwanjee Manockjee Petit twenty years ago to perpetuate the memory of his only son, Mr. Jarnsetjee Nusserwanjee Petit. Its object is the maintenance and education of orphan and other destitute Parsee boys. The initial endowment was over Rs. 7 lakhs. The orphanage is not a purely technical institution, although there is a technical branch added to it. It is meant exclusively for Parsees.

2. In the Industrial branch of the Institution the handicrafts taught are (1) Carpentry, (2) Coopering, (3) Printing in all its branches and Book-binding (taught practically in the Printing Press attached to the Institution), and (4) Tailoring and Cutting. The text-book followed in the Carpentry classes is Dr. A. W. Thomson's "Manual Training for Indian Schools." The courses of instruction extend over a period of three years. At the end of each year Dr. A. W. Thomson, Professor of Engineering at the College of Science, Poona, and Government Inspector of all Technical Schools in the Presidency, examines the Technical Departments of the Institution.

In addition to the above training given to those students who are to earn their livelihood as such craftsmen, all the students of the Institution are required to undergo a course of instruction in Manual Training (in wood) for a period of four years, working at the rate of two hours a week. The system followed is the Swedish Sloyd modified and adapted to our requirements.

3. This being a charitable institution, no fees are charged. A certain number of Scholarships ranging from Rs. 10 to 25 is awarded to deserving students.

4. Excepting a small number, all the students, at present numbering 198, are provided with education, board and lodging,

&c., free of any charges, at the Institution. Besides these there are 34 paying Boarders who are charged a fee of Rs. 20 per month for tuition and lodging.

5. Students of the Institution who have completed the 15th year of their age are admitted into the Technical Departments of the Institution. By that time they complete the education given in the Middle School and some of them even that given in the High School Department of the Institution.

6. The capital cost of the whole Institution has amounted to several lakhs and the maintenance charges come to about Rs. 50,000 a year. The sum, however, that could be apportioned to the technical branch, as maintenance expenses, would come to about Rs. 5,000 per year.

7. The sources of income are the original endowments and subsequent donations.

8. The strength of the classes is as follows:—Carpentry and Coopering, 16 students; Printing and Book-binding, 7; Tailoring and Cutting, 6. Besides, selected students are sent to the Victoria Jubilee Technical Institute and the J. J. School of Art to learn some of the arts taught there.

9. The school has till now turned out 47 Carpenters and Coopers, 42 Printers, Compositors, Book-binders, Rulers, Litho Copy-writers, &c., 11 Cane weavers and Cane Furniture makers, 5 Boot and Shoe-makers, 9 Tailors and Cutters, 15 Fitters, 1 Gardener, 1 Watch and Clock répairer, and 1 Motor Car Driver. The industries except those mentioned in para. 2 are discontinued. Those who pass out of the Institution, and especially those who have taken up carpentry, are employed at the Government Dock Yard, Railway, and other Workshops for high class furniture in the city. A few have started shops on their own account in Bombay and elsewhere. They are spread all over the Presidency, some having even gone to distant parts of the country. A large number of these students earn from Rs. 20 to 50, and even more, per month.

10. The Parsees take a keen interest in the welfare of the Orphan lads of their Community and prefer to engage in their service, lads trained at the Institution. In fact, the demand for Orphanage boys from Bombay and up-country Parsees is so great that we find it difficult to meet it.

11. Mr. S. H. Gotlaseth is the Manual Training Master. There are, besides, teachers in Carpentry, Tailoring and Printing.

THE VICTORIA JUBILEE TECHNICAL INSTITUTE, SUKKUR (SIND).

(From the Annual Reports and the body of Rules.)

The Sukkur Victoria Jubilee Technical Institute, was founded in commemoration of the Jubilee of the late Queen-Empress. Its object is to promote technical education in the town of Sukkur and surrounding districts of Sind. It is under the control of a Board composed partly of official and partly of non-official members appointed in accordance with rules framed for the purpose.

Courses.—The School consists of two branches, the *School Branch* and the *Workshop Branch*. In the former are taught Practical Geometry, Free-hand and Colour Drawing (as required by the First Grade Art Examination), Mechanical Drawing, Standards II to V in Vernacular (the Standards being modified by the omission of History, Geography and Poetry), and Elementary Mensuration (being taught in the Fifth Standard). Any person desirous of attending the Drawing Class only may be admitted, if convenient, on payment of Rs. 5 as a deposit to ensure his passing the First Grade Art Examination from this school. Such deposit will be returned to him on his passing the examination as a student of the Victoria Jubilee Technical Institute in one year.

In the Workshop Branch instruction is given in (1) Carpentry—Cabinet-making, Wood-carving, Inlaying, French polishing, Wood-turning on country and English lathes; (2) Blacksmithing—Fitting, Brass Casting, and the use of the lathe, punching and shearing and drilling machines and circular saw:

and (3) Weaving on improved looms. The Workshop course in the case of the first two is divided into three terms.* Pupils admitted between the ages of 10 and 12 shall go through this course in five years, completing their first term in two years, second term in two years and the third term in one year; those admitted between the ages of 12 and 14, in four years, completing the first term in two years and the second and the third term in one year each; and those admitted above the age of 14, in three years, completing each term in one year. A student who completes his course and satisfies the examiners at his final examination and whose good conduct is certified shall be awarded a proficiency certificate over the signatures of the Educational Inspector in Sind, the Chief Examiner appointed for the occasion, and the Collector and President, Victoria Jubilee Technical School Board, Sukkur.

The course for the Weaving Class will extend to two years in the case of students admitted at the age of 14, and to three years in the case of students between 10 and 14 years.

Fees and Scholarships, etc.—No fees are, as a general rule, levied from the students attending the school and the workshop.

In accordance with the rules laid down by the Board† three scholarships of Rs. 5 each per month are awarded to First Term students, three of Rs. 6 each to Second Term students, and three of Rs. 7 each to Third Term students. Two pupil teacherships of the value of Rs. 10 per month and tenable for one year are awarded to selected students of the Institute who have passed their course successfully and obtained the Final Certificate.

Prizes to the extent of Rs. 75 may be awarded to the students annually, allotted among the different classes of the students.

Finances of the Institute.—The income of the Institute is derived chiefly from the following sources:—Interest on the Endowment Fund of Rs. 38,500; Government grant of one-half of the salaries of the staff amounting to about Rs. 1,780 per

* For details see rules of the Institute p.p. 22-27.

† *Vide* Rules of the Institute, p. p. 18-21.

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Courses.—The School consists of two branches, the *School Branch* and the *Workshop Branch*. In the former are taught Practical Geometry, Free-hand and Colour Drawing (as required by the First Grade Art Examination), Mechanical Drawing, Standards II to V in Vernacular (the Standards being modified by the omission of History, Geography and Poetry), and Elementary Mensuration (being taught in the Fifth Standard). Any person desirous of attending the Drawing Class only may be admitted, if convenient, on payment of Rs. 5 as a deposit to ensure his passing the First Grade Art Examination from this school. Such deposit will be returned to him on his passing the examination as a student of the Victoria Jubilee Technical Institute in one year.

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and (3) Weaving on improved looms. The Workshop course in the case of the first two is divided into three terms.* Pupils admitted between the ages of 10 and 12 shall go through this course in five years, completing their first term in two years, second term in two years and the third term in one year; those admitted between the ages of 12 and 14, in four years, completing the first term in two years and the second and the third term in one year each; and those admitted above the age of 14, in three years, completing each term in one year. A student who completes his course and satisfies the examiners at his final examination and whose good conduct is certified shall be awarded a proficiency certificate over the signatures of the Educational Inspector in Sind, the Chief Examiner appointed for the occasion, and the Collector and President, Victoria Jubilee Technical School Board, Sukkur.

The course for the Weaving Class will extend to two years in the case of students admitted at the age of 14, and to three years in the case of students between 10 and 14 years.

Fees and Scholarships, etc.—No fees are, as a general rule, levied from the students attending the school and the workshop.

In accordance with the rules laid down by the Board† three scholarships of Rs. 5 each per month are awarded to First Term students, three of Rs. 6 each to Second Term students, and three of Rs. 7 each to Third Term students. Two pupil teacherships of the value of Rs. 10 per month and tenable for one year are awarded to selected students of the Institute who have passed their course successfully and obtained the Final Certificate.

Prizes to the extent of Rs. 75 may be awarded to the students annually, allotted among the different classes of the students.

Finances of the Institute.—The income of the Institute is derived chiefly from the following sources:—Interest on the Endowment Fund of Rs. 38,500; Government grant of one-half of the salaries of the staff amounting to about Rs. 1,780 per

*For details see rules of the Institute p p. 22-27.

† *Ibid* Rules of the Institute, p. p. 18-21.

annum; an annual contribution of Rs. 2,500 from the Shikarpur District Local Board. The expenditure is less than the income and the finances are in a satisfactory condition.

Numbers on the Rolls.—The numbers on the rolls have varied between 67 and 39. There has been some fall in this on account of successive epidemics of plague. Most of the students are in the Carpentry branch. Many of the students who passed out of the Institute have obtained suitable employments.

Staff.—Mr. V. H. Malani, L. M. E., is the permanent and Mr. Goverdhan Das L. Gurnani the acting Superintendent and Head Master of the Institute.

THE I. P. MISSION INDUSTRIAL SCHOOL, BORSAD. (BOMBAY PRESIDENCY).

In this school Carpentry, Weaving (with yarn dyeing), Tailoring, Smithing, Farming, and Home Industries (Crochet, Lace, Embroidery, and Buttons) are taught. Altogether about 70 boys work in the various departments and of these only 3 or 4 are wage-earners. Over 65 are learners and most of them attend the Mission's English School or Vernacular School for a part of the day. The expenses are met from the Mission funds, over and above the amount received for goods sold. All kinds of articles usually made by carpenters, cloth, caps, coats, etc., are made in the school.

'The lace industry,' writes the manager, Mr. Robert Henderson, 'has become a fairly important one here in recent years. Orders are now received for lace, crochet, embroidery, etc., done by women here in their own homes not only from a great many parts but from Europe and Australia.'

BYRAMJEE JEEJEEBHOY BOMBAY COLLEGE OF COMMERCE.

(Note by the Principal Mr. K. Subramani Aiyar.)

Introductory.—In 1890, the late Hon. Mr. Byramjee Jeejeebhoy, C. S. I., finding that the educational institutions then existing for the benefit of the poor of his community, were not able to cope with the numbers that sought admission into their

portals, resolved to establish another charitable school for them, and vested 4 per cent. Government paper of the value of about $3\frac{1}{2}$ lakhs of Rupees in Trustees. Mr. Rustomjee Byramjee Jeejeebhoy has from time to time contributed to the Funds of the Institution from his own pocket and from his Family Trust to the extent of a lakh and a half. A new building costing about $3\frac{1}{2}$ lakhs was erected, the Government making a Building Grant of nearly a lakh of rupees. It has three floors with spacious class-rooms, and a small top-floor for the Library and Museum. On the second floor there is a spacious hall suitable for examinations, lectures, and school exhibitions. The Institution now receives an annual grant from Government of about Rs. 3,200.

The Primary and Middle School Departments were started in September 1891, to which High School Classes were added in 1895. The Trustees were from the beginning resolved on giving their school a commercial bent. They desired, however, to proceed tentatively, and only a few commercial subjects were at first introduced into the school, with the concurrence of the Educational Department. Early in 1900, the Trustees resolved to develop the Institution into a Commercial High School and College and appointed Mr. K. S. Aiyar, B. A., L. T., J. P., F. S. A. A., an expert in Commercial Education, as Principal in 1900, a Commercial College Department was added, and the High School was developed into a Commercial High School.

Management.—The Board of Trustees consists of Mr. Rustomjee Byramjee Jeejeebhoy, J. P., Chairman, Mr. P. N. Wadia, J. P., Managing Trustee, Mr. M. N. Wadia, J. P., Khan Bahadur M. C. Murzban, J. P. C., I. E., Sir Jamsetjee Jeejeebhoy, Bart., J. P., and Mr. Byramjee. R. B. Jeejeebhoy.

Library and Apparatus.—The Library contains about 2,000 volumes, the books on commercial subjects forming a special feature. Some leading magazines on Education, Accountancy, Banking, Insurance, and Commerce are also subscribed for. The College is well provided with Industrial and Commercial Maps, and the best available apparatus for the intelligent teach-

ing of Physical and Commercial Geography. The commercial section of this library contains the best collection of books on commerce that has as yet been formed in India.

Departments.—The Institution is divided into four departments, *viz.*, 1. the Primary School, 2. the Middle School, 3. the Commercial High School, 4. the Commercial College. Freehand drawing is a compulsory subject in the middle and high school departments and the higher classes of the Primary Departments.

The Commercial High School prepares students for the School Final Examination, conducted by the Bombay Government. Students of the High School Classes are taught 1. English, 2. Gujarati, 3. Arithmetic, 4. Indian History, 5. the Physical, Political, Commercial Geography of the world in general and of the British Empire in particular, 6. (*a*), either shorthand and typewriting or (*b*) elementary book-keeping, Commercial Arithmetic, and commercial correspondence.

Day Commercial College.—The College Department is open primarily to such as have passed the School Final or the Matriculation Examination. The College Department is intended for the benefit of the graduates and undergraduates that can give their undivided attention to the scientific study of Commerce and provides an organised course of studies in the essentials of Higher Commercial Education, *viz.*, English, Commercial Mathematics, Accountancy and Auditing, Shipping and Insurance, Commercial Law, Banking and Currency, Commercial Geography, Shorthand and Typewriting. Students are sent up for the Senior Examinations of the London Chamber of Commerce, held in Bombay, in May every year, under the auspices of the Government of Bombay, in 1. Book-keeping, and Accountancy, 2. Business Machinery and Methods, 3. Commercial and Industrial Law, 4. Banking and Currency, 5. Commercial Geography and Commercial History, and the Junior Examinations in 1. Shorthand, 2. Typewriting. The course is for a year and a half from January every year to the month of May in the subsequent year.

Subjects taught in the College.—These are:—

1. **English** with special reference to the drafting of letters, circulars, and prospectuses and to *Precis-writing*.
2. **Commercial Arithmetic.** Different methods of calculating interest on Accounts current with interest products ; averaging and balancing accounts, equation of payments, Direct and Indirect Exchange, Stock Exchange Calculations.
3. **Accountancy.** The accounts of import and export merchants; recording transactions in subsidiary books, posting and closing the Ledger, and the preparation of Trading and Revenue Accounts and Balance Sheets. The peculiarities of the books of account kept by Joint Stock Companies, Manufacturers, Bankers, Insurance Companies, Railway, Tramway, and Gas Companies, Stock Jobbers, Executors, Trustees, &c.
4. **Machinery of Business.** The law and practice relating to Cheques, Bills of Exchange, and Promissory Notes ; Direct Exchanges ; Indirect Exchanges; the best methods of making remittances &c. Charterparties and Bills of Lading ; Customs Regulations and Ware-housing ; Jettison and General Average; Marine Insurance ; Total Loss and Particular Average ; Salvage Loss ; Preparation of Average Statements, The Stock Exchange.—Brokers and Jobbers ; Bull and Bear Operations ; Cantango and Backwardation ; Theory of Options, Coupons, Dividends ; The Public Funds.
5. **Commercial and Industrial Law.** The nature of mercantile contracts, the law relating to sales, partnership, agency, joint-stock companies, bankruptcy, arbitration, negotiable instruments, shipping and insurance, &c.
6. **Banking and Currency.** The scope and utility of Banking and Banking Institutions ; the formation and administration of Joint Stock and Private Banks; Banks of deposit, circulation, and discount, and Cash-credit Banks; the law of Banker and Customer ; the laws and usages relating to Negotiable Instruments and Documentary Bills ; Joint accounts, Trust accounts and Executorship accounts ; Currency and Coinage ; the Money-market ; the Foreign Exchanges ; the Clearing House ; the Gold Discoveries and their effects ; the Modern Monetary question ; the Double Standard.
7. **Commercial Geography.**—The natural resources of different countries, the conditions of soil and climate, favouring the production of particular commodities, the seasons of production, the markets for commodities, the means of transport to such markets ; the principal products of the vegetable, animal, and mineral kingdoms that enter into the commerce of the world, the sources of supply of such products, the processes by which the raw materials of commerce are rendered fit for the market, the facilities possessed by a country for increasing the production of particular raw materials, the manufactures in which they are largely utilized, and the places in which they are bought, sold, or largely consumed.

8. **Commercial History.** The History of the growth and vicissitudes of commerce in the principal countries of the world; an examination of the economic and other grounds for the steady growth of commerce in one country, the recent rapid growth of commerce in some countries, and the decline of commercial prosperity in the case of other countries; Ancient, Mediaeval, and Modern Commerce,

9. **Political Economy.**

10. **Pitman's system of Shorthand.**

Commercial Examinations.—During the seven years, April 1900 to April 1907, six batches of students have been trained in this College and 89 students have passed the London Chamber of Commerce Examinations out of 111 students sent up. These 89 passed students of this College have secured 201 certificates of the London Chamber of Commerce in 1. Book-keeping and Accountancy, 2. Methods and Machinery of Business, 3. Commercial and Industrial Law, 4. Banking and Currency, 5. Political Economy, 6. Commercial History and Geography, 7. Shorthand,*8, Typewriting. Of these 201 certificates, 30 are Senior Distinction Certificates, and 4 are Teacher's Diplomas with Distinction.

It was in 1900 that the London Chamber of Commerce Examinations began to be held under Government Supervision and in that year 29 Bombay candidates passed in Senior Book-keeping and Accountancy. It was in 1901 that Bombay candidates appeared for the first time in Methods and Machinery of Business; and out of 32 candidates that passed in this subject in 1901, 20 were from this College, 6 from Aiyar's School of Commerce, 4 from the Accountancy Institution, 1 from the Commercial Training Institution, and 1 was a private candidate. We notice from the Pass Lists from the Government Gazette that the first passes in Commercial Law, Banking, and Commercial Geography in Bombay were in 1902 and that all the passed candidates of that year in these three subjects were from this College. Similarly in Political Economy, the first passes in Bombay were in 1903, and all the passed candidates of that year in this subject were from this College. At the

first Teachers' Diploma Examination held by the London Chamber of Commerce in 1905, we find that only 1 Bombay candidate passed who was a student of this College. We also find that only four *Teachers' Diplomas* with *distinction* have till now been secured by Bombay candidates and all these four are from this College.

Fifteen Teachers' Diplomas have up to date been secured by Bombay candidates; of these, we find 6 have been secured by students of this College, 1 by an old student of this College, 2 by a teacher of this College, 2 by present and past students of Aiyar's School of Commerce, 3 by students of Davar's College, and 1 by a student of the Accountancy Institution.

History of passed students.—Out of 89 students that have passed in Commerce from this College:—8 are traders, brokers, and salesmen making from Rs. 100 to Rs. 200 a month; 5 are teachers, one of them being Headmaster of the Government, Clerical and Commercial School at Amritsar in the Punjab on Rs. 150; 42 are Clerks in Firms drawing Rs. 30 and more per month; 29 are Mercantile Clerks drawing Rs. 50 to Rs. 100 per month; 3 are Mercantile Assistants on Rs. 125 to Rs. 175 with free Board and Lodging in Hongkong and Shanghai. It is worthy of note that College students generally secure appointments soon after their examinations are over, and even before the examination results are announced. They generally start on Rs. 30 to Rs. 35 a month, though a few have been able to secure initial salaries of Rs. 40 or even Rs. 50 a month. Their subsequent promotions have, however, been more rapid than they would have been if they had received no training in this Commercial College. There are several cases in which students have left before completing the course, in consequence of their securing lucrative appointments.

Staff.—The Principal has been Mr. K. Subramani Aiyar, F. S. A. A., J. P., etc. He is assisted by a staff of four graduates, five under graduates, four vernacular teachers, and special teachers for Drawing, Shorthand and Typewriting.

DAVAR'S COLLEGE OF COMMERCE, BOMBAY.

(*From the Prospectus of the College.*)

This institution was started by Professor S. R. Davar, who is highly qualified in Commercial Subjects. The subjects taught in the College are Higher Accountancy and Book-keeping; Commercial Correspondence; Commercial Law; Methods and Machinery of Business; Banking and Currency; Commercial Geography and Commercial History; Elements of Political Economy; Commercial Arithmetic; Company and Law Company Work. Besides the above subjects Professor Davar undertakes to teach others required for the Government P. W. D. Accountants' Examinations, and the various examinations of the Institute and the Society of Accountants, London, etc. Thorough instruction is given in Shorthand and Typewriting as well. There is a valuable Reference Library in the College.

The '*Bureau System*' of imparting Commercial Education is adopted in Professor Davar's College. Under this scheme the College is divided into separate departments for instructions in Theory and Practice. In the School and College Department an efficient education in the Theory and Practice of Commerce is imparted by means of class lectures and text-books, whereas the Commercial Bureau worked in connection with the College on fixed days afford students opportunities to put into practice that which is grasped out of text-books and lectures. Actual printed forms of Documents and Commercial Instruments are used in the working of the Commercial Bureau, the Books of Accounts, Letter Files, Press Copy Books, Letter Registers and Letter Indexes, Business Diaries, Card Index, and various subsidiary books. Great care is taken to create the impression on the students of being in actual business, and strict business regularity is observed in dealing with the various mock transactions that are specially framed by the teachers out of practical business transactions. Mock Stock Exchange Meetings and Meetings of Shareholders, Directors, Creditors, etc., are held and worked on constitutional lines, with the close details of which the students are brought in touch in their daily lectures and text-books study.

The *Correspondence System* of teaching is also in force. It is devised to suit the varied requirements of students all over India, who may not be able or inclined to study in the College at Bombay.

Employment Department.—A list of past students is kept at the institution and will also be registered at the Bombay Chamber of Commerce. Arrangements for constant advertisements in this direction are made. The College authorities receive regular enquiries from mercantile and other firms for trained Accountants and Business Clerks. Many of the men who passed out of this College hold excellent positions both in India and Europe.

Davar's 'London Scheme.'—Under this scheme a batch of specially trained students is taken to England to complete in the Higher Commercial, Secretarial and Accountancy Examinations, held exclusively in England besides those held simultaneously in England and India. The fees for this scheme have to be specially paid. Under this scheme students are trained for all or any of the following examinations, provided they fulfil the educational and other requirements of the various Boards: the Chartered Institute of Secretaries (London) Intermediate or Final; the Institute of Actuaries (London), Parts I, II, III and IV; the Institute of Chartered Accountants (London), Intermediate or final; the Society of Accountants and Auditors (London), Intermediate or Final; the Society of Arts (London), all Advanced Commercial Subjects; the Lancashire and Cheshire Union of Institutes, all Advanced Commercial Subjects; also other Commercial or Professional Examinations held exclusively in England. Up-country students are coached through the Correspondence System of the College, and may go to Bombay only a few days before the date of sailing for England.

Prizes open to the students of the College.—There are three medals—one gold, one silver and one bronze—and some valuable books, given away as prizes by the Principal to students who pass creditably.

AIYAR'S SCHOOL OF COMMERCE, BOMBAY.

This Institution was opened on 1st June 1900, by Mr. K. Subramani Aiyar, B. A., L. T., F. S. A. A., J. P., Fellow of the University of Bombay, an Incorporated Accountant of London, and lately Principal of the Byramjee Jeejeebhoy College of Commerce. The School is under Government Inspection.

Admission.—As the Byramjee Jeejeebhoy College of Commerce makes ample provision for the Commercial Education of Parsees, Aiyar's School of Commerce is confined to Non Parsees. Graduates, Under-graduates, and such as have been students of the matriculation class are eligible for admission. *Admission in December and January.*

Course.—The course begins in January every year and extends over a year and a half till the month of May in the succeeding year, in the case of the Accountancy, Shorthand, and Business courses.

Examinations.—Students are prepared for the Commercial Examinations of the National Union of Teachers, London, for the Junior and Senior Examinations of the London Chamber of Commerce held, under Government supervision, in the Elphinstone High School, Bombay, and for the examinations of the Institute of Bankers, London. These examinations are held in Bombay in April and May.

Accountancy Course.—Students in the Accountancy Section attend an hour a day for a year and a half, pay a tuition fee of Rs. 150 for the course, and are prepared for the London Chamber of Commerce Senior Examinations in 1.—Book-keeping and Accountancy, and 2.—Machinery of Business and for the Advanced Examination in Book-keeping of the National Union of Teachers, London.

Shorthand Course.—Pitman's Shorthand is taught in this school by a Professional Shorthand Reporter, a Fellow of the Incorporated Phonographic Society of London, holding a Teacher's Diploma. Students are prepared for the London Chamber

of Commerce, Junior Examination in Shorthand held in May and for the N. U. T. Examinations in Shorthand held in April. Fees Rupees 60 for the Shorthand course. Rs. 150 for the Accountancy course. Rs. 200 for the Accountancy course, and the shorthand course, if taken up together.

Business Course.—Students in the Business Section of this school pay a fee of Rs. 500 for the course and are prepared for the London Chamber of Commerce Senior Examinations in 1.—Book-keeping and Accountancy, 2.—Methods and Machinery of Business 3.—Commercial and Industrial Law, 4.—Banking and Currency and 5.—Shorthand, and the N. U. T. Examinations in (1) Commercial Arithmetic, (2) Commercial Correspondence, (3) Theory and Practice of Commerce, (4) Shorthand and (5) Typewriting. Students of this section are prepared for all these examinations in a year and a half. Such as are not able to pass in all the subjects on the first occasion will be prepared for the next subsequent examination in the subjects in which they have not passed. The fees paid by students of the Business Section include the supply of the necessary text books free of charge and Entry Fees for the Commercial Examinations for which students of this Section are prepared.

Institute of Bankers' Section.—Special classes are held to prepare Bank clerks for the Preliminary and Final Examinations of the Institute of Bankers, London, on passing which they will be elected Associates of the Institute of Bankers, London. The course is for 2 years from June, or for 2½ years from January. Fees for this course—Rs. 500 inclusive of the cost of text books and examination fees. Subjects as laid down by the Institute of Bankers.

Incorporated Accountants' Section.—Special classes are held to prepare candidates for the Incorporated and Chartered Accountants' examinations. Such as are desirous of becoming Incorporated or Chartered Accountants are advised to consult Mr. K. S. Aiyar who will be prepared to help them in achieving their object.

London Course.—Students joining any of these sections will, under special arrangements, be taken to England in charge of a Qualified Assistant for passing commercial examinations not held in India.

Practical Training in accountancy and audit work is imparted to advanced students of this school, especially to those in the Business, Incorporated Accountants and London sections.

Appointments Secured.—Young men trained in this school have, all of them, easily secured lucrative situations as book-keepers, accountants, shorthand writers, bank and insurance clerks, or as partners of Firms. A History of passed students is maintained in this school which enables the Principal to recommend qualified young men for mercantile appointments, in response to enquiries from Heads of Firms. A Register of passed candidates is maintained at the office of the Bombay Chamber of Commerce to enable merchants to select suitable men for appointments in their offices.

History of Past Students.—87 young men, including 8 graduates have been trained in this Night School during the past six years. Four of those have become working partners in their Family Firms, three have been taken as working partners in newly started Factories, two others have jointly started a grocer's business and two others have become traders. Thus 12 past students are now doing business as merchants and traders. One student first became Senior Assistant in an Indian Firm in Japan on Rs. 125 a month and then started a Business of his own with Japan. Two are Lecturers in Commerce in the Government Colleges at Calcutta and Lahore on Rs. 125 and 150 a month, 18 are employed in Government and Quasi-government offices on salaries ranging from Rs. 30 to Rs. 100 a month. All the rest are employed in Banks and mercantile firms on salaries ranging from Rs. 30 to Rs. 125 a month, as book-keepers, correspondence-clerks, shorthand writers and salesmen.

THE MUNICIPAL COMMERCIAL SCHOOL, SHOLAPUR.

(From a Note by the Head Master.)

The Municipal Commercial School, Sholapur, was started in August, 1899, by the Local Municipal Council for imparting systematic commercial training and equipping young men for a commercial career. The cost of the up-keep of the school is Rs. 1,700 a year. Of this sum Rs. 300 is derived from fees, Rs. 600 is contributed by Government, and the Municipal Council finds the balance. The scale of fees is very low being from four annas to one rupee. Free studentships up to 30 per cent. are allowed, and some scholarships are also awarded. The boys who seek admission to the school must have passed the fourth standard Departmental Examination. There are at present 83 students on the rolls. The approximate number who annually pass out of the school is 75 per cent. of the total. Some of these are usefully employed as shopkeepers, etc., as the result of the training they have received in the institution. The subjects taught are English, Arithmetic (commercial and ordinary), Book-keeping (in Marathi), Commercial Correspondence, Commercial, Physical and Political Geography, and Drawing.

The Head Master is Mr. Trimbak Bhaskar Khare, and he has four assistants.

THE COMMERCIAL CLASS, SURAT.

In November, 1906, a commercial class was started in connection with the Sir J. J. English School, Surat, which is a charity institution. Till that date, the school was teaching up to Anglo-Vernacular Standard V only, after which some of the pupils joined the Sixth Standard of other schools, and a majority left off studies. Of those that joined other schools a very poor percentage only could pass the Matriculation Examination, and a much poorer percentage indeed ever received college education. The result was that in these hard days of keen competition, the one great object of the charity school—*i.e.*, to enable

the sons of poor Parsees to earn their bread—was frustrated. The starting of the Commercial Class is therefore quite opportune.

The course of studies is as follows:—The First Year's Course (after the completion of the fifth standard): English, Commercial Correspondence, Commercial History, Commercial Geography, Commercial Arithmetic, Native Accounts, Mental Arithmetic, Book-keeping, Drawing and Shorthand. The Second Year's Course: English, Translation, Precise-writing, Commercial Correspondence, Commercial History, Commercial Geography, Commercial Arithmetic, Mental Arithmetic, Book-keeping, Brokerage, Drawing and Shorthand. The Third Year's Course: English, Commercial Correspondence, Type-writing, Commercial Arithmetic, Mental Arithmetic, Book-keeping, Drawing and Shorthand.

Weekly, Terminal and Annual Examinations are held.

No boy is admitted in the classes before he has completed at least Standard V of an Anglo-Vernacular School. At present there are three boys in the Senior and seven in the Junior Class.

Boys whose fathers have a monthly income of Rs. 40, or more, have to pay a fee of Rs. 2 per mensem.

Two scholarships of Rs. 2 each are reserved for each class.

No boarding house is attached to the school.

No initial expenditure was incurred in starting the classes. The annual expenditure is about Rs. 2,000. The school is maintained from the funds of the Parsee Panchayet.

No pupil has passed out of the school as yet.

The staff consists of four men, two of whom are Graduates who teach English, and one a certified commercial hand who teaches all the other subjects except "Deshi Námáh" which is taught by a "Mhetáji."

The School Committee are thinking of making some changes in the curriculum next year, with a view to increase its utility.

THE VETERINARY COLLEGE, BOMBAY.

(From the Quinquennial Report on Education in the Bombay

Presidency for 1902-3 to 1906-7, &c.)

There is only one independent veterinary school—the Veterinary College—in Bombay. It is under the joint control of the Director of Public Instruction and the Director of Agriculture. A professorship of Bovine Pathology has been created, a new school building and quarters for students have been erected, and it is proposed to provide quarters for some Professors. Some good Bacteriological and Microscopical work has been done. Outside their proper College work the staff render considerable service to the public in the matter of the care of animals and the prevention of disease. Examiners report that the teaching in the College has improved. Quite half of the pupils come from Native States in or beyond the Presidency. Those who pass out obtain employment as Veterinary Inspectors, or Heads of Veterinary Dispensaries under Local Boards, or as Supervisors of Slaughter-houses under Municipalities. Others go abroad. Others are absorbed in the Civil Veterinary Department. Others are trained as Sanitary Surveyors.

The entrance qualification of candidates is the Matriculation or school final, or sixth English Standard, and a special entrance examination. The length of the course is three years. The language of instruction is English. There is one examination at the end of each year, held by a Board of Examiners appointed by the Government. A diploma as graduate of the College is given after passing the final examination, and a special certificate of proficiency to students who attend supplementary courses and pass examinations in them.

The subjects taught include Anatomy, Elementary Physiology, Elementary Chemistry, Elementary Botany, Theoretical principles of horse-shoeing, etc.

**TECHNICAL AND INDUSTRIAL SCHOOLS
IN THE BOMBAY PRESIDENCY.***

*(From the Quinquennial report on Education in Bombay for
1902-3-1903-7.)*

The Central Division.—The principal industries taught in this division are Carpentry, Smithing, Enamelling, Embroidery, Weaving, Rug making, Laundry work, and Lace-making. There were at the end of the year 1906-7, twenty-two schools for teaching these various industries against sixteen in 1907-8. Of these 22 schools, 10 are independent and 12 are attached to other schools: 2 are Government schools, 2 are Municipal, 13 are aided, 4 are unaided, and 1 is a Local Board institution. The Municipal Industrial School at Dhulia was transferred to the Local Board during the quinquennium. The following 7 new Schools were added:—(1) The American Mission Girls' Sewing Class, Bombay, (2) the American Mission Laundry Class, Bombay, (3) the Weaving Class attached to the Sir D. M. Petit Industrial School at Nagar, (4) the American Mission Lace School at Nagar, (5) St. Monica's S. P. G. Mission Lace School at Nagar, (6) the American Mission Lace School at Wadala, (7) the American Mission Manual Training Class at Nagar. The Free Church Mission Industrial School at Poona was closed. The total number of pupils in these schools was 2,096 against 1,592 in 1901-2. The art of Lace making has for the first time been taken up in this division. Another interesting departure is the foundation of the Laundry Class at Bombay.

The Southern Division.—In the Southern Division, the only important school is the school of Industry at Ratnagiri. The subjects taught there are Marathi up to Standard V, Drawing, Carpentry, Wood turning, and Inlaying. A short time ago a class for weaving was started. A large workshop for making inlaid furniture is attached to this school. The Basal Mission have introduced handlooms into Southern Canara, and make good fine cloth, which they sell at a profit. The Collector of

* Not separately treated.

Canara, who has complained of the want of technical schools in his district and who desires improvements on old methods of work and a greater variety of occupations, has induced the District Local Board to devote Rs. 1,600 to the opening of Carpentry, Smithy, and Weaving Classes.

The Northern Division.—In the Northern Division there are six Industrial Schools, with 478 students on their rolls: 1 is a Municipal School, 4 are aided, and 1 is a Native State School. The first five receive a Government grant. The most important of these is the Parekh Technical Institute, Surat. Next in importance is the Industrial School of the American Mission at Nadiad. The students are exclusively members of the Mission Orphanage and are mostly famine children. By caste most of them are Kolis or members of other backward communities. The teachers are highly qualified, and they devote themselves specially to the Training of Fitters and Mechanics for whom there is a large demand in the Railway Workshops and Mills at Ahmedabad. Special attention is paid both at Surat and Nadiad to drawing, which is considered to form an excellent foundation for technical education. Three humbler institutions are the Mission Industrial School at Bulsar, the Mahajan Home for destitute children at Surat, and the Indian Presbyterian Mission School at Borsad. The Ranchodhlal Chhotalal Textile Institute will soon be started at Ahmedabad.

* * *

Dr. Thomson's Remarks.—Dr. Thomson, Inspector of Technical Schools, in the Bombay Presidency, says of them generally that 'the pupils must have passed the Second Vernacular Standard before joining; the course extends over three or four years; the pupils receive instruction in the three R's up to the fifth Vernacular Standard during half the day and spend the remaining time in the Drawing Class, in the Manual Training Class in wood, and in the Workshop, Drawing and Manual Training in wood are compulsory for nearly all the pupils.

Manual Training—Manual Training in wood has now been introduced into about half a dozen High Schools and into the

Training Colleges at Dharwar and Hyderabad. Sometimes a carpenter's shop is attached to the schools, sometimes the pupils attend special classes in the Local Technical School. Many of the pupils take much interest in the work and prepare themselves for examination for the Manual Training Certificate and for the optional subject 'Manual Training' at the School Final Examination.

Drawing Classes.—In the year 1903-04, the rules for the examination in Drawing were altered, the chief features of the new scheme being the introduction of colour and of the principles of design and of geometry in connection with design. The subject has, in consequence, become immensely popular and in the Central Division alone the number of pupils has more than doubled. It was 3,480 five years ago: it is now 7,830. There are three grades. The examinations in the first and second which are in elementary drawing, are held at appointed centres: and special examinations in the third grade and for the Drawing Teacher's Certificate are held in the School of Art for those who are not members of the School. Memory drawing and design would appear to be the subjects in which pupils do best. It is said that in design they show extraordinary ingenuity.

Commercial Education.—Mr. K. S. Aiyar has night classes in Bombay.* There is a small Mercantile School in Ahmedabad, and two small Commercial Schools have been started in Sind; Commerce is also recognised as an optional subject in the School Final Examination.

SCIENCE IN THE BOMBAY UNIVERSITY.

(*From the Calendar for 1907-08 and Lieut.-Col., K. R. Kirtikar's article in the Modern Review for March 1907.*)

There is no separate faculty of Science. Among the Boards of Studies are one for Physics and Chemistry and one for Biology (including Botany, Physiology and Zoology) and Physical Geography and Geology.

* *Vide page 84 supra.*

Candidates for the Matriculation examination will be examined in Elementary Science-Chemistry and Astronomy (one paper). There will be one paper in Physics in the Intermediate Examination. Candidates for the degree of B. A., may take up Chemistry and Physics or Natural Science (Botany and Zoology) as an optional subject. Candidates for the B. Sc. degree will be examined in Chemistry, Physics and General Biology in the Intermediate examination, and in Experimental Physics, Chemistry, Botany, Zoology, Animal Physiology, and Physical Geography and Geology in the Degree Examination. They have to undergo a practical test in all the subjects. Among the branches of the M. A. degree examination are Experimental Physics, Chemistry and Natural Science (Zoology, Botany, Physical Geography and Geology or Animal Physiology).

The Manakji Simji Gold Medal, to be awarded annually for the best essay by a graduate in Arts, Science, Medicine, Law, or Civil Engineering, was thrice awarded for essays on scientific subjects. The Homeji Cursetji Dady Prize was once awarded for an essay on a scientific subject. The Chancellor's Gold Medal was five times awarded to the M. A. candidate who passed in first class with the highest number of marks in a Natural Science subject. Between 1876 and 1904 the Dossabhoy Hormusji Cama Prize was awarded nine times for the best essay on a medical subject. The Sir D. M. Petit Science Scholarship was instituted in 1902, to be awarded annually to the candidate passing the Intermediate Science examination for the Degree of B. Sc. in the first class with the highest number of marks. Between 1902 and 1904 the Scholarship was not awarded.

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[At present proposals are under consideration for re-organising Science education in the University.]

In the Elphinstone College, Bombay, there is a Professor in Physics, and there are Lecturers in Biology and Chemistry. The Deccan College, Poona, has a Professor of Physics. Wilson College, Bombay, Professors of Chemistry and

Biology. There is also provision made for teaching Geology in this College. St. Xavier's College, Bombay, has Professors of Biology, Chemistry and Physics. Gujarat College, Ahmedabad, has a Professor of Science. Rajaram College, Kolhapore, has a Professor of Science. In the Baroda College there are Professors of Chemistry and Biology. In the Fergusson College, Poona, there are Professors of Physics and Chemistry and a Lecturer in Biology. Samaldas College, Bhavnagar, has a Lecturer in Physical Science. Dayaram Jethmal College, Sind, has lectures in Biology, Science and Engineering. Bahau-din College, Junagadh, has a Professor of Science. In the College of Science, Poona, there is a Professor of Chemistry and Geology, one of Physics and Electrical Engineering and Professors of Botany and Agriculture.

BENGAL.

THE CIVIL ENGINEERING COLLEGE, SIBPUR.
*(From the Calendar and the Annual Report of the College
 and the Quinquennial Report on Education in Bengal).*

Introductory.—The Civil Engineering College, Sibpur, which was started in 1879 and has been considerably re-organised since, is the only Engineering College of University rank in the three provinces of Bengal, Eastern Bengal and Assam and Burma, and to it students from these provinces, who wish to be trained for appointments in the Provincial Branch of the Public Works Department, are sent for education. The College is a Government institution, and is conducted with a general view to the recruitment of the several branches of the Public Works Department. It is under the general supervision of a Board of Visitors appointed by the Government. The Principal is charged with the general control of the College and Workshops, including the regulation of the course of instruction, both theoretical and practical, the supervision of the messes and other domestic arrangements, and the maintenance of discipline, and he will, from time to time, issue such rules as may be necessary to secure those objects. The Government of Bengal have decided to remove the College to Ranchi.

Subjects, Courses and Examinations.—There are in the College an Engineer Department, and an Apprentice Department, a Mining Class, a Mechanical Testing Laboratory, a Model Room, a Chemical Laboratory, a Physical Laboratory, and an Agricultural Department.

THE ENGINEER DEPARTMENT.

Rules for Admission.—For admission to the Engineer Department, a student must have passed one of the following tests:—

- (1) The B. Sc. or B. A. examination, in the B. course in Physics and Chemistry, of the Calcutta University. The candidate's age must be under 23 years.

- (2) The F. A. examination of the Calcutta or the Madras University.
- (3) The Intermediate examination of the Allahabad or the Punjab University.
- (4) The Intermediate examination for the degree of B. A. of the Bombay University.
- (5) The High School examination for Europeans and Eurasians.

The candidate's age in (2), (3), (4) and (5) must be under 21 years.

In selecting candidates who have passed the F. A. (all other things being equal), preference will be given to those who have passed in Sanitary Science in addition to the ordinary subjects of the F. A. examination.

Every candidate for admission to this Department must apply to the Principal not later than the 15th May, and the application must be accompanied by a registration fee of Re. 1.

The number to be admitted each year is limited to 40. The position in the University examination and the age of candidates will be taken into consideration when selection is made, and such selection will be made by the Principal. Before any application is accepted the candidate will be examined by the College Surgeon, and if this officer's report is unsatisfactory, the applicant will not be admitted.

Each student received into the College will be required to pay an admission fee of Rs. 10.

The Session begins on the first Monday in June.

One student annually is nominated by the Principal, from amongst the newly-admitted students, to undergo a two-years' course of training in Telegraphy at the Thomason College, Roorkee, to qualify himself to appear at the competitive examination for one or two guaranteed appointments as apprentice in the Telegraph Department on a salary of Rs. 100 per month. They are appointed as Assistant Superintendents on Rs. 225 a month, on proving their thorough fitness within three years.

Special Students.—Provision is made for the admission of special students to study at the College, who will not compete for Government posts, but wish to be prepared for the development of the industrial resources of the country. No limit of age will be placed upon such students.

Course of Instruction.—The course of instruction in the Engineer class will extend over five years, during the first four of which the instruction will be both theoretical and practical. The last year will be spent entirely in practical work.

An examination called the Intermediate Examination in Engineering will be held at the end of the second year of training. The graduate course of study is offered in three distinct branches (1) Civil Engineering, (2) Electrical and Mechanical Engineering, (3) Mining Engineering, and the Bachelor of Engineering degree is given in each of these branches. The student will thus be enabled to spend two years in the study of the higher branches of technical or professional subjects, and the public have brought within their reach high grade specialised instruction in the three branches named, which will be of real use in training experts for the development of the industries of the country.

Practical Training.—Four or more graduates or licentiates of the Calcutta University (being students of the Civil Engineering Colleges, Sibpur) will be taken in the order of merit in which they stand on the University list, and placed on practical training in the Public Works Department for one year.

Three B. E. or L. E. Students of the Civil Engineering College will be attached each year to the Sanitary Engineer for one year's practical training.

Two passed B. E. or L. E. Students annually may be sent to undergo a course of two years' practical training on a mine approved by Government. This will be considered as equivalent to the one year's practical training in the Public Works Department. Each of these years will extend over a session of nine months' service in a mine and three months' training in assaying.

While a student is under practical training he is entitled to (1) the travelling allowance admissible to Overseers of the Public Works Department, and a conveyance allowance of Rs. 30 per mensem, whenever necessary.

