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Government of Madras.

EDUCATIONAL DEPARTMENT.

Retd.

Regd.

} 1913.

Enclosures

Spare copies

G.O. No. 798, 26th August 1913.

Technical education.

Submitting to the Government of India the remarks of this Government on the report made by Colonel Atkinson and Mr. Dawson on their enquiry regarding the possibility of bringing technical institutions into closer touch with employers of labour.

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தமிழ்நாடு ஆவணக்காப்பகம்
பாதுகாப்பு பிரிவு

செப்பனிட்டவரின் பெயர் : டி. அனந்தசுந்தரன்

செப்பனிருவதற்கு

எடுத்துக்கொண்ட நாள் :

செப்பனிட்டு முடித்த நாள் :

-- சரிபார்க்கப்பட்டது --

முநிபாள(1) முநிபாள(2) ஆராய்ச்சி உதவியாளர்

Technical education.

Submitting to the Government of India the remarks of this Government on the report made by Colonel Atkinson and Mr. Dawson on their enquiry regarding the possibility of bringing technical institutions into closer touch with employers of labour.

GOVERNMENT OF MADRAS.
EDUCATIONAL DEPARTMENT.

READ—the following papers:—

I

Letter—from the Hon'ble Mr. H. SHARP, C.I.E., Joint Secretary to the Government of India, Department of Education.
To—the Secretary to the Government of Madras, Educational Department.
Dated—Simla, the 27th September 1912.
No.—2225-Education.

I am directed to invite the attention of the Governor in Council to the proposals contained in the report of Lieutenant-Colonel E. H. deV. Atkinson, R.E., Principal of the Thomason College, Roorkee, and Mr. T. S. Dawson, Principal of the Victoria Jubilee Technical Institute, Bombay, forwarded herewith.

2. Much has been written and said about technical education in India and many experiments have been made. It seemed to the Government of India that the time had come to endeavour to connect educational institutions more closely with business firms, railways and other employers of labour, to enquire how the former can better meet the requirements of the latter and to point out the way to further employment of Indians in them. For this enquiry Colonel Atkinson and Mr. Dawson were selected as having special practical experience of the subject. They have conducted the enquiry with evident care in the leading industrial centres of India—the Government of Burma agreed that no special enquiry was needed in that province—and they have submitted an extremely interesting and valuable report from which the Government of India have little doubt, much good will result in the future.

3. One of the features of the report is the record in Part II of the interviews with employers of labour. This is perhaps the most useful contribution yet recorded on the subject of technical education in India, representing as it does the matured experience of practical men of business. The Government of India desire to thank the gentlemen whose opinions have been incorporated in Part II for the assistance which they have given in this enquiry and for their frank expression of their experience and opinion. To those many who are ready to assist in future by taking apprentices their special thanks are due.

4. The Governor General in Council is disposed to agree with the conclusion (paragraph 15 of the report) that the general result of the enquiry, except for the present in the high grade, is very favourable. There are in India, as there have been elsewhere, difficulties to be overcome, but on the whole, and seeing how young technical education in India still is, there seems good reason to hope that with patience they will be surmounted. The great need which the report emphasises is to make education more practical not only in technical schools but also in primary and secondary schools.

5. The general recommendations of Colonel Atkinson and Mr. Dawson are contained in paragraph 48 and some special recommendations in Chapter XV. The Government of India will be glad to have the opinion of the Governor in Council on these recommendations and also on any of the suggestions contained in Part IV of the report in which your Government is interested. You will be separately addressed regarding the proposals as to State technical scholarships when the recommendations of the Committee in England now considering the subject are received.

II

Endorsement No. 2678-1, Educational, dated 11th November 1912.

Referred to the Director of Public Instruction for remarks with reference to paragraph 5 of the Government of India's letter.

(By Order.)

M. S. MASCARENHAS,
Under Secretary to Government.

To the Director of Public Instruction.

III

Letter—from the Hon'ble Sir ALFRED GIBBS BOURNE, D.Sc., F.R.S., K.C.I.E.,
Director of Public Instruction.
To—the Secretary to Government, Educational Department.
Dated—Madras, the 18th March 1913.
No.—Ref. on Cnr. 9187/12.

With reference to Government Endorsement No. 2678-1, Educational, dated 11th November 1912, referring for remarks the proposals of Lieutenant-Colonel E. H. deV. Atkinson and Mr. Tom S. Dawson, contained in their report on the enquiry to bring technical institutions into closer touch and more practical relations with the employers of labour in India, I have the honour to submit the opinions expressed in the enclosed notes by the Principal, College of Engineering, and the Superintendent of Industrial Education after a personal discussion between them and to state that I have little to add to them.

2. The "general recommendations" referred to in the Hon'ble Mr. Sharp's letter contain little that can, in this Presidency at any rate, be a basis for definite action. The following points call for some remarks:—

(1) Apprenticeship is recommended after training in a technical institute. A scheme is now being considered by Government in which provision is made for the technical instruction of apprentices during their period of apprenticeship. Nothing in the report suggests any need for alteration in this scheme.

(2) *Chapter VII* (11).—The Superintendent of Industrial Education might consider whether the establishment of such classes in connection with the mills in Madras or elsewhere is desirable.

(3) *Chapter VII* (12).—The recommendation is sufficiently dealt with by Mr. James. The remainder of the recommendations are recognised in this Presidency as matters of course.

Chapter XV contains further special recommendations.

(1) *Chapter XV* (paragraphs 176 and 177).—While I agree on the whole with the conclusions in these paragraphs, I do not think they have much application to this Presidency. We have so far selected trades, for scholarship-holders, in which instruction is not to be had here, and always if possible select men as scholarship-holders who have acquired what experience they could in the selected trade. As regards engineering Mr. James' remarks are of value.

(2) *Paragraph 178*.—In this Presidency the Government technical examinations certainly provide a sufficiently accurately standardised system of certificates. It is a question whether the rigidity of the system has not tended to a perverted development of technical and industrial training. It is in contemplation to make the College of Engineering a "Central Institute" of the kind the report seems to have in view. Pending this, it seems unnecessary to discuss the relation it may properly come to have with other institutions. In any case we should probably maintain the system under which grants-in-aid are awarded by the department on the report of an officer like the present Superintendent of Industrial Education.

3. *Paragraph 193*.—The manual training schools recommended in this paragraph are apparently schools of the kind recommended by me in connection with the question of education for the children of operatives (*vide* my letter Ref. on Cnr. No. 4297, dated 8th October 1912, read in G.O. No. 1089, Educational, dated 9th December 1912).

4. The subject of the letter of the Principal, College of Engineering, No. 3174-C, dated 5th March 1909, referred to in paragraph 5 of his notes was embodied in this office letter Ref. on Cur. No. 1601, dated 17th July 1909, disposed of in G.O. No. 3072, Revenue, dated 12th November 1909.

5. The enclosures are herewith returned.

ENCLOSURES.

(1) *A general note by Mr. K. T. B. Treveler, Superintendent of Industrial Education.*

A trade or profession is both a science and an art, but neither science nor art by themselves constitute a practical qualification. To fill the numerous positions that modern industry offers, a combined qualification is necessary, the two elements being associated in varying degrees according to the particular class of post to be filled.

2. The investigations made by Colonel Atkinson and Mr. Dawson really resolve themselves into an enquiry as to the nature of the combination needful to produce the classes of worker required in modern industry. The tendency in India at the present time is to move in extremes, and the only classes now represented to any extent are the bazaar workmen on the one hand—representing art untempered by science and the graduate on the other—representing unadulterated book science.

3. For purposes of classification the workers in an industry—on the technical side—may be roughly divided into three groups: the workman, the foreman and the technical assistant. In the last group a very high standard of attainment is called for; in the next the scientific standard is lower but a good deal of practical experience is demanded also; in the first group a very high standard of practical skill is required. Skill and experience may be regarded as the “art” qualifications.

It follows therefore that the problem to be solved is this: to infuse a sufficient degree of science or art into the training now provided in the extreme classes, to leave the same and turn it into a thing of industrial value, and further to develop the intermediate group which at present may be said to be non-existent. In considering this problem certain fundamental facts must be borne in mind. First and foremost it must be recognised that, although the science of a trade can be imparted by teaching, the art can only be acquired by practice; further, as a fact proved by general experience, that the only way of improving the art of a trade is to improve the conditions under which it is practised, i.e., to improve the workshop organisation. In technical education we have therefore two separate educational factors to consider: the school and the workshop, the functions and scope of each being entirely distinct.

4. Corresponding to the three grades of workers, three degrees of scientific attainment may be recognised. The high qualification required by workers of the “technical assistant” class can only be acquired in a school of the University type such as the Engineering College: a technical school represents a more elementary type of training suited to the foreman class of workers. The scientific requirements of a workman may be described by the term “commonsense” or scientific analysis. Whether this mode of scientific thought which lies at the root of all scientific knowledge can be taught at all I am inclined to doubt. At any rate it cannot be taught in the ordinary academic manner in a school. In practice therefore only two types of scientific training can be provided in schools: the “art” training having in every case to be provided by the workshop.

5. Under existing conditions it is only in the matter of school training that the educational department can influence industrial education. From what has been said it will be clear that such training, however excellent it may be intrinsically, cannot possibly be expected by itself to lead to a complete solution of the problem under consideration. School training may teach a pupil the principles of his trade; by a suitable scheme of instruction the exercise of common sense may no doubt also be stimulated; but when all is said and done it is in the workshop and the workshop alone that the industrial worker is made—if indeed he can be made at all.

6. It may be arranged that technical classes shall be conducted only by men possessing a practical working knowledge of the trade they teach. In the higher scientific instruction there may possibly be room for improvement on the common-sense side—on this point I cannot offer an opinion and as regards technical education for lower classes of workers much may be done by cutting out “fancy frills”: by limiting the courses of instruction for foremen to things that they can understand and find practical use for, and by refraining from trying to stuff workmen's brains with a lot of information that they cannot assimilate. Beyond this, however, nothing more is to be expected from teaching pure and simple. If technical education is to be made more practical it is the workshop that we must look to and not the school.

7. Colonel Atkinson and Mr. Dawson's report inasmuch as it represents a résumé of everything that has previously been said on the subject, no doubt possesses a certain value, but its only original feature is the series of recommendations made in Chapter VII. Of these, Nos. 1, 3 and

4 are statements of fact and not recommendations at all. Numbers 5, 6 and 7 and the first sentence of 8 and 10 are truisms. The only recommendations are paragraphs 2, 9 and 11. Of these, 9 deals with the mining industry and need not be considered here. Two suggests apprenticeship for one year for pupils passing out of the Engineering College—which is now being followed—and 11 contains recommendations for the establishment of technical schools. Twelve suggests the establishment of a Labour Bureau. This seems to be a question rather outside the scope of the enquiry.