College Scholarships and Prizes.—One Junior Scholarship of Rs. 20 a month, one of Rs. 15 a month, and six of Rs. 10 a month, tenable for two years will be given annually to students entering the first-year Engineer Class who do not already hold University Scholarships. The Scholarships will be awarded by the Director of Public Instruction to B. Sc.'s, B. A.'s and F. A.'s in order. There will be in addition one scholarship of Rs. 20 a month and one of Rs. 10 a month for Europeans and Eurasians. Should there be no suitable candidates for these scholarships, they will be awarded to the general candidates. Two Senior Scholarships of Rs. 20 a month, one of Rs. 15, and seven of Rs. 10 a month will be competed for at the annual examination for promotion from the second to the third-year class by all candidates without regard to race or creed. Two Scholarships of Rs. 10 a month each, tenable for one year, called 'Forbes' Scholarships, will be awarded on the result of the first examination in Engineering of the Calcutta University. A Forbes' Scholar, unless he also holds a College Scholarship, will be exempted from paying the tuition fee.

A gold medal will be awarded to the student who gains the highest marks in Mathematics at the Examination for the B. E. degree. A silver medal will be awarded to that candidate at the B. E. and L. E. Examinations who, not having won the gold medal, obtains the highest number of marks.

On the result of the University Examination for degrees and licenses, two Graduate Mining Scholarships of Rs. 50 a month, tenable for two years, may be awarded, and a number of Graduate Scholarships of Rs. 50 a month, tenable for one year, varying in number according to the number of Mining Scholarships held during the year, will also be awarded, provided that the total number of Scholarships in the two classes together does not exceed ten at any one time. Rupees 30 will be paid each

month to the student, and the balance at the rate of Rs. 20 will be paid on the completion of his practical training, if he is judged to have worked satisfactorily. The Mining Scholarships will be tenable on a mine approved by Government, and will be payable monthly on a report that the holders continued to work satisfactorily under the orders of the Mine Superintendent. Three Scholarships of the value of Rs. 50 per mensem, tenable for one year, will be awarded to the passed B. E. or L. E. students who are selected to undergo a course of practical training under the Sanitary Engineer. A B. E. or L. E. student who has been through the Public Works Department practical course satisfactorily, but has failed to obtain an appointment, shall be eligible for election to a Sanitary Scholarship.

Fees.—The tuition fee for students of the Engineer Class is Rs. 10 a month for each month of the year, vacation included.

Boarding.—Except with the special sanction of the Principal, students of the Engineer Department will be required to reside on the College premises, so far as the accommodation will permit, at a rent to be fixed from time to time by the Government. The present rate is Rs. 2 a month.

Every resident European Student will join the European Mess and pay Rs. 20 a month. The grand total to a European of the cost of living at the College is Rs. 352 a year. The messing fee for an Indian Student is Rs. 7 per month, while the grand total of the cost of living at the College comes to Rs. 226 a year including fees.

Appointments.—Appointments as District Engineers, Assistant Engineers, Overseers and Sub-Overseers are open to the passed students.

The Apprentice Department.—The other chief department of the College is the Apprentice Department, to which many institutions in the two provinces of Bengal and Eastern Bengal and Assam are affiliated. These are the Bankipore and Dacca Engineering Schools for the Overseer Standard and the schools at Kurseong, Midnapore, Burdwan, Bankipore, Dacca, Rangpur, Pabna, Comilla and Barisal for the Sub-Overseer Standard.

The present course of instruction is one of general Engineering, it lasts for five years and consists of three distinct stages—the Sub-Overseer course (two years); the Overseer course (two years): these two correspond to the Lower and Upper Subordinate Classes at Madras and Roorkee; and the Foreman Mechanic course (one year), at the end of which the full College certificates are given. In the Foreman Mechanic course at Sibpur training in Electrical Engineering is offered to a few students selected on the results of the Final or Overseer Examination. A special course in mining is given at Sibpur in the Overseer standard leading to the Government of India Diploma in the principles of Mining.

It is probable that during the next cold weather the whole of the Sub-Overseer, Overseer and Foreman Mechanic courses will be remodelled and that the Overseer course will be offered in three branches (1) Civil, (2) Mechanical and Electrical, and (3) Mining; the Standard of admission to them being the passing of the Sub-Overseer Examination.

For admission to the Apprentice Department candidates must have passed the Entrance Examination and their age must not be less than 15 or more than 17. The number to be admitted each year is limited to 60. Apprentices will attend in the Class-rooms as well as the Workshops. They will all be required to reside on the College premises. Their tuition-fee is Rs. 3 a month. After the final examination 10 stipends of Rs. 10 and 10 of Rs. 6, each tenable for one year and a half will be awarded to those students who pass best in the examination, theoretical and practical. One appointment is guaranteed yearly to an apprentice of the College, the selected man being posted as Overseer in the State Railways.

The Electrical Department.—It is stated that a man who successfully takes the course in Mechanical and Electrical Engineering for the B. E. Degree of the Calcutta University will possess high qualifications in the Electrical Branch. It is added that the alterations proposed in the Apprentice Course of the College will, if sanctioned, admit of a better electrical

training being given to this class of students than has hitherto been feasible, as specialisation will be possible, in the third and fourth years.

The Mining Class.—The Mining Class was opened after the annual examination in February 1906, with thirteen students. Only five of these completed the course and have secured good posts. The course taken is a modification of the ordinary curriculum of the Apprentice Department. A student of this department who has passed the Sub-overseer examination and wishes to specialise in mining, may join the class, in which case he is put through a specialised course of two years, at the end of which an examination on the principles of mining will be held. On the results of this examination diplomas will be awarded. The special subjects of the mining course are as follows:—

First year course, (1) Geology applied to Mining, (2) Mining-Engineering, (3) Coal-Mining, (4) Metal-Mining; Second year course, (1) Descriptive Mineralogy, (2) Mining-Engineering, (3) Coal-Mining, (4) Metal-Mining. A Special College Camp of Practical Surveying and Mining to last six weeks will be arranged during the cold weather of each year. Here the students will attend a definite course of instruction, both in Mining, Surveying and practical Mining, suitably co-ordinated to their College studies and under the direct charge of the Professor of Mining. Under the rules for Mining certificates which have been published by the Government of India under section 20 of the Indian Mines Act of 1901, provision is made for the award of certificates of competency of two grades—First Class and Second Class. A candidate for a First Class certificate must be at least 23 years of age and have had five year's practical experience in a coal mine, and no one may compete for a Second Class certificate who has not had three years' practical experience and is over 21. The possession of the Sibpur Mining diploma may with the permission of the Board of Examiners exempt the holder in the case of both the First Class and the Second Class certificate from two years of the period of practical experience demanded.

Mr. Robertson, the Professor of mining, proposes to experiment with Indian coal and attempt to separate on a commercial scale the ash for the clean coal. An experimental coal-washing plant will be added later on. He also proposes to make practical boring part of the regular work of the students.

Motor Driver Mechanics Class.—A class has been opened for Training Motor Driver Mechanics. The course of instruction comprises (a) keeping a car in order and carrying out ordinary running repairs and (b) driving.

Proposed Classes in Industrial Chemistry.—A scheme for the establishment of classes for imparting instruction in Industrial Chemistry at the Sibpur College has been worked out and submitted to Government. According to the proposals classes are to be started to impart instruction in (a) Technological Chemistry and (b) Dyeing and the Chemistry of Dyeing, the full course of instruction covering three years and comprising the following branches of the subjects, each of which is to be dealt with not only in lectures but also practically in the laboratory :—I Technological Chemistry—(a) Organic Chemistry (general); (b) applied Chemistry; (c) heat engines (d) the principles of machine design, (e) the drawing of buildings and machines and (b) manual training, carpentry and fitting; II Dyeing and the chemistry of dyeing—(a) organic chemistry (general), (b) the chemistry of dye-stuffs and textile materials, (c) the study of practical processes upon an experimental scale, (d) heat engines, (e) the principles of machine design, (f) the drawings of buildings and machines, and (g) manual training, carpentry and fitting. It is proposed that admission to the class should be by nomination by a Commissioner of a division, and that the number of nominations, annually available, should be about 14. It has also been suggested that stipends to cover the cost of living at the College should be provided for all the students. These classes, if sanctioned, will be opened as a tentative measure.

The Agricultural Department.—This will be closed from the 1st November, 1908, as a Provincial Agricultural College for Bengal will be opened at Lahore near Bhagalpur.

Workshops and Laboratory.—The College possesses large Workshops electrically driven, fine Physical and Chemical Laboratories, and a fair Library. A hundred ton testing machine and two cement testers were added to the equipment of the College and proposals have been sanctioned for developing a bureau of scientific testing.

Cost.—The total expenditure on the College during 1906-7, amounted to Rs. 2,22,981. This total includes Rs. 11,252 spent on the Agricultural Class. The cost to the Provincial revenues of the whole College was Rs. 1,92,618.

Strength.—On the 31st March, 1907 there were 366 students of all classes on the rolls of the College. Of these 94 were in the Engineer Department, 233 in the Apprentice Department, 24 in the Agricultural Class and 15 in the Artisan Classes. The figures for each department show an increase during the quinquennium, except those for the Artisan Classes, in which the attendance decreased by 20.

Staff.—B. Heaton Esq., Principal; W. Tate, Esq., A. R. C. S., F. C. S., Professor of Chemistry; Dr. C. E. Cullis, P. H. D., Professor of Mathematics; W. H. Everett, Esq., B. E. (Royal), M. I. C. E., Professor of Mechanical and Electrical Engineering; T. H. Richardson Esq., B. A. I., M. I. C. E., (Ireland), Professor of Engineering; E. R. Watson, Esq.; E. H. Robertson, Esq., M. Sc., M. I. M. E., Professor of Mining Engineering; P. Bruhl, Esq., M. I. E. E., F. G. S., F. C. S., Professor of Physics; J. V. Francis, Esq., Superintendent, Apprentice Department; Babu Surendra Kumar Bose, Professor of Drawing. There are besides, a Mining Instructor, a drawing Master, three Teachers, three Foreman Instructors, and a Librarian.

THE BENGAL TECHNICAL INSTITUTE, CALCUTTA.

The Bengal Technical Institute was founded in the year 1906 by the Society for the Promotion of Technical Education in Bengal. Any person interested in technical education and paying an annual subscription of Rs. 25 may be elected a member of the Society. The Institute is located at the Upper Circular Road, Calcutta. Nearly a lakh of rupees has been contributed to the Society's funds in the shape of donations, while the yearly subscriptions amount to nearly Rs. 3,000 and

Members' fees to over Rs. 3,000. The recurrent monthly expenditure comes up to Rs. 3,000. Up to date a sum of over a lakh of rupees has been spent in the construction of workshops, fitting up of laboratories, and purchase of furniture, machinery and tools. The work of construction is still in progress.

The Institute has two departments at present, *viz.*, the Intermediate and the Secondary; the Primary Department which formed part of the original scheme having not yet been opened.

The Intermediate Department.—This department is intended for turning out skilled operatives and assistants to Foremen, Engine Drivers, Fitters (Mechanical and Electrical), and Mechanical Draftsmen. A general course of training is given to students in Drawing, Arithmetic, Algebra, Geometry, Elementary Physics, Elementary Chemistry and English. Every student will be required to elect one of the following special courses:—Mechanical Fitting, Electrical Fitting, Electroplating, Lithography, Dyeing and Bleaching, Tanning and Manufacture of Leather Goods, Soap-making, Pottery, Carpentry. Students who have read up to (a) the third class standard of a high English school, or (b) the third standard of the Bengal National Council of Education, and students approaching a standard of proficiency similar to the above and passing a test examination in English, Mathematics, and Geography, are qualified for admission to this department. The course of instruction extends to a period of three years at present. The tuition fee is Rs. 3 per month and admission fee Rs. 5. There are about 60 students on the rolls of this department.

The Secondary Department.—The object of this department is to turn out trained Foremen and Assistant Engineers who will be able to take entire charge of small factories. Candidates seeking admission into this department must have at least passed the University Matriculation examination or the Fifth Standard examination of the Bengal National Council of Education or must at least possess some equivalent qualification to be tested by a special College examination. The course of studies in the first year comprises English, Mathematics, Physics, Chemistry, Drawing, Carpentry, Fitting, and Smithery.

At the beginning of the second year a special subject has also to be selected by each student from amongst the following :— Mechanical Engineering, Electrical Engineering, Sheet-metal and Foundry work, Pottery, Tanning, Dyeing and Bleaching, Soap and Perfumery making, Chemistry, Economic Geology and Mineralogy. The courses of study in Mechanical Engineering, Electrical Engineering and Chemistry will take four years and in the remaining subjects three years. In the fourth year each student will have to devote himself entirely to the special subject chosen by him. The medium of instruction is English. The tuition fee is Rs. 4 a month and admission fee Rs. 5. The course of studies will take a period of four years. The number of students in this department is about 100. In both the departments a limited number of students is admitted.

Provision has been made for teaching the practical portion of Ceramics, Tanning and Soap-making in certain factories. There is also attached to the Institute a workshop fitted up with modern appliances, and students have got regularly to work in it with their professors. *

Staff.—Superintendent and Professor of Chemistry, Babu Prafulla Chandra Mitter ; Superintendent of Workshops, Mr. B. B. Ranade ; Mechanical Engineering, J. K. Das Gupta ; Electrical Engineering, Mr. C. F. Boak and Mr. Manmatha Roy ; Ceramics, Babu Satya Sundar Deb ; Tanning, Mr. R. Colum, E. D. C. ; Dyeing, Bleaching and Calico-printing, Mr. G. C. Sen ; Carpentry, Babu Madan Mohan Dutt ; Smithy and Fitting, Mr. G. W. Davis ; Physics and Mathematics, Babu Susil Chandra Chakravarti and Surendra Madhab Mullick ; Chemistry, Mittra and Jyotish Chandra Bose ; Geology and Mineralogy, Babu Krishna Chandra Sammaddar, etc., etc.

THE BENGAL NATIONAL COLLEGE, CALCUTTA.

The College was started in 1906 in response to the demand that arose for education independent of the University. It is under the management of the National Council of Education, Bengal. It relies for its income on private contributions including a fair amount of endowed property. Its schemes of study comprise Literary as well as Scientific and Technical

* Further information can be obtained on application to the Honorary Secretary, Dr. Nil Ratan Sircar ; Office, 92, Upper Circular Road, Calcutta.

Education. In the Primary stage, literary and scientific education is designed to go together in combination with rudimentary technical education such as Training of the Senses, Drawing and the like. In the Secondary stage, too, the same course is followed, the technical education comprising such branches as may be necessary to prepare the student for his intended career in life.

The Primary Stage.—The Primary Stage is of three years' duration. Object-lessons and Freehand Drawing are taught in this period.

The Secondary Stage.—The Secondary Scientific course includes Physics and Chemistry, and any one of the following groups :—Mathematics, Drawing and Workshop Practice ; Biology and Physiology (with laboratory work) ; Geology and Biology (with laboratory work) ; Agriculture and Biology (with laboratory work). The course extends over two years.

The Secondary Technical Course, extending over three years, comprises (A) a general course of instruction in Physics, Chemistry, Mathematics and Drawing ; and (B) a Special course of instruction in Machine Drawing, Mechanics, Steam-engines, Boilers and Prime Movers, Hand and Machine Tools, Pattern-making, Brass-moulding, Smithy, Turning and Fitting.

Industries Taught.—Besides receiving a Scientific education in principles, the students are specially trained to apply the principles in practice, so as to be able to take up the smaller industries not requiring the investment of large capital. Thus, in the workshops attached to the physical, chemical and technical departments, the students will be taught and required to manufacture as far as practicable their own instruments and apparatus. It is also in contemplation to supply institutions affiliated to the National Council with instruments and appliances manufactured in the College workshops. It is proposed *for the present* to teach the manufactures of articles under the following heads :

I.—CARD-BOARD AND PAPER-WORK :—

- (a.) Medicine cases.
- (b.) Stationery boxes.
- (c.) Other assorted boxes.

- (d.) Envelope cases.
- (e.) Port folios.
- (f.) Blotting pads.
- (g.) Geometrical Models.
- (h.) Envelopes, letter-papers, post cards, etc.

II.—WICKER WORK :—

- (a.) Arm-chairs.
- (b.) Waste-paper baskets.
- (c.) Boxes.
- (d.) Travelling bags.
- (e.) Tea-poys, etc., etc.

III.—CLAY-Moulding ;—

Clay-figures.

IV.—WOOD-WORK :—

- (a.) Candle-sticks.
- (b.) Picture-frames.
- (c.) Toys.
- (d.) Handles, pen-holders and stationery cases.
- (e.) Artistic furniture (fret-work).
- (f.) Wood-carving.
- (g.) Instrument-boxes.
- (h.) Stands, tables, supports, lifts and other fittings and appliances for chemical and physical laboratories.
- (i.) Drawing boards.
- (j.) Set-squares.
- (k.) T. squares.
- (l.) Parallel rules.
- (m.) Geometrical drawing models.
- (n.) Measuring scales.
- (o.) Models of verniers.
- (p.) Kindergarten materials for children in Elementary Schools.
- (q.) Machine and Engineering Models (wheels, pulleys, inclined planes, screws, toy-engines, culverts, etc., etc.)

V.—METAL WORK :—

Scientific instruments and Apparatus for Physical and Chemical Laboratories.

VI.—METAL WORK :—

Garden tools and agricultural implements.

VII.—METAL WORK :—

Cutlery.

VIII.—METAL WORK :—

Small hand-presses, Pumps, Pulley-blocks, Screw-vices, &c.

IX.—METAL WORK :—

Sheet-metal Goods :—

- (a.) Locks and keys.
- (b.) Trunks.
- (c.) Candle-sticks.
- (d.) Water-buckets.
- (e.) Office-boxes.
- (f.) Canisters.
- (g.) Varnish and oil-cans.
- (h.) Butter tins.
- &c., &c.

X.—METAL WORK :—

Grinding and polishing.

XI.—GLASS-BLOWING :—

Glass apparatus used in Chemical Laboratories.

Apprenticeship course.—Students who have passed any previous examination or passed through any course of studies may be admitted into the Technical Department as out-students for practical instruction in one or more of the arts and industries mentioned above or as many of them as may be provided for by the Council. They will receive certificates of successful apprenticeship.

Affiliated Schools.—The National Schools at Rangpur, Dacca, Dinajpur, Comilla, Mymensingh, Khulna, Kishoregunge, Chandpur, Magura, Majpara, Bara-Bashalia, Jalpaiguri, Noakhali, Jessore, Dhap, Kamargram and Sylhet, are affiliated to the National Council of Education.

THE GOVERNMENT SCHOOL OF ART,
CALCUTTA.

(From "Progress of Education in India, 1897-8 to 1901-2," &c.)

The School of Art at Calcutta has no manufacturing industrial side and answers more nearly than do the other Schools to the acceptance of the name 'School of Art' that is usual in England. The School is located in good buildings adjoining the Government Art gallery. The course of instruction was re-organized in 1896. The School has now two divisions. The first affords systematic instruction in Drawing and Design for

drawing and technical art teachers, for skilled general draftsmen, for artisans and art workmen, and for designers for art industries; it includes special classes for engineering and architectural drawing, wood engraving, lithography and modelling. In the Design Classes practical instruction is given in Stencilling, Fresco painting and other processes of wall decoration and in Lacquer work and the making of stained glass windows. The second division is intended for pupils who wish to study drawing, painting and modelling, with a view to becoming painters or sculptors.

The following are the subjects of study in the first division.—(1) Elementary free-hand drawing, (2) Advanced free-hand drawing, (3) Studies in light and shade, (4) Geometrical drawing, (5) Perspective drawing, (6) Modelling, (7) Elementary design, (8) Elementary painting, (9) Advanced design, (10) Lithography, (11) Wooden graving.

The particular group of subjects, of divisions of subjects, taken up by a student is determined by the nature of the occupation for which he wishes to qualify.

Special instruction in Practical Geometry and Mechanical Drawing from measurement is given to artisans, and sons of artisans not under the age of 12 years, at greatly reduced fees. The length of the course for general draftsmen, elementary drawing teachers, industrial art workmen, designers, and advanced drawing and technical art teachers, is from two to three years; for mechanical and engineering draftsmen it is from two to four years; and for architectural draftsmen, modellers, lithographers and wood-engravers it is from three to four years.

In the second division the course for painters comprises Drawing and painting from the cast, from still life, from flowers and foliage, and from the human figure, and the study of anatomy; the course for sculptors includes modelling from the cast, from flowers and foliage, from the human figure, and the study of anatomy. Except in special cases students of the second division must go through a preliminary course in the first division.

Students are not ordinarily admitted under the age of 15 years, and they are charged a monthly fee of Rs. 3 in the first and Rs. 5 in the second division. Free admission is given to a limited number of students, and the Government awards Scholarships up to the total value of Rs. 75 a month. Examinations are held annually, and passed students are granted certificates as such which are signed by the Principal and countersigned by the Director of Public Instruction. Passed Students of the School quickly find employment in various capacities, such as drawing masters of high schools, in lithography work and as draftsmen, designers, etc.

No hostel is attached to the School.

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The total expenditure during 1906-7 amounted to Rs. 23,191, towards this sum the contribution from fees amounted to Rs. 5,969, the balance came from Provincial Revenues.

There were 254 students on the roll on the 31st March, 1908.

Staff.—Principal, E. B. Havell, Esq. (on leave); Officiating Principal, Babu Abanindra Nath Tagore; Head Master, Babu H. N. Bose; there are eight teachers besides.

THE BIHAR SCHOOL OF ENGINEERING, BANKIPORE.

(From Syllabus and Prospectus.)

Introductory.—The Bihar School of Engineering owes its origin to a fund raised by the residents of Bihar to commemorate the visit of H. R. H. the Prince of Wales (now H. M. the King-Emperor) to India in 1875. The object of the fund was the promotion of technical education in Bihar. As at present constituted, it was formed by the amalgamation of the old Patna Survey School with the Bihar Industrial School, and the present building was erected by means of the fund above mentioned. It was formally opened by His Honour the Lieutenant-Governor of Bengal in the year 1900. The school is staffed and administered by the Bengal Government. It is under the control of a Board of Visitors and is directly under the supervision of the

Principal of the Patna College. The Head Master is charged with the immediate control and maintenance of discipline. The school is equipped with Workshops and Machinery, Chemical and Physical Laboratories, Lecture Theatre, Drawing Halls, Hostel, etc. The school is the most important institution of its kind in the province after the Sibpur Engineering College.

Subjects Courses, etc.—The school is chiefly engaged in training students for appointment as Sub-Overseers and Overseers. The curriculum includes (1) a sound study of elementary Mathematics; (2) careful training in Survey work; (3) Drawing, both free-hand and engineering; (4) elements of Road-making and the construction of simple Buildings, and (5) Workshop practice with hand tools and machinery. The courses extend to four years. The subjects taught are Physics and Chemistry, Practical Mathematics, Engineering, Drawing, Surveying, Estimating, Trigonomics, Mechanics and Hydrostatics, Electricity and Magnetism, Applied Mechanics, Buildings, etc.

Admission.—Candidates for admission to the Overseer Department must be under 20 years of age and must have passed the Entrance examination of an Indian University in English and Mathematics, or Standard VII of the Code of European schools, or an examination specially held by the Principal of the Patna College in English and Mathematics. Candidates for admission must apply to the Principal not later than the 30th June stating the particulars required.

The number of students admitted to the first-year class of each year will be limited to 60. Preference is to be given to Biharis. Failing, however, a sufficient number of Bihari applicants, students who are natives of other provinces may be admitted, preference being given to Bengalis, domiciled in Bihar over non-domiciled Bengalis or other applicants. As far as accommodation is available, students who have passed the final "B" class examination will be admitted to the second-year class, provided they are not over 21 years of age, preference again being given to Biharis and domiciled Bengalis.

Fees and Scholarships.—In the Overseer Department, which corresponds to the Apprentice Department of the Sibpur

College, the monthly fee is Re. 1-8-0, except for non-domiciled Bengalis, who shall pay Rs. 3. All scholarship-holders, however, receive free tuition. Government scholarships of the value of Rs. 7 a month, tenable for one year, are awarded each year on the results of the annual examinations, *eight* being tenable in the second-year class, *six* in the third-year class, and *six* in the fourth-year class. Of the scholarships attached to the school, 75 per cent. are to be reserved for those students who are Biharis by race.

The Amin Class.—There is an Amin class admission to which may be obtained by students who do not know English. In the Amin class the course of study is for one year, and the monthly fee is Re. 1. An Amin-student is taught elementary surveying with a corresponding amount of Mathematics and of Geometrical drawing. He will not be admitted to the workshop. A student in the first-year class of the Overseer Department, who fails to pass the examination for promotion to the second-year class, but who has shown an adequate knowledge of elementary Surveying and the other subjects taught in the Amin class, may, at his option, leave the school with an Amin certificate. Candidates for the Amin class, who have not passed the Middle English or Middle Vernacular examination, will be examined at the school; candidates failing at this examination will not be admitted.

Boarding.—There is a hostel in connection with the school. The fees are Re. 1-8 for room and Re. 1 for light. Students make their own mess arrangements. Students joining the Overseer classes must reside in the hostel, unless they are residents with parents or with nearly related guardians whose homes are near enough to enable them to attend the school at the required times. The Principal of the College will decide whether a student should reside in the school hostel, or whether the guardian proposed can be accepted as such.

Finances.—The expenditure on Establishment is Rs. 24,566 a year; on Workshop contingencies, Rs. 6,000 a year; Special contingencies, Rs. 4,144; Government and District Board

scholarships, Rs. 7,223; and Miscellaneous, Rs. 4,200. The receipts are :—Government grant, Rs. 42,700; Fees and Fines, Rs. 4,894; District Board scholarships, Rs. 3,432; Proceeds of sale of Workshop articles, Rs. 2,485.

Strength.—There are more than 150 students on the roll.

Past Students.—The students who passed out of the school, about 64 of whom particulars are available, are all employed in good positions, and they have never found any difficulty in securing suitable employment.

Staff.—P. Walford, Esq., A. R. C. S., M. I. M., E., Head Master; W. F. Webster, Esq., Superintendent, Workshop; P. Bhagawati Charan Das, M. A., Assistant Head Master. There are, besides, Masters in Engineering, Science, Drawing, two Assistant Masters, and an Amin Class teacher.

THE MAISADAL TECHNICAL SCHOOL, MIDNAPORE.
(From the Calendar of the Sibpur Engineering College and the Report on Education in Bengal from 1902-3 to 1906-7.)

This School was founded in 1885. The initial cost of establishing the school was met by the leading Rajahs and Zamindars of the district including a contribution of Rs. 5,000 by the Rajah of Maisadal after whom the school is named. On first formation the school consisted of Artizan and Amin Classes only; the Sub-Overseer Class was added in 1896, and the school affiliated to the Sibpur Engineering College in 1898. The 'B' Classes of the Collegiate School get their technical education at the Technical School. It has been decided that the school shall be removed to a better site and provided with a proper building towards the construction of which Government has made a grant of Rs. 5,000. The control of the School, which was formerly in the hands of the Education Committee of the District Board, is handed over to a committee consisting of the Magistrate as *ex-officio* president, the Executive Engineer, the District Engineer, one or two representatives of the District Board and of the Municipal Committee, and some representatives of the original donors of the fund. The Staff consists of a Head-master and one assistant; also instructors in carpentry and smithy.

THE BURDWAN TECHNICAL SCHOOL, BURDWAN.

(From the Calendar of the Sibpur College.)

This School was started in April, 1893, by the District Board of Burdwan, for the purpose of training Artizans and Amins. It received a grant from the Municipality of Rs. 20 monthly, and in 1895, on the opening of Sub-Overseer Classes and its affiliation to the Apprentice Department of the Sibpur College, Government sanctioned a grant-in-aid of Rs. 30. The Amin Classes were then closed; the school is housed rent-free in a building owned by the Burdwan Raj. The Artisan Classes are (1) Blacksmith, (2) Carpenters. These are supported by four stipends of Rs. 4 presented by the Burdwan Raj. The Staff consists of a Superintendent who is a Foreman Mechanic of Sibpur, a second teacher, one smith and two carpenters.

THE SURVEY SCHOOL, CUTTACK.

(From the Report on Education in Bengal from 1902-3 to 1906-7.)

The Cuttack School is the only Survey School so called in the province. The complete curriculum of the school extends over two years, but at the end of the first year's course an examination is held on the results of which *Amin's* certificates are issued to successful candidates. The curriculum includes Surveying, Road-making, Estimating and Mathematics, but not carpentry, smithery or science. The improvement of the Amin Classes is under the consideration of Government. On the 31st March, 1907, there were 99 students undergoing instruction in the school. The total cost of the school during 1906-7 was Rs. 5,577, of which sum Rs. 4,399 came from Provincial Revenues. Passed candidates can secure appointments on salaries ranging from Rs. 15 to Rs. 80 a month.

It has recently been decided that the school is to be developed into an Engineering School, the complete Sub-Overseer course being to start with taken and ultimately the complete Overseer course. A site for the enlarged school has already been selected.

THE OXFORD MISSION INDUSTRIAL SCHOOL,
CALCUTTA.

(Note by the Rev. M. L. Ghose, Superintendent.)

The technical subjects taught are Carpentry, Blacksmith's Work, Silversmith's Work, Drawing-Freehand, Perspective and Mechanical, and Practical Geometry. The boys are all Christian boarder paying fees according to the circumstances of their parents and ranging from Re. 1 to Rs. 3 per month, while some are free students and boarders as there is none to pay for them. Boys must be above six and below 12 years of age at the time of admission and must be Christians. There are 100 students, of whom only 40 attended the workshop. The annual cost of the upkeep of the school is Rs. 13,140, of which fees cover Rs. 1,600 and Government grant is Rs. 360. The balance is defrayed from the funds of the Oxford Mission.

The Superintendent is a missionary brought up in Bishop's College. The Assistant Superintendent is an under-graduate who passed in Electrical Engineering.

THE VICTORIA SCHOOL, KURSEONG.

(From the Calendar of the Sibpur College.)

In 1879, Sir Ashley Eden, the then Lieutenant-Governor of Bengal, founded a school in Kurseong for the children of Government servants. This was the parent of Victoria School. Starting with 15 children, the school grew steadily until in 1898 the present buildings were erected to accommodate 200 boys. The school estate of about 50 acres is situated in the Government Forest above Kurseong, 6,000 feet above sea level. Admissions to the technical class are made from lads that pass the Middle School Examination. The School is fees, including board and tuition range from Rs. 30 monthly. The school is intended for Europeans and Eurasians, for whom there is a commercial class as well.

THE BUNDU INDUSTRIAL SCHOOL, BUNDU,
(CHOTA NAGPUR).

(*Note by Mr. Nemdhari Lal Mistri, Head Master.*)

The instructing staff consists of two teachers, one carpenter and the other a blacksmith. The carpenter gets Rs. 15 a month and blacksmith gets Rs. 4-8 a month. There is no fee charged from the students. Those boys who are taught for four years, if fit, are sent up for the final examination; if those boys come out successful a scholarship of Rs. 4 a month is awarded to each of them for two years by the District Board of Ranchi. Boys wanting admission into the school are not required to have any qualification. There is no hostel in connection with this school. There are 24 boys on the rolls, and there are four classes. During the four years of complete teaching boys are taught sawing, planing, joining, making tables, doors, stools, chairs, benches, dovetailed boxes, almirahs, and different varieties of household furnitures, and also the polishing and varnishing of work turned out by them.

THE KALIMPONG LACE SCHOOL, KALIMPONG.

(*From the Quinquennial Report on Education in Bengal.*)

In March, 1905, a school was opened at Kalimpong by the Church of Scotland Mission for the instruction of the women and girls of the neighbourhood in lace work. Any woman, whatever her religion, can join the school. The ordinary period of training is for a year, after which period the majority of the pupils are fit to carry on the industry in their own homes. If, however, after a year's training a pupil is not fit to work on her own account, she is retained in the school for further training. The school is in the hands of an English lady who is an expert in lace work. An hour's instruction in the 'three R's' is given daily before the lace-work begins. Attendance is voluntary, but the great majority of the pupils take advantage of this instruction.

The success of the school has surpassed expectations. The school opened with 16 pupils, but in July, 1906, there were 84

women and girls at work. The industry is in fact in a fair way to establish itself in Sikkim and the Darjeeling district, and the deftness and the good taste of the hill women promise well for the success of the industry in future.

The scope of the school has up to the present been practically local. The establishment in different parts of Sikkim and the Darjeeling district of branch lace schools staffed by women trained at the Kalimpong school was part of the original scheme, and two such schools have already been started. But the local success which this attempt, to introduce lace work as a cottage industry among women has attained, has led to a scheme being formulated for establishing the industry in other parts of Bengal by means of a system of which the school at Kalimpong will be the centre. The central school will, to start with at any rate, train the women who will become the teachers at the branch schools. Other functions essential to the development of the industry will also devolve upon it. It will study the popular taste and prepare and issue designs accordingly, taking care that the proper kind of thread is selected in each case. It will control the industry by receiving all orders and distributing the work among the various local branches, an attempt being made to apportion, as far as possible, the manufacture of a particular kind of lace to a particular branch. In this way the underselling of one branch by another and sweating will be prevented.

The extension of the scope of the Kalimpong school on these lines is now under consideration. Briefly, what is immediately required to give effect to these proposals is the engagement of an additional lady teacher and a competent designer for the staff of the Kalimpong school, the construction of a hostel in which students sent to Kalimpong for training can reside, and the provision of scholarships which will enable the students to defray the cost of living at Kalimpong. Travelling expenses will also have to be considered. Since the opening of the Lace School Government has contributed on its account to the Mission an annual sum of Rs. 20,000. Towards the extended scheme, the Mission asks for an annual grant of Rs. 5,400. An inquiry is now

being made of District Boards and Missions to ascertain whether these bodies will be willing to provide scholarships to be held by students attending the central school at Kalimpong.

THE MAHILA SHILPA SAMITI, CALCUTTA.

(From the Quinquennial Report on Education in Bengal from 1902-3 to 1906-7.)

For some time a committee of Indian ladies in Calcutta has been doing a certain amount of social and educational work among women who do not appear in public. One of the results of the efforts of these ladies was the formation of a society called the Mahila Silpa Samiti (Ladies' Industrial League), of which the Maharani of Mayurbhanj is President. The problem with which this society set itself to deal was how the women of the middle and upper classes of Bengali Society, especially Hindu widows, could be trained to industrial work which they could do in their own houses and on which they could make a reasonable profit. The urgency of the problem was brought home to the Indian lady who acts as Secretary to the Society by the discovery that the ladies of several middle class Mahomedan families in that part of Calcutta in which she lived habitually worked at the making of coats for Mahomedan tailors, and that they were remunerated for this labour at the rate of 1½ and 2 pice a coat. At the beginning of 1907 the Mahila Silpa Samiti opened an Industrial School in Calcutta in the neighbourhood of Cornwallis Street, and on the 3rd March, 1907, the school had 30 pupils on its rolls. At present technical instruction is given in Silk-weaving, Lace-work, Stocking-knitting, and Needle-work. An attempt is also made to induce the women who attend the school to spend a certain amount of time every day on their general education. A trained lace-maker has been obtained from Kalimpong, and trained teachers are employed for the other branches of the technical work. A number of well qualified Bengali ladies are giving their services both as general and technical teachers. The school has a section for Mahomedan women. The school is visited by female officials only. The

Education Department is making a monthly grant of Rs. 304 towards the current expenses of the institution, and a sum of Rs. 1,450 was contributed from public sources towards the initial outlay. The Inspectress of Schools describes the opening of the school as 'a most important development,' and she thinks that even the Mahomedan section of the institution promises well

THE WOOL-DYING AND WOOL-WEAVING SCHOOLS, KALIMPONG, (BENGAL).

(From the Quinquennial Report on Education in Bengal from 1902-3 to 1906-7.)

Concurrently with the lace-industry scheme the Church of Scotland Mission at Kalimpong sent up in 1904 a scheme for instructing women in wool-dyeing and wool-weaving. This scheme, which contemplated the sending of a man and his wife to North Sikkim, there to learn the methods of dyeing and weaving wool from the Scandinavian Alliance Missionaries and their employment in Kalimpong, on their return to teach the craft to others, was approved by Government and an initial and an annual grant in support of it were sanctioned.

The scheme was not carried into effect owing chiefly to the want of proper instructors. But there is now at Kalimpong a lady, the wife of one of the masters of the St. Andrew's Homes, who was formerly the Superintendent of a hand-loom weaving establishment in London, and a modified scheme has now been evolved for starting a weaving school for women under the guidance of this lady, who will be assisted by two Tibetans, one with a knowledge of dyeing, the other an expert in the weaving of Tibetan rugs and carpets. The Education Department has sanctioned in support of this scheme an initial grant of Rs. 600 and a recurring grant of Rs. 87 a month, and the Weaving School was opened on the 1st October, 1907.

The venture is said to promise well, for the price of wool at Kalimpong is lower than it is anywhere else in the province and the capacity of the natives of Sikkim to make good cloth when properly taught and the ready sale of such cloth have already been proved.

THE BENGAL VETERINARY COLLEGE, CALCUTTA.

(From *Quinquennial Report on Education in India, 1897-8 to 1901-2.*)

The Bengal Veterinary institution, situated at Belgatchia, Calcutta, consisting of a veterinary school and hospital, was founded in 1893 and was raised in 1899 to the status of a college. The college is a large building in which there are three lecture rooms, a museum, a library, a pharmacy, a lecturer's room, and a photographic room. The veterinary hospital consists of four horse-wards, a *post-mortem* and dissecting room, a shoeing forge, an operating shed, and store rooms; special isolation ward are provided outside the college compound. A hostel with accommodation for 50 boarders is attached to the college.

The subjects of instruction are anatomy, elementary physiology, elementary chemistry, elementary botany, materia medica and pharmacy, practical microscopy, shoeing, etc.

The candidate seeking admission must have at least passed the Middle English scholarship examination. The length of the course is three years. There is one examination at the end of each year, held by a Board of Examiners appointed by the Government. A diploma as graduate of the college is given after a candidate passes the final examination, and a special certificate of proficiency to one who has performed satisfactorily the duties of chemical Clerks, prosecutors and monitors.

The staff consists of a principal, an assistant principal, three lecturers, a hospital surgeon, and a subordinate staff. The whole is controlled by a committee of officers and Indian gentlemen appointed by the Government.

INDUSTRIAL SCHOOLS IN BENGAL.*

(From the *Report on Education in Bengal from 1902-3 to 1906-7.*)

Calcutta.—There are two schools for Mahomedans only—the *Muhammedan Orphanage* and the *Kareya Industrial School*—of which the former teaches Printers' work, Embroidery

* Not treated separately.

and Tailoring, the latter Tailoring and Watch-repairing. Another institution is the *Calcutta Orphanage*, at which on the 31st March, 1907, 17 Hindus were being taught, some Carpentry and others Tailoring. All these schools provide instruction in the three 'R's.'

The Presidency Division (outside Calcutta).—In the Presidency Division outside Calcutta 3 industrial schools are returned. One of these is at *Kaorapakur* and teaches Carpentry; the other two are at *Khulna* and *Saragachi* near Murshidabad; the former teaches Carpentry, the latter Carpentry and Weaving. All three institutions teach the three 'R's.' The Church Missionary Society have a Middle English school at *Hat Chapra* near Krishnagar in which the Lloyd system of manual training is taught, and attached to the school are workshops in which boys are trained with a special view to employment in the workshops of the Eastern Bengal State Railway at Kanchrapara.

The Burdwan Division.—In the Burdwan division, in addition to what is attempted at the technical schools at Burdwan and Midnapore, some instruction in carpentry is given at the industrial school which is attached to the Wesleyan Mission Boys' School at *Kharsuli* near Raniganj. The Wesleyan Mission School at *Bankura* has also workshops in which Christian boys are trained in Carpentry, Cane-weaving, Shoemaking, and Hand-loom weaving. The only other school in the Division is the Seri-Agricultural School at *Sabang*. There were 5 students on the rolls of this school on the 31st March, 1907.

The Patna Division.—Five industrial schools were started in the Patna Division in 1904-5. Three of these are in *Saran* and teach Basket-work to the Maghia Domes. Of the others one is attached to the railway workshops at *Samastipur* and teaches Carpentry and Blacksmith's work; the fifth is at *Gaya* and teaches Carpentry. The Schools in Saran and at *Samastipur* teach the three 'R's.'

Orissa.—The only industrial schools in Orissa are three institutions in the *Balasore district* which teach Carpentry, Blacksmiths' work and Weaving.

INDUSTRIAL SCHOOLS IN BENGAL FOR INDIAN GIRLS AND WOMEN.*

(From the *Quinquennial Report on Education in Bengal, 1902-3 to 1906-7.*)

In addition to the institutions separately treated, there are the following schools in which industrial instruction is imparted to Indian girls and women :—The Roman Catholic Convent at Ranchi and the Baptist Mission Technical Class at Cuttack, both of which are reported to be turning out a good quality of lace; the Roman Catholic Mission at Chaibassa, which is trying to introduce the weaving industry among the Hindu women; also a Missionary school at Baranagar near Calcutta, where carpet-weaving, embroidery, and the making of *chatni* (pickles) are taught to Hindu widows.

* * * *

One hundred and eighteen girls and women were returned as undergoing technical or industrial instruction at the end of 1906-7. This indicates a distinct advance, for at the end of the preceding quinquennium the figure for the province of Bengal, which then included Eastern Bengal, was 26. The Inspectress of Schools alludes in her quinquennial report to 'the increasing amount of attention that is being paid to the development of suitable industries' as 'a noticeable feature in connection with work among Indian women.' She adds that 'a very hopeful aspect of this kind of work is the endeavour to develop industries that require really skilled work and careful preparation for it.'

PRIVATE ART SCHOOLS IN CALCUTTA.

(From *Report on Education in Bengal, 1902-3 to 1906-7.*)

These institutions are (1) the Indian Art School, (2) the Jubilee Art Academy, and (3) the Albert Temple of Science. The expenditure on these institutions during 1906-7 is returned as Rs. 13,338. The Indian Art School received during the year a grant of Rs. 100 from the Calcutta Municipality. The schools are said to teach drawing, engraving, moulding and lithography.

* Not separately treated.

TECHNICAL CLASSES (' B ' CLASSES) ATTACHED
TO HIGH SCHOOLS IN BENGAL.

*(From the report on Education in Bengal from
1902-3 to 1906-7.)*

As a result of reports by Mr. J. S. Slater, Principal of the Sibpur Engineering College, and Sir Alexander Pedler, Director of Public Instruction in Bengal, a scheme for the bifurcation of studies in high schools was evolved. This scheme provided that there should be two courses alternative with the University Entrance Course. These have been called the 'B' and 'C' course, the ordinary literary course for the University Entrance Examination being known as the 'A' course. The scheme was sanctioned by Government and its introduction was ordered in certain Government and District Board schools with effect from the 1st January, 1901. The 'C' classes were intended especially to prepare boys for employment in connection with commerce.

The aim of the 'B' classes is partly general and partly special. Their aim is general in so far as their inauguration represents an attempt to give a more practical turn to school education; it is specialised in so far as these classes were deliberately intended to impart a preliminary training suitable for a specific profession and because as such they were brought into direct relation with the scheme of engineering training which has grown up round the Civil Engineering College, Sibpur. The curriculum includes elementary engineering and manual training in a workshop, and students who have passed the examination, which terminates the course, may be admitted to the second year of the Apprentice Department Course. The arrangement when 'B' classes are held at a Technical or Industrial school is that the technical subjects are taught at the technical or industrial school, and the ordinary school subjects are taught at a neighbouring high school. Similarly, when 'B' classes are held at a high school, the technical instruction required is ordinarily imparted at a neighbouring technical or industrial school.

The classes have not been a success. They were opened at but few places, and even there the number of students has

steadily declined, the decrease being from 21 in 1903 to 6 in 1907. It has been reported by one officer that the only students who join the 'B' classes are those who are unable to pass the annual school examinations.

The reasons urged for the failure of the 'B' classes are that the University Entrance Examination dominates completely the curriculum of secondary schools; that no special effort has been made to foster their development; and that the ambition of parents that their sons should obtain Government employments, stands in the way of these classes being patronized.

The classes are now held at Bhagalpur, Bankipore, and Midnapore. They will shortly be opened at Khulna, and, probably, at Cuttack as well.

THE GOVERNMENT COMMERCIAL CLASSES, CALCUTTA.

(From Notification of the Bengal Government.)

These classes were first opened in 1901 in the Calcutta Presidency College in connection with the bifurcation of studies in the two highest classes of high schools. The commercial classes in schools are called 'C' classes as the industrial classes are called 'B' classes. The scheme of studies was remodelled in 1905 on the recommendations of a committee appointed by the Lieutenant-Governor. The classes were removed from the Presidency College in March 1907 and are now installed at 303, Bow Bazar Street in suitable quarters which were originally built for a commercial school and which are easily accessible from all parts of the business quarter.

Courses of Study and Delivery of Lectures.—The arrangements are for instruction to be imparted and examination to be held in two different courses of study—one to be a complete course every part of which shall be obligatory, and the other to consist of a series of lectures or classes all or any of which may be attended at option. The lectures in the former course shall be delivered during the day, while those in the latter shall be delivered in the evening only.

The subjects prescribed for the day course shall be (i) English (modern), and especially English correspondence, including commercial correspondence, letter-drafting and *precis*-writing; (ii) Arithmetic, including commercial and mental arithmetic; (iii) one of the following subjects, *viz.*, Book-keeping, Shorthand writing or Type-writing; and (iv) Commercial History and Geography. The course shall extend over a period of two years, at the end of which an examination shall be held in the prescribed subjects, in all of which the candidates will be required to pass. No candidate will be allowed to pass unless his answers on every subject are written in a good, legible handwriting.

The following shall be the subjects prescribed for the evening course:—(i) outlines of Political Economy; (ii) Banking and Currency; (iii) Commercial and industrial Law; (iv) Annuities and Insurance; (v) Book-keeping; (vi) Shorthand-writing; (vii) Type-writing, and (viii) English (modern). In these subjects special examinations shall be held, candidates being allowed to take up each separately and to obtain certificates of having passed in it.

Certificates.—Certificates shall be awarded by the Education Department to students passing the examinations, and shall require endorsement by the Secretary to the Bengal Chamber of Commerce, and lists of successful candidates, without classification, shall be published by that Chamber and by the Bengal National Chamber of Commerce.

Admission.—There will be no age-limit for candidates for either course. Candidates who have passed the 'C class' Examination of High Schools or the Entrance Examination will be eligible for admission to the day course; but others will be admitted only if they satisfy the Education Department, by passing a preliminary test-examination of a similar standard, that they have sufficient general education to enable them to derive advantage from the lectures. Candidates who have not attended the lectures in the day course, will be allowed to compete at the examination only if they have passed the Entrance or the 'C class' Examination or satisfied the Education Department, by passing a preliminary test-examination, that they

have a reasonable prospect of success. Those only who have passed the 'C class' or Entrance Examination, and after attending the full day course of lectures have passed the prescribed examination, will be considered to be eligible for the full commercial certificate. Candidates who have attended the lectures in the day course, will be eligible for admission to the evening course and allowed to compete at the examination.

Examinations.—The setting of the papers for the examinations will be left to an Examination Board, which shall be constituted for the purpose by the Director of Public Instruction, and upon which the Education Department, the Bengal Chamber of Commerce, and the Bengal National Chamber of Commerce shall be represented.

Fees.—The fee shall not exceed Rs. 3 per mensem payable for the whole school year for the entire day course, and the like sum for each series of 15 lectures in the evening course on (i) banking and currency, (ii) commercial and industrial law, (iii) annuities and insurance, (iv) English (modern). The fee for each course of 32 lectures on the outlines of political economy shall be Rs. 5. As the evening lectures on book-keeping, shorthand-writing, and type-writing will be on advanced portions of those subjects and will continue over a considerable period, the fee for each course shall be Rs. 10.

Scholarships.—Four scholarships, of Rs. 16, Rs. 12, Rs. 8, and Rs. 8 per mensem, tenable for two years, respectively, are available for candidates admitted to the day course who have passed the 'C class' Examination; and candidates who have obtained similar scholarships at the Entrance Examination will be permitted to hold them during the day course.

Prizes.—Three gold medals, offered by the Remington Type-writer Company, shall be awarded on the results of the examination on the evening course of lectures on type-writing to the three students awarded the highest marks for efficiency.

Staff.—For the day course the following staff of whole-time lecturers were appointed: (1) A lecturer in English on a salary of Rs. 400—20—500 a month, (2) a lecturer on Mathematics on Rs. 150, (3) a lecturer on commercial history and

geography on Rs. 150, (4) a lecturer on book-keeping on Rs. 125, a lecturer on Bengali on Rs. 100, and (6) a lecturer on short-hand and type-writing on Rs. 75 a month.

MINING INSTRUCTION IN THE MINING DISTRICTS OF BENGAL.

(From the Quinquennial Report on Education in Bengal.)

The opening of a Mining Class at the Civil Engineering College, Sibpur, is one part of the scheme to provide for mining instruction in Bengal. The other is the delivery of a course of lectures in the mining districts. Mr. Griffiths, the lecturer appointed for the latter, began his work in May, 1906, by a series of 13 preliminary lectures which were delivered at Jherria and Sijua. These lectures were well attended. In November, 1906, a regular course of instruction was started at Jherria, Loyabad, Charanpore, and Sanctoria. One lecture a week was given at each of these centres, and more than 20 lectures were delivered at each centre. The course of instruction was approved by the Mining Advisory Board, which was constituted by Government in 1904 to advise on questions connected with the practical teaching of mining in the districts. The attendance at the lectures was very satisfactory, and at their annual meeting held in May, 1907, the members of the Mining Advisory Board expressed themselves as well pleased with the progress which had been made. Examinations will be held at the four lecturing centres mentioned above, and on the results of these examinations certificates will be issued under the signature of the President of the Mining Advisory Board. Local committees have been formed to make arrangements and to encourage attendance at the lectures. These committees have been of great assistance to Mr. Griffiths.

SCIENCE IN THE CALCUTTA UNIVERSITY.

(From the Calendar for 1908.)

There is a Faculty of Science in the Calcutta University, and some science is also included in the examinations in Medicine. The Faculty of Science appoints Boards of Studies in

Chemistry, Experimental and Mathematical Physics, Zoology, Geology and Mineralogy, Botany and Physiology.

Among the optional subjects for the F. A. Examination are Physics, Chemistry, Physiology, Botany, Zoology and Geology. For the B. A. degree the following are the optional subjects:—Physics, Chemistry, Physiology, Botany and Zoology. Among the subjects that may be taken up by candidates for the M. A. degree are Physics, Chemistry, Geology, Botany and Zoology.

The Science subjects for the Intermediate Examination in Science are Physics, Chemistry, Botany, Zoology, Physiology, and Geology. Every candidate for the B. Sc. degree shall be examined in three of the following subjects to be selected by himself:—Physiology, Botany, Zoology, Physics, Chemistry, Mathematics and Experimental Psychology. A candidate for the M. Sc. degree may take up any of the following subjects:—Mathematics, Physics, Chemistry, Physiology, Botany, Zoology and Comparative Anatomy, Geology, Experimental Psychology. In all the Science Examinations the candidate has to pass in Practical tests besides the written examination. A candidate for the D. Sc. degree has to be an M. Sc. and submit a thesis on some subject in which he passed the M. Sc. He may, in addition, be required to pass a written examination.

A candidate who goes up for the Preliminary Scientific M. B. examination will be examined in the following subjects:—In Organic Chemistry, Physics, Botany and Zoology. There is a practical course as well. Every candidate for the First M. B. examination shall be examined in the following subjects:—Anatomy, Physiology, Pharmacology including Pharmacy, Materia Medica and Therapeutics and Organic Chemistry.

Any Bachelor of Engineering of the University of Calcutta may offer himself as a candidate for the degree of D. Sc. in Engineering. He has to submit a thesis on a new application of scientific principles or an investigation of methods or materials of practical importance in some branch of Engineering. He may further be required to pass a written examination if the Board of Examiners so decide.

(From Lieutenant-Colonel K. R. Kirtikar's article in the
'Modern Review' for April 1907).

Among the Endowments there is the Premchand Roychand Studentship of Rs. 1,400 a year tenable for two years in the first instance and for three years more if the student satisfies the Syndicate of his work. It is open, among others, to students of Botany, Physiology and Zoology, and Geology and Mineralogy.

The teaching staff in the Colleges affiliated to the University is as follows. In the Presidency College, Calcutta, among others there is a Professor of Biology, a Lecturer on Sanitary Science, and a teacher of Physiography and Demonstrator in Geology. St. Xavier's College, Calcutta, has a Professor of Sanitary Science. The General Assembly's Institution, Church of Scotland Mission, Calcutta, has on its teaching staff a Lecturer on Physiology. Ravenshaw College, Cuttack, has a lecturer on Sanitary Science. Metropolitan Institution, Calcutta, has a Professor of Sanitary Science. City College, Calcutta, has a Lecturer on Sanitary Science. Rangoon College has a Science Lecturer. Victoria College, Cooch Behar, has a Professor of Science. In the Victoria College, Naral, there is a Professor of Science. In the Behar National College, Bankipore, there is a Lecturer on Sanitary Science. In the Central College, Calcutta, there is a Professor of Hygiene. In Jagannath College, Dacca, there is a Lecturer on Sanitary Science and Physiology. Baptist College, Rangoon, has a Professor of Science. Krishna Chandra College, Hetampur, in the district of Birbhum, has a Professor of Sanitary Science, Physiology and Hygiene. Dublin University Mission College, Hazaribagh, has a Professor of Physiology and Sanitary Science. The Tangail Pramatha-Manmatha College provides for a Professorship of Physiology, Hygiene, etc. In the City College, Mymensingh Branch, there is a Professor of Physiology and Sanitary Science. In the Bangabasi College, Calcutta, the Principal teaches Botany and Physiology.

THE UNITED PROVINCES.

THE THOMASON COLLEGE, ROORKEE.

(*Note by Major E. H. de V. Atkinson, Principal of the College.*)

Brief History.—The Thomason Civil Engineering College was founded in 1847 by Mr. Thomason, then Lieutenant-Governor of these Provinces, for the systematic training of Civil Engineers, the want of which was being acutely felt on the large canal and road projects which were then being carried out. On the 19th October, 1847, Lieutenant R. Meclagan of the Engineers, was appointed the first Principal. There were three Departments, the First Department for training candidates for the appointment of Sub-Assistant Civil Engineer, the Second Department for European Non-Commissioned Officers and soldiers for training as Overseers, the Third Department for the training of Indian youths in Surveying, Levelling and Plan Drawing. The success of this modest scheme was so marked that in 1851 it was found necessary to embark on a very much larger scheme which included the addition of a Senior Department of Officers of the Army and the completion of buildings at an estimated cost of Rs. 1,56,207 with an annual charge of Rs. 83,896. Metal and stone printing presses were installed, with a Book-binder's establishment, and all the necessaries for the publication of scientific works with appropriate drawings and illustrations; a work which has been steadily developed from that date into the large Photo Mechanical and Lithographic Press now existing.

Space forbids any attempt at describing the gradual building up and consolidation of the scheme founded by the statesman-like and far-seeing genius of Mr. Thomason.

The year 1875 may be said to mark the close of the first period. The chief characteristic of this period was the pecuniary aid given by the Government to each student. It was a period of pioneering in an untrodden country and government had to bear the cost of the journey; but the public mind was awakening

to the benefits of the public works and to the advantages of Engineering as a profession. The result was that Government found it possible to restrict the pecuniary aid given to students and to limit the numbers of guaranteed appointments to the Public Service. In 1891 Sir Auckland Colvin appointed a Committee to enquire into the Technical Education of the North-West Provinces; 1894 was the last year in which men passed out of Roorkee into the Imperial service; the Provincial service was founded; and in 1896 the College was re-organised in accordance with the recommendations of the Committee. Henceforth all students except soldiers paid fees; the College was transferred from the Public Works to the Educational Department; courses were revised and made practical; a Committee of Management was appointed; the Entrance Examination revised; Mechanical Apprentice Classes and Industrial Classes formed; the Staff was greatly strengthened, Laboratories started and Technical Workshops built and equipped. In the words of Sir Antony MacDonnell uttered in 1900, the object was 'to develop this College into a Technical Institute for these Provinces, which shall control, stimulate and inspire technical teaching of all kinds.'

From that date every year has been marked by expansion and activity and under the orders of Sir James LaTouche a very large scheme for expansion was initiated in 1906 and is now approaching completion. The main items of this scheme were: An additional water supply; Doubling the Workshop accommodation, Model Machine rooms, Motor Car sheds, New Engine and Boiler room and the installation of a large and up-to-date Engine plant: the installation of Electric light, fans and telephones, the whole of the workshops, press and waterworks being worked electrically; a large increase in class room and hostel accommodation; the building of new and up-to-date Laboratories and the inauguration of the new Technical Classes. It will now perhaps be useful to describe the Departments of the College and each Class as it at present exists. The number of students now on the rolls is: Civil and Electrical Engineer Classes 71; Upper Subordinate Class 76; Apprentice Overseers 16; Lower

Subordinate Class 121; Draftsman and Computer Class 14; Technical Class 63; Mechanical Apprentice Class 55; Industrial Classes 103; Automobile Driver Class 19; Military Survey Classes 26; Total 564. Ten years ago the total number of students on the rolls was 233. It should be noted generally that a candidate for admission to most of the Classes must be a statutory Native of India, other than Natives of pure Asiatic descent whose parents or guardians are domiciled in Bengal, Madras or Bombay.

Departments of the College.—The College may be said to consist of two distinct parts. The Engineering College proper, and the Technical side which is likely to be developed now into a Technological Institute. *The Civil Engineering College* (proper) consists of the following classes :—

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|-------------------------------|-----------------------------------|
| 1. Civil Engineer Class. | 5. Draftsman and Computer Class. |
| 2. Electrical Engineer Class. | 6. British Military Survey Class. |
| 3. Upper Subordinate Class. | 7. Native Military Survey Class. |
| 4. Lower Subordinate Class. | |

These classes are educated by the following Departments, each presided over by a Professor with his special staff, who is directly responsible to the Principal for the teaching of his department throughout the College. Any department which has not a professor at its head is under the Principal direct. All classes go through a complete practical course in the College workshops.

1. Department of Civil Engineering including Estimating, Surveying and Drawing.
2. Department of Mathematics and Applied Mechanics.
3. Department of Electricity, Electrical Engineering and Physics.
4. Department of Chemistry, now Mineralogy.
5. Department of Applied Science teaching Ferro-type and Photography (under Principal).
6. Workshops (under Principal).

Examinations.—Candidates desirous of entering most of the classes are required to have certain definite educational qualifications (which will be detailed hereafter) before they are permitted to appear for any of the College Entrance Examinations which are held annually in June.

The College Session extends from the 15th October to the 15th July and is divided into 3 terms, at the end of each of which examinations are held. At the end of each Session a student must obtain $\frac{1}{3}$ marks in each group of subjects and $\frac{1}{2}$ marks in the aggregate for the Session, or he is not permitted to rejoin the College.

A special feature of the College course is the group "Physique," in which marks are assigned to Gymnastics, Athletic sports and games, Health, and General Physical and Moral fitness for future work in the Engineering world.

Discipline.—There are no punishments except expulsion, removal from the College and fines of marks for Fitness for Department under the group Physique. Owing however to the large numbers and the diversity of races and creeds a very high state of discipline is necessary. It is found that the association of British soldiers (who are not admitted if there is any record against them in their defaulter sheets) with the other students, has a marked beneficial effect on the general tone of the College, owing to their strict training in habits of obedience, punctuality and discipline.

For discipline in classes, the Engineer Class is under the Assistant Military Principal and the Upper and Lower Subordinate Classes each have an officer in charge, the Professors being responsible for discipline during their working hours. For discipline in barracks, the Engineer Class and all European and Military students are under the Assistant Military Principal; Indian students are generally under the Superintendent and Native Superintendent of buildings and grounds, while the barracks for each class have an Indian resident master specially in charge.

Civil Engineer Class.—Candidates for admission must not be under 17 or above 21 years of age on the 1st June immediately preceding the Entrance Examination of the College, in which they wish to appear. Married Europeans or Eurasians are not admitted.

The application must be accompanied by an Examination Fee of Rs. 20 and a statement of date of birth of the candidate;

the school or schools at which he has been educated; the profession, situation, relationship and residence of his father or guardian (by whom and not by the candidate himself, the application for admission should be made); one of the examination centres where he wishes to be examined; the selection from Special Subject No. 6 the candidate elects to be examined in. Every Candidate will be required to produce testimonials (which will not be returned) of good moral conduct, and these testimonials should have reference especially to his conduct during the two years immediately preceding his application for admission.

The qualifying tests for admission to the Entrance Examination are the First Arts or Intermediate Examination of an Indian University, or the Final or High Standard Examination under the Code Regulations for European Schools in force in Bengal, the United Provinces, the Punjab and the Central Provinces, or one of the following:—(1) Oxford University Responsions Certificate; (2) Oxford Senior Local Pass Certificate; (3) Cambridge Senior Local Pass Certificate; (4) Cambridge University Previous Certificate; (5) The London University Matriculation Certificate; (6) any United Kingdom University Entrance Examination Certificate.

The Entrance Examination is competitive, and those who stand highest on the list of passed candidates (only to the number of available vacancies) which is for the present fixed at 20, will be selected for admission.

The following is the list of the six subjects for the Roorkee Entrance Examination. They are the same for both English and Indian candidates. The Examination will be held by means of papers at the following centres only, *viz.*, Roorkee, Allahabad, Lucknow, Nainital, Lahore, Rangoon, Nagpur and Shillong.

1. Languages.	English Essay	..	.. 100
	Precis writing		.. 50
	Hindustani	..	.. 50
2. Physical Science.	(Elementary Physics and Chemistry.)		50
3. History.	(English and Anglo Indian)		.. 50

4. Mathematics.	Arithmetic	60
	Algebra.	60
	Geometry.	60
	Trigonometry.	60
	Mensuration.	60
5. Drawing.	Geometrical	60
	Freehand	40
6. Special subject.	.. ..	100
(a) One of the following languages.—		
Latin, French, German, Sanskrit, Persian or Arabic.		
(b) A further course of Physics and Chemistry.		
(c) Mechanics.		

Half the full number of marks in each of the three subjects of English Essay, Mathematics and Drawing, and in the aggregate, is required for passing. No minimum of marks is prescribed for any of the other subjects; but the marks in no paper in which less than one-quarter of the full number of marks has been obtained, shall be allowed to count. Candidates will be expected to write a clear, legible hand. Up to one-tenth of the marks of each paper will be deducted for slovenly work.

Ten Scholarships are sanctioned for this Class, viz., three of Rs. 40 and seven of Rs. 30 a month. Of these Scholarships, four of Rs. 30 a month will be awarded to First Year Students, three of Rs. 30 a month to Second Year Students.

These Scholarships are awarded to First Year Students on the results of the Entrance Examination, and to Second and Third Year Students on the results of the Examination of the First and Second Years, and are tenable for *the nine months of the College Session.*

A College fee of Rs. 16 per mensem during the Session will be paid by each student entering the College. Quarters are provided for English Students at a cost of Rs. 7 to Rs. 14 and for Indian Students at Rs. 5 per mensem. Six and seven appointments in the Public Works Department are guaranteed for competition in alternate years, to the Civil Engineer Class. These appointments are subject to the conditions stated below.

The Civil Engineering Courses extend over three years. In the third year in June the Final Examinations are held, when those students who have completed their course of study and have qualified will receive certificates to that effect.

For the purpose of awarding the six and seven guaranteed appointments in alternate years in the Public Works Department, *not more than twelve and fourteen qualified Civil Engineer Students in alternate years, respectively, in order of merit in which they stand in the Final Examination lists, are appointed as apprentices in the Public Works Department*, and will be allotted to the several Local Governments and Administrations in the proportion of two Apprentices to each guaranteed appointment, one of the two Apprentices being from among the first six and seven in alternate years, respectively, in order of merit, of the Civil Engineer Students.

On the expiry of one year the Local Government or Administration shall decide, as between two apprentices serving under it in respect of a guaranteed appointment, whether either has or both have proved in the course of his or their practical training, his or their thorough fitness for appointment to the Public Works Department.

If the Local Government or Administration decide that neither has proved his fitness, it may dispense with the services of either or both, or may extend the probation of either or both, for a further period not exceeding two years from such date. If the Local Government or Administration decide that one only of the two has proved his fitness it shall appoint him to be Assistant Engineer, and shall discharge the other.

If the Local Government or Administration decide that both are fit for appointment, it shall select and appoint to be Assistant Engineer the apprentice who stood first in order of merit in the College Final Examination, and in discharging the other shall cause to be endorsed on his College Certificate, a certificate of his practical fitness.

An apprentice shall receive a salary of Rs. 100 a month if a European or Eurasian and of Rs. 50 if a pure Native of India.

Expenses.—The tuitional expenses for books and instruments are calculated at Rs. 232 for the 1st year, Rs. 106 for the 2nd year and Rs. 43 for the 3rd year.

With regard to current living expenses the regular monthly charges amount to about Rs. 40. The other ordinary charges are for messing, personal servants and clothes. Of these it has been arranged that the first, *i.e.*, Mess items, can only be obtained on cash payment; the other two and any other expenses the student may incur, are beyond the control of the College Staff. For Indians the fixed charges amount to Rs. 26-4-0.

Complete information may be obtained from the Circulars and Syllabi which can be obtained on application.

The three years course of study comprises 15 subjects grouped under six heads to which the following numerical values are given.

			Rs.
Group I.	..	Pure and Applied Mathematics ..	2,300
Group II.	..	Science	900
Group III.	..	Descriptive Engineering ..	1,050
Group IV.	..	Engineering Practice ..	1,250
Group V.	..	Survey and Drawing ..	1,600
Group VI.	..	Physique ..	500
			7,600

To obtain a Higher Certificate the minimum pass marks of 33 per cent. in each group and 66 per cent. in the total must be earned. To obtain an Ordinary Certificate 33 per cent. in each group and 50 per cent. in the total.

The project.—Is a distinctive feature of the Engineer Class curriculum. Three months independent work in the 3rd year are devoted to it and 1,000 marks allotted.

It is designed to be a practical test of all the practical and theoretical work the students has done in his three years at College.

Electrical Engineer Class.—This Class was formed for the training of students for the Telegraph Department and the Electrical Engineering Profession. Nominations were given to students from the Engineering Colleges at Sibpur, Madras and Poona. It has not fulfilled its object successfully and is to be either abolished or reformed. Till this is done it is not worthwhile giving details.

Upper Subordinate Class.—This Class is in three grades Military, European, Civilians and Indians. Each has a separate entrance examination, but in entering the College they come into open competition with each other. For the whole Class there are 27 vacancies every year. Of these, 12 are of the 1st Grade for Soldiers, 9 are of the 2nd Grade for English Civilians, and 6 are of the 3rd Grade for Indians. In the event of there being insufficient passed Candidates in any of the grades, the total number (27) will be made up by more admissions in the other grades so as to ensure sufficient competition among the students for the 16 guaranteed appointments. In addition to these 27 vacancies, 13 men next on the list will be admitted as unprivileged students paying a fee of Rs. 20 per mensem. These students will be eligible for guaranteed appointments and second year scholarships. The course is for two years at the College and one year practical apprenticeship on works for those who gain guaranteed appointments. Those who pass by the "Higher" or "College" Standard will receive Special Certificates, exempting them from all further *theoretical* examination for promotion to Sub-Engineer. Of those who pass successfully, 16 men will be appointed as "Overseer Apprentices," preference being given to the first 7 Military men of the Second Year on the list, then to Second Year men, Military and Civil, in order of standing. They will still be borne on the lists of the College and receive salaries of Rs. 80, 60, 40 according to grade.

The apprentices will keep Notes of the Works they are instructed on, which they will submit monthly, with a diary of occupation, through the Instructor and Executive Engineer to the Principal at Roorkee. The Principal will finally decide which apprentices are fitted for permanent appointment to the Public Works Department.

1st Grade.—For *British Non-Commissioned Officer.*—Candidates for admission to this Class must be Non-Commissioned officers of not less than three years' service in the Army, of *thoroughly* good character, not over 28 years of age on the 1st

June immediately preceding the Entrance Examination of this College in which they wish to appear.

The following is a list of the subjects for the Entrance Examination:—

1. English—Reading and Dictation.
2. Arithmetic.
3. Algebra.
4. Geometry Euclid Books I and II.
5. Hindustani.
6. Drawing (optional).

2nd Grade.—*For Europeans and Eurasians.*

3rd Grade.—*For Indian.*

Candidates for admission to this class must not be under 17 or above 22 years on the 1st June immediately preceding the Entrance Examination of this College in which they wish to appear.

Applications for admission should *reach* the Principal, complete in all respects, *not later* than the 15th April, preceding, accompanied by a statement of the date of birth of the candidate, the schools or school at which he has been educated, the profession, situation, relationship and residence of his father or guardian (by whom ordinarily, and not by the Candidate himself, the application for admission should be made), one of the seven Examination centres (mentioned above) he wishes to be examined at.

Every Candidate will be required to produce testimonials (which will not be returned) of good moral conduct.

The qualifying tests for admission to Entrance Examination will be the Entrance Examination of an Indian University, or the School Final in the United Provinces, or the Alternative Entrance in the Punjab, or the School Final in Bombay, or the the Upper Secondary Examination in Madras, or the Final or High Standard Examination under the Code of Regulation for Europeans Schools in force in Bengal, United Provinces, Punjab and Central Provinces.

A "registration" fee of ten (10) rupees must accompany the Candidate's application for Examination.

The following is a list of subjects for the Entrance Examination which is held separately for each grade.

1. English writing from Dictation.	..	50.
2. Arithmetic.	..	75.
3. Algebra.	..	75.
4. Geometry Euclid Books I and II.	..	50.
5. Hindustani.	..	50.
6. Drawing.	..	100.
		<hr/>
		400

In this Class a College fee of Rs. 8 a month during the Session is charged to Students admitted through the Entrance Examination. All Students of this Class will be provided with quarters in the the College Barracks at a monthly rent of Rs. 2 for Grade II and Re. 1 Grade III.

For Grade II.—There are 12 Scholarships of Rs. 25 each per mensem tenable for *the nine months of the college Session*; of these six are awarded annually on the results of the Entrance Examination, and the remaining six on the results of the First Year's Final Examination.

For Grade III.—There are six Scholarships of Rs. 10 each per mensem tenable *for the 9 months of the College Sessions*; of these three are awarded annually on the result of the Entrance Examination, and the remaining three on the first year's Final Examination.

The initial expenses for books and instruments are calculated at Rs. 125 for the first year and Rs. 66 for the second year. The current monthly expenses, for 9 months only, will be Rs. 40 for English Students and Rs. 30 for an Indian Student.

The College course comprises the following subjects:—

1. Elementary Mathematics	..	..	..	800
2. Mechanics	..	..	..	200
3. Applied Mechanics	..	..	..	320
4. Natural Science	..	..	..	150
5. Drawing	..	..	..	600
6. Surveying	..	..	..	500
7. Estimating	..	..	..	200
8. Accounts	..	..	..	100
9. Languages	..	..	..	100
10. Engineering	..	..	..	860
11. Workshops	..	..	..	200
12. Process work	..	..	..	40
13. Physique	..	..	..	300
				<hr/>
				4370

For an ordinary certificate a student must obtain during his course one-half in total and one-third in each subject. For the Higher or College certificate a student must obtain three-fifths of the total and one-half in each subject.

Lower Subordinate Class. The admissions at present are limited to sixty. Forty of whom pay a fee of Rs. 4 per mensem, the remaining 20 being "unprivileged" students and pay a fee of Rs. 10. All candidates must be between 17 and 21 years of age on 1st June immediately preceding the Entrance Examination of this College in which they wish to appear and must furnish a certificate of sound health and physical fitness for the duties of Sub-Overseer (*vide* form below); no other form will be accepted. A registration fee of five (5) rupees must accompany the candidate's application for examination. For admission, candidates must be well recommended as students of good character by the Master of the school in which they have been instructed, or by the Deputy Educational Inspector of the district to which they belong. In the case of passed "Teachers;" certificates must be furnished that three years have elapsed since they left the Normal School, or that they have the permission of the Inspector of Schools of their district to apply for entrance to this College.

The subjects for the Entrance Examination are as below :—

	Marks assigned.	Prize, Rs. a. p.
Arithmetic, as in Kirkman and Field's Arithmetic for schools	100	2 8 0
Printing as for Plans	50	0 6 0
Elementary Geometry (1st and 2nd Books of Euclid)	50	No Text-book.
Mensuration of Planes (Pierpoint's Elementary Mensuration for Indian Schools, Part I)	50	1 14 0
Text-book of Indian History (<i>Krene's</i>)	50	
Elementary Geography (<i>S. A. Hill</i> , 1st and 2nd Books)	50	
English Dictation	50	
English Colloquial	50	No Text-book.
Total	450	

The examination will be conducted in English; marks will be given for hand-writing in all the papers. No qualifying test for admission to the Entrance Examination is required.

Scholarships are awarded monthly during the College Sessions according to the standing of the students in the Entrance and the Term Examinations. No man will receive a Scholarship who has not gained qualifying marks in all subjects for the month in which the Scholarship is payable. *In the Sub-Overseer Classes the Scholarships are—the first five men at Rs. 6, the next ten at Rs. 5, the next ten who qualify will receive Rs. 4 monthly.* Ten of the above Scholarships to the Sub-Overseer Classes are granted by the Director of Public Instruction, United Provinces, five to the first year and five to the second year according to the order of Standing.

Free quarters are provided, but no member of a student's family is allowed to reside in them with him.

Students of these classes are intended for the Lower Sub-ordinate grades of the Public Works Department, but appointment is not guaranteed. The pay of the several grades is as follows, consolidated, with certain allowances for travelling:—

	Quinquennial		Maximum.
	Minimum.	increase.	
	Rs.	Rs.	Ks.
Sub-Overseer, 1st grade ..	50	10	70
Sub-Overseer, 2nd grade ..	35	5	45
Sub-Overseer, 3rd grade ..	30	5	35

No appointments are guaranteed but the Principal maintains a register of employment and assists all passed men to obtain posts.

The initial expenses for books and instruments are calculated at Rs. 100 and the current monthly expenses for nine months only, will be Rs. 15.

The College course of study comprises the following 13 subjects:—

1. Elementary mathematics ..	..	..	640
2. Mechanics ..	..	..	100
3. Applied Mechanics ..	..	..	160
4. Natural Science ..	..	..	60
5. Drawing ..	..	..	700
6. Surveying ..	..	..	700
7. Estimating ..	..	..	300
8. Accounts ..	..	..	100
9. Languages ..	..	..	300
10. Engineering ..	..	..	500
11. Workshops ..	..	..	200
12. Process work ..	..	..	40
13. Physique ..	..	..	4,040

To qualify for a certificate as a 3rd grade Sub-Overseer, students must gain at least one-third marks in each subject and one-half of the total marks.

Draftsman and Computer's Class.—Any candidate for the Entrance Examination of the Lower Subordinate Class who has passed, but who is not among the successful candidates for the Lower Subordinate Class, may appear for a special Examination in Drawing held in the first week in the Session. The five candidates who stand highest in order of merit may be admitted to the Draftsman and Computer Class.

The course will be for three years.

The last year will be entirely devoted to the preparation of working drawings, specifications and estimates for actual works from data supplied.

Each student will pay a College fee of Rs. 4 under paragraph 10.

On completion of the Three Year's Course qualified students will receive certificates as Draftsmen and Computers.

British and Native Military Survey Classes.—Eight British Non-Commissioned Officers (ordinarily four from the Punjab and four from the Bengal Command) and twenty Non-Commissioned Officers and men of the native army, of good character, and likely to become proficient, will be trained as surveyors annually at Roorkee. The course will be from the 16th October to the 15th July. British candidates should preferably have passed the Lower Standard in Urdu, and must have not less than three year's service with four years to serve in India. On selection they will be required to extend their service to twelve years. Native candidates must be young soldiers of the following classes:—Pathans, Sikhs (including Khatri Sikhs from Tirah), Kizilbashes, Afghan Musalmans (preferentially Shiabs), Gurkhas, Jats, Dogras, and Rajputs. They must be able to write English, Urdu or Nagri from dictation and must possess a knowledge of arithmetic including decimals.

The Technical Side.—The Engineering side of the College described above devotes itself entirely to the Civil Engineering

profession, while the Technical side now about to be described is intended to train men for the rest of the Engineering professions and to foster and assist any trade or Industry which can give an Indian an opening to earn an honest livelihood through the work of his hands and brains. To carry out this scheme there is a finely equipped Educational workshop with the latest up-to-date tools and plant and a large Photo, Mechanical and Lithographic Department.

The Classes at present existing are the—

- Technical Class.
- Mechanical Apprentice Class.
- Automobile Driver Class.
- Industrial Classes.

Technical Class.—There are 35 vacancies yearly for admission into this class. Candidates must be of pure Indian descent, domiciled in the United Provinces of Agra and Oudh, not more than 22 years of age on the 1st June of the year in which they wish to be admitted, and must have passed the Entrance or School Final Examination. District Boards in these Provinces may each nominate one candidate and submit their nominations to the Commissioners of their Divisions who, from the candidates so nominated, will select the numbers allotted to their divisions for admission to the College. When they consider it necessary, District Boards may give Scholarships not exceeding Rs. 12 per mensem to students they have nominated to cover College expenses. The Principal, Thomson College, Roorkee, may nominate 10 students to the class and the Vaishya Mahasabha, Allahabad, may nominate two students.

The course will extend for three years.—On joining, a student may join either Division A or B of the class. For the first 21 months half the day will be spent in practical and half in theoretical work. The practical work will be done in the following shops :—

- Carpenter's shop—six months.
- Forge and Foundry—six months.
- Fitting and Machine shops—nine months.

At the end of 21 months, apprentices will be required to choose a Section or Sections of his Division to specialize in, and the last six months will be entirely devoted to practical work in this Section or Sections.

The Divisions and Sections are—

- Division A.*—(i) Electrical Power Installations,
(ii) Electric Light Installations,
(iii) Telephone Exchange Installations,
(iv) Motor Cars,

- Division B.*—(i) Steam, Gas or Oil Engines,
(ii) Machines related to the Cotton Industry,
(iii) Machines related to the Manufacture of Ice,
(iv) Machines related to the Manufacture of
Sugar,

or any other Technical subject which a student intends to take up as a means of livelihood after the completion of his course.

Students of this class will pay no fees. A free grant of necessary books and instruments at a maximum cost of Rs. 100 will be made by the College to each student. These books and instruments will not become the property of the student until he has completed his whole course in a successful manner and received his certificate.

Free quarters are provided at the College, but no member of a student's family is allowed to reside there with him. Students are not allowed to remain in the quarters during vacations.

Expenses of Students of the Technical Class.—The only fixed charge to students is 8 annas a month for the Recreation fund. The other charges are for messing, personal servants and clothes. These and any other expenses the student may incur are beyond the control of the College staff. These are estimated at Rs. 15 a month.

Mechanical Apprentice Class.—There are 25 vacancies yearly for admission to this class, twenty for competitive examination and five for nomination. Candidates must be statutory natives of India, and must not be under 15 or above 22 years of

age on 1st June, immediately preceding the Entrance Examination of this college in which they wish to appear.

An examination Fee of Rs. 2 together with the usual statements must be forwarded with an application for examination.

The Entrance Examination is competitive and as follows—

I. Elementary English—			
(i)	Reading .. .. .	..	100
(ii)	Dictation .. .. .	..	50
II. Elementary Mathematics—			
(i)	Arithmetic up to decimals.	..	100
(ii)	Mensuration simple .. .. .	..	70
(iii)	Algebra (four rules) .. .	..	50
III. Drawing—			
(i)	Elementary Plane Geometry ..	..	100
(ii)	Elementary Freehand Drawing ..	..	50
(iii)	Elementary model Drawing ..	..	70
IV. Practical Carpentry (simple joints)			
		..	100

The course for this class will extend to five years. Three years will be spent at the College. These three years consist of three sessions (16th October, to 15th July) of nine months each. For the first 21 months, half the day will be spent in practical and half in theoretical work, in the following shops:—Carpenters' shop, six months. Forge and Foundry, six months. Fitting and Machine shops, nine months. At the end of 21 months, apprentices will be required to choose a branch to specialize in, and the last six months of College work will be entirely devoted to practical work in this branch. The branches at present available are—(1) Engine Drivers—Locomotive, Stationary, Portable or Oil engines. (2) Fitters. (3) Electric Light Installations; (4) Mechanical Draftsmen.

For the remaining two years of the course apprentices will, if possible, be formally indentured out to some employer in the branch they have chosen. The apprentice will be required to undertake to keep the hours and rules specified by his employer, and not to leave his employment during the two years.

On the conclusion of five years' apprenticeship, a certificate as mechanic in the particular branch chosen will be issued on the recommendation of the employer. Apprentices in Branch

(1) Engine Drivers, will further be required to obtain a certificate under Notification No. 1278M., of 2nd July 1901, " Rules and Orders under the United Provinces Steam Boilers and Prime Movers Act, 1899."

Students of this class, whose parents or guardians are domiciled elsewhere than in Bengal, Eastern Bengal and Assam, Madras or Bombay, pay no fees. Fifteen stipends of Rs. 8 each a month are available for the class during the three years at the College.

A free grant of books and instruments at a maximum cost of Rs. 72 can be made at the discretion of the Principal to each student. These books and instruments will not become the property of the student until he has completed his whole course in a satisfactory manner and received his certificate.

During the last two years of practical apprenticeship, apprentices (if vacancies can be obtained for them) will receive, in addition to any wages given by their employers, Scholarship, of Rs. 8 a month from the College, tenable for two years. The Scholarship will be given on the condition that the apprentice works hard, and honestly carries out the terms of his indenture.

Free quarters are provided at the College, but no member of a student's family is allowed to reside there with him. Students are not allowed to remain in their quarters during vacations.

Automobile Drivers Class.—A certain number of apprentices will be admitted yearly on the 16th October, for training as drivers of Motor Cars. Natives of pure Asiatic descent, whose parents or guardians are domiciled in Bengal, Madras and Bombay, are not eligible for admission to these Classes.

The object is to turn out two grades of drivers.—

Grade I.—A " chaffeur " who cannot only drive but has a thorough knowledge of the design and theory of Motor Cars and their electrical connections, who will be competent to carry out all repairs and take complete charge of a car, or who may wish to start Motor Car repairing workshops.

Grade II. A capable driver who has a general knowledge of the construction of a car and its electrical connections and can carry out simple repairs.

The course for Grade I lasts about 18 months and for Grade II three months.

No fees are charged.

Industrial Apprentice Class.—A certain number of apprentices will be admitted yearly on the 16th October, for training as workmen. Natives of pure Asiatic descent, whose parents or guardians are domiciled in Bengal, Madras and Bombay, are not eligible for admission to these Classes.

For admission, candidates must submit a certificate signed by the Head Master of the school in which they have been instructed, countersigned by the Inspector of the Educational District to which they belong, showing that they are of good character, industrious and have an aptitude for scientific or mechanical pursuits, and that they are educated up to the following standard :—

In Vernacular..	{	1. To read a simple vernacular reader.
		2. To write passages from it in dictation.
In Arithmetic..	{	To know the four compound rules in money and bazar weights, and to be able to work simple examples from them.
In English ..	{	To know the English alphabet and English figures.

The object of admitting apprentices being solely to turn out more highly skilled workmen than are at present obtainable in the country; no candidate will be admitted who does not intend to gain his livelihood after leaving the College by following the trade in which he has been trained, and a declaration to this effect must be signed by the candidate and his guardian.

Apprentices may elect to be trained in any of the following trades :—

1. Lithographic Draftsmen.
2. Ditto Pressmen.
3. Photographers.
4. Photographic Transfer men
5. Photo-Mechanical Operators.
6. Electric Jobbers.
7. Any branch of workshop practice carried on in the College Workshops.

Apprentices pay no fees and will be provided with free quarters, but no member of an apprentice's family is allowed to reside in them with him.

No stipends will be given, but a certain number of scholarships of Rs. 4 per mensem are available to be given at the discretion of the Principal to such apprentices as show marked application and ability. No apprentice can receive a Scholarship till he has been in the College for three months or may hold Scholarship for more than a year. No Scholarship will be payable while an apprentice is on leave or vacation.

When an apprentice has acquired sufficient skill to enable him to turn out useful work, he may be paid wages according to the value of his outturn, at the discretion of the Principal if the Department in which he is being trained requires his services. No wages will be paid to an apprentice who holds a Scholarship.

Apprentices working in the Lithographic or Photo-Mechanical Departments will work all the year round and may be granted casual leave up to 20 days in the year at the discretion of the Principal.

The College Workshops being closed from the 16th July to the 15th October, apprentices working in them will go on vacation during those months and are not allowed to remain in their quarters during vacation.

Tools and materials will be supplied free for the use of apprentices, but remain the property of the College, and all work turned out during working hours will be the property of the College.

No time limit is laid down for the apprentices' course. When in the opinion of the Principal an apprentice is a skilled workman, competent to earn his livelihood, he will be granted a certificate as such. The College does not undertake to find employment for any men, though it will give all the assistance it can. Certificate holders are expected to find employment for themselves in the open market. Any apprentice leaving before he is, in the opinion of the Principal, a skilled and competent workman, will on no consideration be given a certificate.

Grade II. A capable driver who has a general knowledge of the construction of a car and its electrical connections and can carry out simple repairs.

The course for Grade I lasts about 18 months and for Grade II three months.

No fees are charged.

Industrial Apprentice Class.—A certain number of apprentices will be admitted yearly on the 16th October, for training as workmen. Natives of pure Asiatic descent, whose parents or guardians are domiciled in Bengal, Madras and Bombay, are not eligible for admission to these Classes. *

For admission, candidates must submit a certificate signed by the Head Master of the school in which they have been instructed, countersigned by the Inspector of the Educational District to which they belong, showing that they are of good character, industrious and have an aptitude for scientific or mechanical pursuits, and that they are educated up to the following standard :—

In Vernacular..	{	1. To read a simple vernacular reader.
		2. To write passages from it in dictation.
In Arithmetic..	{	To know the, four compound rules in money and bazar weights, and to be able to work simple examples from them.
In English ..	{	To know the English alphabet and English figures.

The object of admitting apprentices being solely to turn out more highly skilled workmen than are at present obtainable in the country; no candidate will be admitted who does not intend to gain his livelihood after leaving the College by following the trade in which he has been trained, and a declaration to this effect must be signed by the candidate and his guardian.

Apprentices may elect to be trained in any of the following trades :—

1. Lithographic Draftsmen.
2. Ditto Pressmen.
3. Photographers.
4. Photographic Transfer men
5. Photo-Mechanical Operators.
6. Electric Jobbers.
7. Any branch of workshop practice carried on in the College Workshops.

Apprentices pay no fees and will be provided with free quarters, but no member of an apprentice's family is allowed to reside in them with him.

No stipends will be given, but a certain number of scholarships of Rs. 4 per mensem are available to be given at the discretion of the Principal to such apprentices as show marked application and ability. No apprentice can receive a Scholarship till he has been in the College for three months or may hold Scholarship for more than a year. No Scholarship will be payable while an apprentice is on leave or vacation.

When an apprentice has acquired sufficient skill to enable him to turn out useful work, he may be paid wages according to the value of his outturn, at the discretion of the Principal if the Department in which he is being trained requires his services. No wages will be paid to an apprentice who holds a Scholarship.

Apprentices working in the Lithographic or Photo-Mechanical Departments will work all the year round and may be granted casual leave up to 20 days in the year at the discretion of the Principal.

The College Workshops being closed from the 16th July to the 15th October, apprentices working in them will go on vacation during those months and are not allowed to remain in their quarters during vacation.

Tools and materials will be supplied free for the use of apprentices, but remain the property of the College, and all work turned out during working hours will be the property of the College.

No time limit is laid down for the apprentices' course. When in the opinion of the Principal an apprentice is a skilled workman, competent to earn his livelihood, he will be granted a certificate as such. The College does not undertake to find employment for any men, though it will give all the assistance it can. Certificate holders are expected to find employment for themselves in the open market. Any apprentice leaving before he is, in the opinion of the Principal, a skilled and competent workman, will on no consideration be given a certificate.

Photo Mechanical and Lithographic Department.—Primarily formed in 1851 for the printing and illustration of scientific works, the Press has steadily been improved and not only now carries out a large amount of map, reproduction and illustrative work for the professional and scientific departments of Government, but trains a number of Indians in these arts for which they are peculiarly well fitted and which they cannot learn elsewhere.

The Department is organised into the following sections.—

1. Superintendence and clerical.
2. Lithographic Drawing.
3. Negative and Transfer.
4. Lithographic Printing.
5. Photo engraving and printing.
6. Pure photography and printing.
7. Typography.
8. Miscellaneous.