I am however unable to find in the whole of the report any definite suggestions regarding ways and means, nor are such suggestions really to be expected since as explained above, the real solution of the problem lies with the employer of labour—over whom Government has no control—and not with the teacher or professor in schools.

*Note by Mr. W. H. James, Principal, College of Engineering, Madras.**I. General recommendations, page 16, paragraph 48.*

The existing system of training in central colleges is unquestionably the best suited to the requirements of this country. It is in reality one of natural growth and, taking this college for instance, the present constitution and methods of working are the result of experience gained during its existence from establishment as a survey school over a hundred years ago. Committees, invariably including among their members engineers of many years' practical experience, have from time to time been constituted to advise Government in regard to its organisation and to bringing it into line with changing conditions and it may therefore be reasonably assumed it is adapted to serve the purpose for which it is intended.

I fully concur in the recommendation that training for all grades should be concentrated in large colleges. The proposal, put forward at the Outcaste Conference, 1909, to establish separate institutions for the training of lower subordinates was opposed partly for the reasons set forth in paragraph 21, and it was only after further reflection on the possibilities in this connection that I felt justified in making the proposals, which were accepted by Government, for the establishment of the probationary class to act as a feeder for the higher classes, and which have the effect of linking up more closely the two subordinate classes.

(2) Provision for such training as an integral part of the courses has been made for students passing out of our engineer and upper subordinate classes for the last 60 years and under the special conditions that exist in this country something of the sort is undoubtedly necessary. I would not be opposed to a suggestion that our lower subordinate students should also be granted this privilege, but I do not consider it nearly so requisite as for the other classes. Lower subordinates take employment as draftsmen, surveyors, etc., and their college courses can only be regarded at the best as a kind of preliminary and elementary general training. Whatever line they enter on they will in the majority of cases follow all their lives, and rather than we should attempt to make their training correspond with that of the higher classes, it would be better that employers should realise they are taking on subordinates of absolutely no experience, pay them accordingly, and if they intend to retain their services any length of time they should in their own interests give them the necessary facilities for obtaining the practical knowledge necessary or advisable for the special work on which they may be engaged.

(3) I am not prepared to go as far as to say that there are no openings for the mechanical engineers we turn out of our engineer class. As a matter of fact with the introduction of mechanical plant which I understand is taking place in the Public Works Department, there will be employment in that department for such men, and I receive inquiries from time to time which lead me to think that some students can be safe of finding careers on mechanical and electrical engineering work. It is very necessary for the sake of these men, and more so from considerations of the industrial development of the country, that facilities should be provided for their training, and in any case a great deal of use can be made of the same laboratory and workshop plant for the training of the more subordinate type of men for whom there is an admitted demand.

(4) The kind of employment implied is presumably similar to that of a Supervisor or Foreman—a man who can and does set to work himself if his men are not going on properly. It is a truism that such men can find employment in any country, but they usually rise from the ranks and have to make the best of their opportunities in their spare time to gain a little theoretical knowledge in order to qualify themselves for positions higher than that of the ordinary artisan.

Here the proposal is that they should receive some preliminary training in a technical institute and, in the present state of India from the industrial standpoint, it is probable that such training will help to meet a demand that is known to exist, but it must be clearly realised that the training can be only preliminary, that no college or institute can supply the place of the commercial workshop, and that the future of the student will depend on his own exertions after he has left the college and not on any educational certificate he may have obtained. I have found many men, able to work conscientiously and well under tutelage, in many cases fail afterwards to sustain their efforts and to fulfil the promise of their student days.

(5) This recommendation is similar to the scheme set forth in some detail in my letter No. 8174-C, dated 5th March 1909, dealing with proposals for the training of Mechanical Engineering subordinates, and which was explained to the committee on their visit here. I still think it expresses the lines along which something may be done in this Presidency.

(6) In the first place I should say that I dissent altogether from the notion that college training can be practical in the sense the word is applied to an out-door profession. With a qualified staff and adequate workshop facilities much can be done in the way of instructing students in the principles underlying the proper manipulation of tools, etc., but in a technical school this training must be educational and can to no appreciable extent replace that of a commercial workshop where economical working is the prime consideration. The bearing of the allusion in this paragraph to the high scientific character of education in the west is not quite understood as no provision is made in such institutions for the training of men of the class contemplated in recommendation (5). As a matter of fact our engineer class is the only one in any way comparable to classes in European universities, and it has always seemed to me that there is some confusion in this connection and that it is not sufficiently realized how much more is done in the matter of training subordinates for practical work at engineering colleges in this country than elsewhere. Subordinates abroad are a kind of natural growth and almost invariably they are men who have forced their way to the front from among their fellows and have extensive experience of practical work. More often than not, employers here expect the qualities of such men in the college trained student just completing his course and require that he shall at once be capable of discharging duties for the efficient performance of which habit of assessing themselves at the same standard and ask for starting salaries above their true value. So much is this the case that I understand it is becoming possible to obtain Europeans of equal abilities and better experience for the pay often demanded by an Indian engineer who is at any rate working in his native country.

(7) I believe it is now generally accepted that the mere founding of technical institutes can do little good in the way of advancing the material interests of the country, and that such institutes should rather follow in the wake of industries already established and making a demand for trained men.

The same also may be said of the suggestion that it is preferable to have a large central college rather than a number of small institutions dealing with separate branches; and the stage of development reached in this Presidency certainly does not justify the duplication of facilities for the training of technical students.

(8) In addition to the qualifications specified it seems to me that teaching experience is also of some value, and in any case there is not the competition for academic appointments under present conditions that this recommendation would imply. The successful man of extensive practical experience is never desirous of sacrificing his career and prospects in the practical but to appoint young men with inclination towards academic work and of necessity little practical experience. I fully agree with the recommendation that members of the staffs of technical institutes should be allowed to take up consulting and advisory work, and in fact I recommended the adoption of this course, as far as the senior members of the staff here are concerned, in my letter No. 3290-C, dated 24th March 1909. I am aware the idea is not viewed with favour in some quarters, but it still seems to me the only feasible way of keeping the professors in touch with the real requirements of the country.

In regard to the junior members of our staff their transfer in a body to the Public Works Department and the recruitment of men temporarily for three years from that department is calculated to serve the same end.

(9), (10) & (11). These recommendations have little application as far as this Presidency is concerned. It is possible that men of the type we train might be of use in mine surveying operations, and should there be any demand we could easily make provision for the small amount of extra and specialized instruction that would be required.

In regard to the textile industries it can hardly be said there is at present any call for technically trained assistants, but if, as has been suggested, this college should in the future be developed into a kind of technological institute, the facilities for training connected with civil, mechanical and electrical engineering would form a good basis from which to start any expansion intended to provide for industries closely allied to engineering.

(12) I doubt whether such an officer could be of appreciable assistance in this Presidency. The circumstances are so different in the several provinces that to me it seems somewhat hopeful to expect that any one person will be able to appreciate fully the special local conditions that exist everywhere, keep closely in touch with local employers and at the same time observe the results achieved. Any kind of centralization in connection with technical education should be avoided, and it would be more to the purpose, if satisfactory progress is to be maintained, that officers of Provincial Governments should be given full freedom and power in these matters.

In regard to the statement that central control is necessary because if arrangements are left to Provincial authorities they will reserve facilities for local apprenticeships, this to me is suggestive of forced technical education. In my opinion no technical institution should undertake to train men unless there is a demand in the province for their services, which necessarily implies there will be ample facilities for practical training. If it is decided to adopt the scheme of passing on the partially trained student to an apprenticeship, the Principal of the institution concerned should get into communication with the employer and reliance on the intervention of a third person might for obvious reasons prove a disadvantage.

In order to assist qualified students to obtain their first appointments this college at present to some extent performs functions of an employment bureau. Printed lists of passed men are sent periodically to prospective employers and we always readily supply them with the names of men we have not heard to have obtained employment, and we also post particulars of their requirements on the college notice boards. In some cases special recommendations are made in response to requests for men of particular attainments, but ordinarily the lists are allowed to speak for themselves. I am also at present developing a system of notifying vacancies to any ex-students who may desire such information, and I see no difficulty, with the necessary clerical assistance, of developing in this manner into what would to all intents and purposes constitute an employment bureau for alumni of the college.

II.—Special recommendations on page 85, paragraph 196.

(1) I am fully in agreement with the recommendation that the present system of state scholarships for engineering should be discontinued. There is no reason as far as college training in engineering is concerned, why institutions in this country should be regarded as in any way inferior to similar places in other countries. It is merely a question of comparatively moderate expenditure on staff and equipment, and we always have here the advantage of knowing and being able to direct our methods of study and training to suit the special needs of the country. Another objection may be exemplified by the case of a subordinate student proceeding to England some time ago who stated candidly that he did not care much where he went to, but was actuated chiefly by what he considered the prevalent opinion that he only had to get some sort of certificate from a college at home to enable him to obtain an appointment as a temporary engineer or something similar, which even an engineer student in this country could not aspire to straight from college. Any idea of this kind must necessarily be detrimental to the interests of Indian Engineering Colleges and their students, but I have reason for thinking there is improvement now in this respect. One is, however, hardly yet in a position to tell students without any reservation that their advancement depends solely on their own abilities, and although in principle it is correct that initial appointments to particular grades should depend on educational qualifications, when the theoretical training implied is necessary for the efficient performance of the duties of the service, in my opinion the regulations generally should be more elastic to admit of a more efficient system of promotion by selection.

I would strongly support the proposal to grant stipends to qualified students who are prepared to undergo the drudgery, involving long hours and hard work, inseparable from practical apprenticeship with engineering firms in Europe. In my judgment however this should not be large enough to make them altogether independent of the wages they may earn, as the "gentleman" apprentice rarely makes the best use of his opportunities, it being nobody's business to see that he does a fair day's work. On a system of this kind there would be many failures, but the men who go through with it successfully would be imbued with a sense of discipline, engendered by loyal subordination to foremen of somewhat inferior general education, which is wanting in this country, and they could be safely left to look after themselves and should prove of immense use in advancing the industrial prosperity of the country.

(2) This recommendation has little application in the Madras Presidency if the distinction between technical and industrial training carries any weight but it is obviously a general principle that should be followed. Some co-ordination must naturally exist to avoid overlapping and waste of effort and minor institutions should be in a position to act as feeders to the central college, and thus provide an avenue for their more capable students to pass on to higher training.

(3) I think it may be safely said that the opinion is general among employers in England that for the great majority of manual workers it is of no advantage as far as the efficient and expeditious carrying out of their work is concerned to take their education beyond the "three R's" and anything more tends to promote unreasoning restlessness and discontent. In this country no special effort in my opinion should be made to impart even this instruction except in the vernaculars and thus remove temptation from the way of men who should be artisans to aspire to become clerks and attenders on account of the smattering of English they possess.

(4) The establishment of manual training schools may assist the end in view, and means may very well be adopted suited to the particular circumstances of the trade and locality to encourage and provide facilities for the apprenticeship of young lads, but under the peculiar conditions that exist in India I doubt very much the continued success, except possibly in a few

selected places, of any system of combining apprenticeship with ordinary education. Some employers may be prepared to assist in this way, but if the services of the apprentices are of any value pressure of work will in the generality of cases be sufficient excuse for keeping the boys from school attendance. I think also the fact should be recognised that, when it is clearly understood this extra school education is not to lead to clerical employment, the boys themselves will not be at all keen on their books after they have once started on what they will regard as men's work, and as far as obtaining theoretical knowledge of their trade goes, the only kind of "technical education" of use to a man of this kind is that he picks up in the workshop. Technical training in a school under such arrangements can be of little or no value and it is a case of "a little knowledge being a dangerous thing," for what is required of a workman is that he should do as he is told and in the way directed, and not ponder over the reasons why or attempt to do better. I am aware it is suggested that theoretical knowledge assists the workman in performing his duties more intelligently and to better advantage but my experience leads me to think that what is lost is more than what is gained in this respect. Every opportunity should of course be afforded exceptional men, who show special ability, to obtain higher training by assisting them with full-time scholarships at technical institutions, but these will only form a very small minority and forced technical education for the mass is waste of energy and money, and is certainly not going to work for the good of the country.

III. Suggestions relating to Madras—Chapter XIX, page 95.

Paragraphs 224 and 225.—With reference to the remarks in the second part of the paragraph, it may be safely said that it does not require very long residence here to appreciate the fact that by instinct and tradition men of the higher castes are not adapted for manual work. They cannot also to any degree be regarded as practical in the engineering sense, but this I am inclined to think is due to some extent to faulty early training, and improvement in this respect is likely with a more efficient system of primary and secondary education. The large majority of our students being Brahmins, one manifest step forward is the provision of adequately equipped laboratories and workshops, which I have been constantly urging the necessity for during the last ten years.

It was partly on this account also that the recruitment of the subordinate staff from the Public Works Department for service in the college for short periods was recommended, and the adoption of this course must tend to prevent our instructional work running too much in the groove of pure theory, and assist in impressing on students the fact that the ultimate end of their training is the application in practice of the knowledge they gain during their college careers.

The admission of students at an earlier age under the revised rules and their thus coming into contact with practical men before the habit of placing complete reliance on the "words of books" becomes inextricably fixed should also help in this direction, and with the corresponding lowering of the general educational qualification and also the principle of selection, based to a great extent on the capacity shown for practical work, for promotion from the probationary to the upper subordinate class, fair and equal opportunity is afforded students of all social classes for proving their worth for technical work.

Paragraphs 226 and 227.—Students are trained at this college for appointments as civil and mechanical engineers, and for subordinate posts as upper and lower subordinates on civil engineering work. The engineer is the highly trained or University type of man and although the demand for civil engineers is not very great, the number of openings appears to be increasing and in any case these men easily get employment as upper subordinates on higher pay and with presumably better chances of promotion than men with only the upper subordinate qualification. Passed men of all grades under civil engineering readily find employment and the demand is greater than can be met from the college.

It is early as yet to say anything about the few mechanical engineers who have qualified but it is very necessary to provide facilities for the training of this type of man although it would be wrong in this Presidency, where the openings are so few, to gather students together merely for the sake of filling classes. Those who join the classes are afforded every encouragement and assistance as far as possible in obtaining employment at the end of the course, but it is impressed on them that the college can take no responsibility in the matter. This policy must entail a natural growth of the class, and expansion to meet increasing demand will necessarily follow, as I have no reason for thinking that students in this country are more backward than elsewhere in anticipating the possibilities of the future in regard to remunerative employment.

Much the same may be said in regard to provision for the training of mechanical engineering supervisors or foremen, or improvers as they are termed in this report. If a scheme on the lines I have proposed is adopted, arrangements may be made for the training of electrical as well as mechanical engineering subordinates, and I certainly do not accept the implied suggestion in paragraph 227 that the Bombay Technical school can do all that is necessary in this direction.

The training of skilled mechanics is one of industrial rather than technical education and I gather from the report that a scheme in this connection for Madras is now being considered by Government.

References to the textile and mining industries have already been made and students who desire technical training for the former may very well for the present take advantage of the facilities provided in other provinces for the purpose.

Paragraph 243.—*Permanent-way Inspector*.—I cannot gather from the information I have that any passed students of this college are employed on railway work, and it is very essential that something should be done to bring technical institutions into contact with these large employers of engineering labour, as I am satisfied there are many railway appointments the technically trained man is suited for.

Provision can be made here for the theoretical training of permanent-way inspectors or any other type of engineering subordinates if suitable arrangements are made for the services of a qualified instructor when it is a case of training in part for specialised work. It would of course be necessary for the railway authorities to state clearly what they require and perhaps the conference suggested would be the best way of coming to an understanding on this matter.

Order—No. 798, Educational, dated 26th August 1913.

The Government of India will be addressed.

(True Extract.)

W. FRANCIS,
Ag. Secretary to Government.

10 7/798

GOVERNMENT OF MADRAS.
EDUCATIONAL DEPARTMENT.

No. 799.

From

THE HON'BLE MR. W. FRANCIS, I.C.S.,

Acting Secretary to the Government of Madras,

Educational Department.

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,

DEPARTMENT OF EDUCATION.

Dated Ootacamund, the 26th August 1913.

SIR,

I am directed to reply to your letter No. 2225-Education, dated 27th September 1912, referring for the remarks of this Government the report made by Colonel Atkinson and Mr. Dawson on their enquiry regarding the possibility of bringing technical institutions into closer touch with employers of labour.

2. The enquiry has reference rather to those Provinces in which industries are already widely developed than to Madras where neither coal nor iron are mined; agriculture and the preparation for the market of agricultural produce, with some hand-loom weaving, are the chief industries; factories (except cotton spinning and weaving mills) are few; and the natural resources of the country (excepting perhaps its forests and its leather) do not invite industrial enterprise on any large scale.

3. Generally speaking, however, His Excellency the Governor in Council is in accord with the recommendations of Colonel Atkinson and Mr. Dawson and many of these have indeed already been adopted as part of the set policy of this Government with regard to industrial education. In Madras, for example, training for the profession of Civil Engineer is given only in the central college at the Presidency town (recommendation (1) in paragraph 48 of the report); except the lower subordinates, the students trained therein are required to undergo a year's practical course after passing out (recommendation (2)) and arrangements for widening this practical training are now under consideration; the production of high grade mechanical and electrical engineers with purely theoretical attainments (recommendation (3)) is not aimed at—though it appears doubtful whether, if these men could be taught to be more practical and self-reliant, a demand for them would not arise; and as industrial development is not well advanced in Madras no large mechanical and electrical institutes (recommendations (7) and (8)) are maintained there. The ninth recommendation has no application in this Presidency, where mining is almost non-existent, and the tenth and eleventh very little, as is indeed admitted in paragraph 228 of the report.

4. The remaining (fourth, fifth and sixth) recommendations meet with this Government's general approval and are again in several respects in accordance with their existing policy. The chief need at present in this Presidency is for moulders, pattern-makers, fitters, general machinememen and drivers of the oil and other engines the use of which is rapidly extending in rice-hulling, cotton-pressing and ginning, sugar-making, pumping for irrigation, etc. The railway companies and bigger mills and workshops commonly train their own men. For others of this class, the new Technical Institute at Madura, the chief town in the south of the Presidency, will provide elementary classes for the benefit of intelligent artizans, to be followed by a course of apprenticeship, and this Government are encouraging by grants and other assistance a selected number of privately-managed industrial schools in different parts of the Presidency. The scheme for the provision of technical training and State apprenticeships in the manufacturing quarter of Madras City, which follows the lines laid down in the last two clauses of paragraph 196 of the report, is referred to in paragraphs 130 and 226 thereof. It is a part of the Government's policy that all this instruction shall be essentially practical and capable of being applied commercially and the present Superintendent of Industrial Education is thoroughly alive to this fact.

In addition, to advance the needs of the hand-loom industry an English expert in dyeing, who is also to control a dyeing school attached to the Madura Technical Institute, has been appointed and a peripatetic party is travelling through the weaving districts to demonstrate the advantages of improved machinery, while to further the trade in leather a European expert has been entertained and a tanning and leather school, to be under his charge, has been sanctioned for Madras City. Further developments may be hoped to follow the orders of the Secretary of State, which have been asked for, regarding the establishment of a Department of Industries, and in organizing these the Government will profit by a consideration of the recommendations made by Colonel Atkinson and Mr. Dawson.

5. This Government are in complete agreement with those gentlemen as to the need for bringing into closer touch the industrial student and the employer, but they doubt whether in this Presidency the controlling officer and central employment bureau recommended in paragraph 48 (12) of their report would be of any real use in effecting this object. Technical education must vary in scope and ideals with the varying needs of different Provinces, and any attempt to control it throughout India at the bidding of any one officer would be unlikely to succeed; while at present the number of trained students here who are unable to find work in their own Presidency is so small that there would be no field for any but a Provincial employment bureau. Such a bureau is already in effect maintained by the Principal of the Madras Engineering College, who takes much pains to procure situations for students who have passed out of that institution.

I have the honour to be,

Sir,

Your most obedient servant,

W. FRANCIS,
Ag. Secretary to Government.

EDUCATIONAL DEPARTMENT.

NOTES CONNECTED WITH G.O. Nos. 798-99, EDUCATIONAL,
DATED 26TH AUGUST 1913.

[SUBJECT.—*Technical Education in India.*]

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The file deals with the special report by Lieutenant-Colonel Atkinson and Mr. Dawson on their enquiry to bring technical institutions into closer touch and more practical relations with the employers of labour in India. The Government of India have asked for the opinion of this Government—

- on the general recommendations contained in paragraph 48 of the report,
- on the special recommendation contained in chapter XV, and
- on any of the suggestions contained in part IV of the report in which this Government is interested.

The Government of India's letter was referred to the Director of Public Instruction for remarks and he has submitted the remarks of Mr. K. T. B. Tressler, Superintendent of Industrial Education, and of Mr. James, Principal, College of Engineering, with his own remarks.