It employs over 100 workmen, industrial and other apprentices. The Typographic work done is however only what is required for the rest of the department.

Special Courses and Examinations.—The College conducts the following outside examinations.—

1. Examination for admission or promotion to the Grade of Sub-Engineer.
2. Examination for outsider candidates for the Grade of Overseer.
3. Entrance Examination for the Superior Establishment of the Accounts Branch.
4. Examination for Entrance to the 4th Grade of Accountants, Public Works Department.
5. Examination qualifying Accountants for promotion to the 2nd Grade Part I.

Register of Employment.—This register is kept up by the Principal for Engineers, Overseers, Sub-overseers, Draftsmen, Mistries, Mechanics and Artizans of various kinds requiring employment. No fees are charged. Candidates are required to fill in a form giving full particulars of the nature and periods of their previous services, their reasons for leaving and salary

required. They are required to send copies of their certificates which must be verified by an Officer. Confidential enquiries are also made from their employers. The register is printed at intervals and will be sent to any one on application.

Employment is found from 150 to 200 men annually.

The Library.—Is a general and scientific library containing some 22,000 books.

The Model Room.—Is a spacious hall filled with Engineering and Technical models.

The Laboratories.—When the new building is completed these will be worthy of the College.

They consist of.—

1. Chemical Laboratory.
2. Electrical "
3. Physical "
4. Mineralogical "
5. Mechanics (Mathematical) Laboratory.
6. Engineering Laboratory.

Testing Department.—This has been instituted for giving advice and assistance to Government offices and the public generally. A scale of fees and tests can be forwarded on application.

Meteorological Office.—Is a branch office under the Meteorological Department.

The Book Depot.—Supplies all College manuals, test books and instruments to students at the lowest possible prices.

The Water Works consists of two systems both worked electrically and run in pipes. One a well supply for drinking and the second a supply from the Ganges Canal for washing and irrigation.

The College Stores, Dairy and Soda water factory.—Supply the students with all provisions, stationery and include a bakery, tailors, shoe-makers and banias shop.

The College Dispensary in charge of an Assistant Surgeon under the Civil Surgeon deals with all minor cases of sickness. Serious cases are dealt with in the Civil and Station Hospitals.

The Sports and Athletic Clubs.—Each Class has its recreation grounds and sports are fostered in every way. A Regatta

and Athletic sports meeting are held yearly. Gymnastics is voluntary and classes are held every evening under an Instructor.

The Volunteer Company.—All European students are obliged to join this Company which is part of the Mussoorie Volunteer Rifles and is very efficient.

Yearly outturn of students.—It is impossible to give any details of the numbers which have passed out of the College but yearly in rough figures the outturn is at present :—

Civil Engineers.	..	20
Upper Subordinates.	..	40
Lower	..	60
Draftsmen.	..	4
British Military Survey Class.	..	8
Native	..	20
Technical Class.	..	35
Mechanical Apprentice Class.	..	20
Automobile Drivers.	..	45
Industrial Classes.	..	30
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There is no difficulty in obtaining employment for any of these men.

The above very briefly describes the varied and multifarious duties of the Thomson College, the chief aim being to train Statutory Natives for lucrative and honourable positions in the Engineering and Industrial works.

In carrying out the recommendations of the Technical and Industrial Conference convened by His Honor Sir John Hewett at Naini Tal last year, it is possible that a Technological Institute for the Engineering trades and metal Industries may be established at Roorkee which may materially modify the above described organisation.

List of Staff of Thomson College, Roorkee.

No.	Names.	Designation.
1.	Major E. H. de. Atkinson R. E.,	.. Principal.
2.	Captain H. B. D. Cambell, R. E.,	.. Military Assistant.
3.	Mr. E. F. Tipple, B. A.,	.. Professor of Mathematics.
4.	Mr. F. W. Sedgwick, M. A., A. M. I. E. E.,	.. " of Experimental Science.
5.	Lieutenant D. K. Edgar, R. E. ..	.. Professor of Drawing and Surveying.
6.	Dr. P. P. Phillips, Ph. D., F. C. S.,	.. Professor of Chemistry.
7.	Conductor F. W. Hart ..	.. Instructor in Photography and Applied Science.

THE AGRICULTURAL COLLEGE, CAWNPORE.

Brief History.—There is one college in these provinces for teaching Scientific Agriculture, and it is called “The Agricultural College, Cawnpore.” As the result of the recommendations of the Technical Education Committee, the Government of the United Provinces sanctioned on 22nd July, 1892, the establishment of an Agricultural School at the Government Experimental Farm, Cawnpore. Previous to this, there existed at Cawnpore a special class, for the instruction of candidates for the Subordinate Revenue Service, which was absorbed by the Agricultural School in 1893. The first Head Master of the school was the late Mr. P. V. Subbiah, an Indian Graduate of the Saidapat College, Madras. From 1893 to 1906, the number of students increased and additions were year by year made to the number of teaching staff and the number of subjects taught, which in the latter year included Chemistry, Physics, Geology, Botany and Entomology. In 1906 the school was converted into a college, the two years’ course was extended to three years, the syllabus was further enlarged, and the whole establishment re-organised. Three European officers (Principal, Economic Botanist and Agricultural Chemist) were appointed to superintend the studies and further additions were made to the staff.

Course.—The course is meant to meet the requirements of the students of the following classes:—

- (a) Candidates for posts in Subordinate Revenue Service.
- (b) Candidates for employment under Government in the Agricultural or other Departments.
- (c) Landholders and students who propose to follow the profession of Land-Agents.
- (d) Students who desire to follow Horticulture or Agriculture as a means of livelihood.

The course of study extends over 2½ years, during which the subjects taught are:—

1. The theory and practice of Agriculture (including the care and treatment of farm animals, the working of a Dairy Farm book-keeping, and a veterinary course).

2. The elements of the following branches of Science, as far as they are required for a proper understanding of the Agricultural course—Physics, Meteorology, Chemistry, Geology, Botany, Entomology, Zoology, and Agricultural Engineering.

3. The Land records and Tenancy system of the Province and Estate management.

4. Hindi and Urdu. Special instruction is given in these subjects to students of class (A) whose knowledge is deficient.

Riding and Gymnastics are also taught by qualified Instructors, and with the object of developing the physique of the students, a special point is made of games which are compulsory on 4 days in the week.

The following special courses are arranged after the final examination to meet the practical needs of students. Endeavours will be made to arrange other courses to meet the needs of individual students.

1. Class (A) Additional instruction in surveying and in preparation and supervision of the land records.

2. Class (B) Additional instruction in practical agriculture in one of the Departmental Farms.

3. Class (C. D.) Additional instruction in Estate management in one of the Estates under Court of Wards' management.

4. Class (D) Additional instruction in Horticulture under one of the superintendents of Government Horticultural Gardens.

There are no prescribed text books; all the teaching is by lectures and practical instruction both on the field and in the laboratories. The College holds its own examination at the end of the third term and confers its own Diploma.

The year's terms are divided into three as follows:—(1) From about 10 days after Dasehra to 23rd December; (2) From about 4th January to about end of April; and (3) From 1st July to about 10 days before Dasehra.

Fees.—There are no fees either tutional or Boarding House charged at present, but it is probable that small fee will be charged from next October. Students are required to subscribe to the various college clubs in whose benefit they share. The

present total subscription is Rs. 3 per month for riding, games, reading room, etc., with an entrance fee of Rs. 15.

Scholarships and Prizes.—Scholarships and prizes are awarded to the students as stated below :—13 Scholarships (five senior and eight junior) are awarded to the students of each year. The value of the senior Scholarship is Rs. 8 monthly for two years and Rs. 12 monthly for the third year, that of a Junior Scholarship is Rs. 5 monthly for two years and Rs. 10 monthly for the third year. There is one Subbiah Medal which is given yearly to the student who passes first in the final examination, and other prizes for the respective years amount to Rs. 50 for the first year students, Rs. 75 for the second year students, and Rs. 100 for the third year students.

Boarding Houses.—Students are required to reside in the Boarding Houses, which are provided with tables and chairs. Students are given free medical attendance by an Assistant Surgeon. There are seven Boarding Houses, and two dining halls, one for Hindus and one for Muslims, and kitchens are in course of construction. Four Indian lecturers of the College reside in quarters attached to the Boarding Houses and act as superintendents.

Qualifications of Students seeking admission.—All students are required to have passed the Entrance, School Final, or some higher examination, and candidates for posts in the Subordinate Revenue Service are admitted only on the nomination of a District Officer serving in the United Provinces. In special cases students of class C. and D. may be admitted without having passed either of the above examinations, but must have a good knowledge of English.

Finance.—The entire cost of the institution is borne by Government.

Number of Students.—At present there are only I and II year's classes and the students in each are as follows :—I year, 55 ; II year, 46 ; total, 101.

Past Students.—Upto this time there have passed out of this institution about 276 Diplomates, the majority of whom are

servicing in the Subordinate Revenue Service, while some are holding responsible posts in the Agricultural Departments of the United Provinces and the Punjab. A few are farming on their own account and a few are in the service of landlords.

General.—This institution is very popular in these provinces and has got a very wide reputation in Northern India. Its popularity and reputation can be gauged by the facts that the numbers admitted to it rose from 20 students in 1893 to 22 in 1897, 29 in 1901, 50 in 1905, and 55 in 1907.

Last year applications for admission to all the sections of the College were 285 in number. Students come from all grades of life from scions of historic families to sons of hereditary farmers. It has attracted students from as far East as Assam, as far West as North-West Frontier Province, and as far South as Bhopal.

Staff.—Principal, A. W. Fremantle, Esq.; Lecturer in Agriculture, B. V. Patwardhan, Esq.; Economic Botanist, H. M. Leake, Esq., F. L. S.; Lecturer in Zoology, Bhopal Singh, Esq.; Lecturer in Entomology, E. S. David, Esq.; Lecturer in Botany, R. V. Damle, Esq.; Agricultural Chemist, G. Clarke, Esq., F. I. C.; Lecturer in Physics and Geology, Pandit Tej Shankar Kochak; Lecturer in Chemistry, Lala Har Narain. There are several Assistant Lecturers besides.

THE GOVERNMENT INDUSTRIAL SCHOOL, LUCKNOW.

*(From Report on Public Instruction for 1906-7 and a Note
by the Head Master.)*

History.—The principal object with which this school was established in 1892 was to train men for employment as subordinates on the Railways; and it was hoped that it might at the same time turn out men able to earn a good living as cabinet makers and carpenters. At first only members of the artizan class were admissible and in its first year about 90 per cent. of the pupils were sons of railway employees. But in less than ten years almost no trace of the original aim of the institution was visible. The sons of artizans who alone originally were eligible for admission had been practically eliminated and the literary education which formed part of the course of instruction, was found to be the chief attraction, while industrial education lan-

guished. Accordingly in 1901-2 several drastic remedies were applied. Literary subjects were abolished, bazar workshops were organized on the Casanova lines and a night school was established. But these experiments proved disastrous. The abolition of literary subjects practically emptied the school. In less than a year the number of pupils fell from 155 to 59 and a year later to 18, of whom only two were sons of artizans. The bazar workshops scheme was a complete failure, and the night school which was never attended by pupils outside the school, was empty on March 31st, 1903. It was, therefore, decided in 1903, while emphasizing the importance of the industrial side of the work to re-introduce elementary general education, to abandon the scheme of bazar workshops on the Casanova plan and to close the night school. The restoration of literary subjects, though in due subordination to the aims of the school, was followed by a recovery in numbers as rapid as the previous decline. By the end of the year the number rose to 94, of whom 14 were sons of artizans, and a year later there were, 16 boys at the school. Since then the enrolment has been steadily increasing, and the number of the sons of artizans during the year reached 53. The manual work in the school has meanwhile been improved considerably and brought into closer relation with local industries. This brief review of the school's vicissitudes will show the futility of making an absolute separation between industrial and general education, even though the latter may be of only an elementary character.

Workshop.— At the opening of the school workshop instruction was given in wood work and iron work. This have from time to time been added to and at the present time a new workshop is being built to accommodate all the technical courses particulars of which are given below.

The workshops are being fitted with a complete equipment of general tools and machines both for wood and iron working which will be electrically driven, the necessary current being supplied by the School Power House which has been specially built for the purpose this year.

Subjects.— The subjects taught at the School are Industrial Drawing, Practical Mathematics and Practical English. The

Workshop training is in the following, any of which may be selected by the student :—(1) Iron and steel forging and fitting ; (2) Iron and steel turning, Screw cutting, Machine work and fitting ; (3) Moulding in brass and iron, including simple Pattern making; (4) Carpentry, Joinery and Cabinet work; (5) Carpentry, Joinery Machinery work and Turning ; (6) Painting and Polishing.

Additional instruction is probably to be given shortly in Electric wire work and fitting and Motor car driving and repairing including vulcanising etc.

There is also a special drawing course in which instruction in mechanical and free-hand drawing and dimension sketching together with manual training in wood work is given. The course also includes Memory, Light and shades Plant. Geometrical, and Model drawing, also class teaching and management.

Number on the Rolls.—The number on the rolls in November 1908, was 305. These included sons of artizans, of traders and shop-keepers, of clerks, and mukhtars, of doctors and hakims, of landowners and agriculturists, of pensioners and wasikaholders, of menials, of contractors etc. Forty-five boys were in the Special Drawing classes, 101 were taking the ordinary course, and 159 were taking the preliminary course. The attendance in the special drawing classes which was poor in the beginning owing to the high fees charged in the class has more than doubled.

Fees.—The fees charged are as follows:—Preliminary course, 4 as. per month ; ordinary course, 8 as., 12 as., and Re. 1 per month, and Special Drawing Classes, as for classes V to X in the U. P. Government High Schools. Admission fee to Preliminary and ordinary classes is Re. 1, and to the Special Drawing Classes Rs. 2.

Free studentships.—The number of *free studentships* is limited at present to 120, 20 of whom may be sons of Europeans or Eurasians, and the rest must be sons of artizans and preferably those related to Railway Artizans. Only boys from orphanages may be admitted as free students even if they be not sons of artisans on condition that they remain in the School

to complete one of the prescribed courses. Poor boys who are not eligible for these freestudentships may be admitted as free or half freestudents up to a limit of 5 per cent. of the paying students as in district schools. Free students are supplied gratis with books, drawing instruments and other appliances.

Scholarships.—Thirty-six Scholarships of the total value of Rs. 88 per month are awarded among the several classes. These are not generally given to students in the special Drawing Classes.

Admission.—No boy will under any circumstances be admitted to the ordinary course who is over 15 or under 10 years of age, and no boy may remain at school after he has completed the age of 21 years.

Length of Course.—The course of instruction ordinarily extends over a period of six years. The preliminary course ordinarily takes two years.

Finances.—The capital cost of the school including present extensions is about Rs. 1,06,500. The present annual maintenance charges are about Rs. 14,000. The whole cost is borne by the U. P. Government. The fee-income is about 1,500 a year and receipts from sale-proceeds, etc., another Rs. 550.

Past students.—No boy who has passed through the School is out of employment, and of passed students it has been found on enquiry that 5 are employed as workmen or head mistries, 12 as draftsmen, 19 as drawing masters and 2 as overseers on Municipal work.

Staff.—Head Master, P. H. Surinbhatt, Esq. There are nine masters besides and 9 mistries.

THE HEWETT WEAVING SCHOOL, BARA BANKI.

(Note by M. Kulecut Rai, the Superintendent.)

The Hewett Weaving School of Bara Banki, which is the only institution imparting industrial education in that district was started by the Bara Banki District Board in March 1907, with a view to encourage the factory system among the capitalists and to ameliorate the condition of the hand weavers by

introducing among them the improved processes of warping and sizing the yarn and dressing it before it is taken to the loom for weaving and by substituting improved looms in place of antiquated country loom hitherto used by them. The school has two departments:—(1) Weaving; (2) Hosiery.

In the weaving department again there are two sections. In the first section boys are trained to make and size warps according to the new method by which 80 yards long warp of 700 threads can be prepared in three to four hours. The warping machinery is very simple and can be made even by a village carpenter for Rs. 3 or even less. Here the boys are also trained in heald making, designing and manipulating silk thread on looms of Benares pattern and when they become quite efficient in this part of their education they are promoted to the second section where weaving of all kinds of silk, cotton and woolen cloth is taught on the improved looms, but it is discretionary with the boys to discontinue their study after completing the course of the first section only, as even then they are in a position to earn a livelihood by weaving silk cloth like Coosi silk of various kinds, Sangi, Cheoli and Tapti &c., or they might join section 2 at the very outset without undergoing the training in the first section, but in this case they will not become thoroughly proficient in the art.

In the hosiery class is taught the making of socks, stockings, banyans, undervests and about three dozen other articles of clothing. The period of training in every section of the weaving department and the hosiery class is three months after which time an examination is held and certificate awarded to successful students. The only condition of admission into the school is that every student has to purchase a loom or a knitting machine for him before he is allowed to receive instruction. No fee is charged except annas eight a month in the hosiery class. Fixed scholarships are not allowed, but brilliant students are, after having shown good work, allowed something in the shape of piece wages which system has proved conducive of very good results.

There is a Boarding House attached to the school, but on account of a heavy rush of out-side students it is very difficult to find room for every student at all times of the year. Private messes have therefore been started by students in the neighbourhood of the school and every help has been given them by the school staff in their management.

No special qualification is necessary in the candidate seeking admission into the school.

The capital cost of the school is Rs. 25,000 and the maintenance expenditure of the institution comes roughly to Rs. 6,000 a year. The school is maintained by the District Board and is aided by the Government as well. Besides this the Talukdars frequently send in donations towards the improvement of the school.

The names of the members of the staff are as follows:—

M. Kalwant Rai M. A.,	..	Superintendent ;
B. Chandra Shekhar, ..	..	Assistant Superintendent ;
Mr. R. DeCruze, ..	•	Hosiery instructor, (formerly master at Lokmanji Solamanji firm (Bombay) ;
Abdulla, .. ..	..	An expert in Benares work of all kinds of silk cloth ;
Daha Ali and Ramzan Ali ..	..	Masters for teaching work on improved looms ;
Syed Jaiar Husain and Syed Abdul Rahman		Teachers of Kundi work.

The number of students at present on the roll and also the number of students that passed out of the said institution are noted below:—

WEAVING DEPARTMENT,	ENROLMENT	NO. OF CANDIDATES PASSED
Section (a)	15	25
Section (b)	51	43
HOSIERY CLASS	6	13

It is gratifying to note that the school has been able to practically demonstrate the immense superiority of the Swadeshi improved loom and the enormous increase in the out-turn as compared with that of the stereo-typed looms so commonly used among the weavers.

THE ST. MARTIN'S CRAFT SCHOOL OF THE S. P. G.
MISSION, CAWNPORE.

(Note by the Rev. B. H. P. Fisher, Superintendent.)

This school, as well as the Methodist Mission School, which is in charge of the Rev. H. R. Calkins, is open to Christian students only. It has a Press Department founded in 1892, Carpentry Department founded in 1894, and a Foundry founded in 1903. It is a factory maintained for the sake of and managed in the interests of apprentices, rather than a technical or an industrial school. There is a preparatory school for boys under 14. The apprenticeship is in the Press, 3 years; the Carpentry, 5 years; the Foundry and Finishing Shop, 5 years. No technical certificates are given. The fees are Rs. 5 per mensem including board and clothing; but the majority of boys are free. It is a strictly residentiary school, as there are no apprentices not living under the control of the Superintendent. The conditions of admission are that the boy must be a Christian and have received primary education. The three shops are each financially independent and receive no grants. The residentiary department costs about Rs. 6,500 per annum. The income is derived from Mission and private sources. At present there are 16 apprentices in the Press Department, 10 in the Carpentry Department, 10 in the Foundry, and 30 in the Preparatory School. But the numbers are at present about 25 per cent. short of the normal.

The Rev. B. H. P. Fisher, M. A., is the Superintendent, and Mr. W. E. Burrows, General Manager.

BOYS' INDUSTRIAL ORPHANAGE, ALIGARH.

This Industrial Orphanage was started in the year 1900, with famine boys brought from Rajputana. There are at present 90 boys in the Orphanage. The cost of maintaining each boy is Rs. 4. The sources of income are contributions received from America and a grant from Government for teaching industries. Primary Education is given to the boys, who are taught Carpentry, Weaving, Chick and Bamboo work, and Shoe-making. The Missionary in charge is Mr. C. H. Plomer.

THE COMMERCIAL NIGHT SCHOOL, CAWNPORE.

(From Report on Public Instruction for 1906-7.)

This school, which is managed by a Local Committee of Indian gentlemen, was opened in 1903, in response to a request of certain bankers and tradesmen of the city. It is still held in the Society for the Propagation of the Gospel Mission School, Generalganj, in the heart of the business quarter where it was first started. The object of the institution was to provide elementary instruction for boys and men of the working classes who were engaged in earning their living in the course of the day or to enable them to continue their education; but as the subjects of study originally included Bahi Khata, Office Work, Telegraphy, Mahajani and English, the school attracted a different class, namely, clerks and youths entering business. The Committee recognising that it was fulfilling a different though equally useful purpose from that originally intended, added shortly afterwards shorthand and type-writing. Fees range from 4 as. to 6 Rs., the latter for the complete course, including shorthand and type-writing. The enrolment at the end of the first year was 22: it is now said to be 76 in the vernacular and seven in the English Department. This would be a satisfactory indication that the school was meeting a real want but for the fact that many of the scholars are little boys, who have no business in a night school at all. Mahajani and English together, however, attract a class of scholar that really needs a night school, and for the sake of these the school is worth maintaining. Probably the most useful portion is Mahajani. But it seems to be badly organised and to contain many little boys, and the teachers are so poorly paid that changes in the staff are constantly occurring. The Municipal Board makes it a grant of Rs. 20 per mensem.

RAILWAY NIGHT SCHOOLS, LUCKNOW AND JHANSI

(From Report on Public Instruction for 1906-7.)

The Lucknow School.—There are two Railway Night Schools. The first is at Lucknow for the European and Eurasian apprentices in the Oudh and Rohilkhand Railway workshops. The roll rose during the year to 52, and included new apprentices

from the locomotive works, the engineering department, and the carriage and wagon works. The Railway authorities contribute Rs. 2 for each scholar, and the Government gives a grant which during the year amounted to Rs. 450. The school is divided into three divisions, which receive theoretical instruction for two hours one night a week and two hours' instruction in drawing on Saturday mornings. The work ranges from elementary arithmetic and mensuration in the lowest to instruction on steam, the steam engine, hydraulics, strength of materials, the automatic vacuum brake and the injector. The school is well managed and does satisfactory work. The furniture has recently been renewed and the accommodation increased.

The Jhansi School.—The other school is maintained by the Great Indian Peninsula Railway at Jhansi, also for Europeans. It was only opened in October, 1906, and is still small, but as attendance and industry at the school will be a pass-port to promotion, the number on the roll is likely to increase. The work, though still quite elementary, is reported to be promising, but the school is as yet in the experimental stage.

THE REFORMATORY SCHOOL, CHUNAR.

(From Report on Public Instruction for 1906-7.)

The school was removed in August, 1902, from Bareilly to its present home, the old fort at Chunar, which was, not without some detriment to its, archæological interest, adapted to accommodate it. More trade masters have had to be employed owing to the introduction of new industries, and newer and more up-to-date methods have been introduced as a result of the visits paid by the superintendent to other reformatories. The last annual report of the school enumerates ten trades practised at the school. It is a matter for regret that more boys do not subsequently practise the industries learnt at the school; but even though they do not take as a rule to the trades they have learnt there, they have in the process of learning them acquired habits of industry and manual dexterity which should serve them well in after life. What to do with those who leave always a difficult problem; but as far as possible and when necessary,

employment is found for them. The number of those who are lost sight of continues to be considerable amounting to 33 out of 153 in the last three years. Steps have, however, lately been taken to keep in better touch with them. The expenditure on the school in 1906-7 amounted to Rs. 26,554, which was a considerable increase over the figures of past years.

COMMERCIAL CLASSES IN COLLEGES IN THE UNITED PROVINCES.

(From Report on Public Instruction for 1906-7.)

Though the University has decided that the development of commercial education falls outside its province, some of the aided and unaided colleges have established departments for the benefit of students, who are likely to pursue clerical careers. There are well-developed business departments at St. John's College, Agra, and the Reid Christian College, Lucknow, and typewriting is taught at Aligarh College, the Agra College, Meerut College, the Reid Christian College and the Kayastha Pathshala, Allahabad, and shorthand at the Meerut and Agra Colleges. The Government of the United Provinces have sanctioned 4 stipends at Rs. 15 per mensem each for graduates and 4 at Rs. 12 per mensem each for under-graduates tenable at the Commercial Normal Department of the Reid Christian College, Lucknow.

THE SCHOOL-LEAVING CERTIFICATE EXAMINATION, THE UNITED PROVINCES.

1. The examination will be opened to all candidates who have completed 16 years of age and who have attended a re-organised school, and have obtained 75 per cent. of attendances at school meetings held during the two sessions previous to the latest date of sending in the application. No fee is charged for admission to the examination.

2. The subjects of examination will be 1 *Compulsory*—English,* Mathematics (Arithmetic with Mensuration, Algebra,

* Stress will be laid on a candidate's ability to speak English with fluency and correctness and to follow it readily when spoken.

Geometry), the vernacular of the candidate, History of India (including an outline of the present system of administration), and General Geography (outlines, including the elements of mathematical and physical geography, with geography of India in further detail). And II *Optional*—Sanskrit, Arabic with Persian, or Latin, Commerce, Physics and Chemistry, Physiography, a further course in Mathematics, including Mechanics and Trigonometry, Botany, Agriculture, Drawing, Manual Training.

The syllabus in Commerce comprises Book-keeping and Commercial Arithmetic, Commercial Correspondence, Type-writing. The examination will consist of two papers and a practical test. The syllabus in Physics and Chemistry is the same as for the University Matriculation. The syllabus in Physiography is not ready yet. The syllabus of further course in Mathematics includes Algebra, Mechanics and Trigonometry. Elementary Botany will be taught as a branch of nature study and illustrated by the common plants of the locality. The syllabus in Agriculture comprises the growth of plants and the way in which it can be influenced by the cultivator, the weather of the United Provinces, the soils of the Provinces, drainage, tillage, sowing and seed, irrigation, manuring, harvesting, plant diseases and pests, cattle and other farm animals, management of a holding, management and improvement of estates, the agricultural regions of the Provinces, rainfall tracts, and the principal crops. The examination in Agriculture consists of two papers and an oral test. The latter may be directed to any part of the foregoing syllabus. In particular, candidates may be called on to distinguish soils according to the classification current in the district, to recognise the crops of the province as set out above from growing plants and from seed or other products, and to recognise the effects of insect pests or plant diseases common in the district. The syllabus in Drawing comprises freehand from the flat, model drawing, geometrical drawing, and drawing to scale. The syllabus in Manual Training comprises drawing and practical carpentry—use of tools, joints, piece of work.

Candidates must take up one optional subject for examination, and no candidate will be examined in more than one. A candi-

date who has passed the school-leaving certificate examination may present himself for examination in the ensuing year in one or at most two different optional subjects, and will not be required to take the compulsory subjects again.

3. In the written examination great consideration will be given to hand-writing, spelling, and accuracy and neatness of work.

4. The examination will be conducted at the candidate's school by a board of examiners, but for the convenience of the board the candidates from two or more schools in the same town may be collected at a single centre for the written examination in any subject.

5. The examinations are held during the months of February and March.

6. A school must obtain recognition separately for each optional subject taken up.

SCIENCE IN THE ALLAHABAD UNIVERSITY.

(From the University Calendar for 1908.)

There is a Faculty of Science which elects Boards of Studies for Physics, Chemistry, General Biology, Mathematics, and Drawing and Surveying.

Among the optional subjects of Matriculation Examination are Physics, Chemistry, Drawing, and Agriculture with Surveying. Candidates for the Intermediate Examination may choose to be examined in Physics and Chemistry, which with Mathematics form the B course. At the examination for the Degree of Bachelor of Science every candidate shall be examined in English and in *either* (A) Mathematics, Physics and Inorganic Chemistry, *or* (B) Inorganic Chemistry, Organic Chemistry, and Biology. The subject of examination for the M. Sc. and D. Sc. degrees shall be Mathematics, Physics or Chemistry.

The Queen-Empress Gold Medal is awarded in alternate years for candidates taking the B side of the Arts course or going up for the B. Sc. examination. The Sir Charles Elliott Scholarship is tenable for one year by a student of the Muir

Central College, Allahabad, who has taken his B. A. degree in Physical Science or B. Sc. degree and intends to proceed to the M. A. degree in the same subject. The Swarnamayi Uma Charan Prize is awarded annually to the most successful candidate at the B. Sc. degree examination.

There are Professors of Physics, Chemistry and Biology at the Muir Central College, Allahabad, in which is also awarded the Peary Mohan Gold Medal for Science. There is a Professor of Physical Science at Queen's College, Benares. There are two Professors of Science at Canning College, Lucknow. There is a Professor of Science at the Muhammadan Anglo-Oriental College, Aligarh. There is a Professor of Physics and Chemistry at Agra College. St. John's College, Agra, has Professors of Physics, Chemistry and Biology. There is a Professor of Science at Christ Church College, Cawnpore. There is a Professor of Science at the Maharajah's College, Jaipur. At the Morris Memorial College, Nagpur, there is a Professor of Physical Science. At the Hislop College, Nagpur, there are Professors of Science and Physics. There are Professors of Chemistry and Physics at the Central Hindu College, Benares. There are Professors of Science at the Government College, Ajmere, and at Bareilly College. There are Professors of Physics and Chemistry at Reid Christian College, Lucknow, Meerut College, and Government College, Jubbulpore. At Victoria College, Gwalior, there are Professors of Science and Chemistry. There are at the Christian College, Allahabad, a Professor of Physics and Director of Physical Science Laboratory, a Professor of Chemistry, and a Professor of Electrical Engineering, which is a special subject taught at the College. There are Professors of Science at the Canadian Mission College, Indore, the Tukojirao Holkar College, Indore, and the Ramsay College, Almora. There is a Professor of Science at the Church Mission St. Andrew's College, Gorakhpur. There is a Professor of Physiology—Mrs. S. C. Andrews—at the Woodstock College, Mussorie.

THE PUNJAB.

THE MAYO SCHOOL OF ART, LAHORE.

(Compiled from Materials supplied by the Principal.)

Brief History.—This school was founded to perpetuate the name and memory of the late Lord Mayo, and its object is to give instruction in the Art of design, with special reference to the artistic industries indigenous to the Punjab, and to the Architectural and Decorative styles of Art peculiar to the province; and to exercise a general supervision over the Industrial and Technical Schools of the Punjab, and over instruction in Elementary Drawing in ordinary schools. A bungalow was rented for the first school premises, and in April, 1875, Mr. John L. Kipling, who had been working at Bombay as Professor of Modelling in the Art School there, arrived in Lahore to take up the duties of Principal. The present school buildings were completed in 1883 at a total cost of Rs. 43,000. The arrangement of the classes now in vogue in the school is practically the same as that at first inaugurated by Mr. Kipling, although the enormous increase in the number of students and the extended sphere of work in the present day have led to certain modifications in the curriculum. 'The main object throughout has been not to train draftsmen but craftsmen, and the idea, current to some extent, that the school is an art manufactory has had to be suppressed and the public and others interested given to understand that the outturn of the school is not primarily objects of art, but art workmen.' Mr. Kipling retired in 1893 and was succeeded by Mr. F. H. Andrews, and when he resigned in 1897, the present Principal, Mr. Percy Brown, was appointed. The school is supported by Government and is under the control of the Director of Public Instruction, the Punjab. The total annual expenditure on the school amounts to nearly Rs. 33,000.

The School has developed greatly during the thirty odd years of its existence. In the early beginning the number of students on the rolls was not more than 20 or 30, in 1891, it was 94, in 1899 nearly 200, and in 1906, not less than 539.

Course of Study.—The school is divided into four main departments—(1) The Elementary Department, (2) the Industrial Arts Department, (3) the Draftsmen's Department, (4) the Teachers' Department.

All the students joining the school must work through a prescribed course in the classes for *elementary subjects* for a period of two years. They will receive instruction in Freehand, Geometry, Scale Drawing, Model Drawing, Perspective, Plant Drawing, Clay Modelling, Elementary Design, and a handicraft such as metal-work, wood-work, or decorative painting. Having passed successfully through this course, they will then be qualified to study in one of the higher departments.

[Students applying from local Industrial Schools may not be required to attend this course, but will be admitted to the various classes according to their qualifications.]

The course in the *Industrial Arts Department* will be of three years, and is specially arranged for those students who desire to make themselves proficient in any one of the Industrial Arts taught in the school. Instruction is given in Wood-work, Joinery, Carving and Cabinet work, Metal work, Repousse and Blacksmith's work, Decorative painting in oil, water colour and distemper, Lithographic Drawing, Illuminating, Book-illustrating, etc., Modelling in clay, Moulding in plaster of Paris, Terra-cotta work, Glazed work, Papier Mache. Students in this section will also work through a course of advanced drawing, design and estimating.

The classes of the *Draftsmen's Department* are open to students who have passed successfully the final examination in the Elementary Department of the School of Art and hold a discharge certificate stating that they have worked through the Middle Standard. The course will consist of a study of the following subjects and cover a period of three years:—Architectural Drawing and Design, Building construction, Surveying and Estimating. Each student in this class will be required to spend a portion of his time in making himself acquainted with one of the handicrafts taught in the school.

Admission to the classes of the *Teachers' Department* is open to students who have passed the final examination of the Elementary Department of the School of Art and hold a discharge certificate stating that they have worked through the Middle Standard. The course is of three years, and is for those students who desire to become teachers of drawing. The subjects taught are Advanced drawing, Shading, Memory drawing, Blackboard drawing, design, Colour work, Preparation of Charts and the general principles of Art teaching. Students who have successfully passed through the course are eligible to enter for the Senior Drawing Masters' Examination held by the Punjab Education Department.

Every effort is made to render the teaching in the school as practical as possible. Design and construction go hand in hand. The student designs his work before executing it. The school has its own sets of charts and models designed by the present Principal, all that is best approved and most up-to-date having been included in the schemes and indigenous designs being given a prominent place. Each branch of drawing has its own series and a sure test of the efficiency of the methods employed is to be found in the remarkable celerity with which the elementary course is mastered even by the smallest students.

Fees.—These are levied from all students who are not sons or near relatives of artizans or craftsmen, and are to be paid according to the following scale:—Elementary Department, 2 annas per mensem; Industrial Arts Department, 4 annas per mensem; Draftsmen's Department, 6 annas per mensem; Teachers' Department, 8 annas per mensem.

Stipends.—A number of these are granted by the Government and various Local Boards. Ten stipends are also sanctioned by the Local Government to students who have passed the Middle Industrial School Examination.

The amount sanctioned for Government Stipends is Rs. 135 per mensem and is at the disposal of the Principal. Students who do creditable work in the school or pass the school examinations are eligible for these stipends which vary from Re. 1 per

mensem to Rs. 10 per mensem according to the qualifications of the student.

The Local Board Stipends are granted by District and Municipal Boards and also by independent states to lads who are residents of those localities. These stipends are usually of Rs. 7 per mensem, and any student who shows exceptional promise is recommended by the Principal for one of these.

Ten Middle School Stipends, each of the value of Rs. 7 per mensem, are granted annually by the Local Government to selected students who pass the Middle Industrial School Examination and desire to continue their studies in the Mayo School of Art.

Scholarships.—Five Scholarships, called 'John Lawrence' Scholarships each of the value of Rs. 15 per mensem, are tenable in the Mayo School of Art. One of these is awarded every second year to the best students in each of the following subjects:—Wood work, Metal work, Repousse, Modelling, Decorative painting. These scholarships are awarded by the Principal to the most deserving and distinguished students of the year. The holders of these scholarships may occasionally be called upon to assist in the Elementary teaching.

Prizes.—Prizes amounting to Rs. 400 per annum are open to competition amongst all the Students of the School. This sum has been distributed at the rate of three prizes of the value of Rs. 50, 20, 10 each in each of the five departments of the School.

Certificates.—Certificates are granted to all Students who pass the final examination in either the Elementary, Industrial or Draftsmen's Department. The final certificate for the Teachers' Department is that granted to Students passing the Senior Drawing Masters' Examination.

Boarding House.—An extensive boarding-house has been opened in connection with the School and all Students from outlying districts are allowed accommodation in the building at eight annas per mensem. This has been specially arranged for the convenience of pupils who are attending the School on Stipends granted by Local Bodies and Independent States.

Strength.—There are nearly 400 Students on the rolls, these mostly belonging to the Hindu and Mahomedan communities.

Influence of the School.—Within recent years Industrial Schools in various parts of the Punjab have become in a sense affiliated to the Mayo School of Art, being dependent on it and its Staff for examination and advice. All over the North of India Students of the School are to be found working as Draftsmen and Teachers, and students from the Industrial Art Section are opening shops wherever a demand for their work occurs.

Staff.—Principal, Percy Brown, Esq., A. R. C. A.; Vice-Principal, Sirdar Sahib Bhai Ram Singh. Besides there are Teachers in Design and Decorative Paintings, Modelling and Casting in Plaster of Paris, Geometrical Drawing and Perspective, Repousse Work, Wood-carving and Joinery, Metal Work, Drawing and Design, and Freehand and Model Drawing.

THE GOVERNMENT TECHNICAL SCHOOL, LAHORE

(Note by the Head Master.)

General.—This School was established in February 1889 as a result of the resolution passed by a committee appointed by the Government to consider the question of technical education. Its objects are to provide education for the children of artisans which would enable them to become better and more intelligent mechanics. The School is supported entirely by the Government and is under the control of the Inspector of Schools, Lahore Circle and the superintendence of a committee consisting of the Director of Public Instruction, the Punjab, the Managers, the North-Western Railway, the Loco and Carriage Superintendent, the N.-W. Railway, and the Principal, Mayo School of Art, Lahore.

Subjects, Courses, etc.—The School contains an Upper and Lower Primary and an Infant Department and a High Department will be organised as soon as a sufficient number of scholars have passed the Middle Standard examination for Industrial Schools. The High Department will consist mainly of boys who are employed in the Railway workshops as apprentices after the competition of the Middle School course and who

will attend the School daily for theoretical instruction in subjects connected with their practical work.

The time for instruction extends over 7 hours and 6 hours in the Middle and Primary Departments during the cold season and reduced by one hour in the hot season.

The present Scheme of studies can be briefly described as consisting of—

I. GENERAL EDUCATION :—

- (1) A knowledge of Urdu up to the V Primary class.
- (2) Arithmetic—whole.
- (3) Object-lessons (made as practical as possible.)
- (4) Physics and a detailed knowledge of mechanical powers.

II. INDUSTRIAL :—

- (1) Drawing—Free-hand, Geometrical, Model, Scale and Machine.
- (2) Carpentry—Simple carving, Joints, Turning.
- (3) Metal work—Soldering, Welding, Rivetting, Iron work (Forging, Braising, the use of Lathe,) Brass (casting), Tin-Smith's work.

The School is inspected on the general side by the Inspector of Schools, Lahore Circle, and on the technical side, by the Principal, Mayo School of Art.

Fees and Scholarships.—No fees are charged from the sons or near relations of artisans. Others are charged the same fees as are charged in other Schools for general education maintained by Government. Forty-four Scholarships are current; 20 in the Primary Department and 24 in the Middle of the value of Rs. 2 and Rs. 3 per month respectively, and are paid out of the John Lawrence Memorial Fund. Free-studentships are granted to the extent of 10 per cent.

Boarding.—There is no boarding house attached to the School. The Students must make their own arrangements.

Admission.—The boys generally join as infants. Boys coming from other Schools are kept in the special class where they learn technical subjects chiefly, and are then put in the regular classes of the School. In the special class provision has been made for revision of general subjects as well, so that the boys might not forget what they have learnt already.

Strength.—There are 80 Students in the Middle Department, 96 in the Primary Department, and 187 in the Special Department, making a total of 363.

Students passed out.—One hundred and thirty boys passed out and out of them 42 have taken up mechanical work under the Railway, 17 have been employed in private firms, 10 have taken up their own business, 9 have become Government servants as Draftsmen and the like, 17 have obtained miscellaneous employment on the Railway, 19 have gone in for a more advanced course of study in the Mayo School of Art, and 16 have gone in for other study.

Finances.—The expenditure excluding buildings, etc., up to the 31st December 1907 amounted to Rs. 1,47,970. The current expenditure amounts to nearly Rs. 14,500 a year. The total expenditure on buildings, etc., amounted to Rs. 1,45,625. The whole of the expenditure is borne by the Government.

Staff.—Lala Madan Gopal, B. A., S. A. V., is Head Master on Rs. 120 a month. There are 17 other Masters, their salaries ranging from Rs. 60 to Rs. 15 per month. The total expenditure on the Staff is Rs. 670 a month.

THE RAILWAY TECHNICAL SCHOOL, LAHORE.

(From Report on Public Instruction in the Punjab for 1905-06.)

The rolls contain 334 boys' names against 399 the previous year. The decrease in numbers confined to the Primary Department is said to be due to the revised Scheme of Studies by which English has been eliminated from the Upper Primary course, and has been considerably reduced in the Middle Department. Since the end of the year the numbers show a slight tendency to increase. By far the greater number (232) are Muhammadans. The Artisan Class numbered 288 and Non-artisans 46; most of the Artisans whose sons attend the School are employed in the North-Western Railway Workshops. Non-artisans paid Rs. 230 in fees as against Rs. 294. The expenditure was Rs. 666 against Rs. 7,598. There were 44 Lord Lawrence scholarships current against 38, and they

amounted to Rs. 1,294 against Rs. 1,159. The results of the examinations on both the General and Technical sides were satisfactory; 21 out of 24 passed the Middle Standard examination held in January; in the various departments, except the Infant, an improvement is shown over the results of last year. With the exception of the infants all learn Drawing, 268 learn Wood-work, and only 66 now learn Smiths' work, which does not seem to gain in popularity. Several improvements were effected during the year in the Machinery and appliances, and a greater number of visits was paid by the boys to the Railway Workshops. An old student's register has been opened, and has 237 names of boys who left for the Middle Department. Passed students earn salaries ranging from Rs. 15 to Rs. 50 a month; some go to the Mayo School of Art, some to the Railway Workshops and generally are favourably reported upon; while others take up various trades and occupations in the city.

The Evening Classes, Railway Technical School, Lahore, are established for the benefit of Artisans and apprentices in the Railway Workshops and meet three times a week. There were 51 Students on the roll (against 25 last year), but the average attendance fell from 14 to 10, due, in some measure, to the students having to work overtime. No tuition fees are levied. The expenditure was Rs. 876 against Rs. 943 last year.

THE GOVERNMENT SCHOOL OF ENGINEERING, LAHORE.

(From Report on Public Instruction in the Punjab for 1905-6.)

The Government School of Engineering is under the Principal of the Mayo School of Art. It was formerly under the control of the Punjab University. There were 98 Students on the rolls against 57 in the previous year. The fees totalled Rs. 572, and the expenditure on stipends was Rs. 288. In the First Examination in Civil Engineering 12 passed out of 22, and the School gained the first place on the list. Twelve students succeeded in gaining employment on salaries ranging from

Rs. 30 in Amritsar to Rs. 200 in South Africa. The Work of the class has been very good in spite of the fact that one teacher only was employed by the University. Improvements have been effected in the matter of staff, apparatus, equipment, etc. No less than 250 pupils are now on the rolls, and the popularity and efficiency of the new Government School of Engineering is already assured.

THE VICTORIA DIAMOND JUBILEE HINDU TECHNICAL INSTITUTE, LAHORE.

(From Report on Public Instruction in the Punjab for 1905-6.)

The Victoria Diamond Jubilee Hindu Technical Institute, Lahore, had 83 students on the rolls against 56 last year. The Special Subjects taught are smithing, carpentry, photography, typewriting shorthand, rubber stamp making and engraving; while there is a city branch where needlework is taught to some 12 girls. The total expenditure amounted to Rs. 5,913, or Rs. 1,067 more than last year. The Municipal Committee gives a grant of Rs. 1,200 annually. There were 16 stipends paid from subscriptions besides one Anglo-Vernacular Middle Scholarship of Rs. 35 monthly awarded to a student in Mechanical and Electrical Engineering at Bombay.

The *evening classes* attached to this Institute had only 6 pupils, all of whom simply learnt typewriting, and paid Rs. 209 as tuition fees, which left a saving of Rs. 44-8-0 to the Managers. The students obtain good appointments though they pass no public examination.

THE CLERICAL AND COMMERCIAL SCHOOL, AMRITSAR.

(From the Quinquennial Report on Education in India and the Government.)

The Municipal Board of Amritsar maintain a clerical and commercial School. Boys are admitted after passing the Middle English examination, or by special leave of the Inspector. The

staff consists of three Masters and a teacher of native commercial arithmetic. A hostel is attached to the School. Fees are charged at the rate of Rs. 3 a month in the senior, and Rs. 2-8 a month in the junior class. For a time these classes were amalgamated with the High School to the detriment of both; since June 1902 they have been separated. The course extends over two years, after which the students are presented for the clerical and commercial examination of the Punjab University. The subjects of instruction comprise type-writing, short-hand, general and commercial geography, book-keeping, precis-writing, arithmetic, native system of accounts, and English. After the University examination many boys return to be coached for the examination held at Roorkee for admission to the Public Works Accounts Department. They learn short-hand (reporting style) and higher book-keeping.

THE S. P. G. INDUSTRIAL SCHOOL, GURGAON.

This School was started eleven years ago and is exclusively for boys. It has 50 inmates. Persian, Urdu is taught, and Drawing is compulsory. The handicrafts taught are Tailoring, Shoe-making (*desi* and *vilayati*), and Carpentry. The children are generally about 8 years old when admitted and they remain in School till 18 or 19. About four hours a day is given to industry in the case of those learning in the School department, and those who have left it have to work in the shop for about 8 hours or practically the whole of the working day. Many children are free but a good many parents pay from 8 As. to Rs. 2 according to their means. There are no scholarships. The School is a boarding institution which no outsiders attend. No preliminary qualification is required in the case of boys seeking admission. The monthly charges of the School amount to Rs. 3.95, of which rather less than 1/12 is met from the Government grant. Most of the boys are sent from Gurgaon to the S.P.G. Workshop, Cawnpore. Many of the boys who have completed their training are earning decent sums. "Our principle" says the Superintendent, "is to subordinate trade considerations to the Primary object of teaching each inmate a trade, so that

from a pecuniary point of view we do not make our School yet a success. The public patronage of our shoe trade is ample. There are a Superintendent and 7 masters and teachers in the school.

THE S. P. G. INDUSTRIAL SCHOOL, DELHI.

This School, started about 11 years ago, is exclusively for girls, and for poor girls. It is an indigenous School and the standard of life and domestic economy is kept as simple as possible. For this reason no English is taught. There are 45 inmates. The handicrafts taught are Shoe-embroidery, Spinning and Lace-work, besides Needlework, plain and fancy. The children are 8 years old as a rule when admitted and they remain till the age of 11. Any children are educated free, but a good many parents pay from 8 As. to Rs. 2 according to their means. No Scholarships are awarded. The School is a boarding school. The monthly cost of the School is Rs. 400. This includes all expenditure for board and maintenance. Most of the girls marry after they leave school and are in a position to augment their husband's income by having learnt some useful work.

The Superintendent of the School is Miss Coleman who is assisted by a matron and four teachers.

THE MUNICIPAL BOARD INDUSTRIAL SCHOOL, DELHI.

(From Note by Mr. Jaimal Singh, Head Master.)

The Municipal Board Industrial School, was established in 1890 and is still located in a rented building. The management is in the hands of the Municipal Committee. Besides some literary subjects Wood-working such as joints, carving and lathing, and Drawing of all kinds (Freehand, Model, Scale, and Geometrical) are taught to the boys. The industrial classes are inspected annually by the Principal, the Mayo School of Art, Lahore. Any boy not less than five years old can be admitted into the school. The number of boys is 95. The boys who pass the last examination of this school continue their study

at the Mayo School of Art, Lahore, and to them is awarded a scholarship of Rs. 5 by the Delhi Municipal Committee. The boys when they have completed their training find no difficulty in making an honest living by turning to use the work they have learnt.

THE MUNICIPAL BOARD INDUSTRIAL SCHOOL, AMRITSAR.

(Information supplied by the Head Master.)

The Municipal Board Industrial School, Amritsar, was established by the local Municipal Committee in 1886. It had in July last 208 boys on the roll. The courses are the same as in the Railway Technical School, Lahore, and extend over eight years. Instruction is given in Drawing, Carpentry, Repousse work, Urdu reading and writing, Arithmetic, Science and Object lessons. Moderate fees are charged on boys other than sons of artisans who are admitted free. Scholarships are awarded from the Provincial Fund in the upper primary department and from the Municipal Fund in the middle department. The expenditure is about Rs. 4,360 a year and comes out of the Municipal Fund. Many boys from the school are stated to have passed the Industrial Middle Standard examination and are working as Drawing Masters, Draftsmen, Goldsmiths, &c.

THE DISTRICT BOARD INDUSTRIAL SCHOOL, LUDHIANA.

(From Report on Public Instruction in the Punjab for 1905-6.)

The District Board Industrial School, Ludhiana, had in 1905 123 boys on the roll against 146 the previous year; 81 of these were sons of artisans. The falling-off of 23 is attributed to the change in the Scheme of Studies. On the Technical side, Drawing, Carpentry and Blacksmithy are taught; while Urdu, English, Arithmetic and Object Lessons are taught on the General side. Drawing and Wood-work are well taught.

THE VETERINARY COLLEGE, LAHORE.

(From Quinquennial Report on Education in India, 1897-8 to 1901-2, and Report on Public Instruction in the Punjab for 1905-6.)

The Lahore Veterinary College has a public hospital for animals attached to it with a large in-patient and out-patient practice; there is a well appointed operating theatre and a large shoeing forge. The staff consists of a principal, two professors, three lecturers and a clinical clerk, and the institution is under the general control of the Director of Land Records and Agriculture.

The entrance qualification of candidates is the Middle School examination and an examination in the handling of animals. The length of the course is three years and the language of instruction is the vernacular. There is one examination at the end of each year, the first by the college staff and the second and the third by a Board of Examiners. A certificate as veterinary assistant is given on passing the final examination.

The subjects taught are Chemistry, Anatomy and Physiology, Medicine and Surgery.

In accordance with the orders of the Government of India the whole of the Indian teaching staff and students of the Ajmere Veterinary School were transferred to the College on April 1st, 1905.

There are over 200 students and nearly 50 scholarshipholders.

The expenditure is over Rs. 70,000 a year. The income from fees is nearly Rs. 4,000 a year.

SCHOOLS IN THE PUNJAB.*

(From Quinquennial Report on Education in India, 1897-8 to 1901-2, and Report on Public Instruction in the Punjab for 1905-6.)

The Punjab Educational Code prescribes a regular course of general and technical education for industrial schools under public management; the schools are divided into infant, lower

* Not separately treated.

primary, upper primary and middle departments. The infant department has one class, the two primary departments two classes each, and the middle department three classes; the whole course, therefore, occupies eight years. The subjects of instruction are vernacular, English, geography, arithmetic, drawing and practical geometry, elementary physical science, and wood-work or other handicraft. All pupils are taught wood-work in the lower primary stage. The course is to a very large extent of a literary character. Examinations are held at the end of each stage, above the infant stage by the Principal of the School of Art. The subjects of technical training are chiefly carpentry and metal-work: photography is taught in the Amritsar school. The boys are put through a regular course of instruction on the class system. There are evening classes attached to the railway technical school, but the average attendance is small, and they are not appreciated by the class of persons for whom they are intended.

There are Tailoring, Engineering and Drawing Classes in the *Dayanand Anglo-Vedic College, Lahore*. The first had 8 pupils in 1905-6 against 11 in 1904-5, costing Rs. 238 against Rs. 371. The second had 56 students, while there were 6 in the Drawing Class and 11 in the Preparatory Rurki Class. Fees (for 9 months) realised Rs. 1,509, and the total expenditure (9 months only) was Rs. 1,633.

There is a *School of Surveying* in the new Mughal Sarai, Muzang, *Lahore*, kept by a retired Draftsman which has about 100 students.

There are three Workshops or Classes attached to the *Christian Boys' Boarding School, Ludhiana*. The Carpenter's Shop had 18 pupils, Carpet-weaving Shop 6, and the Tailor's Shop 7.

In the *Clarkabad Mission Orphanage* tailoring, carpentry, shoe-making and gardening are taught to 13 boys.

In the *St. Francis' Orphanage* carpet-weaving, shoe-making, dyeing, tailoring and cooking are taught.

The *Boys' Industrial Home, Gujranwalla*, is an aided indigenous industrial school. The technical subjects receive proper attention ; good progress has been made in drawing, and tailoring has much improved. Carpentry, smithing and weaving continue to be well taught. The introduction of other branches, such as shoe-making, is contemplated. The school is well managed, and continues to do good work. The pupils wear clothes of their own weaving and sewing, and all are required to help in farming and cooking. There are 82 on the rolls.

The *Arya Samaj Orphanage, Ferozepore*, teaches drawing (freehand), tailoring, carpentry, blacksmithing and weaving to the boys; the girls learn knitting, embroidery and cooking with a fair amount of success.

The *Indigenous Industrial Settlement, Salamatpur, Palwal (Gurgaon district)*, had 101 orphan girls (24 more than last year) who learn needle-work, including embroidery and lace-making, and household duties. The School is doing very good work, and some are being trained in Palwal as Hospital Nurses. There is an *Industrial Home at Parsur* where Christian girls, mostly orphans, learn spinning, weaving, sewing and grinding. In the *Sorankari M. B. School, Maghiana*, the number of girls on the roll has fallen from 38 to 16. This is a *Pardah* institution, and sewing, embroidery, *Kashida* and knitting are the subjects taught.

The *Aided Indigenous Industrial School, 'Isa Khel (Mianwali district)*, is a mixed School. The girls' roll declined from 72 to 68 and the boys' increased from 38 to 46.

At *Mankera* there is a fair Gurmukhi School, of an *Aided Indigenous Industrial* character, with 47 on the rolls, and another *mixed School at Musahel* where the numbers have increased to 20 girls and 9 boys, but the work generally was not satisfactorily done. The *District Board Primary Industrial School Musaffargarh*, is a new institution with 33 boys (the boarder are fed from District Funds) and drawing and carpentry are taught.

The Daira-i-Din-Panah Girls' Aided Indigenous Industrial School had 32 girls doing satisfactory work, especially in needlework. *The Unaided Nagri Indigenous Industrial School, Alipur (Muzaffargarh)*, had 36 girls where needlework was the only special subject. *Mongomerywala Aided Indigenous Industrial School* had 54 girls against 27, where the industrial work was good. *The Batemanabad Aided Indigenous Industrial School* had only 18 girls. *The Arya Putri Pathshala, Lyallpur* is an Indigenous Industrial School with 66 girls.

The *Khalsa Kanya School, Lyallpur*, had 42 girls. Needlework, including knitting, is the special subject generally taught in these Schools. The Orphanage maintained by the *Anjuman-i-Himayat-i-Islam, Lahore*, trains some 20 boys in tailoring, stocking making, working with a handloom, and type-writing; while the Senior Girls learn needlework and cooking.

'The Punjab has been more successful (than other provinces), owing perhaps to the natural bent of the Punjab towards an industrial life. The Punjab Schools are attended by boys both of the artisan and non-artisan classes, and it is said that a considerable number of the ex-pupils, to whatever class they belong, follow an industrial occupation after leaving School. In the Railway technical School at Lahore all but 38 of the pupils on the rolls on the 31st March 1902, were sons of artisans, mostly of artisans employed in the Railway workshops. The Railway authorities find the boys trained in the school more useful than outsiders, they have a better chance of employment, and they secure higher wages.

COMMERCIAL SCHOOLS IN THE PUNJAB.

These are (1) Government High School, Delhi, (2) Harbhagawan Memorial High School Ferozpur city, (3) Central Model High School, Lahore, (4) Government Clerical and Commercial School, Amritsar, (5) Government High School, Lyallpur, (6) U. P. Mission High School, Rawalpindi, (7) Government High School, Multan city, and (8) Sir Ranbir High School, Jammu.

Attached to the Government High School, Multan, are Clerical and Commercial classes, Junior and Senior, in which the following subjects are taught :—Book-keeping, Shorthand, Commercial Arithmetic, Correspondence and Precise-writing, English, General and Commercial Geography and Caligraphy.

Classes are attached also to the Municipal Board School at Hoshiarpur, the Rewari Board School, the Board School at Gujranwalla. One branch of the Victoria Diamond Jubilee Hindu Technical Institute at Lahore is devoted to clerical and commercial work; the pupils study chiefly shorthand and accounts. The Board Schools at Hoshiarpur and Ludhiana have shorthand classes.

SCIENCE IN THE PUNJAB UNIVERSITY.

(From Lieutenant-Colonel K. R. Kirtikar's Article in the 'Modern Review' for June, 1907.)

At the *Entrance Examination* of the Oriental Faculty and Arts Faculty, Elementary Physical Science forms one of the Optional Subjects. At the same examination in the Science Faculty, Physics and Chemistry, along with the Elementary Principles of Mechanics and Hydrostatics, form one of the four 'fixed and elementary' subjects. Whereas among the optional subjects there are:—(1) Botany and Zoology; (2) Agriculture; (3) Drawing. In the Oriental and Arts Faculties, there is an Oral Examination in Physical Science. In the Science Faculty in each Science subject, there is an oral and a practical examination. A candidate has to pass in each of these tests. At the *Intermediate Examination* in the Oriental, Arts, and Science Faculties, the following are the subjects:—Oriental Faculty: Botany, Zoology, Animal Physiology and Geology, among other subjects; Science Faculty: The 'Fixed' subjects are English, Mathematics, Physics, and Chemistry. Among the 'Elective' subjects one and only one of the following must be taken:—(1) Botany and Zoology, (2) Physiology, and (3) Geology. There is also a stiff Practical and Oral Exami-

nation. For the Degree of Bachelor of Oriental Learning the 4th subject is a Branch of Science. These two branches mean Botany, Zoology, Geology and Animal Physiology. Every candidate for the Degree of Bachelor of Arts in the A. course has to take up one elective subject, of which a Branch of Natural Science is one, and in the B. course, Mathematics or a Branch of Science among fixed subjects, and one Elective Subject of which a Branch of Science is one. In the Science Faculty for the B. A. Degree, every candidate has to take up English and one of the following groups:—Mathematics and Astronomy, Physics and Chemistry, Botany and Zoology, Geology and Mineralogy, Physiology, Agricultural Science (including Forestry and Surveying). There is in each of these branches besides paper-examination, a searching practical and an oral examination. For the degree of Master of Arts there are the following rules:—A B. A. of the Punjab University has to take up one or more of five subjects of which the 5th is termed Science, *i.e.*, Chemistry, Zoology, Botany, Geology and Physiology. Candidates are examined in what is termed the doctrine of Scientific Method and in one of the following subjects.—Physics, Chemistry, Zoology and Comparative Anatomy, Botany, Geology, Physiology. For the degree of Doctor of Science, a candidate is not approved in any case unless he shows a thorough *practical knowledge* of the selected subject. A knowledge of Botany is required in candidates for the L. M. S. examination. For the M. B. Degree, in the Preliminary Scientific Examination, a knowledge of Chemistry, Botany, Comparative Anatomy and Zoology is required.

Under the Revised Rules relating to endowed Readers and Translators in connection with the Punjab University, the following provisions are made for the encouragement of Natural Science, the Alexandra Readership is awarded to a graduate who distinguishes himself in Natural Science or Mathematics (value Rs. 70 per month, tenable for three years); and the McLeod Kapurthala Natural Science Readership is awarded to a graduate who has distinguished himself in Natural Science (value Rs. 72 per month, tenable for three years).

There are Natural Science Reader in Oriental College, Lahore ; a Professor of Science in Government College, Lahore ; Professor of Chemistry and Physics in St. Stephen's College, Delhi ; Professors of Biology and Science in Forman Christian College, Lahore ; Professor of Science in Dayanand Anglo-Vedic College, Lahore ; Professor of Science in Scottish Mission College, Sialkote ; Professor of Science in Gordon Mission College Rawalpindi ; a Professor of Science in Islamia College, Lahore ; a Professor of Science (with a well equipped Science Laboratory) in Randhir College, Kapurthala ; a Professor of Science in Hindu College, Delhi ; a Professor of Science in Khalsa College, Amritsar ; and Professors (with Chemical, Physiological and Pathological Laboratories) in the Medical College, Lahore.

BURMA.

THE GOVERNMENT SCHOOL OF ENGINEERING, INSEIN (BURMA).

(Note by the Head Master).

The School.—At first the school was modelled on the subordinate classes at the Thomson College, Roorkee, and trained, as that College does, in two years, Overseers and Sub-Overseers for the P. W. D. From 1895 to 1905 it was so worked. But thereafter it was re-organised and the Apprentice Department of the Engineering College at Sibpur was taken as the model. Mechanical Engineering and a considerable amount of Workshop practice were introduced, and room has been left for expansion in the future. Electrical Engineering will probably be introduced before two or three years are over. The cost of maintenance is about Rs. 39,000 per annum.

Subjects, etc.—The subjects taught, courses of instruction, text-books, length of courses, and examinations are practically the same as in the Apprentice Department of the Sibpur College

Fees and Scholarships.—Fees are charged for twelve months in the year as follows:—Upper Subordinate and Drafts-men class, Rs. 6 per mensem; Lower Subordinate class, Rs. 4 per mensem. There are no free-studentships. Scholarships are awarded annually as follows:—Upper Subordinate class—2 of Rs. 15 per month tenable for $3\frac{1}{2}$ years; Draftsman class—1 of Rs. 15 per month tenable for $3\frac{1}{2}$ years; Lower Subordinate class—3 of Rs. 9 per mensem tenable for $2\frac{1}{2}$ years. Maung Ohn Ghine, C. I. E., a broker of Rangoon, has also endowed a gold medal and a scholarship.

Boarding.—Dormitories are provided for 80 students. A mess, managed by one of the Masters, caters for 50 Burmese and European students, the charges being—Annual subscription, Rs. 5; monthly, for 10 months, at Rs. 10; monthly, for two months, at Rs. 3. Hindus and Mahomedans cater for their own food, but cook-houses are provided by the school.

Admission.—The Entrance qualifications for the different departments are :—Upper Subordinate and Draftsman Classes—Matriculation of an Indian University or its equivalent; Lower Subordinate Class—Seventh Standard, Anglo-Vernacular, of Burma, or its equivalent. The candidates for the former must be not less than 16 nor more than 22 years of age, and for the latter not less than 14 nor more than 20.

Strength.—There are 35 students in the Upper Subordinate class, 3 in the Draftsman class, and 29 in the Lower Subordinate class.

Appointments.—The students who passed out of the school in previous years are employed as under :—

Upper Subordinates.—Supervisors, P. W. D., 6; Overseers, 10; Temporary Upper Subordinates, 11; Superintendent, Land Records, 1; in the Manchester School of Technology, 1; in Municipalities, etc., 9.

Lower Subordinates.—Sub-overseers, P. W. D., 45; Private firms, 5.

Staff.—Mr. F. H. O'Connor Mitchell, M. S. E., Head Master. There are several assistants.

THE TECHNICAL HIGH SCHOOL, INSEIN (BURMA.)

This School has just been started under the Management of the Engineering School. It is the technical equivalent of the VIIIth, IXth, and Xth, standards in literary High Schools, and its final examination is the Technical High School Final. The subjects taught are Practical English, Second Language (Practical), Mathematics (Arithmetic, simple Algebra, Geometry and Mensuration), Geography (Commercial and Physical), and a practical course of Carpentry and Iron work in the Engineering Workshops. The courses designed to cover the ground work of technics, and specialising is avoided. The length of the course is three years. The fee charged is Rs. 4 per mensem. Ten Scholarships of Rs. 8 each per mensem and tenable for three years are awarded. The intending student must have passed the seventh Standard Anglo Vernacular of Burma or its equivalent, and must not be under 14 or over 20 years of age.

The Technical Instructor is Mr. J. D. McNeilage, who holds the Board of Trade Chief Engineer's Certificate. There are several Assistant instructors besides.

THE APPRENTICE SCHOOL, INSIEN.

The technical class attached to the Insien Railway Workshops is a night class where European apprentices are taught such subjects as Mensuration, Plane Geometry and elementary facts concerning the Steam Engine and Steam. The class has been in existence since 1894. The arrangements for the conduct of the work are made by the Locomotive Superintendent and an examination is held annually by the Education Department. Government awards a monthly grant of Rs. 50 to the class instructor. The number of pupils at the end of 1906-7 stood at 40 as against 57 in 1901-2.

THE FOREST SCHOOL, THARAWADDY, (BURMA). (From *Quinquennial Report on Education in India, 1897-8 to 1901-2.*)

Subordinates of the Burma Forest Department were formerly trained at Dehra Dun but the plan of sending Burmans to India for instruction worked badly, and in 1899 a Provincial School of forestry was opened at Tharawaddy in the Pegu division. The annual number of admissions was at first fixed at 8 but was afterwards raised to 12 and again to 20. The school is primarily intended for the training of those already in the Subordinate service, namely : Rangers, Deputy Rangers, Foresters, and Forest Guards ; but if all the vacancies in the school are not filled by Government students, private candidates are admitted, and two stipends of the value of Rs. 14 a month may be awarded to private students. The school is under the administrative control of the Conservator of Forests, Pegu Circle, assisted by a Board of Control, and is supervised by the Divisional Forest Officer, Tharawaddy. The staff consists of an instructor and an assistant instructor who are officers of the Forest Department. The course of instruction extends over two years and is given in the vernacular. The subjects taught are : Sylviculture, utilisation, working-plans, forest law and departmental organisation, elementary surveying and engineering, and forest accounts and returns. The theoretical instruction is of an elementary and simple character, and the practical work (much of which is given

in the forest) is made as thorough as possible. The theoretical course is completed during the first year of study. The instructor holds monthly examinations, an oral examination is held by a Committee at the end of the theoretical course, and certificates are granted by the Board of Control to those students of the second year who are found to be proficient at the end of the course. The certificates are of two kinds—(1) the higher certificate which qualifies for a Deputy Ranger's appointment, and (2) the lower certificate which qualifies for a forester's, appointment. The grade of certificate depends upon the marks gained by the student in the theoretical examination and on the character of the report on his practical work. Quarters are provided for students; but Rangers may make their own arrangement, and other forest students who bring their wives and families are not required to reside on the college premises.

THE BURMA VETERINARY SCHOOL.

*(From Quinquennial Report on Education, in India,
1897-8 to 1901-2.)*

The Burma School has a small number of students, and they receive their training partly in the school and partly by working under Veterinary Assistants of the Provincial Department. The length of the course is two years, which may extend to three in the case of backward pupils. The language of instruction is the vernacular. A qualifying examination is held at the end of the course and a certificate is given on passing it. Instruction is given in Anatomy, Physiology, the care of stock, etc. It is impressed on the pupils throughout the course that their chief work will be in looking after the welfare of the agricultural stock. All passed students have obtained employment.

TECHNICAL SCHOOLS IN BURMA.*

*(From the Quinquennial Report on Education in Burma,
1902-3 to 1906-7.)*

Names.—The following is a list of these:—(1) Technical Department, American Baptist Mission Paku-Karen School, Toungoo; (2) Technical Department, Methodist Girls' High

* Not treated separately.

School, Rangoon; (3) Technical Department, American Baptist Mission, Bghai-Karen School, Toungoo; (4) Technical Department, American Baptist Mission Burmese Girls' School, Kemmendine; (5) Technical Department, St. Mary's S. P. G. School, Rangoon; (6) Technical Department, Baptist College, Alôn, Rangoon; (7) Technical Department, Y. M. C. A. Students' Branch, Rangoon; (8) Technical Department, St. John's College, S. P. G., Rangoon, (9) Roman Catholic Mission Industrial School, Prome Road, Rangoon; (10) Industrial School, Insein Reformatory, Insein; (11) Sloyd Department, Government High and Normal Schools, Moulmein; (12) Sloyd Department, Government Normal School, Mandalay; (13) Lloyd Department, Baptist College, Rangoon; (14) Sloyd Department, St. John's College, Rangoon; (15) Sloyd Department, Roman Catholic Mission School, Tönze.

Aided School.—The number of aided schools in which industries are pursued fell from 4 to 3 in the quinquennium but the total of scholars rose from 83 to 193.

Subjects.—The subjects usually taught in the schools are one or more of the following:—Cooking, needle-work, dress-making, lace-making, carpentry, cane-work, tin-smith's work, weaving, tailoring, book-binding and printing. Of these the first four are naturally preferred in girls' schools, the other in boys' institutions. The equipment and apparatus maintained for these purposes is, on the whole, very fair and in some instances good. In all cases the purely technical instruction is accompanied by a literary course sometimes of a simpler kind than the regular standard curriculum.

Survey Schools.—Survey Schools are institutions under the control of the Settlement Commissioner and Director of Land Records, in which surveying, arithmetic, drawing, and revenue law are taught to youths over 15, of whom very moderate qualifications for admission are demanded. Examinations are held by the Educational Syndicate and the schools are inspected by the Director of Land Records and his assistants. There are 18 such schools as against 21 in 1901-2 and of these all but five

are provided with Government buildings. The total of students last year was 392 against 552 in 1901-2.

Government Reformatory, Insein.—Efforts were made in the quinquennium to render the treatment less penal in character and to develop the educational side of the management. The crafts taught are gardening, tin-smithing, carpentry and cane-work. It is proposed to add boat-making to the crafts already undertaken.

Manual Training.—Under this are treated 'Sloyd,' certain elements in Kindergarten and Drawing. The 'Sloyd' course is a general course of manual training comprising in the earlier stages such Kindergarten work as paper-folding, crayon colouring, etc., and ascending to card board and clay modelling and wood work. It is taken at all the Government Normal Schools, except Akyab, and at the Government High School, Moulmein. The Roman Catholic School, Thônze, and St. John's Collegiate School, Rangoon, also make specialities of this subject.

Expenditure.—The total expenditure on technical education (excluding that on Kindergarten and Survey Schools) was Rs. 27,030 for 1906-7, in 1901-2, Rs. 43,605, the increase being accounted for by the enhanced cost of the Government Engineering and Reformatory Schools at Insein.

EASTERN BENGAL AND ASSAM.

THE ASHANULLAH SCHOOL OF ENGINEERING, DACCA.

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7).

This school was established in the year 1876 as a Survey School. Up to the year 1897 the course was of two years ; and students at the end of that course were eligible for appointment as Surveyors, Kanungos or Amius. In the year 1897 the course was revised, and it was decided that students should be entitled to an Amin's Certificate on passing the first year examination, to a Survey Final Certificate on passing the second year examination, and to a Sub-Overseer's Certificate on passing the third year examination. It was also arranged that students, who had passed the third year examination, and who wished to pursue their studies further should be allowed to join the third year class of the Apprentice Department of the Civil Engineering College, Sibpur. As the result of a recommendation made in 1898 by Mr. J. S. Slater, at that time Principal of the Sibpur College, the Government of Bengal decided in the year 1902 that the Dacca School of Survey should be constituted a School of Engineering for the purpose of training students up to the Overseer Standard. Measures have accordingly since been taken to carry this decision into effect with a grant of Rs 60,000 from Government and a handsome donation of Rs. 1,12,000 from the late Nawab of Dacca, after whom the school is named. A new building has been erected for the schools on a suitable site and is being provided with furniture, apparatus, etc. At the same time to enable the new school to work on advanced lines, a European Head Master, a European Foreman and teachers on higher rates of pay have been appointed.

The Dacca School of Engineering thus comprises the four Overseer classes, and pupils presenting themselves from it at the Sibpur College Examination are eligible for Overseer Certificates. But the final 18 months' course of practical training,

which leads up to the Foreman Mechanics' Certificate, and which is an integral part of the Overseer Standard, was not until lately arranged for at Dacca. Steps have now been taken to remove this want by fully equipping the workshops. The original Survey School still exists in the shape of Amin and Survey classes. The number of pupils was 140 in 1901-2. Since its establishment as an Engineering School, the total has more than doubled. It amounted in 1905-6 to 289 and, in 1906-7, to as much as 304. The total receipts (including sale proceeds) of the Dacca School which amounted to Rs. 4,104 in 1901-2, increased, in 1905-6, to Rs. 6,837 and, in 1906-7, to Rs. 8,404. Expenditure increased during the same period from Rs. 16,358 and Rs. 36,941 to Rs. 37,639. This last figure was made up of Rs. 29,235 met from Provincial Revenues and Rs. 8,404 from fees, fines and other sources. Twenty-two students appeared, in 1906-7, for the Overseer Examination, and 11 passed. Of the 62 who appeared for the Sub-Overseer Examination, 41 are successful. In the Survey Final Examination, 35 passed out of 39 presented. In the first Aminship Examination, 77 appeared and 54 were successful. At the Survey Examination of Pleaders, 24 candidates appeared, but only five passed.

. The number on the rolls in 1907 was 103.

Many of the passed students of the Survey Department have been serving in various capacities, as Sub-Deputies (Kanungos, Civil Court) and Cadastral Amins, as well as under Indian Zamindars. They are all highly spoken of by their superiors.

An Artizan class was opened in the workshop of the school on the 15th January, 1907. Stipends of the total value of Rs. 30 a month have been sanctioned by Government for the students of this class: three of the value of Rs. 5 each are awarded by the District Board of Dacca, and others by that of Mymensingh. The fitting shop seems to be the most popular. After this comes the carpenter's and the moulding shops.

There is a large new hostel attached to the school, capable of holding 100 students where rooms are provided rent-free. Arrangements for messing, etc., are, however, made by the students themselves under the supervision of two teachers who live in the hostel.

The Ashanullah School of Engineering has proved highly popular, and, already housed as it is in magnificent class-rooms and a commodious hostel which form part of the great group of buildings which will eventually comprise the Dacca College, it may be expected to have a brilliant future before it. Steps are being taken to add the course for the Foreman Mechanics' Certificate; and it is perhaps not optimistic to look forward to the time when an Engineering Department will be super-imposed.

Staff.—F. C. Turner, Esq., B. A. (Oxon), Head Master; Babu Radha Raman Guha, L. C. E., Assistant Head Master; Babu Surendra Nath Ghosh, M. A., Science Teacher; B. K. Evans, Esq., Foreman Instructor. There are five more masters.

THE KASHI KISHORE TECHNICAL SCHOOL, MYMENSINGH.

*(From the Report on Education in Eastern Bengal and Assam,
from 1901-2 to 1906-7.)*

The Kashi Kishore Technical School in the town of Mymensingh is an institution under the direct management of the District Board. It was first established in 1893 with the aid of a generous donation (Rs. 10,000 plus Rs. 2,000 per mensem, the latter being subsequently compounded by an additional gift of Rs. 15,000) from Rai Bahadur Jogendra Kishore Rai Chunduri of Ramgopalpur. The pupils received instruction in carpentry together, since last year, with the vernaculars 3 'R'S.' During 1905-6 a weaving class was also started under the impetus of the *Swa-desi* movement; but it collapsed during the following year for want of students, as the higher caste Hindu boys, who joined, soon found the work distasteful. The number of boys on the rolls of this school on the 31st March

1907 was 31 against 59 and 13 respectively on the corresponding dates in 1905-6- and 1901-2. The artizans proper numbered 13 in 1901-2 and 10 in 1906-7, the fall in the number being ascribed to the stipends being inadequate to maintain the boys in these times of rising prices. Two stipends of Rs. 4 each and four of Rs. 3 each, tenable at this school, are awarded by the District Board to deserving students. The Superintendent of the School, however, considers that the rate of stipends is too low to attract Mofussil boys and that, to prevent a further fall in the numbers, the stipends should be raised. An examination of the Senior artizans is held locally at the close of their two years' course. From 1901-2 to 1906-7, 19 students appeared at this test, of whom 15 passed. Acting on a suggestion of the Director of Public Instruction, the Superintendent has lately opened a register of the passed boys of this School. He reports that, of the 15 passed students, four are under training in the Sibpur Engineering College in black-smith's work, one will join that College soon, nine have taken to the profession of carpenter, and one only is unemployed. As an encouragement to these boys, two Scholarships of Rs. 10 each, tenable for three years at the Sibpur Engineering College, are now awarded annually by the Board to the two best senior artizans of this school for supplementing their carpentry by learning black-smith's work. The Inspector of Dacca suggests that the Dacca Engineering School having now been moved into its new buildings, it would be preferable to make these scholarships tenable at Dacca. The total expenditure in this school during 1906-7 was Rs. 2,553 against Rs. 2,816 in the preceding year. This total includes the Government contribution of Rs. 960 towards the pay of the Superintendent for undertaking part of the tuition of the 'B.' class students.

Staff.—Babu Sanath Kumar Basu, passed Sub-Engineer and Foreman Mechanic of the Sibpur Engineering Collage, is Superintendent.

THE ELLIOTT BANAMALI TECHNICAL SCHOOL, PABNA.

This institution which was founded on 3rd December, 1892 by the District Board's Education Committee, is under the maintenance and general supervision of the District Board of Pabna. It was affiliated to the Civil Engineering College Sibpur. The Head Master and Superintendent is charged with the general control and supervision of the institution whether in classes or in workshops.

The Class Department.—Candidates who have been promoted to the Second Class of a High English School will be admitted, preference being given to those who have secured good marks in English and Mathematics. The session commences in the first week of February; candidates will not be admitted after the 31st of March.

The course of instruction extends over two years. The successful boys will be allowed to prosecute their studies in the Second year Class of the Apprentice Department of the Civil Engineering College Sibpur, provided their age be below 18 years at the time of joining the College, or they may join the third year apprentice class (*i. e.* the Senior Sub-overseer class) of this school if they so desire. There is no age-limit for admission to this school.

There are three Scholarships of Rs. 16 each, five of Rs. 12 each, and six of Rs. 8 each tenable for two years and open to competition among the candidates of the B. Class School Final Examination.

Engineering, Drawing, Surveying and Carpentry are taught by the teachers of the Technical School and Modern English, Mathematics, Science and Freehand Drawing, by the teachers of the Zillah School.

The Apprentice Department.—For admission to the Second year Apprentice class (*i. e.*, the Junior Sub-overseer class corresponding to the first year Apprentice class of the Civil Engineering College, Sibpur, the candidates must have passed the Entrance Examination of the Calcutta University or a similar standard

of any other Indian University recognised by the Calcutta University, or must have at least secured the pass marks in Mathematics at the Entrance Examination. The candidates who have completed the full course of the first class of a High English School may be admitted directly into the Second year class if they can produce a Certificate of special proficiency in Mathematics and have acquired some proficiency in Geometrical Drawing and in Carpentry by practicing regularly in the School workshops from February to June prior to admission, for which no fees are charged. The number of such candidates who can be allowed to practise in the workshops depends on the accommodation available, subject to a maximum of 10. The candidates who have passed the B. Class School Final Examination may be admitted to the Third year Apprentice Class (i. e., the Senior Sub-overseer Class corresponding to the Second year Apprentice Class of the Sibpur Engineering College) up to the 31st of March or within a fortnight of the publication in the Gazette of the results of the B. Class School Final Examination. There is no age limit for admission to the school, but the number that can be admitted is limited to 50. Admission, re-admission and withdrawal fees will be charged at the rate of Rs. 2 from each candidate. School fees will be charged at the rate of Rs. 2 per month. Free-studentship is not ordinarily allowed, though after the half-yearly Examination the poor and desiring boys may expect to get free-studentships if available. There is a Hindu Boarding House attached to the school under the supervision of the Head Master and Superintendent, and the Messing charge is Rs. 6 per mensem.

Course of Instruction.—The Subjects taught are Mathematics, Surveying, Drawing, Engineering (Building Construction and Materials and Estimating), English, Practical Elementary Physics and Chemistry, and Carpentry and Blacksmith's work. The course extends over a period of 15 months.

Finances.—Donations amounting to Rs. 27,000 have been made by Rai Banomali Ray Bahadur, Pabna district, for the erection of school workshops and hostels. It receives Rs. 600

annually from Government. The deficit in receipts from all sources is met by the District Board which contributed Rs. 2,244 in 1906-7 to defray establishment charges which came up to Rs. 8,360.

Passed Students.—The successful students have been able to secure employments carrying salaries ranging from Rs. 15 to Rs. 60 under District Boards, Municipalities, Railway Companies, etc.

Staff.—*Babu Anath Bandhu Deb*, Head Master and Superintendent. Besides there are three Assistant Masters, two Carpenters and two Blacksmiths.

THE DIAMOND JUBILEE INSTITUTION, RAMPUR BOALIA.

(*From the Report on Education in Eastern Bengal
and Assam from 1901-2 to 1906-7.*)

The Diamond Jubilee Institution at Rampur Boalia is managed by the Rajshahi District Board. It has three departments, *viz.*, *Sericultural Weaving* and *Engineering*. The Engineering department, which has three separate sections, *viz.*, Sub-Overseer class, Survey or Amin class and Artizan class, was opened in January 1905, but has not been affiliated to the Sibpur Engineering College. The management of the Sericultural Department was taken over by Government in January, 1907; it has a mulberry garden attached to it, and deals with mulberry cultivation, microscopic examination of seeds, and with detection and prevention of silkworm pests. The weaving department imparts training in reeling, weaving and bleaching of silk. A smithy was started during the year 1906-7, for the benefit of the Sub-Overseer class students to learn black-smith's work. There was an Agricultural class also, but it was discontinued from June 1906. The School had, in 1906-7, 101 pupils on the rolls, distributed among the different departments. Sixteen were in the Sub-Overseer department, 77 in the Surveying department, 3 in the Artizan department, while 5 were in the Sericultural department.

Two prizes of Rs. 100 each were awarded to a Hindu and a Mahomedan student for starting seed nurseries on an approved plan in their own houses. An expenditure of Rs. 1,760 was incurred from Provincial Revenues, Rs. 1,200 from the District Fund, Rs. 1,019 from fees during the year 1906-7, besides a sum of Rs. 1,958 which was realised from the sale proceeds of manufactured articles.

Staff.—Babu Tulshi Charan Dutta, Upper Subordinate and Foreman Mechanic, Superintendent; Babu Mukand Nath Ghosh, Science and Mathematical Teacher. There are, besides, two Assistant Masters, one Weaving Master, one Carpenter and one Smith.

THE RANCHI GOVERNMENT INDUSTRIAL SCHOOL, RANCHI.

(From the Calendar of the Sibpur College.)

The Ranchi Government Industrial School was started about 1870 by the Missionaries of the Society for the Propagation of the Gospel, in order to train mistries in carpentry, to assist in the construction of churches and school buildings. The school was assisted by Government with a small grant, and located on its present site, the management remaining in the hands of the Missionaries. In 1878 or 1879 the District Committee of Education made over to the school about Rs. 15,000, the surplus of the Chutia Fair Fund, and the interest on this amount was utilised for giving stipends to aboriginal pupils. In 1891 a qualified Superintendent, Mr. D'Silva, a Foreman Mechanic of the Sibpur College, was appointed to manage the school and in 1894 Government took the school over permanently. The reputation of the school continued to increase, as also its importance. In 1901 'B' classes were opened at the local Zilla School, the students attending the Industrial School workshop for instruction in manual training. In 1905 it was decided to raise the status of the school to the Sub-Overseer standard, and to secure its affiliation to the Apprentice Department of the Sibpur College. The necessary extensions were made and the staff was engaged; the 'B' classes were transferred from the Zilla School,

and a machine and fitting shop erected.* There are the following Artisan classes:—Carpentry, Carriage-building, Fitting, Painting, Blacksmith's. The staff consists of a Superintendent on Rs. 150 per mensem, an Engineering teacher on Rs. 100, an English teacher on Rs. 60, a Science teacher on Rs. 50, and a Hindi teacher on Rs. 20.

THE ELLIOTT ARTIZAN SCHOOL, COMILLA.

(From the Calendar of the Sibpur College and the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

This School was founded as a workshop on 15th November 1890, to train youths to furnish a local supply. It was then called the 'Artizan Workshop.' The name was changed to the Elliott Artizan School to commemorate the visit to the institution of the then Lieutenant-Governor, Sir Charles Elliott. Originally only blacksmith and carpenter classes were formed, but tinsmith classes were added in 1891 when Government sanctioned a recurring grant of Rs. 800 a year for this class. The school gradually developed till now when there are the Apprentice and Artizan Departments, affiliated to the Sibpur 'Engineer'ing College. Students of the 'B' classes of the local Zillah School are taught practical carpentry and technical subjects in this school. In the Artizan Department, the subjects of tinsmithy, blacksmithy and carpentry are taught. The Apprentice Department teaches the course of the Sub-Overseer class. The number of pupils in the Artizan class rose from 19 in 1901-2 to 28 in 1906-7, and that in the Apprentice Department from 27 in 1901-2 to 38 in 1906-7. Of passed students some are in the Sibpur College, and others are employed as Overseers, Sub-Overseers, Draftsmen, etc.

Fees of Rs. 2 and Rs. 1-8-0 are charged in the Apprentice Department.

* But the new classes have not yet actually been started because it was doubtful if these classes would be required if the Sibpur College were removed to Ranchi.—*Report on Education.*

There are 11 stipends attached to the Artizan Department varying in value from Rs. 3 to Rs. 4. These are paid from the District Funds. No fee is charged in the Artizan Department. The full course in the Artizan class generally extends over four years. But it has been found difficult to induce the pupils in the Artizan Department, who generally come from the lower classes, to complete the full length of the course. This tendency may be checked if the boys be allowed a share of the profits of the workshop.

The School is mainly maintained by the District Board of Tipperah, and managed by a committee appointed by them. It receives a yearly grant of Rs. 920 from the Government. His Highness the Maharajah of Tipperah made over to the District Board the land on which the workshop, office, godown and staff quarters are located. He also gave a large donation when the school was first established. Rajah Benoy Krishna Bahadur also gave a donation on this occasion. The Government granted Rs. 950 in 1904-5 for the purchase of survey instruments, etc. The amount of expenditure was Rs. 8,969 in 1906-7.

Staff.—Babu Jogendra Chandra Sen, Superintendent. There are, besides, a Mathematical Teacher, a Science Teacher, a Survey Teacher, a Blacksmith Instructor, a Carpenter Instructor, a Tinsmith Instructor, and an Assistant Carpenter.

THE BARISAL TECHNICAL SCHOOL, BARISAL.

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1905-6, and the Calendar of the Sibpur Engineering College.)

This School was founded in August 1890, and was under the management of the District Board till November 1901, when it was amalgamated with the Barisal Zilla School under the bifurcation scheme, with a contribution of Rs. 4,083 from the District Board for its maintenance. On the Zilla School becoming provincialised, the management was resumed by the District Board with effect from the 1st September 1906. The school was affiliated to the Sibpur College in 1897-98. Originally there were two classes formed called the Upper and Lower. In 1897 Sub-Overseer classes were opened.

The school has at present two different sections, *viz.*, the Sub-Overseer side (leading up to the Sub-Overseer Examination) and the Artizan side where carpentry and blacksmith's work is taught. This number of pupils on the 31st March 1907 was 50 (36 in the Sub-Overseer classes and 14 in the Artizan class) against 18 artizans on March 31st 1906. The total expenditure on this school during 1906-7 was Rs. 6,216, of which Rs. 4,359 was contributed by the District Board and Rs. 924 by the Government towards the pay of the Superintendent for looking after the carpentry, etc., of the 'B' class students.

Babu Ramgopal Chakravarti is the Superintendent and he is assisted by a Survey Teacher, a Blacksmith Instructor, three Carpenter Instructors.

THE BAILEY GOVIND LAL TECHNICAL SCHOOL, RANGPUR.

(From the Calendar of the Sibpur Engineering College and the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

This school was founded in January 1889, and is maintained by contributions from Government, the District Board, and Rajah Govinda Lal Ray of Tajhat. It is under the direct management of the District Board. The school originally consisted of an Upper and a Lower Division. In 1895 it was reorganised. It is affiliated to the Sibpur Engineering College and has four departments—the Sub-Overseer, the Amin, the Artizan and the Agricultural. Its strength on the 31st March 1907 was 97. The institution receives a yearly subsidy of Rs. 960 from the Provincial Revenues and Rs. 150 from Maharajah Covinda Lal's estate. The District Board contributes annually to the extent of the deficit in receipts from other sources to defray the establishment charges. The total income from all sources amounted in 1906-7 to Rs. 6,313. There is a boarding house attached to the school for Hindu students, who have to pay Rs. 4 per mensem as messing charges.