2. Before considering the recommendations in the special report, it may perhaps be useful to premise what has been done here already and what stage activities in respect of technical and industrial education have now reached. The movement for the furtherance of industrial development in this Presidency dates from the appointment of the Director of Industrial and

Vide G.O. No. 1421, Revenue, dated 20th May 1908.

Technical Enquiries in 1906. A strong impetus to this movement was given by the Industrial Conference which was held at Ootacamund in 1908 at the invitation of Government. Since then—

G.O. No. 2894, Revenue, dated 17th October 1908.

G.O. No. 647, Educational, dated 18th July 1912.

G.O. No. 756, Educational, dated 31st October 1911.

G.O. No. 163, Educational, dated 21st March 1911.

G.O. No. 613, Educational, dated 10th July 1912.

(d) proposals are under consideration for the opening of an industrial school in North Madras with a number of State apprenticeships attached to it (this matter is now lying over pending receipt of proposals for constituting a committee to consider the details);

G.O. No. 198, Educational, dated 4th March 1913.

(f) proposals have been considered for developing the Madras Engineering College to embrace a wider range of instruction in technological subjects (proposals have been submitted to the Government of India); and

[Note.—For the list of institutions please see pages 26 to 30 of Volume II of Public Instruction Report, which give also the subjects taught. Of these the Engineering College and the Madura Technical Institute under Government and the Chengalvaraya Nayakkar's school under private management impart higher grade instruction. The St. Aloysius school, Vizagapatam, would have been added in the current year.]

3. The object of the present investigation by Messrs. Atkinson and Dawson is, as stated by Mr. Tressler, to infuse a sufficient degree of science or art into the training now provided to turn it into a thing of industrial value. This question was in some measure dealt with by Mr. Tressler in his special note on industrial education, which is referred to in clause (g) of the previous paragraph. Mr. Tressler characterised the existing system of industrial education as absolutely wanting in common and definite objective and has suggested a definite policy for the approval of Government. This latter note was the outcome of a resolution of the Ootacamund Industrial Conference which laid down that industrial education should

Recommendation 15 on page 216 of the Ootacamund Conference Report. arise out of and be developed to suit the needs of some existing industries or industries started for experimental purposes—an object which coincides with the purpose of the report under consideration. Reference will be made to Mr. Tressler's note in appropriate places in considering the several recommendations of the report.

4. These recommendations will be dealt with *seriatim*. Mr. James' note alone deals with all the recommendations, while Mr. Tressler offers very few specific remarks, though in his note he gives a clear analysis of the purpose of the report. For convenience of reference, the remarks of Mr. James and those of Mr. Tressler and the Director of Public Instruction are printed under each recommendation.

(a) the Madura Technical Institute, the only institution besides the Engineering College under the control of Government, has been reorganized;

(b) two experts in leather and dyeing industries have been entertained;

(c) sanction has been accorded to the opening of a leather trade school in Madras and for attaching a dyeing school to the Madura Technical Institute;

(e) a peripatetic party has been organized to demonstrate to people the improved machinery in weaving;

(f) proposals have been considered for developing the Madras Engineering College to embrace a wider range of instruction in technological subjects (proposals have been submitted to the Government of India); and

(g) lastly, proposals have been submitted to Government for placing industrial education in this Presidency on a sound basis. (This question is now lying over pending the orders of the Secretary of State on the proposals for the establishment of a separate Department of Industries.)

GENERAL RECOMMENDATIONS.

5. RECOMMENDATION (1).—“The existing system of training for the Civil Engineering profession in central colleges is the most suitable one for the requirements of ‘India.’” (Paragraphs 21 and 22.)

Mr. James' remarks—

The existing system of training in central colleges is unquestionably the best suited to the requirements of this country. It is in reality one of natural growth and, taking this college for instance, the present constitution and methods of working are the result of experience gained during its existence from establishment as a survey school over a hundred years ago. Committees, invariably including among their members engineers of many years' practical experience, have from time to time been constituted to advise Government in regard to its organisation and to bringing it into line with changing conditions and it may therefore be reasonably assumed it is adapted to serve the purpose for which it is intended.

I fully concur in the recommendation that training for all grades should be concentrated in large colleges. The proposal, put forward at the Ootacamund Conference, 1909, to establish separate institutions for the training of lower subordinates was opposed partly for the reasons set forth in paragraph 21, and it was only

G.O. No. 451, Educational, dated 8th July 1911 after further reflection on the possibilities in this connection that I felt justified in making the proposals, which were accepted by Government, for the establishment of the probationary class to act as a feeder for the higher classes, and which have the effect of linking up more closely the two subordinate classes.

Mr. Tressler's and Sir Alfred Bourne's remarks.—Nil.

Office-note.

(i) The scope of this recommendation is explained in full in paragraph 22 of the report (page 6). It is clearly stated therein that Engineering education of *every grade* should be concentrated when possible in large colleges; and the reasons for this recommendation are—

(a) that the lower classes can obtain the advantage of the traditions, ideals and moral training; and

(b) that the engineering training in India requires expert supervision of high grade competent staff which can only be met with in large institutions.

Mr. James also concurs in this view.

(ii) It is however observed that a proposal is now under the consideration of Government to establish an Engineering school for the training of subordinate grades in Dowlaishweram. The history of this question is briefly set out in the notes with G.O. No. 547, Educational, dated 10th June 1913. It formed the subject of a resolution moved at the meeting of the Legislative Council held on 14th March last. The Government then stated that they had at that moment under their consideration a similar suggestion; and on this statement the resolution was withdrawn. In connection with the file separately under consideration relating to the questions raised at the debate in the Legislative Council regarding the resolution on the re-organization of the Engineering College, the Hon'ble Sir Harold Stuart has noted that he would like to see an Engineering school established at Dowlaishweram or somewhere else in the Telugu country as well as at Madura in the Tamil country. This file is now again with the Honourable Member. If it is finally decided to open an Engineering school, such a course will be in contravention of the recommendation in the report. The main ground on which the proposal to open the school was urged in the Legislative Council was the distance of the Central Engineering College from the Northern Circars and the resulting meagre proportion of students from those parts in the College. No subsidiary institution of the kind contemplated seems to be maintained under Government control in any of the other provinces in India. But it is not known whether a similar demand exists there. Examining the reasons put forward in the report in

Vide the Hon'ble Mr. B. Narasimheshwara Sarma's speech in G.O. No. 547, Educational, dated 10th June 1913.

support of the recommendation, it is submitted that that based on traditions, ideals

I don't agree. What these boys want more than learning is character—self-reliance, self-discipline. That's why even the Eurasian is usually preferred to them by practical men.

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head of the Public Works Department, namely, the Executive Engineer or the Superintending Engineer. It may be mentioned that the curriculum of studies for the subordinate classes, especially for the lower subordinate class, includes little of

This isn't the point—see above.

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(iii) Recently in connection with the re-organization of the Medical College it has

G.Os. No. 885, Public, dated 13th August 1912 and Nos. 379-80, Public, dated 20th March 1913.

established at Rayapuram, Tanjore and Vizagapatam on the ground that proper facilities for the teaching of pathology and for the scientific training in chemistry, physiology and anatomy were, it was found, impossible to afford in the lower grade institutions. In spite of the invitation of the Government of India to reconsider

Letter No. 380, Public, dated 20th March 1913.

that the transfer of the first portion of the training to the Medical College was essential. It may be observed that this arrangement has been proposed not in consideration of any general principle, but in view of the peculiar circumstances of the facilities available for medical training and need not therefore affect the question of opening subsidiary schools for engineering instruction.

(iv) While as a general principle the recommendation in the report may be

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accepted, it may be pointed out to the Government of India that deviations the re-from should be allowed where exigencies of local circumstances such as those exist in the Presidency warrant such a course.

Secretary's Note.

(i) As a general principle the statement that Central Engineering Colleges are best may be agreed to. The argument in paragraph 22 of the report, that they form character better than any smaller affairs could hope to do, seems strong.

(ii) The re-organized Technical institute at Madura is to have a "Mechanical Engineering section," but as that is to be "strictly limited to elementary classes for the benefit of intelligent artisans" it does not violate the principle. The suggested Dowlaishweram school is so far only a suggestion. Government are in no way committed to it. Mr. Davidson's remarks at the Council meeting of 14th March last were merely that Government had the proposal "under their consideration" but had not thought it necessary to make budget provision for a scheme which as yet was only in the air. In his remarks on Mr. Seshagiri Ayyar's resolution that a commission be appointed to overhaul the Engineering College he did not allude to the matter, nor did any other of the Government's spokesmen. The scheme is still in the air and could be dropped easily.

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6. RECOMMENDATION (2).—"Apprenticeships for one year on practical work in the public Works Department should be granted, if possible, to every student passing out of a Civil Engineering College." (Paragraph 21.)

Mr. James' remarks—

Provision for such training as an integral part of the courses has been made for students passing out of our engineer and upper subordinate classes for the last 50 years and under the special conditions that exist in this country something of the sort is undoubtedly necessary. I would not be opposed to a suggestion that our lower subordinate students should also be granted this privilege, but I do not consider it nearly so requisite as for the other

* Also as Local Fund and Municipal sub-overseers and classes. Lower subordinates take employment as draftsmen, surveyors, etc., and their college courses can only be regarded as the best

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as a kind of preliminary and elementary general training. Whatever line they enter on they will in the majority of cases follow all their lives, and rather than we should attempt to make their training correspond with that of the higher classes, it would be better that employers should realise they are taking on subordinates of absolutely no experience, pay them accordingly, and if they intended to retain their services any length of time they should in their

How can local bodies do this?

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own interests give them the necessary facilities for obtaining the practical knowledge necessary or advisable for the special work on which they may be engaged.

Sir Alfred Bourne and Mr. Tressler.—No remarks.

Office-note.

(i) As pointed out by Mr. James, college rules 11 and 16 and 17 and 21 prescribe one year's practical course on division or workshop for engineering and upper subordinate students, respectively, no such training being prescribed in the case of the lower subordinates. For the reasons given by Mr. James it may not be necessary to enforce practical training of the

See below.

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that the system in the Roorkee College is however different. Students of the lower subordinate class there are intended only for the lower subordinate grades of the Public Works Department; and admission is limited by the apparent demand for such class of servants. After the college course, which lasts for two years, the students are absorbed in the Public Works Department either in the same year or in the subsequent

Page 17 on page 95 of the Roorkee Calendar for 1911.

years; and the certificates granted to them are regarded as complete only on the countersignature of the Executive Engineer to whom the students will be attached for a year. No such exclusive connection between the department and the college

+ Please see rule 10 of the Madras Engineering College rules—page 24 of the calendar which lays down that the subordinates are trained for Public Works Department, Revenue, Survey, Railway, local bodies and various other departments.

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In paragraph 21 of the report, on which the recommendation is based, it is stated that the system in force for the training of apprentice overseers passing out from the Civil Engineering College at Roorkee is a satisfactory one and may be followed. "Overseer apprentices" is the name given to the successful candidates of the upper subordinate class who are attached to divisions and paid an apprentice salary according to the grade. There are three grades of upper subordinate class at Roorkee, the first for British non-commissioned officers, the second for Europeans and Eurasians and the third for pure Indians. Only such of the students as are apparently needed for the department are taken as overseer apprentices and are attached to works receiving pay ranging

Page 62 *ibid.*

Page 70 *ibid.*

Page 80 *ibid.*

from Rs. 40 to Rs. 80 according to the grade mentioned above. After the year's practical training they are absorbed in the department and given permanent appointments. This system is radically different from that pursued in Madras. The system in force at Roorkee is adopted only in the case of the few military students in Madras (please compare rule 46 of the college rules) and these are termed "apprentice

"overseers"; and the other upper subordinates while undergoing practical training in the divisions do not receive any apprenticeship, nor are they guaranteed any appointments, though rule 75 provides that, if a vacancy exists, one appointment annually may be conferred on the civilian upper subordinate student who passes highest at the examination. The college at Roorkee is designed to give instruction in civil engineering to students with a view to their employment on the Public Works Department of the North-West and other provinces; while the Madras College Page 23 of the Roorkee Calendar, 1911. trains students not only for the Public Works Department but for other departments of Government as well as for local bodies and railways, etc. With this material difference, it may not be possible to introduce the Roorkee system in Madras. It has not been stated that the Madras system is defective. The Public Works Department may have some useful remarks to offer on this suggestion.

See below.

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Secretary's Note.

(i) From the lower subordinate class, who at present get no practical training at all, come all the hundreds of overseers and sub-overseers who have the immediate care of the spending of the crores which now annually are allotted to Local and Municipal, Public Works. The supply of these men is not equal to the demand and a President of a district board wanting a new overseer has to take one of these untrained boys straight from the college. Surely it is worth an effort to get these practically trained, more especially owing to the fact, so constantly insisted on in this present report, that the high class educated Indian is usually the most unpractical person when he comes to dealing with men and things instead of with books.

(ii) The Public Works Department could say what is the simplest way of arranging for this practical course, and a separate file could be started to thresh out the question.

(iii) Meanwhile India may be told that the Engineer and upper subordinate classes already get practical training here and that Government is considering the extension of it throughout the college.

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7. RECOMMENDATION (3).—"There is practically no opening at present for the employment of high grade mechanical or electrical engineers whose education is 'mostly of a theoretical character.'" (Paragraph 25.)

Mr. James' remarks—

I am not prepared to go as far as to say that there are no openings for the mechanical engineers we turn out of our Engineer class. As a matter of fact with the introduction of mechanical plant which I understand is taking place in the Public Works Department, there will be employment in that department for such men, and I receive inquiries from time to time which lead me to think that some students can be safe of finding careers on mechanical and electrical engineering work. It is very necessary for the sake of these men, and more so from considerations of the industrial development of the country, that facilities should be provided for their training, and in any case a great deal of use can be made of the same laboratory and workshop plant for the training of the more subordinate type of men for whom there is an admitted demand.

Sir Alfred Bourne and Mr. Tressler.—No remarks

Office-note.

(i) From paragraph 25 of the report on which this recommendation is based it will be seen that it refers mainly to openings outside the Public Works Department. In the Public Works Department itself, it is understood that so far no graduate in

mechanical engineering, who passed out of the local college, is employed in that capacity. All the mechanical engineers that have been employed in the Public Works Department are employed only on civil engineering duties. Mr. James speaks of prospective openings for such men in the department. The Divi Pumping project is the only one outside the workshops that afford scope for the employment of high grade mechanics. These posts are now filled by Europeans with Home training. Similar openings will possibly be created if and when the Kistna and the Cauvery projects come to fruition. The mere and occasional introduction of mechanical plant to replace manual labour will not, it is submitted, create any large necessity for such men. Subordinates with humbler qualifications are appointed to such posts, e.g., Siddhapur Tank project in Kurnool district, motor tractor for excavation and carting of materials and machinery for brick-making in connection with the Madura Technical Institute. It is however for the Public Works Department to accept the statement made by Mr. James.

G. O. No. 232 L. dated 11th June 1912.

(ii) As regards openings outside the department, the University Calendar for 1913 shows that only one of the Bachelors of Engineering is employed in higher post, namely, Superintendent, Indian Aluminium Company, Triplicane. Only once has the State Technical scholarship been given for mechanical or electrical engineering from this Presidency; and the scholarship-holder has not yet returned.

(iii) The object of this recommendation has not been clearly stated. Obviously it should not be taken as suggesting the removal of facilities already existing for such training. The new Engineering College scheme provides for further developments in the study of this subject and provision for higher electrical engineering is to be introduced only at the instance of the Government of India. No action in this direction seems called for. It is for consideration whether any observation should be made with reference to the remark in the report that there are no openings for higher grade mechanical and electrical engineers.

Cf. letter No. 527 W., dated 5th March 1912, paragraph 6.

In G. O. No. 858, dated 5th December 1912.

Secretary's Note.

(i) I don't think the Committee's conclusion here is in accordance with the evidence it took or its own summary thereof in paragraphs 25 and 26 of the report. The evidence is in the paragraphs referred to in the first foot-note on page 7 and in those paragraphs I have marked with red chalk the passages referring to higher education. These show that it is not the case that there are no openings for high-grade mechanical or electrical engineers, but that the firms prefer Europeans for these posts because the Indian "considered himself a gentleman whose hands should not be soiled by actual work"; "could not, as a rule, be trusted in times of emergency or danger"; had no practical experience but asked as much salary as an experienced European; "would not work the long mill hours, was undisciplined, would not do real hard work"; "was too big for any position that could be offered"; him, was "not generally prepared to stick to the work demanded"; "of" him, inspired no confidence in his fellow Indians, would not put his shoulder to the wheel and do rough work, got wrong ideas into his head and passed beyond control.

Paragraph 50.

Paragraph 87.

Paragraph 75.

Paragraph 76.

Paragraph 110.

Paragraph 110.

Paragraph 117.

Paragraph 120.

Paragraph 137.

Paragraph 140.

Paragraph 146.

(ii) It seems rather a dismal view to take, to hold that these faults, fatal as they are, are ineradicable racial characteristics, and that therefore all higher training had better be stopped and Europeans sent for to take up all the highest posts. In Government service the policy is to hope on hope ever that some day or other the

right kind of man will appear. When there are more of these highly trained engineers they will compete with one another and the fine-gentleman bumpiness (if not the other defects) will have to go. Without the highly-trained man, Indian commercial enterprise must stick, as Indian firms cannot easily get good European employees.

(iii) The last sentence of paragraph 25 of the report and the first of paragraph 26 show that the most important words in this third recommendation are the "at present", and that the hope of openings appearing is not so remote that higher training should be abandoned.

India may be told that this Government does not despair of its higher trained men attaining enough experience and character to obtain suitable posts.

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8. RECOMMENDATION (4).—"There is a very large opening for the employment of men in mechanical and electrical engineering, who after training in a properly equipped institute, are willing to gain their practical experience by apprenticeship on a living wage, work with their hands and observe factory hours and rules. This employment is open to Indians of every caste or creed, grade of social position or education, provided these conditions are observed; and the height to which they can rise depends on their individual characteristics." (Paragraphs 27 to 31.)

Mr. James' remarks—

The kind of employment implied is presumably similar to that of a Supervisor or Foreman—a man who can and does set to work himself if his men are not going on properly. It is a truism that such men can find employment in any country, but they usually rise from the ranks and have to make the best of their opportunities in their spare time to gain a little theoretical knowledge in order to qualify themselves for positions higher than that of the ordinary artisan.

Here the proposal is that they should receive some preliminary training in a Technical Institute and in the present state of India from the Industrial standpoint, it is probable that such training will help to meet a demand that is known to exist, but it must be clearly realised that the training can be only preliminary, that no college or institute can supply the place of the commercial workshop, and that the future of the student will depend on his own exertions after he has left the college and not on any educational certificate he may have obtained. I have found many men, able to work conscientiously and well under tutelage, in many cases fail afterwards to sustain their efforts and to fulfil the promise of their student days.

Mr. Tressler thinks that this is a statement of facts and not a recommendation at all.

Sir Alfred Bourne's remarks.—Nil.

Office-note.

(i) It is admitted that a considerable development in mechanical engineering has recently taken place in the Presidency and the movement is creating a demand for trained men which cannot at present be met. The introduction of electric power in the city has also opened new field. In the factories and workshops of Madras, there is a demand for moulders, pattern makers, fitters, foremen, etc., and in the districts there is equally a demand for engine drivers and foremen—please compare Mr. Chatterton's note on pages 4 to 6 of G.O. No. 274, Educational, dated 12th May 1911, and paragraph 3 of the report of the committee for improving the industrial and technical education in the north of Madras on page 4 of G.O. No. 776, Educational, dated 24th August 1912. In paragraph 226 of the present report a doubt is expressed as to whether Madras is sufficiently industrially developed for a technical institute teaching to the "improver grade", i.e., mechanical foreman, etc. Though industries have not advanced far in this Presidency other movements under which machinery is introduced are increasing—please see Memorandum No. 837-2, dated 1st May 1909, on page 2 of G.O. No. 3072, Revenue, dated 12th November 1909.

(ii) It is also an indisputable fact that the man who disciplines himself by subjecting to the factory rules and by freely taking up manual work will eventually prove useful to his employer besides improving his prospects. But how this training is to be given and how the demand is to be met will be considered under the next recommendation.

(iii) Attention is invited to the beginning of Part II of Mr. Tressler's note on industrial problem where he recommends that normal training, i.e., training of a manager should include also previous or concurrent school training (training of workmen) and workshop training (training as foreman). Submitted that the statement in this "recommendation" may be accepted.

Secretary's Note.

This "recommendation" is really a statement of fact leading up to the next. It need not be separately discussed.

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9. RECOMMENDATION (5).—"The best method of training men in mechanical and electrical engineering to meet the existing demand is by a course at a well-equipped institute, followed by an apprenticeship in works. Institutes should not grant any certificates till this apprenticeship is satisfactorily completed." (Paragraph 39.)

Mr. James' remarks—

This recommendation is similar to the scheme set forth in some detail in my letter G.O. No. 3072, Revenue, dated 12th November 1909. No. 3174-C, dated 5th March 1909, dealing with proposals for the training of Mechanical Engineering subordinates, and which was explained to the committee on their visit here. I still think it expresses the lines along which something may be done in this Presidency.

Mr. Tressler considers this as a truism.