Staff.—Babu Sidheswar Shaha, who has 15 years' experience in teaching and in workshop supervision, is Superintendent. There are besides, a Drawing Master, a Survey Master, a Draftsman, a Blacksmith Teacher, and an Accountant.

THE RAILWAY WORKSHOPS, PAHARTOLI (NEAR CHITTAGONG.)

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

Apprentices and artisans are received in the workshops of the Assam-Bengal Railway at Pahartoli near Chittagong under the same scheme and are classed together. If during the first six months (the unpaid term of probation), a lad does not appear smart enough, he is generally put on a machine tender, and is not admitted to the fitting and turning shops.

The period of apprenticeship varies, five years being the maximum. No educational qualifications are required for admission nor are any limits of age laid down. A lad on becoming proficient in one shop, is moved to another and care is taken that he has, as far as possible, a good all-round practical training. There is, however, no provision for training in theory, the apprentices being chiefly lads who do not understand English sufficiently well to follow lectures in that language.

After a short probationary period of six months, the apprentices are placed upon the pay rolls and are paid at a rate varying from four to eight annas per day. In order to enable them to complete their training, a sum of Re. 1 is withheld monthly from their pay until the course is finished, when the sum standing to their credit is made over to them. If they leave before the end of their apprenticeship, they forfeit the amount. There are also two Scholarships of Rs. 7-8 each, awarded to the students of the Victoria Technical Institute, Chittagong, by the District Board of Chittagong, which are tenable at these workshops.

Eighty-one lads are being trained under the Scheme.

THE VICTORIA TECHNICAL INSTITUTE, CHITTAGONG.

The Victoria Technical Institute, Chittagong, was started in 1904 and is managed by a Committee of 14 members with the District Magistrate as President. Carpentry, Weaving, Goldsmiths' and Tinsmiths' work are taught there. The number of

pupils who received instruction in this school in 1904-5, was 83 ; it declined to 44 in 1905-6 ; in 1906-7 it came down to 26. The amount of expenditure, on the school was in 1904-5, Rs. 360, in 1905-6, Rs. 72, and in 1906-7, Rs. 720. The school has had a struggle for existence, but its stability has been ensured by the recent sanction of a monthly grant from Government.

Babu Ganesh Chandra Das is the Supervisor and there are besides, a Jeweller, a Carpenter and a Tinsmith.

THE MALDA WEAVING SCHOOL.

The District Board of Malda started a small Weaving School for weaving and dyeing towards the close of the year 1905-6. The school is reported to be doing well. The Weaving Master learnt weaving at Malda, Serampore and Ludhiana.

THE SURVEY SCHOOL, SILCHAR.

There is a Small Survey School at Silchar for the training of Patwaris. Twenty-three pupils were trained in it in 1906-7.

'B' CLASSES IN EASTERN BENGAL AND ASSAM.

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

In accordance with the recommendation of the Education Commission that 'in the upper classes of High Schools there be two divisions, one leading to the Entrance Examination of the University, and the other of a more practical character intended to fit youths for commercial or non-literary pursuits,' 'B' classes were opened in five schools in Eastern Bengal for the first time in 1901.

There are now seven schools with 'B' classes attached to them. Candidates who have passed the annual examination of the third class of any English High School, are eligible for admission. Practical work is done in the workshops attached to the local Technical Schools, with which these classes are all connected. The training lasts for two years, and success in the 'B' class examination entitles the students of these classes to enter the second year class of the Sub-Overseer course. After

a further period of instruction and after successfully passing the Sub-Overseer examination, they are eligible for admission to the third year class of the apprentice department, either at Dacca or Sibpur. Four Junior Scholarships of the first grade, four of the second grade and eight of the third grade are allotted on the result of competition to 'B' class students from the provinces of Bengal and Eastern Bengal and Assam, the scholarships being paid by the Governments concerned.

The number of students who attended these classes during the last five years was 467, and the number who passed the 'B' final examination was 86. Thirty-four boys secured 'B' class final scholarships from all the schools.

In the Dacca Division, in addition to 'B' classes worked in connection with the School of Engineering at Dacca, the Mymensingh and Barisal Zilla Schools have 'B' classes attached to them, which were both first opened in 1901. At Mymensingh there were 21 boys in 'B' classes on the 31st March last against 9 on the corresponding date in 1902, and, at Barisal, 35 against 38.

In the Rajshahi Division there are 'B' classes attached to Zilla Schools at Rangpur and Pabna and to the Collegiate School at Rajshahi. The last was opened in August 1906, with 16 pupils. The 'B' class at Rangpur was started in February 1901.

In the Chittagong Division the only provision for the bifurcation of studies is that made in the 'B' classes attached to the Comilla Zilla School, which were opened in 1901-2.

COMMERCIAL SCHOOLS IN EASTERN BENGAL.

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

Commercial classes have been opened in the Dacca School of Engineering and in the Pabna Zilla School, but the latter attracted only five pupils in 1905-6 and two in 1906-7. The qualifications for admission are the same as in the case of 'B'

classes. The course extends over two years and the curriculum consists of Mathematics up to the Entrance standard, modern English, History and Geography as in the Entrance standard. Precise writing and Drafting, Drawing and Practical Geometry, Elementary Chemistry and Physics, Elementary Practical Mechanics and Mensuration. After passing the final examination students are entitled to join the special class opened for them in the Presidency College, Calcutta, where, after studying for a further period of two years they are fully competent to take up a commercial career. One junior scholarship is awarded to a student passing the school examination of this standard from this province.

Besides these there are three private unaided commercial schools in Dacca charging moderately high fees and teaching short-hand, typing, and commercial arithmetic. They are doing useful work, but the Director considers that they would do better to raise their standard of qualification for admission.

ART SCHOOLS, DACCA.

There are two unaided Art Schools at Dacca, teaching Photography, Painting and Drawing. They were attended, in 1906-7, by 54 students.

APPRENTICESHIPS IN ASSAM FOR THE TRAINING OF CARPENTERS AND BLACKSMITHS.

(From the Report on Education in Eastern Bengal and Assam from 1901-2 to 1906-7.)

In Assam apprenticeships are given for the training of youths as Carpenters and Blacksmiths, tenable at the Dibrugarh, Jorhat and Tezpur Railway workshops. Only such youths are selected for apprenticeships as can be expected to take to working with their hands. A trial is given to members of such races as the Garo, the Khasi, and the Kachari. To be eligible for apprenticeships a youth must belong to a family resident in Assam. The period of apprenticeships is three years, with a fourth year added

if necessary, for qualification. The monthly stipends are, during the three years of the courses, Rs. 6, Rs. 7, Rs. 8 respectively. In Dibrugarh an extra rupee is given. If the apprenticeship is extended for a fourth year, the stipend is paid at the same rate as during the third year. A grant of Rs. 25 is made to each apprentice who secures a certificate of qualification, in order to assist him in the purchase of tools. Instruction in Drawing forms an essential feature of the scheme. To encourage attention to the apprentices by the workshop staff, a bonus of Rs. 100 is paid to the workshop authorities on the satisfactory completion of the course of each apprentice. The total number of apprenticeships which may be held in Railway Workshops at any one time under these rules is 15. In addition to the above, three apprenticeships are tenable in the workshops of such private artizans as may be selected as possessing special skill. Of the amount annually expended, Rs. 2,400 is drawn from the income of the 'Williamson Endowment,' and the apprenticeships are known as the 'Williamson Apprenticeships.' The cost of training these pupils in each of the years 1904-5, 1905-6, and 1906-7, was Rs. 1,658, Rs. 1,109 and Rs. 1,403 respectively.

C. P. and BERAR.

THE VICTORIA TECHNICAL INSTITUTE, NAGPUR.

*(From a Note by E. H. Beckett, Esq., Professor in the
Institute.)*

Introduction.—It was resolved in the year 1901, as a part of the Victoria Memorial Scheme, to found an institution which, as far as might be, would be the centre of all work and influence in respect of the economic progress of the Central Provinces. With this object in view a society was formed under the name of 'The Central Provinces Victoria Technical Institute,' and it was registered in accordance with the provisions of Act XXI of 1860. The Permanent Trust Fund amounts to Rs. 1,15,000. With the assistance of the Government a fine building has been erected, in which are also located the Agricultural School and the office of the Director of Agriculture. A Public Scientific and Technical Library, which has been fitted up and equipped at the expense of Government, is located in the Hall on the ground floor. The Hall above is an Economic Museum. The rest of the building is fitted up as laboratories and lecture rooms for instruction in Chemistry and Physics and the Allied Sciences, both theoretical and practical. The cost of their fitting up, which was more than Rs. 60,000, has been met entirely from the Provincial Revenues. The maintenance charges are at the present time about Rs. 17,000 a year.

Courses of Instruction and Examinations.—The subjects taught are Chemistry and Physics, the courses of instruction being those prescribed by the University of Allahabad. At the end of the courses students sit for the Allahabad University Science degrees. Should a sufficient number of students wish to take a special course of study in an applied science which is allied to Chemistry or Physics, such as Assaying or Analytical Chemistry, they will be enabled to do so.

Fees.—The majority of the students who attend classes at the Victoria Technical Institute come from the Morris and Hislop Colleges of Nagpur, the idea of Government being that it is more

efficient and economical to have one set of well equipped laboratories to be used by the students of both Colleges than to build laboratories for each College. Half the fees which these students pay to their respective Colleges are afterwards paid by the College authorities to the Victoria Technical Institute. In addition, outside students who are studying Science with some special object in view, and who do not wish to take Science degrees, are admitted at a charge of Rs. 5 per mensem. No free studentships or scholarships have up to the present time been awarded over and above those which are tenable at the other colleges, but it is probable that in the near future scholarships will be awarded for special subjects.

Qualifications of Candidates seeking Admission.—Before students can attend classes they must have passed the Intermediate examination of the Allahabad University, unless they wish to take a special course in Science only, when they must furnish evidence of having had sufficient previous training to enable them to intelligently follow their studies.

Laboratories, Research, etc.—The laboratories provide accommodation for 60 students, exclusive of those doing Research work, for which purpose a special laboratory has been fitted up. Facilities will be given to enable advanced students to do Research work. Every effort is being made to bring the Institute into touch with the local industries. Students will be encouraged to take special post graduate courses in applied science, especially in those branches which are connected with the industries of the province, so that they may be able to obtain appointments.

Staff.—Professor of Chemistry and Physics, R. H. Beckett, Esq., B. Sc. ; Assistant Professor of Physics, Makhmalal De, Esq. ; Workshop Superintendent, Mr. Najoomiya,

THE VICTORIA TECHNICAL INSTITUTE, AMRAOTI.

The Fund.—The Victoria Memorial Fund of Berar has been utilised for the establishment of this Institute, which will shortly be opened. It will be the first of its kind in the Central

Provinces and Berar and is based on the model of the Victoria Technical Institute of Bombay. The public subscriptions amounted to about a lakh and a quarter of rupees, while the Government have made a grant of Rs. 30,000 towards the initial expenditure and have sanctioned an annual contribution not exceeding Rs. 11,360 towards the recurring expenditure. The cost of the buildings which have first been completed will come up to about Rs. 70,000 and of the equipment about Rs. 36,000. Rs. 56,000 of the Memorial Fund has been earmarked for a permanent investment, and this would yield Rs. 1,960 annually. The Municipalities of Berar make a grant of Rs. 1,000 yearly. The total annual expenditure thus comes to about Rs. 14,000.

Control.—The control of the affairs of the Institute is vested in a Governing Body of which the Commissioner of Berar, the Inspector of Schools, Berar, and the Executive Engineer, Amraoti, are ex-officio members, two members are nominated by the Chief Commissioner of the Central Provinces, two are elected by the Municipalities making grants, and two are elected by the Subscribers of the Fund. The present Governing Body consists of 4 official and 5 non-official members.

Subjects and Courses of Instruction.—The instruction to be imparted would for the present, be confined to the department of Mechanical Engineering. There would be an Upper School and a Lower School. In the Upper School the course of studies would be the same as in the Mechanical Engineering Branch of the Bombay Institute, that is, such as would qualify the pupils for the profession of Mechanical Engineers, entitling them to take charge of steam engines and other prime movers under the Boiler Inspection Act. The course would extend over three years. During the first two years students will receive instruction and practical training in Drawing, Mathematics, Physics, Mechanics, Chemistry (inorganic) and laboratory work ; and Practical work in the workshops in carpentry, pattern making, wood-turning and wood-carving, chipping and filing in metal, iron and brass-casting, lead-work, and smithery. The third year course is the Mechanical Engineering Class, and the course of study embraces

the following subjects:—Lecture courses in Mathematics, Steam Engine and other prime movers, Workshops appliances, Mechanicals and Graphic method; Workshop practice in metal turning, fitting and drilling, smithery, carpentry, pattern making and wood carving, machine drawing and sketching, and indicator diagrams. The minimum educational qualification for admission will be the passing of the English Sixth Standard examination of the Berar Education Department, or its equivalent, in English, Mathematics and Drawing.

In the Lower School there will be two divisions, one for Carpentry and the other for Fitters. The course of instruction will extend over two years. The instruction in the first division will be in carpentry and wood carving. In the second division it will be in chipping and filing in metal, lead work, smithy, metal turning, fitting and drilling. Simple drawing will be compulsory in both courses. The minimum qualification for admission in the Lower School will be the passing of the Vernacular Third Standard Examination.

The institution will also give instruction in manual training in the afternoon to students from High Schools and the upper forms of Anglo-Vernacular Schools.

Fees.—No fees will be charged during the first few years; but gradually they may be imposed and raised in the Upper School to Rs. 30 a year.

Staff.—The following Staff of teachers and instructors will be appointed:—Head Master and Superintendent, who will be competent to give Scientific education; one Assistant to teach Mathematics, Physics and Chemistry; one Assistant to teach Drawing (Isometric and Machine) and carpentry; one teacher for Smithy, Moulding and Turning; and two assistants.

[Note.—The Government Industrial School of Amraoti which was started in January 1896 and gave instruction in ordinary carpentry, smithy and tailoring is absorbed in the Berar Victoria Technical Institute of Amraoti.]

THE AGRICULTURAL COLLEGE, NAGPUR.

(Note by the Director of Agriculture, C. P.)

Introductory.—Instruction in Agriculture on scientific principles is imparted in this College, which is a Government institution and is under the control of the Director of Agriculture. The

College is of some two years' standing, and has taken the place of the old Nagpur Agricultural School, which was originally opened on the 1st of June 1888. The present College buildings and laboratory are in the Victoria Technical Institute, Maharajbagh, Sitabuldi, while the Government Experimental Farm situated near by is made use of for the practical instruction of students in Agriculture. Arrangements have, however, been made for the building and equipment in the near future of a larger and more efficient set of laboratories for teaching and research. A field has also been acquired on the Government Farm for the purpose of encouraging athletics among the students who are attached to the College.

Subjects, Courses and Examinations.—The subjects taught and the length of the course in each are as follows* :—

<i>Subject.</i>	<i>Course.</i>
1. Agriculture	3 years.
2. Elementary and Agricultural Botany and Mycology.	Do.
3. Chemistry, Elementary and Agricultural	Do.
4. Veterinary	Do.
5. Physics	1 year.
6. Geology	1st year.
7. Drawing	Do.
8. Land Survey	1st & 2nd year.
9. Agricultural Engineering	2nd & 3rd year.
10. Book-keeping	3 years.
11. Entomology	Do.

Practical work* accompanies all subjects with the exception of 'Book-keeping.'

The students have the privilege of using certain books of suitable nature for their studies, in the Victoria Technical Institute Library. Examinations are held annually in March. Preliminary examinations are held at the end of the first and second year courses. No student who fails to pass will be allowed to proceed to a higher course of study. At the end of the third year course a final examination will be held when

* This statement must however be taken as provisional and at present in a state of probable revision.—

successful students will receive a Diploma in Agriculture. Weekly examinations in individual subjects in rotation are also held.

Fees, Scholarships, Accommodation.—Students pay no fees and are granted lodging in the hostel attached to the College, if not inhabitants of Nagpur, while they pay for their own board.

About 4 scholarships to cover board are granted annually to be held for three years, to students of the first year who have that year passed the Matriculation of a recognized University and who after they have been some time at the College, show by the character of their work that they are worthy of the same.

One hostel is provided under the charge of a master who acts as the Superintendent of the same. The accommodation in the hostel is for about 85. Of this, however, some 20 places are annually reserved for Malguzari students, for whom a special one year course in Agriculture is provided with a view to training them for the management of their own lands.

Admission.—All applicants must have passed the Matriculation or the School Final Examination and must be between the age of 16 and 21 years and be physically fitted for agriculture. Applications for admission must contain name, father's name and occupation, caste, age the date of passing the Matriculation Examination and the Vernacular language. Preference is given to applicants from the Central Provinces and Berar and also to sons of people genuinely connected with Agriculture and of an agricultural class.

Strength.—There are 25 students in the College classes and 16 in the Malguzari class.

No students have as yet passed out of the College as it is at present constituted.

Appointments.—Of the 124 passed out of the old Agricultural School, some 89 are in Government employment of some sort or other, the majority being employed as Inspectors and Revenue Inspectors of the Land Record staff. Some 17 are connected with the Agricultural Department as Overseers and Agricultural Assistants.

Students who obtain a diploma and show fitness for employment in the Agricultural Service will have a preferential claim for appointments in the Agricultural Department of the Central Provinces and Berar on an initial pay of Rs. 40 per mensem.

The following grades have been recommended for the Agricultural Department, 1 on Rs. 250; 2 on Rs. 200 each; 3 on Rs. 175 each; 4 on Rs. 150 each; 9 on Rs. 100 each; 10 on Rs. 75 each; 19 on Rs. 50 each; and 4 on Rs. 40 each.

Natives of the Central Provinces and Berar will have a prior claim. Students who obtain the diploma have also a preferential claim to appointments as Revenue Inspectors in the Land Record and Settlement Department at a minimum salary of Rs. 25 per mensem.

Staff.—Robert G. Allan, Esq., Principal; F. J. Plymen, Esq., Agricultural Chemist; R. J. D. Graham, Esq., Economic Botanist. There are Assistants in Agriculture, Chemistry, Mycology, and Botany, a Veterinary Inspector, a Malguzari class Master; and a Drawing Master.

THE PRACTICAL ENGINEERING SCHOOL, JUBBULPORE.

When want of Lower Subordinates in the P. W. D. of the Central Provinces was felt this school was opened by Government, at first at Nagpur, to train Sub-Overseers, and the passed students were employed in the P. W. D., Municipalities, District Boards, etc. The school has since been removed to Jubbulpore. Under the general management of the Principal of the Government College Jubbulpore, the school is in charge of a specially selected officer, called Superintendent, who will take out the students during the working season for practical instruction on roads and other public works in existence or under construction and will practise them in levelling, surveying, etc. The expenditure annually amounts to about Rs. 5,000.

Subjects, Courses and Examinations.—The subjects taught in the first year of the Instructional Period are—I. Elementary Mathematics (Mensuration and Trigonometry);

II. Engineering (Building materials, Masonry and Foundation, Earth-work and Roads, Survey-Theory) ; III. Estimating (earth-work) ; IV Drawings (Printing scales and Geometrical drawings, Buildings, Bridge, Survey plan) ; V Practical test (Chain and compass survey, using Ghat Tracer, Laying out curves). The course for the second year comprises the following :— i. Mathematics, Public Works Department Accounts ; ii. Engineering (Buildings and Central Provinces Specifications, Carpentry and Bridges, Surveying-plane table survey and levelling) ; iii. Estimating (estimating a building) ; iv. Drawing (building, bridge, survey plan, sections of levels) ; v. Practical Test (levelling). The course for the Practical Period is (1) Making plans and estimates, (2) Setting out work, (3) Surveying and levelling, (4) Measuring up work done, (5) The forms of accounts used by Sub-Overseers in the P. W. D., (6) Materials and (7) Elements of building, such as mixing mortar stone and brick laying, etc.

At the close of the first year a Junior Examination is held ; and at the close of the second year a Semi-Final Examination is held, to which the marks gained at the Junior Examination are added, whole marks for practical subjects and half marks for theoretical subjects. A list of candidates who have passed the Semi-Final Examination will be communicated by the Director to the Chief Engineer, who will distribute them among the different divisions for doing practical work for the six months. Each will be at once placed under the orders of an Executive Engineer, who will put each student to practical work with a Sub-Divisional officer or an Upper or Lower Subordinate. During this period each candidate, whether admitted as a scholarship holder or an ordinary student, will receive a stipend at the rate of Rs. 15 a month, as well as travelling allowance on the scale of that received by a Sub-Overseer. At the close of the period the Chief Engineer or, Superintending Engineer will appoint a Board or Boards, each containing at least one Executive Engineer, who will put the candidate through a practical test called the Final Examination. This examination will be such as to test the candidate's practical knowledge. On passing this test the candidate will receive his certificate.

The session commences on or about June 15th ; and the Principal may reject candidates who join the school late.

Admission of Students.—Candidates for admission must have passed at least the Matriculation or School Final Examination and must not be under 16 or over 22 years of age. Applications for admission should be addressed to the Superintendent, Engineering School, Jubbulpore, and must be accompanied by certificates of age, good character and sound health. The Principal on the recommendation of the Superintendent finally sanctions the admission of candidates. The number of students is strictly limited by the strength and capacity of the teaching staff and by the quantity of surveying and levelling instruments actually available for field work.

Students are of three kinds : Scholarship-holders on Rs. 12 each. (These Scholarships are tenable for two years and are awarded to the University Entrance or School Final passed candidates according to their merit in the examination ; such students must reside in the boarding-house attached to the College) ; ordinary students ; men already on the establishment of the P. W. Department, who being desirous, after some years of practical work, of entering the Lower Subordinate Establishment, may be admitted to the number of one per annum, by the Chief Engineer or Superintending Engineer.

Candidates who have once failed in the Junior or Semi-Final Examination may be re-admitted by grace of the Director on the recommendation of the Principal. Candidates failing in the Final Examination cannot be re-admitted.

The number on the roll at present is 17.

Fee and Accommodation.—No fees are charged for either kind of students ; but all are expected to have sufficient funds to pay their travelling and residential expenses, and to provide themselves with such books and suitable drawing instruments up to about Rs. 50 as are required in the work of the course.

There is generally accommodation in the Boarding House attached to the College for some or all of the Engineering students who will be admitted at the will of the Principal.

Appointments.—At least one appointment of Third Grade Sub-Overseer (beginning on Rs. 30) in the Public Works Department of the Central Provinces is guaranteed to that one of the successful candidates who stands first in the Semi-Final Examination and satisfies the Board in the Final Examination. There are no other guaranteed appointments, but in the selection of candidates for vacancies in the Public Works Department and under Local Bodies, preference will ordinarily be given to candidates trained in this institution over candidates trained in similar institutions outside the Central Provinces. And in point of fact, most of the 172 students passed out of this school since the year 1890 have been employed as Sub-Oversees in the P. W. D., some rising to the grade of Supervisors. Besides, many are employed in Municipalities, District Boards, etc., etc.

Staff.—H. J. Unvala, Esq., B. Sc., L. C. E., Head Master. There are two Assistants besides.

FRIENDS' MISSION INDUSTRIAL WORKS, HOSHANGABAD.

(From a Note by Mr. Alfred Taylor, the Superintendent.)

The workshops were started in 1892. Some twenty Hindu workmen were first employed, the institution being chiefly a commercial concern. But its nature has gradually altered until it is more of a School of Industries, so that there are now two departments, viz., (1) Training School for teaching handicrafts, (2) business on Commercial lines.

The subjects taught are Carpentry, including cabinet-making and joinery and wood-work generally, Carriage-building, blacksmithing and sheet-metal work, Weaving, and Gardening.

The students are Famine, and other orphans for the most part. No fees are charged under the circumstances.

The unmarried youths live on the workshops compound, in houses provided for them.

No particular qualifications are required of boys seeking admission. Boys receive an Upper Primary education before being admitted.

Some Rs. 35,000 have been invested in the various buildings, machinery, tools, and materials as Capital.

The sources of income are :—The proceeds on work produced, and grants from the Mission's Board in London. A Government grant of Rs. 1,500 per annum, is now promised. Income on sales averages about Rs. 15,000 per annum.

The institution is managed by a European superintendent who has had special training in technical work. Under him is a staff, also trained as above, and consisting of a Clerk, a Store-keeper, and Mistris specially chosen to instruct and conduct the work of their particular department. The number of boys on the rolls at present is 43, and those passed out number 82. About 70 of these have continued at their trade. It is suggested that Government examiners be appointed to examine in technical schools.

THE KURKEE AND HILL MISSION INDUSTRIAL SCHOOL.

From a Note by Mr. R. Hansen, Manager.

This Mission Industrial School is the outcome of the two famines of 1896-97 and 1899-1900. The pupils are all orphan boys belonging to the Mission. The object of the Industrial School is to teach them a trade practically by which they will be able to earn their livelihood. The Industrial School which is a work shop at the same time, developed very widely after the famine of 1899-1900. It received many orders from the European Residents but when the Military and Civil Stations were abolished the work naturally declined somewhat. Now it is doing mere ordinary work as tonga and cart-making, etc., etc.

2. The subjects taught are carpentry, black-smithing, tailoring. Only practical, no theoretical training is given. Hence no books are used and no examinations held. When a boy has finished his training, which is dependent on his ability, he is taken on wages or if desiring to leave, receives a certificate.

3. The boys are all orphan boys.

4. They live on the Mission premises in the orphanage attached to it.

5. No outsiders are admitted in the School.

6. The cost of the Institution cannot be ascertained, it being at the same time a Mission station with bungalow, etc., built in the famine of 1899-1900. The maintenance expenditure of the year 1907 was Rs. 3,400.

7. Of this sum the Mission received from Government as Grant-in-aid Rs. 600, from Mission funds Rs. 250, and the rest, Rs. 2,550 is Industrial earning.

8. Number of men—Carpenters 11, Blacksmiths 5. and Tailors 3.

9. The public help the school with their orders and thus seem to appreciate the work done there. Those boys who have finished their training do not find it difficult to obtain new employment elsewhere.

THE C. & M. A. INDUSTRIAL TRAINING SCHOOL, AKOLA.

(From a Note by Mr. R. S. M. Stanley, Manager).

This Industrial Training School was started in November 1888 by Mr. J. P. Rogers, for the purpose of giving a mechanical training to the boys of the Mission's Orphanage and at the same time it has always been open to boys from outside and as a matter of fact there always have been outside boys in training. The work has been dependent on the resourcefulness of the Manager almost entirely for its support.

Subjects and Courses.—The subjects taught are Carpentry, Blacksmithing, Structural iron work : Fitting : Tonga building, Painting and general repair work. At present the course is five years. There are no examinations save that which there is every day in the practical working of the institution.

Fee Accommodation.—There are no fees. Two students are at present supported by another Missionary Society. All others are supported from the earnings of the school. The only hostel is the orphanage.

Admission.—The conditions of admission are that boys are over 14 years of age and have a good moral character and are healthy.

Finances—Since it has been opened it has cost the Mission about Rs. 25,000, and apart from this it has had to depend upon its earnings for its maintenance.

Number of Students.—At present on the roll are the following pupils :—

2 Carpenters, 5 Blacksmiths, 1 Painter, 3 Fitters.

General.—Says the Manager:—One thing very noticeable in our customers is the fact that when they become acquainted with the work done in our school, they rarely ever ask any questions as to its merits or the prices charged and again when the boys have left without completing their time they get no letter of recommendation. Yet as a rule they have but little trouble in getting employment, when they say they have had so much training in our shop. The prospects for our future are very bright. Boys who complete the term of their apprenticeships find their position in life vastly improved; even those who do not go so far are in a better position to get on.

THE METHODIST EPISCOPAL MISSION INDUSTRIAL SCHOOL, NARSINGHPUR.

The necessity of providing for 200 or 300 orphans in charge of the mission led to the establishment of this school. The subjects taught in it are Carpentry, Shoe-making, Tailoring, Blacksmithing, Gardening and Farming. No fees are levied as the students are all orphans. The expense is met by the mission with the help of a grant from the Government. A number of men passed from the school and are earning their living by working at the trades learnt by them. At present there are in the school 29 whole-time students and 58 who work for two hours a day. These latter are taking the regular course in either the Hindi Primary, the Anglo-Vernacular Middle, or the High School, in connection with the mission. There are seven teachers in the school, and they possess knowledge sufficient to teach the boys in the several departments. Mr. D. G. Abbott, M.A., B.Sc., is the manager.

THE MISSION INDUSTRIAL CLASS, BHANDARA.

This was started in the year 1904 for the orphanage boys in the mission. Carpentry, Black-smithy and Tailoring are taught, the course in each extending to three years. No fees are charged, and no scholarships awarded. The pupils board in the orphanage. There are no qualifications required for admission. There are 23 students at present. Forty-eight passed out in previous years. These are mostly employed in Nagpur, Wardha, Bhandara and Raipur on wages up to Rs. 20. The capital cost of the school was Rs. 1,700, and its maintenance costs Rs. 500 per annum. The class is in charge of Mr. J. Cockburn, manager. •

THE AMERICAN CHRISTIAN MISSION SCHOOLS, DAMOH.

This is not a separate school. It is amalgamated with the local Vernacular Middle school. During the first famine, an orphanage was established by the mission. In order to avoid the difficulty of finding out a suitable career for the young men, who as they grow up leave the orphanage every year, the mission authorities have opened the school so that the boys may earn an independent livelihood. Boys are taught Carpentry Black-smithing, Shoe-making and Agriculture including gardening. No theoretical lessons are given but all instruction is practical only. No fees are charged. Only those boys who are looked after by the mission authorities learn in the school. All boys live in the mission buildings and are fed and looked after by the mission authorities. Irrespective of the qualifications, boys who are old enough to do the work are taught one or the other industry in the school. The source of income is the mission fund. The teachers are common artisans having practical knowledge only. Since the mission boys are only taught in the school and as no outsider does come there to learn any of the industries, nothing can be said regarding the appreciation of this institution by the general public.

THE WESLEYAN MISSION INDUSTRIAL SCHOOL,
JUBBULPORE.

There is an industrial school under the Wesleyan Mission, Jubbulpore, which is intended for the orphans in the orphanage of the mission. There are 54 students learning carpentry, weaving, gardening and house service. The institution is aided by Government from 1st April 1907 and Rs. 125 per annum given as fixed grant.

The staff consists of two carpenters on Rs. 13 and Rs. 10, a weaver on Rs. 8-8-0, 2 *mailes* on Rs. 7 and 6 per mensem.

THE MISSION INDUSTRIAL CLASS, CHANDA, C. P.

This was started after the famine of 1900. Carpentry and gardening are taught. There are no fees and no scholarships. The boys board in the mission. There are six of them at present. Two of the past students have obtained employment in Calcutta as fitters. The class is in charge of the Rev. A. Wood, Manager.

THE NIZAM'S DOMINIONS.

THE GOVERNMENT TECHNICAL SCHOOL, NIZAMABAD.

Nizamabad is one of the districts in Medak Soobah and is on the H. G. V. Ry. line. Some of the taluks are noted for lacquer work and also copper-smith's work. The school is opened here in order to revive old industries and to give instruction in various departments.

For the present, drawing, carpentry and smithy are taught and shortly two or three or more branches are to be added, namely, cane-weaving, foundry and coppersmith's work.

Drawing.—The course extends over three years and the Bombay Jamsetji Jijibhoj School of Art system is introduced.

Carpentry.—The course is a three years' one. Thomson's system is adopted.

Smithy.—Forging round and square bars from scrap pieces, making forges of simple pieces such as bolts, drills and burning tools, turning—turning steel wrought iron to sketches. The students are prepared for the Sir J. J. School of Art examinations.

No fees are charged to the students. All are admitted free. Scholarships of the total value of Rs. 120 are awarded every month to the students.

For the present there is no provision of a hostel but it will be soon arranged.

The age of the boys should be ten and upwards, and they must have passed the Second Vernacular Standard at least.

The Government has sanctioned Rs. 2,000 for tools and Rs. 3,000 for materials. Maintenance expenditure is H. S. Rs. 432 every month. The money comes from the local fund.

The number of students at present on the roll, in the several classes, is as follows:—Drawing class, 36; Carpentry, 50; Smithy, 19.

This year 6 out of 8 passed the Sir J. J. School of Art 1st grade examination. Four of them are employed on Rs 30, 25, 20, and 15 in the Engineering Department as Draftsmen.

Teaching Staff.—Mr. G. B. Kadare ; Mr. D. G. Dharap ; Mr. Vishwanath V. Narasayya and Mr. Papanna V. Rachote.

THE INDUSTRIAL SCHOOL, AURANGABAD.

(Note by Mr. S. G. Solhony, Superintendent.)

The Industrial School of Aurangabad was opened in 1891 to revive, foster and improve local arts and industries on improved systems. The institution consisted of Drawing, Karchobi, Carpentry, and Himru weaving branches. Carving, Smithy and Tailoring branches were added in the year 1901. In the year 1907 classes for teaching painting, turning, and cloth weaving were opened.

Drawing up to the 3rd grade of the Sir J. J. School of Art, Bombay, Carpentry, General Cabinet making, Carving and Inlaid work in wood, Silver-smiths' work, Blacksmiths' work, Turning and moulding, Karchobi work, Himru, Mashru, and Silk weaving, and cloth weaving on improved fly-shuttle looms, are taught. The course of instruction extends to three years. The books appointed for the art examination are explained to pupils in their vernacular. The art examination and manual training examination are held here annually.

The instruction is given free. Scholarships ranging from annas 8 to Rs. 10 are awarded on the result of monthly examination and the quality of the work turned out during the month. There are about 125 scholarships.

At present there is no provision for hostel. The question is before the Government and a favourable decision is expected shortly.

A pupil seeking admission in this school has to pass Vernacular Standard III but the children of artizans are exempted from this. They can get admission in one of the Industrial branches

provided they agree to attend the Vernacular School and pass the Vernacular Standard III within 18 months from the date of admission.

The total expenditure including the pay of staff and scholarships, &c., for 1907 was Rs. 12,000. The institution is maintained entirely by the Government of H. H. the Nizam.

The strength of the school is 252, of whom 60 are Art beginners, 16 are in the Silversmithy class, 29 in the Manual Training class, 15 in Carving, 13 in Blacksmithy, 29 in Tailoring, 8 in Weaving, 32 in Embroidery, 31 in the first grade, 15 in the second and 4 in the third.

Of 31 passed students many are employed as schoolmasters, photographers, and Government servants, and one is in the Railway Engineering Department.

Mr. S. G. Sohoni is superintendent on Rs. 235 ; there are 26 other members of the staff on salaries ranging from Rs. 80 to Rs. 15 a month and teaching Drawing, Carpentry, Carpet-making, Metal work, Stone-carving, Silversmithy, Blacksmithy, Engraving, Embroidery and Tailoring.

THE AGRI-HORTICULTURAL SCHOOL, AURANGABAD. .

The school was opened in 1903 to revive grape culture and give instruction in Agriculture and Horticulture on improved methods to the sons of farmers. The gardens attached to Mukbara, where the school is situated, were given in charge of the Institution for the practical work.

Geology, Botany, Entomology, Chemistry and Practical Agriculture, diseases of animals and their cure are taught. The subjects are explained in the vernacular. The course extends over three years.

The instruction is given free. There are 30 scholarships.

There is no hostel attached to the school.

The candidate seeking admission has to pass Vernacular Standard III but it is not compulsory for the children of cultivators.

The total expenditure for the year 1907 was Rs. 2,850. This is a Government institution.

There are 40 pupils in the school.

Mr. S. V. Nagarkar, Head Master, on Rs. 60. There are seven other members of the staff on salaries ranging from Rs. 30 to Rs. 8, and teaching Agriculture, Botany and Gardening.

THE MAHBOOB TECHNICAL SCHOOL, BIR.

(From the Report on Public Instruction.)

This school was organised with a view to supply the long felt want of providing the children of the poorer classes with industrial education. The special object aimed at was to revive silk spinning and enamelling on leather, etc., for which Bir was once noted. Boys receive instruction in the vernacular in the theoretical as well as the practical side of the subject. For instance, a student in the tailoring class not only knows how to cut, but can detect any defect in the machine, etc. A special class has been opened in the school for children of the Bhil caste, which is a class of professional thieves, under the supervision of the police. The senior students can weave a single-threaded cloth, *sisis*, etc., and the junior students are taught to wind the thread on a large or small spoon. No fees are charged. The ages of the students vary from 8 to 17 years.

THE ENGINEERING SCHOOL AND THE INDUSTRIAL SCHOOL, HYDERABAD (DECCAN).

(From the Report on Public Instruction.)

1. The former prepares students for the examination in engineering, which is conducted by a Board of Examiners of passed men from the Public Works Department. The total expenditure on the school is over Rs. 5,000. The number of students is about 30. The school has the reputation of being one of the best technical schools in the state.

2. The Hyderabad Industrial School has a numerical strength of about 30. The expenditure on the school is over Rs. 2,600. The school sends up students for the Art examinations of the Sir J. J. School of Art, Bombay.

MYSORE.

THE GOVERNMENT INDUSTRIAL SCHOOL,
DODBALLAPUR.*(From a Note by the Superintendent.)*

Introductory.—The school was opened in November 1903, when Sir P. N. Krishnamurti, K. C. I. E., was the Dewan of the State. Mr. V. P. Madhava Rao, C. I. E., the present Dewan, takes the same warm interest in it, one of the very first acts of his *regime* being a direction to the State Forest Depôts to supply timber to Technical Schools where carpentry is taught at three-fourths of the actual cost price. The school is primarily a weaving one and its products have uniformly been well spoken of by all who saw or bought them.

Subjects taught.—The chief subjects taught in the institution are: Weaving on improved fly-shuttle looms, carpentry and drawing. It is of great advantage to weavers to learn the latter subjects as thereby they can themselves effect ordinary repairs of looms, and to copy designs of cloth. The winding of thread on bobbins, the weaving of coarse cloth of small width on the country pit-loom, the separating of warp on loom with cross-sticks and the arranging of the same in wooden reeds, the threading of the warp through harness and reed, are first taught; and then the weaver is taught the various processes on the fly-shuttle loom. The difference both in the speed and the nature of the work turned by the old and the new loom is explained to him. Afterwards he is taught the method of treadle, fixing, healds-forming, etc. As he gets on he is trained to weave on the fly-shuttle loom with a steadily increasing speed various kinds of checks, towels, bed-sheets, *sarries*, coatings, etc. Side by side with weaving the students are taught drawing and carpentry. Special attention is given to the repair and the making of looms. They are also taught to make furniture of every-day utility such as boxes, chairs, tables, etc. The period of instruction extends to about four years. The students need not appear at any examination.

Fees and Scholarships.—No fee is levied from students. Ten scholarships of the value of Rs. 10 per mensem and ten of Rs. 2 per mensem are awarded. There is provision to the extent of Rs. 200 per annum for giving wages for work turned out.

Admission.—There is no restriction whatever in regard to admission of students.

Finances.—Up to the end of February 1908, the capital cost has been about Rs. 5,600, and the annual maintenance charges amount to nearly Rs. 1,400. Sale-proceeds of articles made in the school amounted to over Rs. 4,000 between November 1903 and February 1908, the same for the year 1907-8 being nearly Rs. 440.

Numbers of Students.—The number of students on the roll at present is 38. The majority of these belong to the weaver class. One Brahman is learning weaving, and another carpentry. About 45 students passed out of the school and they are understood to be pursuing the crafts they have learnt. But only five have taken to weaving on improved fly-shuttle looms.

Articles made.—There are in use at this school four ordinary native hand-loom, three native pit hand-loom with improved fly-shuttle attachments, and six frame looms with fly-shuttle arrangement, and checks, *dhotis*, towels, silk-bordered *dhotis* and *saris*, silk coatings, counterpanes, dusters, hand-kerchiefs, carpets, wool-coatings, etc., are made on them. In the carpentry section are turned out boxes, door-frames, windows, chairs, tables, benches, desks and stools, book-shelves, fly-shuttle looms with accessories, racks, almirahs, boards, etc.

Staff.—Mr. D. Kongidiyappa, who has passed examinations in Teaching, Hygiene and Agriculture and is a weaver by caste and knows the art, is the Superintendent. There are besides, a Weaving Maistry and a Carpentry Mistry.

GOVERNMENT INDUSTRIAL SCHOOL, CHANNA- PATNA.

(Note by the Superintendent.)

The Industrial School at Channapatna was started on February 10, 1904. Its object is to revive the local industries of

musical wire making and lacquer works, for which the place has long been famous. It would not be out of place to state here that the lacquer works at Channapatna are the finest in India and the musical wires the best in the world.

The lacquer work section is divided into two divisions A and B. The boys of the A division are trained in wood-turning, wood-colouring and designing. The boys of the B division are taught Nature-study and Nature-imitation. Attached to this section there is a Carpentry class for teaching the elements of wood work. A few boys of this section are also taught the methods of refining lac and giving it different colours.

The boys of the musical wire section are trained in blacksmiths' work during the first year and then they are trained for the next two years in the art of preparing finely tempered steel wires for stringed instruments of different kinds. In connection with this institution there is a night school for imparting general education to the boys.

The course of instruction for each industry extends to three years. At the end of the course the Final Examination is held and the successful students are granted certificates.

Tuition is free. Besides there are 24 scholarships ranging from Re. 1 to Rs. 3 a month. The boy that seeks admission into the school must have passed the 2nd Standard Vernacular Examination and he must not be under 12 years of age.

Every student is bound to execute a Muchilika to the effect that he will undergo the full course of training in an industry. The father or guardian of the student has also to sign the Muchilika to show his consent to the above condition. A student who wishes to discontinue the course before its completion should refund the amount of scholarship if he has received any.

The institution is maintained by the Government and the charges are met from Local Funds, General. The annual expenditure is Rs. 760 for raw materials and Rs. 100 for tools and apparatus, while the Establishment charges amount to Rs. 1,932

per annum. The only source of income for the school is the amount realised by selling articles prepared by the students while learning the industries. Last year the work turned out by the boys was of the value of Rs. 1,025 and the sale proceeds amounted to Rs. 903. The number of students at present on the rolls is 41 in the Lacquer Work section and 6 in the Musical Wire Section.

Of the 41 students of the Lacquer Works Section 12 learn the art of Nature Imitation and 7 boys learn Carpentry for 4 hours every day. Besides these, there are 24 seats for the students of the local High School, Anglo-Hindi School and Taluk Kuninda School so that these may attend the Industrial School for one hour every day to receive some Manual Training. 12 students from the Lacquer Works Section, 5 from the Musical Wire Section and 3 from the Carpentry class have passed out of this institution. The successful students have all filled up private workshops and have been earning their living honourably. A noteworthy feature about the business of these artizans is that most of them work jointly. As the demand for lacquered articles and wires is steadily increasing, the school and its alumni have got bright prospects before them.

A student after 3 years' training in the Industrial School will be in a position to earn about Re. 1 a day. Very poor students who cannot afford to fit up private workshops are allowed to work as apprentices in the school and they get from the institution temporary wages for work done by them. Considering the short period of 4- years that the school has been in existence, it has shown good progress. It has won a gold medal, a silver medal, 3 bronze medals, a certificate of merit, 2 certificates of honourable mention and 4 money prizes at the different exhibitions held in India.

The Staff consists of M. Bawa Sahib Miyan, Superintendent, four Instructors, and a Night School Teacher.

WESLEYAN MISSION WORKSHOPS AND TRAINING
SCHOOL OF INDUSTRIES, TUMKUR.

(*From a Note by the Superintendent.*)

Brief history.—In the early days of the Mission a Boarding School was established at Tumkur and for many years excellent work was done here. When the famine of 1877-78 visited the province, hundreds of poor emaciated boys were received from the relief camps and the original buildings were enlarged and new ones added for their accommodation. Thus the Boarding School was transformed into an orphanage. When the orphanage was first established, the great problem was how to keep the emaciated children alive. The mortality among them was appalling, notwithstanding all that love and care could do. When that stage was passed, the missionary had to consider how he should educate and train the surviving ones. After gathering all the information he could from all sources, the missionary, Mr. Sawday, proceeded carefully to train the boys in various trades and occupations. The majority were put to learn farming, others were trained as carpenters, blacksmiths and bricklayers, while the brightest boys were selected for training as teachers. Eventually when the boys grew up and had to leave the orphanage and earn their own livelihood, they were equipped with sufficient instruction and tools so that they were independent of the orphanage. Those who had learned farming were placed on land which they cultivated and from these, three large villages have grown up, each a few miles away from the town. Those who learned the different handicrafts reside in the town and are earning their own living as petty contractors, &c., and some work in their own workshop as wheelwrights and carpenters. Up to the year 1904 the workshop was managed by the missionary on the station who had a mistry in charge of the inside work. From 1904 the Mysore Government have aided the institution so that now a European trained specialist is in charge. He devotes his whole time to the training of the youths and other business of the institution which is increasing year by year.