Sir Alfred Bourne's remarks—

Apprenticeship is recommended after training in a technical institute. A scheme is now being considered by Government in which provision is made for the technical instruction of apprentices during their period of apprenticeship. Nothing in the report suggests any need for alteration in this scheme.

Office-note.

(i) The system referred to in Mr. James' note is described in paragraph 1 of the Director's letter No. 1601, dated 17th July 1909, on page 3 of G.O. No. 3072, Revenue, dated 12th November 1909. In connection with a proposal to provide a course of training in the Engineering College for foremen and others of that class Mr. James suggested a three years' course in which the necessary theoretical and workshop training would be combined. The question of training mechanical foremen, fitters, etc., was then kept in abeyance pending the construction of new buildings for the college at Guindy. G.O. No. 3072, Revenue, dated 12th November 1909.

The proposal, which in effect is the same as that suggested by Messrs. Atkinson and Dawson, is that made by Mr. Tressler in his note on the problem of industrial education. For the workshop and normal training stage certificates, which are intended to qualify persons for the foreman and the technical assistant class, respectively, he prescribes besides a school certificate evidence of having been for at least two years a whole-time apprentice in a recognised workshop. The candidate for normal training stage certificate will be further subjected to a workshop test intended to prove his ability to direct others and ensure due economy in labour and material. These proposals, though they were generally approved by His Excellency Sir Murray Hammick, have not been finally accepted.

* The Government of India were addressed in Revenue letter No. 3852, dated 30th December 1912. pending final orders of the Secretary of State on the creation of the Department of Industries. In these circumstances it is for consideration whether the Government should express general approval of the recommendation.

(ii) It may be pointed out that in the Roorkee College the course for the mechanical apprentices extends to five years, during the last two of which the apprentices are generally indentured out to some employer in the branch in which he has specialized.

(iii) The system of apprenticeships referred to in the Director of Public Instruction's note is the one, detailed proposals relating to which are under consideration in the separate file below. This scheme relates to the training of artisans and does not

* Cf. Colonel Atkinson's demi-official on page 8 of notes with G.O. No. 774, Educational, dated 24th August 1912.

properly appertain to technical education. It is dealt with in its appropriate place in paragraph 192 of the report under the heading "Training of mechanics."

Secretary's Note.

(i) Mr. James' proposal dealt with in G.O. No. 3072, Revenue, dated 12th November 1909, is scarcely "similar", as he claims, to the present one of the Committee. In the former, theoretical and practical training are to be combined in the college, but the Committee want actual apprenticeship in actual works "on a living wage, working with their hands and observing factory hours and rules." All through their report they emphasize the need for actual work in workshops or factories and complain that the present generation of students are impractical, soft and unable to stand long hours, undisciplined and unpunctual, and I doubt if they would accept Mr. James' proposals, which in the above Government Order Government have agreed to introduce when the college gets to Guindy, as an efficient substitute for real apprenticeship.

(ii) The difficulty seems to be the practical one. During the apprenticeship the students will have to remain in touch with the college, as the latter is to give them no certificates until it is "satisfactorily completed." Also the workshops must be of a high class or the time will be wasted. For electrical engineering there is apparently only the Madras Supply Corporation. Whether they would welcome these apprentices is at least doubtful. They would perhaps charge a high premium. For mechanical engineering there are the Perambur Railway Workshops, which ask Rs. 500 premium, the Public Works Workshops and the South Indian Railway Workshops at Trichinopoly and Negapatam. These latter would probably follow Perambur's lead as to premium. In last year there were six mechanical and electrical students to be provided for. Perhaps Public Works Department could take the mechanical men each year into the Public Works Workshops. They may be asked.

(iii) India may be told for the present that the Committee's theory is accepted, but that the practical difficulties are considerable, and be informed of the scheme in G.O. No. 3072, Revenue, dated 12th November 1909.

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10. RECOMMENDATION (6).—"The education given in the institute should be essentially practical, be capable of being applied commercially, and not of such a 'high scientific character as is often considered necessary in the west.'" (Paragraphs 41 and 42.)

Mr. James' remarks—

In the first place I should say that I dissent altogether from the notion that college training can be practical in the sense the word is applied to an out-door profession. With a qualified staff and adequate workshop facilities much can be done in the way of instructing students in the principles underlying the proper manipulation of tools, etc., but in a technical school this training must be educational and can to no appreciable extent replace that of a commercial workshop where economical working is the prime consideration. The bearing of the allusion in this paragraph to the high scientific character of education in the west is not quite understood as no provision is made in such institutions for the training of men of the class contemplated in recommendation 5. As a matter of fact, our engineer class is the only one in any way comparable to classes in European universities, and it has always seemed to me that there is some confusion in this connection and that it is not sufficiently realized how much more is done in the matter of training subordinates for practical work at engineering colleges in this country than elsewhere. Subordinates abroad are a kind of natural growth and almost invariably they are men who have forced their way to the front from among their fellows and have extensive experience of practical work. More often than not employers here expect the qualities of such men in the college trained student just completing his course and require that he shall at once be capable of discharging duties for the efficient performance of which considerable practical experience is essential, with the result that the students have got into the

habit of assessing themselves at the same standard and ask for starting salaries above their true value. So much is this the case that I understand it is becoming possible to obtain Europeans of equal abilities and better experience for the pay often demanded by an Indian engineer who is at any rate working in his native country.

Mr. Tressler considers this as a truism.

Sir Alfred Bourne's remarks.—Nil.

Office-note.

From Mr. James' remarks it would appear that he is speaking from the point of view of the Engineering College alone. Mr. Tressler holds a different opinion and takes the recommendation as a truism itself. In his note on industrial problem Mr. Tressler has himself assumed that "the manufacturer and not the schoolmaster is 'the ultimate judge of what industrial education really is' and that 'when his definition of its object and the means by which the same may be secured is supported by the verdict of humanity it might be expected to command unhesitating acceptance.'" Leaving aside the question regarding the training of workmen which is admittedly manual, the foremen's training should according to him be conducted under conditions of efficient manufacture and should be of a purely commercial character. The curriculum for such instruction is also generally outlined by him on page 10 of his note. In part III thereof he clearly states that instruction in the first two stages should be purely practical and it is only in the normal stage should any technical instruction be recognized. If the scheme proposed by Mr. Tressler be eventually approved, it will only be in furtherance of this recommendation. It is for consideration whether this recommendation may also be generally approved.

Secretary's Note.

Mr. James' view is the one against which the Committee tilts all through. Mr. Tressler agrees with it. These students have to be so trained as to be useful to employers. Employers want them trained on commercial principles. It is not clear why this should be difficult. Waste of time and material are the worst faults of the institute-trained hand, from the employers' point of view. It is not obvious why at the college they should not be required to avoid both.

India may be told that this Government again agree.

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11. RECOMMENDATION (7).—"Large mechanical and electrical institutes are at present only necessary in those provinces in which industrial development is well advanced. Minor institutes should be properly endowed, equipped with adequate staff and apparatus, and placed under proper control as regards their courses and 'certificates.'" (Paragraph 43.)

Mr. James' remarks—

I believe it is now generally accepted that the mere founding of technical institutes can do little good in the way of advancing the material interests of the country, and that such institutes should rather follow in the wake of industries already established and making a demand for trained men.

The same also may be said of the suggestion that it is preferable to have a large central college rather than a number of small institutions dealing with separate branches and the stage of development reached in this Presidency certainly does not justify the duplication of facilities for the training of technical students.

Mr. Tressler considers this as a truism.

Sir Alfred Bourne.—No remarks.

Office-note.

As regards the improvements of minor institutions, Mr. Tressler's note on the problem of industrial education contains adequate proposals regulating the equipment, staff, curriculum and certificates connected with such institutions. The Government of India may perhaps be informed that the Government accept the recommendation and have already taken steps for the improvement of minor institutions.

Secretary's Note.

Mr. Tressler's note is only about industrial schools. The above recommendation applies to mechanical and electrical institutes. We have nothing of the kind here unless the Madura Technical Institute can be so described. The "recommendation" is so axiomatic that Government may cheerfully subscribe to it.

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12. RECOMMENDATION (8).—"The staff of all institutes should be carefully selected, and consist of men with the necessary theoretical attainments and extensive practical experience. To keep in touch with the various industries, the staff should be permitted to take up consulting and advisory work as opportunity offers." (Paragraph 41.)

Mr. James' remarks—

In addition to the qualifications specified, it seems to me that teaching experience is also of some value, and in any case there is not the competition for academic appointments under present conditions that this recommendation would imply. The successful man of extensive practical experience is never desirous of sacrificing his career and prospects in the practical line for what is to him a poorly paid teaching appointment, so that ordinarily there is no choice but to appoint young men with inclination towards academic work and of necessity little practical experience. I fully agree with the recommendation that members of the staffs of technical institutes should be allowed to take up consulting and advisory work, and in fact I recommended the adoption of this course, as far as the senior members of the staff here are concerned, in my letter No. 3296-C, dated 24th March 1909. I am aware the idea is not viewed with favour in some quarters, but it still seems to me the only feasible way of keeping the professors in touch with the real requirements of the country.

In regard to the junior members of our staff their transfer in a body to the Public Works Department and the recruitment of men temporarily for three years from that department is calculated to serve the same end.

Mr. Tressler and Sir Alfred Bourne—offer no remarks.

Office-note.

(i) As regards the latter portion of the resolution, that the staff should be permitted to take up consulting and advisory work, the question has to be decided only with reference to the superior staff of the Engineering College and of the experts employed by Government for the Madura Technical Institute and the leather and industrial school to be opened in Madras.

(ii) The letter referred to in Mr. James' note as regards the superior staff of the Engineering College was not submitted to Government. Under G.O. No. 724, Educational, dated 18th November 1898, the Professor of Engineering is allowed to do testing work at the College for private and other bodies and appropriate a portion of the fees charged therefor. Provided that such a work is undertaken out of office hours and without detriment to his official duties, there seems to be no objection to extend this privilege to other members of the staff of the Engineering College or any mechanical institutes which may hereafter be started.

Secretary's Note.

Mr. James' point that the successful practical man is scarcely likely to take to teaching is a strong one and may be mentioned in the reply to India. Otherwise, Government may again concur in the recommendation.

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13. RECOMMENDATIONS (9), (10) AND (11).—

"(9) The scheme recommended for technical education for the mining industry is detailed in paragraph 203."

"(10) Apprenticeships after a course at an institute as detailed in recommendations (4) and (5) are equally necessary for technical education in the textile industry; in which the courses in spinning and weaving should be separate ones." (Paragraphs 99, 110, 116, 118, 122, 139, 218.)