Subjects and courses, and the examinations held.—Carpentry, cabinet-making, carving, rope-making, rattan work and drawing, are the subjects taught. Every boy who comes to the institution is bound for 4 to 6 years according to his age. The average age is 14 years. When they enter the workshops, in the first year they are allowed to do anything and help every one in whatever way they are able and thereby secure a knowledge of things generally. In the second year they are put to definite work such as planing up wood in the carpentry, and filing and sticking in black-smithery, in fact each boy is treated as an apprentice. In the 3rd year, he is in a class of instruction of all details of his work, supervised by an experienced mistry, and taught to make all things necessary for his trade. Afterwards he is placed in the workshops with men and given different pieces of work to do. Up to now no examinations are held in the Mysore state in connection with the Educational Department.

Free studentships, scholarships, etc.—The majority of the boys are orphans and are boarded in the hostel in connection with the Mission. A small fee is paid in the workshops varying from 6 pies per day to 2 annas per day for work done by the boys. Board and clothing cost the Mission from Rs. 4-8-0 to Rs. 5 per boy per month on an average. Government provide six scholarships for poor Hindu boys at Rs. 3 each per month. So the institute is kept in existence by the hostel and the Mission funds.

Income and Expenditure.—The charges of supervision, the pay of the Mistries, etc., cost every year Rs. 4,764, and of the boarding of students Rs. 2,808, total Rs. 7,572. The Mysore Government give a salary grant equal to one-half of the Superintendent's salary. The balance is met from other sources. The actual income of the Institute is raised from year to year from the business connected with it. Its turn-over has increased from Rs. 7,000 in 1905 to Rs. 14,000 in 1907. Being a business as well as a training institute, its income will fluctuate from year to year.

Number of Students.—There are at present 43 students in the Carpentry and Cabinet-making classes, five in the Blacksmithery classes, 3 in the classes for Rattan-work and 1 in the Tailoring class. Besides there are 40 boys who come to work for half day only and are under 13 years of age.

Most of the old students are settled in villages near Tumkur, others are in different parts of the state following the calling or trade they were taught and many are teachers in the day schools. Since the Institute was in entire control by the present superintendent and manager only a few boys have left and these are now employed as carpenter or blacksmith outside the town in such places and centres as the different Mining Companies have been prospecting.

General.—Hitherto the various industrial and technical schools have only been able to secure students of the poorer classes. There is great scope for the better educated youths of the country who will join such institute and undergo training for 4 to 6 years, with the ability to master the theoretical part coupled with practical knowledge. Such youths would be able to secure positions as mistries or teachers or superintendents of the many industrial schools which are springing up here and there.

Staff.—Mr. R. A. Stott, a practical and trained business-man in cabinet-making, etc., is in charge of the institution.

THE SRINIVASAPUR INDUSTRIAL SCHOOL, SRINIVASAPUR.

The institution was started in February 1905, a desire having been felt for the same by the local people. One of the school masters advanced the capital and the working expenses and he is now taking the most active part in teaching the boys and supervising their work. The Government were kind enough to promptly encourage the effort by sanctioning a monthly grant of Rs. 13.

Carpentry and mat weaving are taught in the institution. The training is mainly intended for the benefit of the boys in

the A.-V. School, and so the instruction is imparted only during the spare hours between 12 and 2 during the day. There are no text books prescribed. The students are given training so long as they continue studying in the school.

No fees are charged for the training. Neither are any scholarships granted.

The school started with a small capital of Rs. 200, and the present working expense is Rs. 13.

The articles manufactured in the school are sold out to the public and the Government offices as well as the Post Offices. The sale-proceeds are the main source of income.

Mr. Venkata Chelaiah is the Manager of the Institution. He has a good knowledge of both Carpentry and Mat-weaving, but has not undergone definite course in any recognized College.

THE GOVERNMENT INDUSTRIAL SCHOOL, CHIKNAYAKANHALLI.

This institution was started on the 20th April 1904. In the first year of its existence boys of the weaving class were able to weave only white yarns of counts 20 and 30 on the fly-shuttle looms. In the second year they were able to weave checks, towels and silk-bordered *dhotis* and bed-sheets, of 40's counts. In the third year laced cloths, laced turbans, *saris* of Alipete and Dharmavaram patterns, bodices of various kinds, fine checks and silk-bordered *dhotis* of white yarn of counts 60's were woven by the boys. During this year white yarns of 80's counts are used for *dhotis* and turbans. Improved methods of Weaving with fly-shuttle looms are taught exclusively to weaver boys. The other subjects taught are *Carpentry* and Elementary Drawing. Chairs, tables, stools, benches, chests of drawers, almirahs, boxes, walking sticks, etc., are prepared in the Carpentry branch. There are 11 weaver boys and 9 boys in the carpentry class getting scholarships of Rs. 3 and 2. The initial expenses of the school were a little over Rs. 1,000, and the monthly charges come to nearly Rs. 160. Among the sources of income are the sale-proceeds of articles made in the school. These have amounted

to nearly Rs. 2,325 during the three years and 10 months of its existence. Many weavers appreciate the advantages of the fly-shuttle loom over the old country-loom.

Staff.—Mr. S. K. Venkata Narayanayyar is the Superintendent of the School, and there are three instructors besides.

THE HARDWICKE COMMERCIAL SCHOOL, MYSORE.

The school was instituted in January 1906, in connection with Hardwicke College, a Boarding School for Christian boys. The classes were however thrown open to the public, and speedily became popular. At the end of six months the number of students in attendance was 37 of whom 24 were day-students.

Shorthand, Typewriting and Book-keeping are taught in this Institution. Students are coached for the Madras Government Technical Examinations. The length of course of Shorthand is two years, Typewriting one year, and Book-keeping one year.

The monthly fee for Shorthand is Re. 1, for Typewriting Rs. 1-8-0 and for Book-keeping Re. 1.

No general hostel is provided, but many of the students are boarders in the adjacent Boarding School for christian boys.

Candidates who have passed the Lower Secondary standard are eligible for admission.

The initial outlay in the provision of typewriters, furniture, commercial library, etc., amounted to over Rs. 1,100. The normal maintenance expenditure is estimated at Rs. 70 a month.

The school has at present no other source of income than that of fees. The average monthly fees amount to Rs. 15, and the balance of expenditure is met from private sources. Application has been made for a Government grant.

The present number of students is 19, of whom 4 have taken both Shorthand and Typewriting, 1 Shorthand, and 14 Typewriting. The school is new, and up to the present only one set of students has taken a full year's course, and appeared for a public examination. Out of 11 who appeared for the Madras

Government Technical Examinations in Typewriting, held in the month of April 1907, 5 passed and of these several have already obtained good employment and are earning salaries at least twice as great as they had any prospect of obtaining previous to their receiving commercial training.

Mr. S. Gnanappaji and Mr. P. D. Ranganadhan are the teachers.

THE INDUSTRIAL SCHOOL, MELCOTE.

(From a Note by the Superintendent.)

Brief History.—This school was started in the year 1891, with only the Carpentry branch. It was a private effort and the first of its kind in Mysore, and the promoters had no easy time of it in popularising it among the Brahman and non-Brahman boys of the place which is a centre of Hindu orthodoxy. The Government of the State sanctioned a small grant of Rs. 10 in 1892, which was raised to Rs. 25 in 1896, Rs. 40 in 1898, and Rs. 80 in 1900. As the finances of the school permitted other branches were added such as Tailoring, Printing, Embroidery, Sewing, Weaving, Dyeing, and Book-binding. It is only after the establishment of this institution that the local weavers have taken to the weaving of cloths with ornamental lace and silk work. In the year 1904, the Superintendent of the School was deputed to visit certain important places in Southern India with a view to introduce foreign fly-shuttle looms, and to learn the colouring and dyeing of cloths.

Subjects and Courses.—The subjects taught are (1) Carpentry, (2) Weaving (on Hand-looms and fly-shuttle looms, and including Dyeing and Printing), (3) Printing (letter-press), (4) Book-binding, and (5) Sewing and Embroidery work. The courses of study extend from three to four years. Besides the above subjects, some handicrafts such as the making of fans, lac-work, etc., are taught in the school. The boys are examined every year by an Inspector of the Mysore Educational Department.

Fees, Scholarships, etc.—No fees are levied from the students. On the other hand scholarships are given to all of them. For this purpose the students are divided into two classes, full-time

students and half-time students; the latter being students of the general school who attend this school as half-timers. The former are awarded scholarships ranging from Re. 1 to Rs. 7 according to their qualifications, and the latter from annas 8 to Rs. 3. There is no hostel attached to the school but the managing committee is willing to feed and clothe students who are orphans until they are able to make a living.

Boys seeking admission into the school must be not less than 10 years of age and literate. Illiterate boys are admitted provided they are willing to receive primary education by attending a school for two or three hours a day.

Finances.—The sources of income are the Government grant, private contributions, and the sale-proceeds of articles made in the school.

Number of Students.—There are at present 52 students on the rolls including 10 girls. The young men who have left the school after receiving a complete training are doing well in their respective vocations.

Staff.—Mr. M. G. Shamiyengar is the Superintendent and there are five instructors well qualified in their respective branches.

THE GOVERNMENT INDUSTRIAL SCHOOL, CHITALDROOG.

(From a Note by the Superintendent.)

The Chitaldroog Industrial School was started by its present Superintendent, Mr. J. Arbuthnot, in January 1902, to instruct students in carpentry and iron work. It was taken over by the Government of Mysore in June 1904. The subjects taught are Drawing, Carpentry and Iron work. In the last section repair of dog-carts, *tongas*, *dummies*, *jutkas*, etc., is taught among other things. No fees are charged. The students are awarded scholarships of from annas 8 to Rs. 2. The cost of the up-keep of the school is between Rs. 2,000 and Rs. 3,000 a year. The number of students on the roll is about a dozen. The Government have proposed to convert the school into a grant-in-aid

institution. The Superintendent has submitted a protest against this proposal as it will have the effect of reducing the usefulness of the school.

THE MAHOMEDAN INDUSTRIAL SCHOOL,
BANGALORE.

This industrial school, opened in the Bamboo Bazar, Bangalore city, in May 1908, had in August 35 young Mahomedans learning various industries, chiefly carpentry, carving, engraving, and ivory-inlaying. Besides the Industrial School they have started a night class, which is largely availed of by many a Mahomedan young man.

THE WESLEYAN MISSION GIRLS' INDUSTRIAL
SCHOOL, HASSAN.

(Note by the Superintendent, the Rev. H. Holliday Newham.)

The school was originally a Famine Orphanage established by the Mission for the reception of destitute orphans in the years of famine 1876-77. A day school was commenced and later a Knitting industry. The institution is still an orphanage admitting destitute and friendless girls, but it has become more and more a Boarding School for the training of the children of poor parents unable to pay the full cost of the children's education, but from whom small fees are collected.

In the day school the ordinary Curriculum of the Government day schools is adhered to. The industrial training consists of practical instruction in various kinds of knitting work, the article mainly produced being the round cap that has become generally known as the 'Hassan Cap.'

The cost of the institution including Boarding School, Training School and Orphanage is about Rs. 10,000 a year for maintenance. The total cost of the buildings that have been erected at various times amounts to about Rs. 16,000. Extensions are now being carried out at a further cost of Rs. 8,000.

The cost has been met mainly by subscriptions, also from the profits on the sale of knitted articles, fees and Government grants.

One hundred girls are now in residence.

A large number of girls has passed out of the institution who are now married and continue the knitting work in their own homes and are thus able to augment their husbands' incomes.

SLOYD (EDUCATIONAL MANUAL TRAINING) IN MYSORE.

(From a Pamphlet by Dr. Gustaf Larsson.)

On the recommendation of Mr. H. J. Bhabha, Inspector-General of Education, Mysore, the Government of the State have introduced the "Sloyd" system of manual training in some of the schools of the State. First, with a view to provide teachers, twenty teachers selected from different parts of the state were made to undergo a systematic training in Sloyd under Dr. Larsson's supervision at Bangalore last year. And in the month of August this year it has been introduced in nine Government schools. Dr. Gustaf Larsson, Principal, Sloyd Training Schools, Boston (U. S.) was brought down last year to organize it in the State Schools.

Sloyd is tool work so arranged and put into practice as to stimulate and promote vigorous and intelligent self-activity for a purpose which the worker recognizes as good. The teachers must be professional teachers and not artisans merely. The visible or material results should in every respect represent the worker's own effort. Generally speaking, this should mean no division of labour, and practically the exclusion of machinery as a labour-saving device. To begin with, children should be selected from the second, third and fourth forms, and the time given to each child should not be less than two consecutive hours a week. When work is satisfactorily carried on in the forms just mentioned, it should be expanded into the lower and higher grades of schools. In the lower grades some correlated handwork in clay, cardboard and thin wood should be introduced and taught by the regular teachers, if competent. In high schools preference should be given to advanced wood-work, supplemented by wood-turning and some carving. The objects made should be such as can be readily appreciated by the worker and should become his property. Work-benches, tools and materials used should be as far as possible, the product of the country rather than imported. Such work as forging, pattern-making and machine work should be placed in the Technical or Industrial Schools. These Technical and Industrial Schools are needed to supply a training to the comparatively few boys who intend to specialize in a particular line of work, or to make a livelihood in some particular trade; but such work has no place in general education.

The outfit of a Sloyd room costs a good deal, but the running expenses are very light. For a class of twenty pupils, the outfit consisting of the best benches and tools will cost about Rs. 945, and the running expenses will be about Rs. 3 per child for the year.

The course given to teachers at Bangalore last year consisted of—

- I. Models : Objects of such interest to the worker that he voluntarily puts forth the effort required in the exercise.
- II. Means for giving a correct mental picture : Such as the study of the model and its evolution and the reading and the making of drawings.
- III. New exercises : An exercise in Sloyd is a specific use of a tool, involving certain mental and physical effort.
- IV. Repeated exercises : Exercises so introduced as to secure needed practice without monotony.
- V. New Tools : Instruments by which the hands give expression to thought.
- VI. Kinds of Wood : Variety of native woods suited to the character of the object.
- VII. Supplementary objects : A variety of objects containing given exercises to suit individual needs.

THE GOVERNMENT INDUSTRIAL SCHOOL MYSORE
(From a Note by the Superintendent, Mr. G. Subbusawmi Iyer.)

The Government Industrial School, Mysore was started on the 1st March 1892 for the purpose of imparting instruction in Carpentry, Masonry, Blacksmith's work, Cane work and Pottery. After a few years, the masonry class was separated and developed into the Government Engineering School for training Sub-overseers and Taluk maistries. Pottery was from the beginning intended to be a tile-making class.

2. The No. on the rolls is as below:—

Carpentry class 67, Blacksmith's work 41, Rattan work 42, Tile-making and Pottery 58, Special Drawing 10, total 218.

This number is made up of Eurasian 1, Christians 13, Mahomedans 26, Brahmins 23, other Hindus 149, Vaisya 1, Lingayets 4 and Panchama 1. Of these, 41 are artisans.

3. The pupils in the Industrial Department are classified according to the courses of instruction prescribed in the Madras Educational Rules. The rates of scholarships for the different classes are as follows:—

				Rs.
Advanced class	...	...	...	10
Intermediate	...	...	...	8
Elementary	...	...	...	6
Standard D	...	...	...	5
Do. C	...	...	...	4
Do. B	...	...	...	3
Do. A	...	...	...	2

A deduction of half anna in the ruppee is made for every day of absence without leave and for every day of absence with leave over four days in a month and 15 days in a year. A boy gets full scholarship for a month on sick leave in a year.

When boys come in first for admission, they are not given scholarships at once but are required to pay a fee of annas eight a month each provided they abide by the rules of the school as regards attendance, &c. If they attend the school for portions

of a school day, they have to pay a fee of rupee one a month. This system of levying fees from boys of this school was introduced from July 1905, and the collections in different years are given below :—

	1908-06.	1906-07.	1907-08.	1908-09	for so
	Rs.	Rs. a. p.	Rs. a. p.	Rs. a. p.	month
Industrial Department...	60	93 0 0	115 12 0	91 8 0	from
Drawing ...	8	19 8 0	16 0 0	31 12 0	July,
					1908.

There are at present 15 boys paying fees. The number was once as high as 32 but several of them have recently been given scholarships. If boys do satisfactory work and if they are regular in attendance, they are given scholarships of the classes for which they are fit at any time two or three months after admission provided the provision under scholarships admits of the same.

The establishment consists of a Superintendent, an Assistant Superintendent, four instructors for Carpentry, two for Blacksmith's work, two for Pottery, one for Rattan, two for Drawing with a pupil, five General Education teachers, one sale room clerk and one store keeper, besides servants.

5. The boys have Industrial work for 6 hours a day (7-30 to 11 A.M. and 3 to 5-30 P.M.) for 6 days in a week and they have General Education for one hour a day up to the Lower Secondary Standard and Drawing for one hour a day between 1 and 3 P.M. There are no long periodical vacations. The school is closed for 10 days during Christmas. It has Industrial work alone for four hours a day from 7-30 to 11-30 A.M. for a month from 1st Monday after the 4th April. The Industrial classes alone work from 7-30 to 11 A.M. on new moon days. The other sundry holidays come up to about 21 days in the year (exclusive of Sundays).

6. The boys of the Standard classes are examined by the Superintendent in June, or July every year and the successful pupils are promoted to the next higher classes. The promotions of boys in the elementary and intermediate classes are regulated by the results of the Madras Government Technical Examinations. The percentage and the quality of passes have of late shown decided improvement.

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Boys of this School headed the list of successful candidates in several subjects. Of the 40 successful candidates in Drawing 28 were from the Industrial Department and the remaining 12 came from the special Drawing class for outsiders.

7. There has been a steady and gradual improvement in the sale proceeds of articles realised. It had gone up to Rs. 15,203 in 1907-08 as shown under :—

					Rs.
Carpentry	...	...	...	...	8,604
File making	...	...	...	...	4,474
Blacksmith's work	...	...	...	...	1,310
Rattan work	...	...	...	...	679
Drawing	...	...	...	...	134
Miscellaneous	...	...	...	...	2

This does not include the value of credit sales remaining uncollected on the last day of the year and of manufactured stock on hand.

BARODA.

THE KALA-BHAVAN, BARODA.

(From the Principal's Report, the Prospectus, etc.)

Brief History.—With the object of helping the people to improve the existing industries and to introduce new ones that might be remunerative His Highness the Maharajah Gaekwar ordered in May 1890, the establishment of a Central Technical Institute at Baroda and of Industrial Schools at some of the prominent industrial centres in the State for the purpose of imparting technical education through the medium of the vernacular. The Central Technical Institute was accordingly opened in June 1890, under the name of the Kala-Bhavan or Temple of Art and a modest beginning was made by the opening of classes in Drawing, Carpentry, and Dyeing and Calico-printing. About a couple of months later a class in Mechanical Engineering was added. The Male Training College and the Agricultural Classes which were already in existence when the Kala-Bhavan was opened were amalgamated with the latter in September 1890. During the second year the subjects of studies for all the different classes were revised and re-arranged. Some more subjects were added in each of the courses and the scope of the institute was widened. This necessitated a change in the names of the classes. Accordingly, the classes in Drawing, Carpentry, Mechanical Engineering and Dyeing and Calico-printing were designated Schools of Art, Architecture, Mechanical Technology and Chemical Technology respectively. The Training College and the Agricultural classes became Schools of Pedagogy and Agriculture respectively in the general change of names. With a view to enable the weavers to understand the advantages of introducing fly-shuttle arrangements in the native hand-loom and to provide technical instruction in the art of hand-loom weaving, a class was added to the Kala-Bhavan in July 1897. This class has since developed into a school of weaving. The School of Agriculture is now

attached to the Model Farm. A class in watch-making was added to the Kala-Bhavan in 1902, and it has since developed into a school of watch-making.

Schools under the Kala-Bhavan.—There are at present the following schools in the Kala-Bhavan, besides three District Industrial Schools at Naosari, Amreli and Padra :—School of Art, School of Architecture, School of Mechanical Technology, School of Chemical Technology, School of Weaving, School of Watch-Making, Training College, School of Commerce, and Evening Class for Artizans. The last two were opened in 1906.

The School of Art.—The School of Art has been on the whole the most popular and prosperous of all the schools in the Bhavan. It has been equipped with studios for Modelling and Photography, and furnished with all necessary apparatus and appliances. Provision is made for teaching both pure and applied art.

There are three ordinary classes which prepare students for the three grades of examinations of the Sir J. J. School of Art, Bombay. As the Kala-Bhavan has been recognized since 1892 as one of the centres for conducting the First and Second Grade Art Examinations of the Sir J. J. School of Art, only the Third Grade students and those desiring to obtain the Architecture, the Draftsman's and the Drawing Teacher's Certificates are required to go to Bombay for their examinations. Over and above the subjects prescribed by the Sir J. J. School of Art for the three grades of Art examination, Model and Object Drawing, and Modelling in clay and plaster of Paris are taught to the students of the First Grade class ; Linear Perspective, Projection and Modelling in clay are taught to the Second Grade class, and Linear Perspective, Shading and Photography are taught to the students of the Third Grade class.

Besides the ordinary classes there are four special classes which provide instruction in Architecture, Painting, Modelling and Engraving. None but those who have passed their Second Grade examination are allowed to avail themselves of these

classes which are intended solely for the advanced students with a view to fit them for joining any one of the four professions.

In order to encourage the students to pay due attention to the additional subjects of study provided for the three ordinary classes as well as to those in the four special classes, it has been arranged since 1905 to hold an annual examination for awarding Diplomas with the title of Licentiate of Art to the successful students.

The subjects prescribed for the examination for the Diploma of Licentiate of Art are as follows:—(1) Shading, (2) Outline Drawing, (3) Perspective, (4) Practical Geometry, (5) any one of the following:—(a) Painting, (b) Architecture, (c) Modelling, (d) Engraving.

The School of Architecture.—The object of the School of Architecture is to provide instruction, both theoretical and practical, with a view to prepare good carpenters, joiners, cabinet-makers, builders, contractors, mistries, surveyors and sub-overseers for the house-building and furniture-making trades.

The subjects taught in the school are practically the same as those taught in the Sub-Overseer's class attached to the Poona College of Science. But they cover a wider scope and provide for a greater variety of occupations, and it is claimed that the workshops afford greater facilities for acquiring practical knowledge in Carpentry and Furniture-making. Diplomas are awarded with the title of Licentiate of Architecture to the successful students at the final examination. In filling up vacancies of mistries and sub-overseers in the Public Works Department of the State preference will be given to the successful students of this school.

The School of Mechanical Technology.—With the rapid growth of mills and factories there has been a growing demand for trained Mechanics such as pattern-makers, moulders, smiths, fitters, turners, and machine-men as well as for qualified engineers who can undertake the management and care of engines and boilers. The object of the School of Mechanical Technology

is to supply this demand and to stimulate the introduction and growth of all sorts of industries either mechanical, textile or chemical.

Of all the schools in the Bhavan this school presents the most extensive field of employment to the successful students. In the year 1900 the Government of Bombay recognised the school and placed its students on the same footing as regards appearing at the Engineer's Certificate Examination held under the Bombay Boiler Inspection Act, with those of the Mechanical Engineering classes of the Poona College of Science and the Bombay Victoria Jubilee Technical Institute. Since then the School has risen in popularity. Applications for admission are received from Gujarat, Kathiawar and the Deccan. The number of applicants being more than there is accommodation for, an entrance examination is held on the result of which selection is made and about 30 new students are admitted every year.

The subjects taught in the school are practically the same as those taught in the Victoria Jubilee Technical Institute, Bombay. It is claimed that the workshops of the Bhavan afford greater facilities for the acquisition of practical knowledge in the several departments of Mechanical Engineering.

Diplomas are awarded with the title of Licentiate of Mechanical Technology to the successful students at the Final Examination.

The School of Chemical Technology.—It was with a view to provide instruction in the theory and practice of Dyeing and Calico-printing on the Modern improved methods that the School of Dyeing was opened. The scope of the school has since been widened and the designation changed and at present the school prepares not only dyers and calico-printers but industrial chemists as well. This school has been the least resorted to of all in the Kala-Bhavan. With a view to make it prosperous diplomas with the title of Licentiate of Chemical Technology have been awarded to the successful students at the final examination. The school is indebted to Mr. Goll of the Bombay

branch of the firm of Messrs. Leopold Cassella and Co. of Germany, who has been giving Rs. 90 every month for distribution as scholarships to the students and rendering much assistance otherwise.

The School of Weaving.—The course in this school extends over three years besides weaving on improved looms: Use of carpenter's tools and practical carpentry are taught to enable the boys to learn how to repair their looms or make new ones.

The School of Watch-making.—The object of this school is to provide such instruction in the theory and practice of horology as will train students to take up after a successful course, the profession of a watch and clock-maker as well as that of a manufacturer of call-bells, mechanical toys and other small articles and contrivances requiring spring and wheel-work for their construction.

The School of Commerce.—This was opened in July 1906. Classes are held in (1) Book-keeping, (2) Accountancy, Banking and Currency, (3) Machinery of Business, (4) Commercial History and Geography, (6) Commercial Law, (7) Elements of Economy, (8) Short-hand, (9) Type-writing. The examinations of the London Chamber of Commerce, the Royal Society of Arts, and the National Union of Teachers are held annually at the Kala-Bhavan under the supervision of the Principal.

Evening School for Artizans.—This school was opened in November 1906, with a view to provide suitable instruction for artizans and craftsmen, such as carpenters, potters, blacksmiths, wood-turners and others who are engaged during the day in mills, factories and workshops. The course of instruction comprises the three R's and Drawing. The 47 students attending the school at the close of the last official year came from the following classes:—carpenters and joiners, wood-turners, gold and silver-smiths, blacksmiths, brick-layers, masons, barbers, and liquor-sellers. Drawing is a very popular subject among these.

Fees, Scholarships, etc.—An entrance fee of Re. 1 is charged from students joining the School of Art, who have to pay in

addition a fee of Re. 1 for six months, and from those joining the School of Mechanical Technology who have to pay Rs. 10 for six months. Students belonging to the state as well as those who come from outside are treated as free students on production of certificates from the Head-Master of the school where they have studied, that they are poor. In the School of Commerce a monthly fee of Rs. 2 is charged in addition to an entrance fee of Re. 1. But students of the Kala-Bhavan and the Baroda High School are charged Re. 1-8 only.

Several scholarships ranging in value from Rs. 2 to Rs. 5 per mensem are awarded to students who pass in the several examinations held at the Kala-Bhavan. Two scholarships of Rs. 4 each per month are awarded from the interest on the fund started in memory of the late Dewan Bahadur R. V. Dhannas-
kar. There are also some scholarships awarded by the Director of Public Instruction, Central Provinces, to students going to the Kala-Bhavan from there and similarly several Kathiawar nobles award scholarships to students belonging to that part of the country.

Students who pass first and second in the final examinations of the Arts, Mechanical Technology and Chemical Technology Schools get awards of medals and prizes. Prizes are awarded to students standing first, second and third in the examination of the School of Watch-making. Silver medals are given to students who satisfy the prescribed conditions from the interest of the Khan Bahadur J. A. Dalal Memorial Fund.

Hostel.—There is a Hostel attached to the Kala-Bhavan for the benefit of students who come from outside. Lodging is free, but they have to pay for boarding.

Admission Rules.—In the Schools of Art, Architecture, Chemical Technology, Weaving and Watch-making, students are admitted in order of the priority of their application to the extent that the available accommodation may permit, but preference is in all cases, given to natives of Baroda state. In the case of candidates seeking admission into the School of Mechanical Technology, an entrance examination is held as already stated.

They will be examined in Arithmetic. Baroda students are given preference over outside ones. Candidates must have passed the English third standard or the vernacular standard examination and must be above 13 years of age, for admission to all schools but those of Art, Mechanical Technology and Commerce. Candidates for the Mechanical Technology school must possess the same qualification but be above 17 years of age. Candidates for the School of Commerce must have passed the English sixth standard.

Income and Expenditure.—The total expenditure of the Kala Bhavan and the District Industrial schools was Rs. 55,267 in the year 1906-7. The annual average cost of educating each pupil is about Rs. 55.

The income during the same year was Rs. 3,300 from fees, Rs. 13,000 profits of the workshops, Rs. 525 miscellaneous, Total Rs. 16,825.

Strength.—There were in 1907, 103 students in the School of Art, 86 in the School of Architecture, 125 in the School of Mechanical Technology, 60 in the School of Chemical Technology, 92 in the School of Weaving, 9 in the Watch-making, 73 in the Male Training College, 14 in the School of Commerce, and 49 in the Evening School for Artizans, making a total of 561 against 479 in the previous year. The strength increased to 662 at the end of January 1908.

Past students.—The students of the School of Art have been employed either as draftsmen or drawing teachers or have established themselves as photographers, painters, engravers or modelers. The Vividha Kala Mandir of Baroda, which has been turning out artistic work in painting, photography, glass etching, glass decorating, engraving, etc., is entirely conducted and managed by the passed students of the Kala Bhavan. The students of the School of Architecture have either been employed as contractors, draftsmen, mistries or sub-overseers in the Public Works Department under various Governments or have set up as carpenters and furniture makers. The students of the School of Mechanical Technology have been employed in mills, factories

and workshops as pattern-makers, moulders, smiths, fitters, turners, machinemen, foremen or engineers. The students of the School of Chemical Technology have been employed either in dye-houses or dyeing and other chemical industries or have set up as dyers and calico-printers. The students of the Weaving School have been either employed in hand-loom weaving factories or have set up as weavers.

Staff.—Rao Bahadur Raojibhai M. Patel, L.C.E., A.M.I.E., Principal; Rao Saheb Ranchoddas K. Luhar, Diplomatist in Watch-making, Extra Superintendent; Khan Saheb Cursetji N. Vevai, L. M. E., Workshop Superintendent. *School of Art*: Rao Saheb Ramchandra J. Budhwakar, Head Master; and four teachers. *School of Mechanical Engineering*: Rao Saheb Waman G. Deshpande, L. C. E., Head Master; Vishnu G. Paranjpe, Esq., Workshop Instructor. *School of Chemical Technology*: Rao Saheb Hirabhai V. Patel, L.M.E.; Dye-house Superintendent; Chhaganlal R. Trivedi, Esq. *General Staff*: Professor Narainbhai D. Nanavati, B. Sc., Professor of Chemistry; Vinayak M. Kotasthane, Esq., B.Sc. L.C.E., Lecturer in Science and Mathematics; and three teachers. *Weaving School*: Lakshman G. Pradhan, Esq., L. T. M., Head Master. *Commercial Class*: Rao Saheb Shankar G. Dongre, Commercial Teacher. *Evening Class for Artizans*: Purushottam V. Patel, Esq., Drawing Teacher; and a Gujarati teacher.

THE AGRICULTURAL SCHOOL, BARODA.

(From the Administration Report for 1906-7.)

This school is located at the capital. The total number of pupils at the end of the year was 17, 12 of whom were in the senior and 5 in the junior class. The condition of the school is stated to be far from satisfactory, and measures to increase its efficiency and to attract more scholars are being devised. The school is under the control and supervision of the Director of Agriculture.

DISTRICT INDUSTRIAL SCHOOLS IN THE BARODA STATE.

There are three District Industrial Schools in Baroda State affiliated to the Kala Bhavan. A school was opened at Kathore in Naosari district with classes in Drawing and Dyeing in August 1891. It was transferred to *Naosari* in 1905. A second was

started at Petlad in the Baroda district with classes in Drawing and Dyeing in November 1891. This was transferred to Vass in 1896, and thence to *Padra* in 1907. One practical result of this school was the opening of a successful Dyeing Factory at Petlad. A third school was started at Patan in the Kadi district with classes in Drawing, Carpentry and Dyeing in April 1892. This school was removed to Kadi in 1899, from there to Vadnagar, and from Vadnagar to *Amreli* in 1906. At present Carpentry and Dyeing are taught here. The total number of students in the three schools was 126 in the last official year against 114 in the preceding year.

MANUAL TRAINING CLASSES IN THE BARODA STATE.

(*From the Administration Report for 1906-7.*)

There are altogether six classes, three in the Kadi district, one each at *Visnagar*, *Kadi* and *Pattan* and one class in each of the Naosari, Baroda and Amreli districts attached to the *Billimora*, *Sojitra* and *Amreli* schools. Drawing and Carpentry are taught in these classes, and the total expenditure on account of them was Rs. 5,321. The number of students has greatly increased, being 868 against 313 in the preceding year, 'a fact that indicates that the schools are highly popular both with the scholars and their parents.'

GWALIOR.

THE GWALIOR WORKS, GWALIOR. LABORATORY SECTION.

The subjects proposed to be taught here are Mechanical Drawing, Pattern-making, Smithy, Foundry, Machine Tools, Turnery, Fitting, Polishing and Finishing, and Erection of Machinery. It is intended to give practical training in all the above subjects. Students when they have completed their term in the Laboratory will be employed on certain conditions in the Laboratory itself and they will be duly remunerated for their work. Students seeking admission must not be below 18 years of age and must have passed the English Fifth Standard examination. They will have further to undergo an entrance examination before admission. To start with, the total of admissions will be restricted to 25 and each student will be required to pay Rs. 5 as entrance fee. The course extends over three years and every student must bind himself not to leave the Laboratory until he has completed the course.

RAJPUTANA.

THE RAJPUTANA VETERINARY SCHOOL, AJMERE.

*(From the Quinquennial Report on Education in India, 1897-8
to 1901-2.)*

This school was founded in the year 1894. The length of the course is two years and the language of instruction the vernacular. One examination is held at the end of each year by a Board of Examiners, and a certificate is given on passing the final examination. The subjects taught include Anatomy, Physiology, etc. There are about 60 students in the school. All but a few of the students who have passed out are employed.

TRAVANCORE.

THE SRI MULA RAMA VARMA TECHNICAL INSTITUTE, NAGERCOIL.

(From a Note by the Superintendent.)

This institute was started on the initiative of Mr. S. E. Vaikuntam Aiyar, Executive Engineer, P. W. D., by the public of South Travancore in commemoration of His Highness' safe return from the Imperial Delhi Durbar, on the 28th May 1903. It was formally opened by Dewan Bahadur K. Krishnaswamy Rao, C. I. E., and its management was vested in a Committee of prominent gentlemen with Mr. S. E. Vaikuntam Aiyar as President. The Institute comprised two main branches, one Engineering and the other Industrial. The former aims at training students for the Madras Government Technical Examinations in the various subjects of Civil Engineering and the latter at training students for those in Weaving, Carpentry and Blacksmith's work. During his administration Mr. V. P. Madhava Rao, C. I. E., visited the Institute and was much impressed by its possibilities. The management of the Institute was taken over by the Government in 1906 at the request of the Committee of Management.

Engineering Section.—Soon after it was taken over by the Government it was felt that the Engineering Section required reorganisation and a set of fixed rules for its working. The Government accordingly took the matter in hand and passed a set of revised rules which came into force in 1907.

In accordance with these rules, there are now two classes:—

(1) Subordinate Engineering Class, (2) Surveyor and Mistry class.

Subordinate Engineering Class.—The course in this extends over two years. The strength in each year is limited to twelve students as a maximum. The admission is regulated by a competitive examination from among those who have passed the

Matriculation Examination of the Madras University or any other Examination accepted by Government as equivalent thereto and whose age is between 16 and 21 on the 15th March of the year in which they seek admission. The competitive examination is held in the Institute every year on or about the 15th April and the course of studies commences on the 1st June following.

The fees payable by the students are Sircar rupees four per month. There is also an admission fee of Sircar Rupees four to be paid.

The following are the subjects taught :—

- I. Mathematics.—(Arithmetic, Algebra, Geometry, Mensuration, and Plane Trigonometry) ;
- II. Engineering.—(Building Materials, Building Construction, Hydraulic Engineering, Applied Mechanics, and Mechanism and Steam Engine) ;
- III. Drawing.—(Geometrical and perspective drawing, Free-hand and Model Drawing, Building Drawing, Machine Drawing, and Estimating) ;
- IV. Surveying.—(Chain Compass and plane table, Levelling, Theodolite Survey, and Topographical Surveying) ;

The School Final Examination is conducted by a board of examiners appointed by the Government. At the end of the first year course, the students are examined in (1) Arithmetic, (2) Algebra, (3) Geometry, (4) Mensuration, (5) Building Materials, (6) Geometrical and Perspective Drawing, (7) Freehand and Model Drawing, (8) Chain, Compass and Plane Table Survey. At the end of the second year, they are examined in all the remaining subjects. The marks obtained by each student are then totalled together and in order to pass the examination candidates must obtain not less than one-third of the marks in each of the five subjects and not less than one-half of the total number of marks. Successful candidates obtaining not less than three-fourths of the total number of marks are declared to have passed with credit.

Those that fail in the final examination will not be permitted to study in the Institute but can appear again for the examination in all the subjects in the succeeding year, on payment of the prescribed fee.

Students can also appear for the Madras Government Technical Examinations in the various subjects taught in their classes.

On passing the final examination, a certificate is issued to each student stating his qualifications. Holders of this certificate are eligible for employment as Overseers, Sub-overseers, Draftsmen, etc., in the P. W. D., Municipal and other Departments.

One appointment annually as a Sub-overseer on Rs. 35 per month is guaranteed to the student who stands first in the combined results of the first and second year examinations conducted by the Board. In filling up vacancies as Overseers, Sub-overseers, etc., in the P. W. D. and other Departments, Government have ordered that preference will be given to passed students of the Institute.

Surveyor and Maistry Class.—The course extends over one year. The strength of the class is limited to twenty as a maximum.

The admission is regulated by a competitive examination from among those who have undergone a full year's course in the fifth form of a recognised high school and who are between the ages of 16 and 21 on the 15th March of the year in which they seek admission. The competitive examination is held in the Institute on or about the 15th April every year and the course of studies commences on the 1st June following.

The fees payable are Sircar Rupees three every month. There is also an admission fee of Sircar Rupees three to be paid before the student can be admitted.

The following are the subjects taught:—

(1) Building Materials, (2) Building Construction, (3) Building Drawing, (4) Estimating, (5) Surveying with chain, compass and plane table, (6) Levelling, (7) Earthwork and Roadmaking, (8) Mensuration, and (9) Gymnastics and Drill.

The School Final Examination is conducted by a Board of Examiners. In order to pass this examination students must obtain not less than one-third of the marks in each of the subjects (1) Building Materials and Construction, (2) Building Drawing and Estimating, (3) Surveying and Levelling, (4) Mensuration, (5) Earthwork and Roadmaking, (6) Gymnastics and Drill; and not less than one-half of the total number of marks. Successful students who obtain not less than three-fourths of the total number of marks will be declared to have passed with credit.

Students can also appear for the Madras Government Technical Examinations in the various subjects taught in the class.

Certificates are given to passed students which will make them eligible for employment in the Public Works Department and kindred departments as Surveyors, Maistries, etc. In filling up vacancies in these departments preference will be given to passed students of the Institute.

So far, there has been no difficulty in passed students of the Institute finding suitable employment.

Industrial Section.—This Section comprises three branches, *viz.*, (1) Weaving, (2) Carpentry and (3) Blacksmithy.

General.—No educational qualifications are prescribed for admission. Boys are admitted throughout the year. No fees are charged. In the case of poor boys making satisfactory progress stipends of 3 rupees a month are granted. These may be forfeited for misconduct, idleness or irregular attendance.

Weaving branch.—The full course extends over four years. After the first two years, boys are sent up for the Elementary grade in 'Cotton Weaving on the European Handloom' (Madras Government Technical Examinations) and after the next two years for the Intermediate Grade.

The instruction is theoretical and practical and consists of:—(1) Working flyshuttle hand-looms and weaving different kinds of fabrics such as towels, *veshtys*, sashes, checks, carpets, bed-sheets, etc.; (2) Designing textile fabrics and the principles of the

various kinds of weaving, *e.g.*, twills, drills, satin, etc., (3) Free hand drawing, (4) General Instruction, reading and writing Tamil; Elements of arithmetic with special reference to calculating quantity of yarn required for cloth from given data; casting goods, etc.

After the end of their course students can practise hand-loom weaving with improved methods, as a profession, or open hand-loom factories. Employment as teachers or foremen in weaving schools can also be secured.

Carpentry branch.—The course extends over four years. Students are trained for the Madras Government Technical Examinations in Freehand Model Drawing and Cabinet-making in the Elementary, Intermediate and Advanced grades.

The instruction is both practical and theoretical and consists of:—(1) Making various kinds of joints in wood, Application of above in making furniture, *e.g.*, chairs, boxes, benches, tables, etc.; (2) Turning wood; (3) Defects in wood, Method of selecting wood; (4) Polishing and finishing furniture, etc., Carving; (5) Freehand Drawing; and (6) General instruction—Reading and writing, Elements of arithmetic with special reference to carpenter's work, *e.g.*, measuring timber and calculating prices, Estimating prices of furniture, etc. After completing this course, students will be able to do any kind of carpenter's work neatly and well.

Blacksmithy.—The course extends over four years. Students are trained for the Madras Government Technical Examinations in Freehand Drawing and Blacksmith's work.

The instruction is both theoretical and practical and consists of:—(1) Forging iron and welding, Tempering chisel, drill bits, etc., Chipping and filing iron, Making and repairing locks, Use of dies for cutting screws, (2) Making iron safes, (3) Freehand Drawing, (4) General instruction, Reading and writing, Elements of arithmetic with special reference to Blacksmith's work, *e.g.*, calculating quantity and weight of iron and their prices, etc. After completing the course, the boys will be able to do any kind ordinary blacksmith's work.

The number of students passed out of the institution are 119, and information is available about 70 of these who are suitably employed. The number on the rolls at present is 70.

The total capital cost of the institution is a little over Rs. 6,000, and the total maintenance charges are about Rs. 9,000 a year, out of this Rs. 1,500 is derived from tuition and admission fees and Rs. 1,200 from the sale-proceeds of manufactured articles.

Concluding remarks.--The system of awarding stipends of the same amount to all students in the industrial classes is not popular among the boys and the Superintendent is also of opinion that it is not calculated to serve even the best interests of the boys themselves for the following reasons:--

(1) When the better boys find themselves paid the same stipends as the others, there is no incentive to them to do good work and there is therefore no spirit of emulation among the boys.

(2) The stipends being fixed at the uniformly low rate of Rs. 3 a month, a diligent boy finds at the end of a year or two that he can earn more outside by taking up outside work and so leaves school without becoming a specialist in his work.

(3) As a consequence, boys seldom stay so long here as to enable them to go up for the advanced grades of the Madras Government Technical Examinations.

A system of stipends graduated according to the merits of the students would therefore be better than the present system.

In the blacksmith's department, the number of boys receiving instruction has always been small, owing to the work being harder and it might be desirable to award a higher stipend in that class than in the others so as to attract suitable boys.

Staff.--The Superintendent is Mr. S. S. Krishna Iyengar; B. A., B. F., M. E. He is assisted by four Assistants and a Carpenter, Instructor and a foreman, a Weaver-instructor and a foreman, a Blacksmith-instructor and two foremen, and a General Instructor.

THE NATIVE TECHNICAL INSTITUTE, TRIVANDRUM.

Brief History.—The Native Technical Institute was one of the earliest Technical institutions started in this State. It was begun in 1900 with the Commercial Section preparing pupils for the Elementary and Intermediate grades of the Madras Government Technical Examinations in the following subjects:— Book-keeping, Commercial Correspondence, Banking, Commercial Geography, Type-writing and Shorthand. To the above subjects Engineering and Printing were added in 1903.