"(11) Afternoon classes for textile jobbers and maistries should, if possible, be instituted in suitable centres if a satisfactory demand exists, to give practical demonstration in the vernacular in the theoretical side of their work." (Paragraph 218.)

Mr. James' remarks—

These recommendations have little application as far as this Presidency is concerned. It is possible that men of the type we train might be of use in mine surveying operations, and should there be any demand we could easily make provision for the small amount of extra and specialized instruction that would be required.

In regard to the textile industries it can hardly be said there is at present any call for technically trained assistants, but if, as has been suggested, this college should in the future be developed into a kind of technological institute, the facilities for training connected with civil, mechanical and electrical engineering would form a good basis from which to start any expansion intended to provide for industries closely allied to engineering.

Mr. Tressler—states that (9) which deals with mining industry need not be considered here.

Sir Alfred Bourne's remarks—

The Superintendent of Industrial Education might consider whether the establishment of such classes in connection with the mills in Madras or elsewhere is desirable.

Office-note.

India may be told that it has no application | (i) Recommendation (9) may be left
in this Presidency. | out of account.

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(ii) As regards recommendation (10) the apprentice course for textile industry also may be accepted—please compare note under recommendation (5).

(iii) The reorganized Madura Technical Institute will provide for higher grade technical instruction in weaving, but the course therein proposed, which is to last for two or three years, does not include

any separate apprentice course in works beyond what is provided for by the Institute factory itself. Further, so far as the proposals at present go, there is no suggestion to train the students to any particular test or certificate. Perhaps if Mr. Tressler's suggestions for instituting grades of examinations, certificates, etc., are approved and if the institute is also required to train students to those tests, then under that scheme the students of the institute will also be required to apprentice themselves in

This apprenticeship should not be difficult to arrange in Messrs. Harvey's large mills at Madura. The point may be noted. Binny & Co. are willing to take apprentices (paragraph 135 of this report).

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(iv) As regards recommendation (11), the general principle involved therein seems acceptable. This recommendation appears under Chapter XVIII, "Bombay"—and has apparently therefore greater application there. Please compare also paragraph 228 of the report, which says that the openings in Madras in the textile industry do not warrant the opening of a special institution. Mr. Tressler does not offer any remarks; and the Director of Public Instruction would call upon him to report whether there is any opening for such a course here. The feasibility of the proposal depends almost entirely upon the co-operation and willingness of the employer. Even should the State provide for any such instruction, the employer should be prepared to let the workmen benefit by it. The scheme of apprenticeship already approved by Government does not touch the existing workers at the mills. In his interview Mr. Simpson of Messrs. Binny & Co. stated that the firm was quite prepared to pay an instructor to teach the theory of textile work, but that it expected the authorities (State?) to assist it by giving a man to

This scheme is commended in paragraph 226 of the present report and may be referred to in our reply to India.

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G.O. No. 776, Educational, dated 24th August 1912.

take up the work. The report suggests that assistance should be given towards such efforts. The recommendation states of the opening of a class where a satisfactory demand exists.

Secretary's Note.

(i) Mr. Tressler may be asked, as the Director of Public Instruction suggests, to report what may best be done in this direction and the Government of India informed.

(ii) They may also be told that we are considering apprenticeship in connexion with the Madura Technical Institute's weaving students.

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14. RECOMMENDATION (12).—"Arrangements should be made for the permanent co-ordination of the relations between institutions and employers of labour by the appointment of a controlling officer, and the establishment of an employment bureau." (Paragraphs 45 and 46.)

Mr. James' remarks—

I doubt whether such an officer could be of appreciable assistance in this Presidency. The circumstances are so different in the several provinces that to me it seems somewhat hopeless to expect that any one person will be able to appreciate fully the special local conditions that exist everywhere keep closely in touch with local employers and at the same time observe the results achieved. Any kind of centralization in connexion with technical education should be avoided, and it would be more to the purpose, if satisfactory progress is to be maintained that officers of Provincial Governments should be given full freedom and power in these matters.

In regard to the statement that central control is necessary because if arrangements are left to provincial authorities they will reserve facilities for local apprenticeships, this to me is suggestive of forced technical education. In my opinion no technical institution should undertake to train men unless there is a demand in the province for their services, which necessarily implies there will be ample facilities for practical training. If it is decided to adopt the scheme of passing on the partially trained student to an apprenticeship, the principal of the institution concerned should get into communication with the employer and reliance on the intervention of a third person might for obvious reasons prove a disadvantage.

In order to assist qualified student to obtain their first appointments this college at present to some extent performs functions of an employment bureau. Printed lists of passed men are sent periodically to prospective employers and we always readily supply them with the names of men we have not heard to have obtained employment, and we also post particulars of their requirements on the college notice boards. In some cases special recommendations are made in response to requests for men of particular attainments, but ordinarily the lists are allowed to speak for themselves. I am also at present developing a system of notifying vacancies to any ex-students who may desire such information, and I see no difficulty, with the necessary clerical assistance, of developing in this manner into what would to all intents and purposes constitute an employment bureau for alumni of the college.

Mr. Tressler—remarks that this seems to be a question rather outside the scope of the enquiry.

Sir Alfred Bourne's remark—

The recommendation is sufficiently dealt with by Mr. James.

Office-note.

(i) There seems to be much force in the arguments of Mr. James. It is doubtful whether the contemplated co-ordination of the relations between the institutions and the employers can be secured by the creation of a central authority who could rarely be expected to be in constant touch with the local mill owners—a factor apparently necessary to secure their co-operation or to devote individual attention to each province. The proposal made in connexion with the north Madras technical school of placing representatives of the mills or factories on its managing board is calculated to be a far more effective means. But this measure can be secured only if, in the case of institutions under private management, both the managers and the employers agree to the course. In such cases the local officers can usefully step in to secure the needed co-ordination.

(ii) There seems to be no objection to the establishment of an employment bureau and here also it may be made a provincial one.

Secretary's Note.

(i) The officer suggested would be a sort of Inspector-General of Technical Education, who would have to "see that technical education is carried out on the lines proposed in this report," "report to the Government of India on the working of technical education" and "act as inspector and advisor for the various Provincial Governments." Thus far, like other Inspectors-General, he would be a nuisance. I can't imagine any province welcoming his interference.

(ii) As to his proposed duties with regard to finding apprenticeships for students, maintaining an employment bureau and keeping employers in touch with technically-trained lads, Mr. James' remarks are sufficient.

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SPECIAL RECOMMENDATIONS

contained in Chapter XV.

15. SPECIAL RECOMMENDATION (1).—"That the present system under which State Technical scholarships are granted to Indians for education in technical institutions in England and elsewhere should be discontinued. That suitable stipends should be granted to Indians, who have successfully completed their theoretical and practical education in India to enable them to be apprenticed for practical experience with firms of repute in England."

Page 85 of report.

Mr. James' remarks—

I am fully in agreement with the recommendation that the present system of state scholarships for engineering should be discontinued. There is no reason as far as college training in engineering is concerned, why institutions in this country should be regarded as in any way inferior to similar places in other countries. It is merely a question of comparatively moderate expenditure on staff and equipment, and we always have here the advantage of knowing and being able to direct our methods of study and training to suit the special needs of the country. Another objection may be exemplified by the case of a subordinate student proceeding to England some time ago who stated candidly that he did not care much where he went to, but was actuated chiefly by what he considered the prevalent opinion that he only had to get some sort of certificate from a college at home to enable him to obtain an appointment as a temporary engineer or something similar, which even an Engineer student in this country could not aspire to straight from college. Any idea of this kind must necessarily be detrimental to the interests of Indian Engineering Colleges and their students, but I have reason for thinking there is improvement now in this respect. One is, however, hardly yet in a position to tell students without any reservation that their advancement depends solely on their own abilities, and although in principle it is correct that initial appointments to particular grades should depend on educational qualifications, when the theoretical training implied is necessary for the efficient performance of the duties of the service, in my opinion the regulations generally should be more elastic to admit of a more efficient system of promotion by selection.

I would strongly support the proposal to grant stipends to qualified students who are prepared to undergo the drudgery, involving long hours and hard work, inseparable from practical apprenticeship with Engineering firms in Europe. In my judgment however this should not be large enough to make them altogether independent of the wages they may earn, as the "gentleman" apprentice rarely makes the best use of his opportunities, it being nobody's business to see that he does a fair day's work. On a system of this kind there would be many failures, but the men who go through with it successfully would be imbued with a sense of discipline, unquenched by loyal subordination to foremen of somewhat inferior general education, which is wanting in this country, and they could be safely left to look after themselves, and should prove of immense use in advancing the industrial prosperity of the country.

Sir Alfred Bourne's remarks—

While I agree on the whole with the conclusions in these paragraphs, I do not think they have much application to this Presidency. We have so far selected trades for scholarship holders, in which instruction is not to be had here, and always if possible select men as scholarship holders who have acquired what experience they could in the selected trade. As regards Engineering Mr. James' remarks are of value.

* Page 81 of report.

Office-note.

(i) The Government of India propose to address local Governments separately regarding the State Technical scholarships and no action is at present called for in regard to this.

(ii) It will however be observed that "Engineering" is now excluded from the scope of the State Technical scholarship scheme—paragraph 3 of India's letter on page 2 of G.O. No. 504, Educational, dated 9th October 1903. In illustration of the Director's note it may be pointed out that the trades so far selected in this Presidency are—

Please see note on page 6 of notes with G.O. No. 62, Educational, dated 25th January 1913.

- | | |
|----------------|--|
| (1) In 1906 .. | 'Weaving.' |
| (2) In 1907 .. | 'Leather industry.' |
| (3) In 1908 .. | 'Textile chemistry as applied to the dyeing, bleaching, finishing and printing of textile fibres.' |
| (4) In 1909 .. | 'Study of the chemistry of soap-making and the use of Native oils.' |
| (5) In 1910 .. | 'Metallurgy.' |
| (6) In 1911 .. | (a) 'Weaving.' |
| | (b) 'Textile manufacture.' |
| (7) In 1912 .. | (a) 'Electrical Engineering.' |
| | (b) 'Applied chemistry and the manufacture of textile fabrics.' |
| (8) in 1913 .. | 'Leather goods industry.' |

16. SPECIAL RECOMMENDATION (2).—"That the minor technical institutes should be placed under the control of one central institution in each province in which such an institution exists, with reference to its courses, equipment, examinations and "certificates."

Mr. James' remarks—

This recommendation has little application in the Madras Presidency if the distinction between technical and industrial training carries any weight but it is obviously a general principle that should be followed. Some co-ordination must naturally exist to avoid overlapping and waste of effort and minor institutions should be in a position to act as feeders to the central college, and thus provide an avenue for their more capable students to pass on to higher training.