Till Makarom 1081 the institution was only a half-time one, worked during morning and evening hours by a staff consisting of Government and other employees who were able to attend and impart instruction during their leisure hours. The students likewise were either employees, apprentices or students of some general school; and the tuition given consisted of one or more subjects taken up by students at their own discretion without any definite aim in view and without any idea of qualifying themselves for any particular profession. This state of things is no longer allowed to continue. The students trained in that incomplete way have nevertheless secured appointments both in the State and elsewhere as demand arose. The Government grant was then Rs. 118-14 chs. The old system of working was entirely given up, and the Institute was in fact reorganized or converted into a full-timed one, working continuously for 5 hours in the day like general schools; and the services of the partial-timed tutors were dispensed with. Fresh and full-timed instructors were then secured on payment of higher salaries and promises of sufficient encouragement in the future. Increase of grant was then applied for and sanctioned by Government, the amount being Rs. 180-7-0, but in so doing, the grant to the commercial section was totally stopped except for type-writing, and a grant for Printing and Weaving sections was newly given. Since then the Institute comprising the Engineering, Type-writing, Weaving and Printing sections is doing systematic work in training pupils for the respective professions.

Engineering.—Before sanction of increase of grant the original classes, about 8 in number, one for each subject, were abolished and re-formed into 2, *viz.*, the Sub-Overseer and Surveyor classes. The course for these then extended to only one year as was the case in the Nagercoil Institute now brought under Government management; and the classes were chiefly composed of partial-timed students who had joined the Institute before the reorganization. But in 1082 the course was extended to 2 years, one year being quite insufficient. Consequently the classes were re-formed as below:—(1) Sub-Overseer Class Junior (1st year course); (2) Sub-Overseer Class Senior (2nd year course); and (3) Overseer class Junior (1st year course).

By Edavom 1083 one more class will have to be formed, *viz.*, Overseer Class Senior (2nd year course). There will be four classes working from Edavom 1083. For the efficient working of the existing three classes, three instructors besides the Superintendent are necessary, while there are at present only two. Moreover for teaching the higher branches of mathematics, the services of a Mathematics graduate are absolutely necessary. A competent graduate is now entertained for that purpose at the sole cost of the management.

Weaving.—Cotton-weaving in European hand-looms and carpet-weaving are taught. A grant has been sanctioned for 6 European hand-looms all of which are satisfactorily at work. But this is only a minimum number, which is quite inadequate when compared with the strength of the class; and hence a grant for six more European hand-looms besides six country looms is now applied for.

Type-Writing.—Grant has been allowed for two Type-writers. But these are insufficient to meet the demand for this special branch and it is therefore proposed to add at present two more kinds different from those in use here.

Printing.—A proper printing machine with all accessories and a sufficient quantity of types has been purchased and put to work.

The fees charged, the number of free-students, scholarships held, and scholarships awarded, are as follows :—

Classes.	Monthly rate.	No. of free students.
	Rs.	
Overseer Class ...	4	
Sub-Overseer Class ...	3	
Typewriting and 1 hr. ...	1	
Shorthand Class 2 hrs. ...	2	
Printing ...		Free.
Weaving ...		Monthly scholarships from Re. 1 to 8 awarded according to merit.

The qualifications required in candidates seeking admission, are as stated below :—

Overseer class ...	... Matriculates generally, and also those that have failed in Matriculation will be admitted in special cases.
Sub-Overseer class ...	... A full course of study in Forms IV, V and upwards.
Typewriting, and Shorthand class ...	... Do. Do.
Industrial classes	Pupils belonging to the several professions will be given preference.

The capital cost of the institution was Rs. 10,000 and the maintenance charges come to Rs. 3,500 per annum.

The sources and the amount of income are Fee Collections and sale of manufactured articles (Rs. 750), besides Government grant.

Most of the students passed out of, or trained in this Institution in the various branches of art or industry have secured employment under the Travancore or the Cochin Government or in private firms and houses of business throughout the Madras Presidency. Some of those trained in the Commercial, Printing and Weaving sections have started business of their own or have joined others in starting small industries requiring a limited outlay, while a host of others have secured employment as clerks, book-keepers, typists, reporters, compositors, press-men, maistries, draftsmen, surveyors, contractors, weavers

and in many other capacities in which the professional knowledge acquired in this Institute, is found useful by them.

Staff.—Mr. R. Subramania Iyer is the Superintendent and there are two assistants, two instructors, and one foreman.

THE INDUSTRIAL SCHOOL OF ARTS, TRIVANDRUM.

(From a Note by the Superintendent.)

The school was started about 18 years ago almost on the model of the MSchoosari of Arts. Students are trained to appear for the Madras Government Technical Examinations in Drawing, Painting and Design, as well as Carpet-weaving, Pottery and Porcelain manufacture, Engraving, Modelling, etc., for Elementary, Intermediate and Advanced Grades.

The fees charged are only 4 chs. or about 2½ annas. There are no free-studentships. Fifteen scholarships are awarded once in 5 years for training in the Industrial branches taught, such as Silversmith's work, Carving and Carpentry, Pottery and Porcelain manufacture, Moulding, Casting and Modelling, Pottery-painting and Carpet-weaving. Lacquer work and stained glass were once taught, but have been discontinued.

No restrictions are imposed on candidates seeking admission.

The average annual expenditure is Rs. 17,000.

The sale proceeds of Ivory, Kuftgari, Pottery, Carpet and other articles give a fluctuating income of between two and five thousand rupees.

The number of students in the Drawing classes at present in the Elementary grade is 15, intermediate grade 8, and Industrial branches 3.

More than two hundred students have passed out of this school, of whom 15 are employed as workmen in the various branches of industry; 13 have obtained Government employment as Draftsmen in the D. P. W., and Drawing teachers in schools, and 5 are doing private work on a small scale.

The public appreciation of the work of this and similar institutions cannot yet be said to be great, for several reasons. First of all the people generally require some training to enable them to properly appreciate artistic work and the institution has not been at work sufficiently long for the purpose. Secondly, the craftsmen in the country have not been given sufficient help or sufficient artistic instruction to improve their skill. The instruction and training given to young boys for short periods even with their inborn tastes is not sufficient to enable them to start work independently, leaving out of account the common difficulty of finding capital for the same.

The Superintendent is Mr. K. Narayana Iyer, B. A., with special training at the Madras School of Arts obtained before the starting of the Institution. He is assisted by a Head Drawing Master, a student of the Madras School of Arts who has passed the necessary Examinations in Drawing, Painting, Design and Modelling, etc., an Assistant Drawing Master, and a Designer. Besides, there are locally trained maistries for Carving, Silversmith's work, Pottery, etc.

THE ST. JOSEPH'S CONVENT SCHOOL, QUILON.

(Note by the Manager.)

Brief History.—The St. Joseph's Convent Technical School, Quilon, was attached to St. Joseph's Convent, Quilon, on the 14th January 1906. Its main object is to teach girls of the poorer classes some sort of industry, so as to enable them to gain their livelihood after they have finished their scholastic career. The industries taught at present are Lace-making, Embroidery, and Dress-making. The profits of the industry are utilized for the maintenance of the orphans supported by the Convent,

Subjects taught.—The subjects taught are Lace-making, Embroidery and Dress-making. The Lace-making course has two sections, Elementary and Intermediate.

The length of the former is a period of six months, and of the latter one year. Examinations are held at the end of the year.

In Embroidery, an elementary class is held, and to work on cloth or net any design is taught. The length of the course is a period of one year, at the end of which a school examination is held. The course of instruction in Dress-making, Elementary class, comprises (1) Hemming, seaming, (top sewing), felling; (2) Cutting out in paper and afterwards in material two simple garments, one of the garments to be made by the cutter out. The length of course is a period of one year, at the end of which a school examination is held. No fees are charged.

No provision of work is kept, but orders received are promptly executed.

No qualifications are required in candidates seeking admission.

Finances.—The capital cost and the maintenance expenditure of the institution, are as follows :—

	Rs.
Cost of implements for the work	836
Pay given to teachers	900
Maintenance expenditure of the institution	1,200

The sources and the amount of income are—

Amount of grant by Government	...	...	675
Income from the sale of work	...	...	207

Number of Students.—The number of students at present on the rolls in the several classes is 37.

Staff.—The Rev., Mother Gertrude, trained in the St. Ann's Convent School, Mangalore, is the Manager, and she is assisted by Miss Carmillia Moses and Miss Rose Abraham, both trained in the St. Joseph's Convent School, Quilon.

THE INFANT JESUS MIXED TECHNICAL SCHOOL FOR GIRLS, MULAGUMUDU (TRAVANCORE).

This school was started 10 years ago, under the supervision of two Belgian sisters, *viz.*, Dame Marie-Louise Demasher, lady superior and Dame Marie Ursule Dejonckheere, lady assistant, with the object of improving the material and moral standard of the poor classes. After one year's observation and trial, lace-making was selected as being the best means of attaining the object in view. Young girls who were poor, ignorant, idle and dirty became in the course of time active, diligent, clean and capable of reading and writing besides. With their wonderful aptitude for imitating and the nimbleness of their fingers they succeeded in copying the most intricate and elaborate patterns of lacework. In the course of these years 658 pupils passed through the school, and they in their turn became teachers in the different villages of the south and that has made the number of lace-makers working for the Mulagumudu institution and depending on it for their daily support, increase to the marvellous extent of 1,439. Of course the number of teachers has increased in proportion.

The subjects taught are Lace in different styles and shapes, besides embroidery and drawn thread. Six courses complete the lace school, and 2 years more the embroidery and drawn thread ones.

No fees are charged and every one is paid for the work she has done and that can obtain sale.

Most of the pupils are poor orphans who stay in the orphanage and are kept there free till their marriage. The outsiders can easily return home every day so that no hostels are required for the present.

Good conduct is all that is required in candidates seeking admission. If unable to read and write they have to attend a Primary school from 11 a. m. to 4 p. m.

The capital cost and maintenance expenditure of the Institution as taken in January last were Rs. 41,500 of capital invested for materials and ready work and Rs. 11,670 for last year's maintenance. Besides, there was last year an extra expenditure for building of Rs. 6,000, of which Rs. 1,300 was granted by Government. The sources of income are a small profit on the sale of work, Government grant of Rs. 2,274, and contributions of friends in Europe.

There are nearly 300 students. Six hundred and fifty-eight passed out of the school, and are married and settled in life, and continue working at home—the institution taking charge of the sale of their work.

The object of the institution is to improve the condition of the poor and to enable them to earn their living in the most respectable way. That their work has been appreciated is clearly shown by the rewards obtained at different exhibitions—gold, silver and bronze medals. The Mulagumudu lace and embroideries are known in and asked for from every part of Asia, Australia, South Africa and the United Kingdom. They have been appreciated most highly at every exhibition where they were shown. H. R. H. the Princess of Wales, on the occasion of her visit to India did the lace the favour of giving it her distinguished appreciation. Lady Minto and many other ladies of high rank asked for it and recommended it to others.

By these means a fast increasing number of poor girls and married women are self-supporting. New schools will soon be

opened at Nagercoil and Cape Comorin to enable more poor children to benefit easily by the Institution.

The Manager and Head Mistress of the Lace Section is F. D. M. Ursule Dejonckheere and of the Embroidery Section D. M. Harris Lecomte. They are assisted by eight assistant mistresses.

THE ATTUNGAL WEAVING INSTITUTE, ATTUNGAL (TRAVANCORE,) AND THE SETU LAKSHMI BHYE WEAVING INSTITUTE.

(From a Note by the Manager.)

These institutes were started in Thye 1079, and Puratausy 1080 respectively, for giving improved methods of English and native hand-loom weaving. These were owned by a Committee known as the "Industrial Development Committee, Attungal." Now these institutions are under the control of the Sree Lakshmi Prasada Vyavasayabhivardhini Company, Ltd., who bought all the rights of the former company. They commenced work with 7 English looms and 4 native hand-loom. But 15 English looms and 5 native hand-loom are now at work. The Attungal Weaving Institute receives at present a grant of Rs. 41 from the Travancore Government. The Setu Lakshmi Bhye Institute is given a grant of Rs. 20 per mensem. These institutes turn out checks, towels, *jamkals* plain and ornamental, laced *kavanies*, silk *doreas*, silk handkerchiefs with laced borders, bedsheets, *Coronattu-pudavay*, *Madura Thuppattas* and tapes, etc., of different patterns and sizes which in point of finish and quality compare favourably with those made in weaving centres of British India.

The subject taught is weaving in European hand-loom and native hand-loom. The first course of instruction comprises the following :—

(1) to prepare hanks for winding, (2) to wind one thread on the bamboo spool, (3) to wind one thread on the small spool, (4) to run the warp on the warp post. The second course comprises, (1) to wind two or three threads on the bamboo spool, (2) to wind as above on the small spool, (3) to stand by

the loom at work and mend the broken warp, (4) to weave a cloth of any simple pattern of 27 wide. The third course is (1) to dress and size the warp, (2) to heddle two sections of the warp, (3) to fix them to the two sections of the healds, and (4) to weave a cloth of a more difficult pattern of 27 wide. The fourth course comprises (1) to loom the warp and to arrange the treadles complete for weaving, (2) to adjust and tie the pattern, (3) to correct and prevent faults in the cloth to be woven, (4) to weave one and a half yards of cloth of check or diaper pattern 27 wide with two colours in the weft. The above courses are intended for the native hand-loom although some of them may be found useful for the European hand-loom.

For the European hand-loom the first course consists of (1) sizing the hanks for reeling, (2) winding two or three threads on bobbin, (3) winding one thread on the quill, (4) fixing bobbin-frame and winding the warp on warping wheel. The second course is (1) to separate a warp on loom with cross sticks and arrange in wooden reeds, (2) to thread the above warp through harness and reed suitable for course, (3) to weave half a yard of cloth with two treadles and one shuttle on any loom. The third comprises (1) to fix a warp on the loom complete for weaving with four treadles a check of any useful pattern and of any convenient width, (2) to weave one yard of cloth from the warp with three different colours. In addition to the courses mentioned above courses on theory in calculating the quantity of yarn required for a given piece of cloth, the finding of the cost of a given cloth, on mode of saying the different ingredients required to prepare a size, the proportion of the things to be fixed etc., are also taught. The length of the course is two years for the Elementary grade and three years for the Intermediate grade. Three examinations are held, Elementary Examination twice and the Intermediate once. No fee is charged. All are free students. Some of them have scholarships too.

The qualification required in candidates seeking admission is that they must be able to read and write their own vernacular. There are 29 students in both institutions.

VIII.—(1) The capital cost and maintenance expenditure.

	Rs.
(a) Salary of Teachers	3875
(b) Scholarships	1099
(c) Amount invested on (1) loom, (2) appendages, (3) furniture, (4) yarns, lace and other expenses, ...	6268
Total	11,242

(2) Sources of income and the amount of income.

	Rs.
(a) Capital invested by members	3665
(b) Maintenance grant	2662
(c) Furniture grant	529
(d) Miscellaneous	60
(e) Proceeds of sale of manufactured goods ...	4563
Total	11,469

Of the passed candidates one is the present Headmaster of the Weaving Institute on Rs. 35 per mensem, another the 1st assistant of this institute on Rs. 12 per mensem, a third the Headmistress of the S. L. B. Institute on Rs. 20 per mensem, another candidate is the general instructor of the same institution on Rs. 10 per mensem and the remaining pupils are attending the intermediate class. Besides these pupils there are nearly a dozen students who had undergone training in the institution and have set up looms independently. There are five of them in this Taluq and in the Trivandrum Taluq and others belonged to the Changanacherry and Mavelikaray Taluqs.

Mr. P. Shungaralingam Aiyar is the Head Master and he is assisted by a staff of instructors and assistants.

THE FORT TECHNICAL INSTITUTE, TRIVANDRUM.

(From a Note by Mr. V. Vaidyanadha Iyer, Manager.)

Brief History.—The Fort Technical Institute, Trivandrum, was started in Panguy 1080 with a view to afford theoretical and practical instruction in Engineering and Commercial subjects and is being aided by the Government from Thye 1081. The students are trained according to the Syllabus of the Madras Government Technical Examinations for different grades in the subjects mentioned above. The students trained in the

Engineering subjects can easily make a living by getting appointments as maistries, surveyors, sub-overseers, draftsmen, in the Public Works, Railways, Local Boards, Municipalities, Forest, and Revenue Survey Departments, and also as Commissioners in Judicial Departments. The students trained in the Commercial subjects similarly find employment as accountants, clerks and typists, in firms and in Government offices and also as reporters of newspapers. About 75 per cent. of the students trained here are practically employed in different capacities as stated above.

Subjects taught.—The subjects taught are I. Civil Engineering. Building Materials and Construction. Building Drawing and Estimating. Hydraulics and Irrigation Works. Earthwork and Roadmaking. Bridge work. Surveying and Levelling. Applied Mechanics. Mensuration. Practical Plane and Solid Geometry. Machine Drawing. Geometrical Drawing, and Freehand outline and model drawing. II. Commerce. Book-keeping. Theory and Practice of Commerce. Banking. Commercial Geography. Shorthand, and Type-writing.

All these subjects are divided into three classes, *viz.*, Elementary, Intermediate and Advanced grades.

Courses of Instruction.—(1) Engineering. Lower Subordinate class. Theoretical instruction shall be conveyed by lectures, while the practical work shall consist of Surveying in the field, drawing etc. The subjects of study shall be those that are prescribed for the following group certificates under the Government of Madras Technical Examination scheme :—

Group certificate in Building Construction. Draftsman's group certificate in Mechanical Drawing. Group certificate in Hydraulic Engineering. Group certificate in Surveying, and Group certificate in Bridge construction.

(2) Engineering Surveyor Class. Theoretical instruction shall be given in class, while the practical work shall consist of surveying in the field, drawing, etc. The subjects shall be those that are prescribed for the Group certificate in Surveying, Theodolite Surveying and Topographical Drawing.

The course of study in Commerce is the portion prescribed for the Intermediate Grade in Book-keeping and for the Elementary Grade in the other subjects, to be finished by the end of the first year, and those prescribed for the Advanced Grade in Book-keeping and the Intermediate Grade in the other subjects by the end of the 2nd year.

Length of courses is three years, viz., one year for Elementary, one year for Intermediate and one year for Advanced.

Fees, etc.—Lower Subordinate class, Rs. 14 per term. Surveyor class, Rs. 10 per term. Commercial class:—Book-keeping, Banking and Theory and Practice of Commerce, Rs. 8 per term. Typewriting and Shorthand Rs. 9½ per term. Each term is of six months. Thirty-four per cent. of the students are free students.

The Capital cost is Rs. 2,500, and the cost of maintenance is Rs. 175. The sources of income are Government aid, fees, etc.

Staff.—Mr. T. C. Anaada Iyer is Superintendent, and he is assisted by a staff of instructors, assistants, etc.

THE RAMA VARMA TECHNICAL INSTITUTE, CHANGANACHERRY.

For two years after the establishment of this Institute, Book-keeping, Commercial Correspondence, Banking, Drawing (Geometrical and Freehand), Carpentry and Blacksmith's work, were taught. Students were presented for the Madras Government Technical Examination in all the subjects except Carpentry and Blacksmith's work and good results were obtained therein. Commercial and Drawing classes had to be stopped after two years owing to want of sufficient number of pupils. Carpentry and Blacksmith's work are the only subjects now taught. But pupils were not presented for any examination as the Director of Public Instruction refused to recognise the Institution and as there was no Travancore examination for the same. There was also the difficulty of keeping the pupils in

school long enough to complete the prescribed course so that the work of the school at present is confined to imparting practical instruction in the subjects, with a view to enable the pupils to ply their trade and earn wages in future. No fees are charged. Pupils seeking admission should have completed the course of instruction prescribed for primary schools. The outlay amounts to Rs. 1,350 in buildings, tools, implements, etc., and the net monthly cost is about Rs. 16. All the expenses in connection with the management are shared between the Bishop of Changanacherry and the Senior Koil Tampuran of Lakshmipuram palace. There is also a grant from Government of Rs. 48. The number of pupils under instruction is 18. Those who passed out in previous years have found suitable employment as drawing masters, clerks, accountants, carpenters and blacksmiths. There are three teachers employed to give instruction in carpentry, cabinet-making, blacksmith's work, fitter's work, etc.

THE TECHNICAL INSTITUTE, MANIANKULAM, PARAVVOR (TRAVANCORE).

The institute was started in 1077 M. E. with the sole object of helping the industrial progress of the country, with particular reference to the manufacture of coir mats, foot rugs, &c. At its initial stage the instructors had only the experience they could pick up from local firms. But later on they were sent out to Bombay, Ceylon and subsequently to many distant parts of India to get themselves thoroughly acquainted with the working of different industrial firms and the practice of the industries they engaged themselves in. In 1079 the institution got a grant-in-aid of Rs. 30 a month from Government. In 1080 a class was formed for young ladies to learn lace-making and embroidery. Various other forms of industry were attempted in the meantime, such as soap making, sugar manufacture, &c., which for want of encouragement and support had to be given up. The Institute was visited at various times by persons of great eminence, both Indian and European. It has enjoyed the privilege of receiving presents and high testimonials from His Highness the Maharajah of Travancore, their Highnesses the Junior and Senior

Ranees of Travancore and the Rajah of Cochin. On several public occasions and at various exhibitions, the articles of manufacture sent up from the Institute, have received universal approbation and won several prize medals.

The subjects taught are varieties of coir works—mats, foot-rugs, &c., lace-making and embroidery. The length of the courses is ordinarily three years. Occasionally pupils have gone on for a longer time. No examination is held but the manufactured articles have to be submitted for the approval of bodies of select persons. No fees are charged and no scholarships given. Nor is any restriction imposed on admission, the reason being that the school imparts general instruction as well. The number on the rolls is 35. The numbers of boys and girls that have passed out of the institute are 34 and 39 respectively. Some of them have started factories in other parts of Travancore, while others carry on the same business at home.

Its only capital is what is invested in building, furniture and appliances, which the Manager has estimated at nearly Rs. 5,000. The annual expenditure is approximately Rs. 2,000. Its income is derived from various sources. Government give a grant of Rs. 360 a year, and the proceeds of the sale of manufactured articles amount to nearly Rs. 1,500 a year.

There are two men teachers and two women teachers. They have not passed any qualifying tests, but are persons of considerable practical experience who have picked up business from respectable firms in different parts of India.

The establishment of similar factories in other parts of Travancore and a steady increase in the number of pupils going in for the profession, afford evidence of the public appreciation of the Institute. A good number of pupils, particularly of the Elava caste, earn their livelihood by the coir works industry. The articles manufactured in the Institute find a ready market for sale in several parts of India and even in several European countries.

THE LONDON MISSIONARY SOCIETY'S EMBROIDERY AND LACE-MAKING SCHOOL, ATTUNGAL (TRAVANCORE).

The London Missionary Society's Embroidery and Lace-Making School was started in 1903. with 13 pupils. Its *object* is to put within the reach of the girls some means of livelihood, to redeem them from their low standard of life, and by inculcation of habits of thrift, cleanliness, neatness and industry to improve the moral, social and industrial conditions of this class of people. There are two instructors, one for each subject.

The subjects taught are Lace and Embroidery making. No fees are charged, and no scholarships awarded. The pupils are accommodated in the Children's Home in the Compound. The qualification for admission is Third Class Primary School Pass. The capital cost of the institution is Rs. 300, and maintenance charges amount to Rs. 818 a year. The produce of work fetches about Rs. 30 and the Government grant is Rs. 216 per annum. The number of students is 11. Ten students have passed out, and all are working at home and partly supporting themselves and thus relieving their families to that extent.

The families so assisted greatly appreciate the training given to their girls. The work done by them in the school has been greatly admired by Lady Curzon, Lady Havelock and Lady Lawley, and many other testimonies have been received about the beauty and value of the work done, from other ladies. Government also have been pleased to ask the school to supply a case of specimens for the museum, Trivandrum, and various Exhibitions. The prospect held out to pupils is ability to contribute to their own maintenance while remaining at home as wives or housekeepers. The natural condition of women is thus partly at least, secured by them, and instead of a life of servitude one of freedom and personal independence is brought within their reach.

THE PUTTALAM ORPHANAGE INDUSTRIAL SCHOOL, PUTTALAM (TRAVANCORE).

A small orphanage was opened at Puttalam in commemoration of the centenary of the L. M. Society in the year 1895. The inmates were sent to the local vernacular Primary School and were taught to read up to the III standard—the highest in the school. It was very difficult to send all of them to other places for more education and it was thought advisable to begin the weaving industry so that it might be a means of earning a livelihood for the boys when they grew up. Accordingly this industry was begun in 1898 with one native hand-loom. In 1904 two English hand-loom were provided. There are now four native hand-loom and six English hand-loom at which the boys practise, one of the latter being the 'Swadeshi Salvation Army Hand-loom.' No fees are charged. One is paid according to his work; five others have scholarships, one of Rs. 7 and the others of Rs. 2 each. There is a hostel in which all except four lodge.

Boys who have learned up to the III standard and upwards are received. Those below that are sent to learn in the Primary School daily for 4 hours. More than Rs. 1,000 has so far been spent. The monthly expenditure is more than Rs. 100. The sources of income are Government grant, donations, and sale-proceeds of work turned out:

THE ST. MICHAEL'S TECHNICAL SCHOOL, TRIVANDRUM.

(From a Note by Mr. S. M. Michael, Manager.)

This school was founded in July 1904 with only six pupils doing pillow lace. The number gradually increased, it being at present 36. In 1905 a separate building was erected, and a Dress-making class was started with six pupils, and it continued until December 1907 when it had to be broken up for want of funds. In January 1906 a short-hand class was started, and a type-writing class was added in January 1907. The subjects taught are Pillow-lace oral instruction according to pattern; Dress-Making (one year's course given); Short-hand (six months'

course for the Elementary and one year's course for the Intermediate; Type-writing (one year's course). The indigent pupils are admitted free. The well-to-do pupils of the institution are charged Re. 1-8-0, and outsiders Rs. 3 per month. The fees charged for Type-writing and short-hand are Rs. 2, for Painting in waters Rs. 3, and for painting in oil colours Rs. 5, per mensem. There are a boarding establishment and an orphanage attached. The cost of the building was nearly Rs. 750 and the expenditure on accessories for the year over Rs. 550, in addition to the cost of maintaining 65 orphans. The sources and the amount of income are Rs. 222 Government grant, and about Rs. 700 besides from typing work, painting, fees and sale of lace. Embroidery in silk, gold, and cotton is taught only to such as can afford to learn it. Stocking, knitting and hand-weaving will be introduced as soon as funds will permit.

THE RAMA VARMA DRAWING AND PAINTING SCHOOL, TRIVANDRUM.

(From a Note by the Manager.)

This institute was started in M. E. 1080. The subjects taught are Painting in Water-Colour, Crayon-painting, etc., and Drawing (Elementary, Free-hand) etc. The duration of the course in either case is one year. The students are prepared for the Madras Government's Technical Examinations. A fee of Re. 1 per month is charged. Six free studentships are given. In admitting students professional men will be given preference. There are 16 students on the rolls and the maintenance charges amount to a little over Rs. 1,000 per month. The amount of income is Rs. 657 and the school receives a grant from Government. The staff consists of the Head Master, Mr. K. Padmanabham Tampi, and an Assistant, Mr. E. Krishnan Tampi.

THE ST. JOSEPH'S EUROPEAN TECHNICAL INSTITUTION, ALLEPPEY.

This school was started in 1904 and is attached to the St. Joseph's Convent and is intended for women. Free-hand outline drawing, Designing, and Geometrical Drawing are taught

in the school in addition to lace-making and embroidery. For the Elementary Grade one year's course and for the Intermediate 2 years' course is prescribed. For lace-making and embroidery the course prescribed is for 3 years for the Elementary Grade. No fees are charged and no scholarships awarded. The pupils are inmates of the Convent where they are fed and lodged. The orphans in the Technical school have a little house and a dispensary. Pupils seeking admission must have received the general instruction prescribed for the Primary Schools. There are 26 pupils on the rolls. From 1904 to 1907, pupils passed in Drawing, Designing and Lace-making.

The salaries of teachers amount to Rs. 35 per mensem and the cost of maintenance of each pupil is Rs. 5. There is a Government grant of Rs. 37½ per mensem. The proceeds of the sale of the articles manufactured and charitable help received from many ladies who take interest in the work are the only other sources of income.

The staff consists of Madame Bianchi, Lady Principal, and two other teachers.

The institution is very much appreciated by ladies and gentlemen of high rank, and is helping a good number of poor children to earn a living for themselves.

THE C. M. S. INDUSTRIAL SCHOOL, KOTTAYAM.

This institution has been in existence for the last 12 years and is conducted by the Church Mission Society. The subjects taught are Reading, Writing, Arithmetic, Carpentry, Blacksmith's work. Carpentry is a 4 years' course, and so is Blacksmith's work. No fees are charged, all the students being taught free. There is a hostel provided for poor boys, and there are now 12 boarders in it. Elementary knowledge of reading, writing and arithmetic is required in candidates for admission. The capital outlay is Rs. 2,000 and the expenditure about Rs. 2,195 per mensem. There is a Government grant of about Rs. 267, and the sale of articles fetches about Rs. 1,475. Besides,

about Rs. 450 are received as contributions from societies and individuals. Thirty-two carpenters and 8 blacksmiths have passed out of the institution. Both these classes are earning decent wages. The institution has done good work in providing people with skilled workmen able to use improved tools and appliances. It has also enabled a large number of artisans to earn a decent living.

THE LONDON MISSION SOCIETY'S CARPENTRY SCHOOL, ATTUNGAL (TRAVANCORE).

This school was started in 1903 with 9 pupils. There is a workshed, and the implements used are English tools—lathe, vise and work benches.

The *object* of the school is to put within the reach of the pupils some means of livelihood, to redeem them from their low standard of life and by the inculcation of habits of thrift, cleanliness, neatness and industry, to improve the moral, social and industrial conditions of this class of people.

Boys are trained to pass the Madras Government Examination.

The *Subjects taught* are Vernacular Reading, Writing, and Arithmetic; English; Freehand and model drawing; Proper use of tools; Model making; joints, etc., new and improved methods. Two hours in the day are given to general education, and four to Technical. No fees are charged and no scholarships awarded. The pupils are accommodated in the children's home in the compound. The qualification for admission is Third Class Primary School pass. The capital cost of the school was Rs. 225, and the maintenance charges in 1907 were Rs. 1,223. The sale of articles fetches about Rs. 300, and the Sircar gives a grant of Rs. 123.

INFANT JESUS TECHNICAL SCHOOL FOR CARPENTARY, MULAGUMUDU (TRAVANCORE).

This school was started by the Rev. Father Donatien with a view of teaching a handicraft to his orphans which might

enable them to settle decently in life afterwards. The management of the said school was taken by the Rev. Dame M. Urusule, after Father Donatien left for home. The crafts taught are Carpentry and Carving. No fees are charged. All are paid daily according to their capacity. All village boys and orphans of the Boys' Orphanage here are admitted. They must have passed the third class Primary School. About Rs. 2,000 has been so far spent. The sources of income are Government grant and private donations. There are 14 pupils. They get good work after leaving school.

COCHIN.

THE COCHIN NATIONAL SCHOOL OF ARTS AND INDUSTRIES, TRICHUR.

This school was started on the 17th August 1907 with 5 pupils on the rolls by Mr. K. V. Venkataramana Iyer. The present strength is 40. The subjects taught are drawing (freehand and geometrical), painting, clay modelling, wood carving and typewriting. The pupils have made good progress in the arts in which they are receiving instruction. The present staff consists of one Superintendent and 3 pupil teachers. The Superintendent, Mr. Venkataramana Iyer, has full certificates in general draftsman's-work, industrial art workmanship, &c., and design, and had his training under heads of technical institutes in Trichinopoly, Madras, Calcutta, Bombay and Howrah. The scale of fees varies according to the number of subjects the students take. The fee in the higher class, for elementary free-hand drawing, painting, clay modelling and design and practical geometry, is Re. 1 each. The fee in the lower class is annas 8, 6, 4 and 2, for D-C-B-A. The fee in the commercial class is, for type writing Rs. 4, and for shorthand Re. 1. The Superintendent has been asked to introduce the teaching of Carving, Embroidery, Carpentry, Mat-making and Lace-making.

INDUSTRIAL SCHOOLS IN COCHIN STATE.

1. **Chempukavee Zenana Mission Industrial School, Trichur**:—Strength, 50. Subjects taught—needle work, gardening, mat making, plaiting and basket weaving. Government aid per month, Rs. 12. This is a mixed school.

2. **Paramekkavee Industrial School, Trichur**:—Strength, 51. Subjects taught—carpentry and needle-work. Government aid per month, Rs. 5. This is a mixed school.

3. **Elthurithe Convent Industrial School, Trichur** :—Strength 56. Subjects taught—tailoring, embroidery, rosery-making, book-binding, shoe-making, rope-making, carpentry and composing. Government aid per month, Rs. 15. This is a boys' school.

4. **Kakkad Natiye Independent Industrial Girls' School, Kunnamkulam** :—Strength, 34. Subjects taught—needle-work (fancy), knitting, and lace-work. Government aid per month, Rs. 5. This is a girls' school.

5. **C. M. S. Lace School, Kunnamkulam** :—Strength, 10. Subject taught—lace-making. Government aid, Rs. 10 per mensem. The pupils of this school are paid something for each yard of lace.

6. **C. M. S. Industrial School, Trichur** :—Strength, 14. Subjects taught, rattaning and carpentry. The school is unaided. This is a boys' school. It gets Rs. 360 per annum as scholarships to 12 boys from the S. P. C. K., and Rs. 40 per mensem as C. M. S. grant.

BHOWNAGAR STATE.

THE BHOWNAGAR COMMERCIAL INSTITUTION, BHOWNAGAR.

(From a Note furnished by the Dewan.)

The Bhow Nagar Commercial Institution was established in 1907 at Bhow Nagar for the benefit of Kathiawar students with the object of imparting a thorough training in various commercial subjects at a moderate charge and preparing them for the recognised commercial examinations such as those of the London Chamber of Commerce, the National Union of Teachers, Clarke's Civil Service Examinations, Commercial Colleges, Pitman's Metropolitan School and the Government Fourth Grade Accounts Examination.

The subjects taught are Book-keeping and Accountancy, Methods and Machinery of Business, Commercial Correspondence, Commercial and Industrial Law, Commercial History and Geography, Banking and Currency, Short-hand and Typewriting. The whole course is finished in a year and a half. Text-books in common use are generally selected. The students generally select two or more subjects at a time as their convenience may dictate, and the length of the course depends upon the subjects selected.

The fees charged are as follows :—Rs. 60 for the course in Book-keeping and Accountancy ; Rs. 25 for Methods and Machinery of Business ; Rs. 10 for Commercial Correspondence ; Rs. 25 each for Commercial and Industrial Law, Commercial History and Geography, and Banking and Currency ; Rs. 50 for Short-hand, and Rs. 20 for Type-writing. The fees for the full course are Rs. 250. There are two free studentships and two scholarships awarded. There is no provision of hostels. Students who have completed the English Fifth Standard are admitted into this institution.

The capital cost of the School is Rs. 750 and the maintenance charges amount to Rs. 60 per mensem. The fees received from the students are about Rs. 50 a month and form the chief source of income.

The number of students on the rolls is 23.

Twenty-six students passed out of the institution. Two of these are employed in the service of B. G. J. P. Railway and most of the rest in commercial offices.

The proprietor of the institution is Mr. C. R. Bhatt, Mr. Juthalal K. Nawadia is Short-hand Writer and Typist and Mr. M. R. Joshi Assistant Manager.

THE UNIVERSAL TRAINING INSTITUTE OF COMMERCE, BHOWNAGAR.

(From a Note furnished by the Dewan.)

The Universal Training Institute of Commerce, Bhownagar, was founded five years ago, and has branches at Baroda and Broach. Its objects as well as the subjects taught in it are the same as in the case of the Bhownagar Commercial Institution. Its special feature is that its principal has his own system of teaching short-hand which is known as the 'Simplex.'

The fees charged are Rs. 140 for the full course, or Rs. 20 to Rs. 40 for particular subjects as the case may be. There are no free studentships, but one scholarship is awarded. The qualification for admission is the English Fifth Standard.

The capital cost was Rs. 850 and the maintenance charges are about Rs. 75 a month. The fee income is about Rs. 50 and is the main source of income.

The Principal is Mr. K. N. Banaji.

TRAINING CLASS ATTACHED TO THE BHAV- SINHJI WORKSHOP, BHOWNAGAR.

(From a Note furnished by the Dewan.)

The Bhavsinhji Workshop has been in existence for about four months. In connection with it a class has been opened to impart instruction and training in theoretical and practical

elementary courses in Mechanics and Electricity as laid down by the South Kensington Polytechnic Institute of London and as required in the Government and Provincial Examinations. The course of instruction lasts for three years. The tuition is free. Candidates seeking admission must be physically fit and of good character and have a fair knowledge of Arithmetic, English and Gujarathi. There are now eight students on the rolls. The proprietor relies on the sale-proceeds of work for the maintenance of the class.

Manager, Mr. Harmushaw Kunder ; Mechanical Engineers, Messrs. D. D. Agga and V. M. Bhat.

THE HAND-LOOM WEAVING CLASS, BHOW-NAGAR.

(From a Note furnished by the Dewan.)

The Hand-loom Weaving Class, Bhownagar, was recently opened by the Young Men's Industrial Association. Its object is to take steps for the revival of indigenous industries. The tuition is free. All adults of good character are admitted. The maintenance charges are about Rs. 35 a month. Ten students are on the rolls, and the average daily attendance is six. The Secretary of the Association, Mr. Popatlal Chudgar, who has set up a separate factory of 10 handlooms of the type of the Swadeshi Buckoo handlooms, is the Supervisor of this class, where instruction is imparted by trained weavers.

THE FEMALES' WORK CLASS AND THE JAINS' FEMALE CLASS, BHOWNAGAR.

(From a Note furnished by the Dewan.)

The Females' Work class and the Jains' Female class, Bhownagar, were started under the supervision of the Secretary of the Young Men's Industrial Association, Bhownagar, to teach sewing, knitting and embroidery work to girls and grown up women. Tuition is free. Besides, two scholarships of Rs. 5 a month are awarded to poor women. Girls and women of good character are admitted. The capital cost was Rs. 500 and the

monthly charges are Rs. 60 for each class. A half of the monthly charges are borne by Seth Ratanji Virjee of Bhow Nagar, and the remainder is found by the Association. There are 90 pupils with an average daily attendance of 60.

Miss Bachubai F. Daruwala is in charge of the classes.

THE ELEMENTARY DRAWING CLASS,
BHOWNAGAR.

(From a Note furnished by the Dewan.)

The Elementary Drawing Class, Bhow Nagar, was opened by the local Young Men's Industrial Association five months ago to teach freehand drawing. The tuition fee is 4 as. a month. The charges are Rs. 15 a month and the chief source of income is the fees paid by the pupils. There are now only 18 on the rolls.

Mr. D. W. Bhendre is the teacher.

KOLHAPUR STATE.

THE JAYSINGRAO GHATGE TECHNICAL SCHOOL, KOLHAPUR.

Introductory.—This institution was founded in the year 1887 in memory of Jaysingrao *alias* Abasaheb Ghatge, Sarjerao Vajarat Ma-ab, Chief of Kagal (senior) and Regent of Kolhapur.

Management.—The school is under the direction of a committee consisting of the Principal, Rajaram College, the State Executive Engineer and the Educational Inspector, Kolhapur, the Principal being the President of the Committee.

Course of study.—The school provides for a four years' practical course of instruction in carpentry, including joinery, wood-turning and French polishing and brass and iron work, including fitting, smithy, metal-turning, brass-founding, simple engine-driving and general knowledge of machinery. Drawing up to the second grade of the Sir J. J. School of Art is also taught during the above 4 years' course. Annual examinations are held in every branch and certificates are granted to students who have completed a four years' course either in carpentry or in brass and iron work.

Fees, Stipends and Scholarships.—Fifteen scholarships, called the Fergusson scholarships, of the value of Rs. 648 are awarded to 2nd, 3rd and 4th year students every year from the interest on the Sir James Fergusson Fund amounting to Rs. 20,000, while 24 stipends of the value of Rs. 936 are awarded every year to first year students of the different castes: being provided from the interest on the Jayasingrao Ghatge Technical School Fund, which amounts to Rs. 26,900. No fees are charged but every student after being admitted is required to provide himself with a box having a lock and key and a set of required tools and drawing instruments. Students who are unable to provide themselves with the above tools, get the necessary tools for class work from the school on depositing Rs. 5, which is refunded when the tools are returned in good condition.

Admission.—Boys who have passed the 4th vernacular standard are admitted into the school.

Capital expenditure and maintenance.—The school-building is provided by the State and is adequately furnished with the necessary tools and furniture, the value of which at present amounts to Rs. 5,518 and Rs. 1,331 respectively.

The total expenditure incurred annually on the institution including establishment charges, purchase of tools and plant, contingencies, etc., amounts to Rs. 4,500 nearly, which is borne by the State.

There is no other source of income, except the Technical School Fund, amounting to Rs. 46,900. This yields an interest of Rs. 1,641-8-0 annually which is spent in awarding scholarships and stipends to students. Besides this about Rs. 200 to Rs. 250 are realised as profit on the sale of articles prepared at the school by the school-boys every year.

Strength.—The number of students on the rolls at present is 43 of whom 28 are learning carpentry and 15 are learning brass and iron work.

About 45 students have passed from this school as fitters and carpenters and almost all of them have been employed as mechanics, fitters, motor-drivers, etc., etc.

Staff.—Mr. S. S. Katre, L. M. E., is the Superintendent. There are four assistants under him.

MORVI STATE.

PROPOSED TECHNICAL INSTITUTE.

[The following note has been kindly supplied about this.]

Last year during his long stay in Bombay, His Highness the Thakore Saheb of Morvi had occasions to come in close contact with Professor T. K. Gajjar, to whom he expressed his earnest desire, which was with him for a long time, to start a scientific institution in his state on the lines of the Zurich Polytechnic School, Charlottenburg Technical High School, and other Continental, British, American and Japanese institutions of similar nature for the promotion and diffusion of scientific knowledge and its application to arts and industries. In order to give a concrete form to this idea, Mr. S. N. Pandit of Rajkot, the State lawyer of Morvi, was specially invited to Bombay for consultation. He, together with Mr. Goculdas R. Mehta, the State Engineer of Morvi, Professor T. K. Gajjar and Dr. M. G. Deshmukh of Bombay, formed a Committee to settle the main features of the proposed scheme and to arrange preliminaries.

His Highness the Thakore Saheb, of his own free will and accord, came forward with an initial grant of 6 lacs of rupees for building and equipment. He also proposed to set apart Rs. 10,000 per mensem for current expenses. His Highness also said that the preliminary as well as the annual grants might be increased, if in future, the revenues of his state permitted him to do so.

With these facts before them, the above Committee settled, after long consideration, that it might not be possible, at this stage, to include all the departments of modern sciences and technology in the programme of the proposed institute. To begin with, the institute should, therefore, be designed to be a Technical College on the most modern lines. The object of the Technical Institute as its title denotes will be to provide instruction and training in the principles of science with a view to a right understanding of the foundations upon which these arts rest and to promote their effective development.

It will be intended for the technical education of the State and municipal technical officials and for all persons wishing to qualify themselves for positions in any branch of science applied to industry and trade.

The essential aim of the instruction will be the training of faculty through a systematic course of sound theoretical study and development of resourcefulness and habit of self-reliance by means of an exact, thorough and progressive course of laboratory and shop work. The institute will further provide facilities for the training of different classes of foremen, artisans, tradesmen and craftsmen by opening science, art, trade and manual classes of secondary and elementary grades in the vernaculars as well as take up apprentices in the different shops and laboratories for practical trades.

The chief object of the Institute will be to provide higher instruction in Chemistry and Technology, with a view to develop the material resources of the country by promoting chemical trades and industries.

The Institute will qualify persons to become—

- (1) Science and Technical Teachers.
- (2) Analysts and Consulting Chemists.
- (3) Chemical Engineers and Manufacturers and Pharmaceutical Chemists.
- (4) Principals, Superintendents and Managers of manufacturing works.
- (5) Bleaching, Dyeing, Printing, Sizing and Finishing Masters.
- (6) Managers and Secretaries of mills and merchants.

The Institute will afford facilities for the prosecution of original research, with the object of the thorough training of the students and for the elucidation of the theory of industrial process.

With these objects in view, the Technical Institute is to consist of the Departments of—

- I. General Science and Education.
- II. Chemistry and Technology (General and Industrial Chemistry).
- III. Mechanical Engineering.
- IV. Electrical Engineering.
- V. Mining Engineering.

These departments will be taken up in the order in which they are mentioned above. The fullest scope is to be given, in the beginning, to the Department of Chemistry and Technology.

Professor T. K. Gajjar has been entrusted with the task of the organisation, and the working out of the details of the above scheme.