Sir Alfred Bourne's remarks—

In this Presidency the Government Technical Examinations certainly provide a sufficiently accurately standardised system of certificates. It is a question whether the rigidity of the system has not tended to a perverted development of technical and industrial training. It is in contemplation to make the College of Engineering a "Central Institute" of the kind the report seems to have in view. Pending this, it seems unnecessary to discuss the relation it may properly come to have with other institutions. In any case we should probably maintain the system under which grants-in-aid are awarded by the department on the report of an officer like the present Superintendent of Industrial Education.

Office-note.

(i) No such institution at present exists. As observed by Sir Alfred Bourne, the matter may be considered when the Engineering College is developed into a Technological Institute after its removal to Guindy. For the present, co-ordination of work can be looked for through the agency of the examinations and the supervision of the superintendent. Mr. Tressler's proposals in this respect are elaborate and seem to cover all minor institutions by giving them an aim to work after.

Secretary's Note.

The Government of India may be informed that the principle is accepted; that we have only one local institute; that this is now controlled by the Superintendent of Industrial Education and kept in line by the Government Technical Examination syllabus and that when the Engineering College gets to Guindy and is developed we shall be more able to arrange for the desired co-ordination.

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17. SPECIAL RECOMMENDATION (3).—"That the education of skilled workmen should only be carried up to vernacular reading, writing, sufficient elementary arithmetic for accounts and sufficient knowledge of drawing to understand a "dimensioned sketch."

Page 85 of report.

Mr. James' remarks—

I think it may be safely said that the opinion is general among employers in England that for the great majority of manual workers it is of no advantage as far as the efficient and expeditions carrying out of their work is concerned to take their education beyond the "three R's" and anything more tends to promote unreasoning restlessness and discontent. In this country no special effort in my opinion should be made to impart even this instruction except in the vernaculars and thus remove temptation from the way of men who should be artisans to aspire to become clerks and attenders on account of the smattering of English they possess.

Sir Alfred Bourne offers no remarks.

Office-note.

Please see paragraph 188 of the report in which it is stated that the great danger in carrying the education of workmen too far is that it will probably induce him to desert his trade and try to enter some less exacting line of life. A similar opinion was expressed by Sir Alfred Bourne in connection with Paragraph 3, page 3 of G.O. No. 198, Educational, dated 4th March 1913.

Page 83 of report.

He observed with regard to a suggestion to provide scholarships for higher classes that it was questionable whether the artificial stimulus should be employed, as the object was not to bring up the pupils to despise weaving. At the Madura Technical Institute provision is to be made for giving general education for the pupils of the industrial classes and in this case also the education is to be continued only up to the fourth standard, that is up to the lower elementary grade. Similarly Mr. Tressler in his scheme for the development of industrial education does not propose any literary qualification for either the workmen or the foremen. In connection, however, with the State apprentice class to be established in the North Madras it has been proposed that the students should possess such educational qualifications as to enable them to take advantage of the instruction in English. But this is a special case and refers to a higher class of skilled artisans. It is therefore for consideration whether to limit the education of workmen only up to the elementary standard may be accepted. No information is available as to whether, and if so, to what extent, general education is being given to workmen in factories, mills and other workshops in the Presidency or in institutions training such workmen.

Paragraph 20, page 20 of G.O. No. 647, Educational, dated 18th July 1912.

Paragraph 12 (4) on page 5 of G.O. No. 776, Educational, dated 24th August 1912.

Cf. Mr. Atkinson's demi-official on page 8 of notes to G.O. No. 776, Educational, dated 24th August 1912.

But this is a special case and refers to a higher class of skilled artisans. It is therefore for consideration whether to limit the education of workmen only up to the elementary standard may be accepted. No information is available as to whether, and if so, to what extent, general education is being given to workmen in factories, mills and other workshops in the Presidency or in institutions training such workmen.

Secretary's Note.

Government may concur in the recommendation.

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18. SPECIAL RECOMMENDATION (4).—"That the most promising method of training skilled workmen is to establish manual training schools for children in big centres and near big workshops; the boys to be apprenticed in workshops from the ages of 12 to 14 years; during the apprenticeship they are to be obliged to attend afternoon classes to complete their literary education and finally to obtain some "theoretical knowledge of their work."

Mr. James' remarks—

The establishment of manual training schools may assist the end in view, and means may very well be adopted suited to the particular circumstances of the trade and locality to encourage and provide facilities for the apprenticeship of young lads, but under the peculiar conditions that exist in India I doubt very much the continued success, except possibly in a few selected places, of any system of combining apprenticeship with ordinary education. Some employers may be prepared to assist in this way, but if the services of the apprentice are of any value pressure of work will in the generality of cases be sufficient excuse for keeping the boys from school attendance. I think also the fact should be recognised that, when it is clearly understood this extra school education is not to lead to clerical employment, the boys themselves will not be at all keen on their books after they have once started on what they will regard as men's work, and as far as obtaining theoretical knowledge of their trade goes, the only kind of "technical education" of use to a man of this kind is that he picks up in the workshop. Technical training in a school under such arrangements can be of little or no value and it is a case of "a little knowledge being a dangerous thing," for what is required of a workman is that he should do as he is told and in the way directed, and not ponder over the reasons why or attempt to do better. I am aware it is suggested that theoretical knowledge assists the workman in performing his duties more intelligently and to better advantage, but my experience leads me to think that what is lost is more than what is gained in this respect. Every opportunity should of course be afforded exceptional men, who show special ability, to obtain higher training by assisting them with full-time scholarships at technical institutions, but these will only form a very small minority and forced technical education for the mass is waste of energy and money, and is certainly not going to work for the good of the country.

Sir Alfred Bourne's remarks—

The manual training schools recommended in this paragraph are apparently schools of the kind recommended by me in connection with the question of education for the children of operatives (*vide* my letter Ref. on Cur. No. 4297, dated 8th October 1912, read in G.O. No. 1089, Educational, dated 9th December 1912).

Office-note

As observed by the Director of Public Instruction the schools contemplated G.O. No. 1089, Educational, dated 9th December 1912.

taken at the instance of the Government of India and they have been informed that if the experiment proved a success the question of providing educational facilities in connection with other factories would be considered. Submitted that the recommendation may be accepted and the Government of India informed that action has already been taken in this matter as evidenced by letter No. 1089, Educational, dated 9th December 1912.

Yes.

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19. The other suggestions relating to Madras on which the Government of India desire the remarks of the Local Government are contained in Chapter XIX on pages 90 and 96 and in Chapter XXII, pages 97 and 98 of the report. Mr. James' remarks on this will be found on page 7 of current file. Neither the Director of Public Instruction nor Mr. Tressler offer any definite remarks on them. Except the recommendation in respect of railways, no others which have not already been noticed seem to call for any specific action. The following paragraphs, however, may need some passing notice.

20. Paragraph 224.—In this the opinion is expressed that the lower social classes of Madras would be the most suitable for technical education. No such reservation

G.O. No. 647, Educational, dated 18th July 1912.

I imagine these are the very people whom the report calls "the lower social classes." It seems to distinguish them from the Brahman, who is said to dislike working with his hands.

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has been recognized in this Presidency. In the case of the Madura Technical Institute and the North Madras Industrial school, the general principle has been approved that students should be drawn from the class of persons who are by heredity or by present calling accustomed to the work which the student proposes to get trained in, and from persons who are likely to pursue after the students' career the calling in which they receive instruction.

21. Paragraph 225.—In this the opinion of the Chief Engineer, Madras Public Works Department (the Hon'ble Mr. C. A. Smith), is quoted that the men turned out in the Engineering College are weak in practical work, a result due to the unsuitability of the material. Mr. James, while not disputing the statement, offers a further explanation by stating that no sufficient importance is attached to manual instruction in the earlier training of the student. Whether the resultant weakness in practical work is due to the reason ascribed by Mr. James, it may be observed that steps have already been taken to introduce a system of manual instruction in the lower stages of education.

22. Paragraphs 226-228.—These deal with the openings available for trained engineers and subordinates. These have already been dealt with under general recommendations.

23. Paragraph 243.—In this and the subsequent few paragraphs, Messrs. Dawson and Atkinson recommend that the Engineering Colleges should be utilized for training permanent-way inspectors and other mechanics required by the railway companies. It is also stated that if the question is to be seriously considered the Railway Board should call in a conference of Chief Engineer and Principals of Colleges to work out the necessary details. Mr. James approves of the suggestion and states that it will be possible to make provision for the theoretical training of these servants in the Engineering College. He also considers that the proposed conference would be the best means of coming to an understanding in the matter. It is submitted that

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the Government may agree with Mr. James and intimate to the Government of India their approval of the recommendation.

C. RAMANUJACHARI—5-7-13.

His Excellency the Governor—

W. FRANCIS—9-7-13.

The natural resources of this Presidency, which is without coal-mining and iron working, offer no opportunity at present for industrial development on a large scale: to discuss large central institutions [paragraph 48 (7) of the report] is therefore unnecessary.

2. Agriculture is the main industry of the Presidency, and in the application of machinery to agriculture, and in a lesser degree to forestry, in sugar factories, ginning, rice-hulling and other modern methods which are being gradually introduced, there will be increasing openings for the use of mechanical skill. For while it is true that technical education cannot create industries, it may at least improve existing methods, and point the way to new developments. This I take it was that this Government is endeavouring to do.

3. Railways, cotton-mills and other firms owning workshops commonly train their own mechanics; Government help where they can; and where industries of a minor character exist which can be improved in scope and method, local educational and technical institutions have been and are being provided; such training being followed by or combined with a period of practical apprenticeship.

4. There is a growing demand for a better class of mechanic and skilled artisan, fitters, plumbers, electricians, motor-drivers, etc., and the Government are properly directing their attention also to providing instruction for those who seek a career in such occupations.

5. There is no field in Madras for a central controlling officer, or a central employment bureau. Further, such organisation when the time for it comes must, to be of any practical benefit, be on provincial and local lines. In this respect the present need and the present effort on the part of Government is to keep in close touch with the employers and their requirements.

6. Our reply to India should, I suggest, avoid reference to particulars of the report and be upon general lines more or less as I have indicated; adding that in dealing with questions of detail we shall profit by the consideration of the recommendations contained in the report.

P[RENTLAND]—18-8-13.

His Excellency the Governor—

Draft for approval.

W. FRANCIS—23-8-13.

Approved.

P[RENTLAND]—24-8-13.

Issued.

W. FRANCIS—26-8-13.

[G.Os. Nos. 798-99, Educational, dated 26th August 1913.]

ORDER:
P.S.The Government of India will be
addressed.

LETTER: No 799 Pol dated 26.8.13

To

The Secretary to the Govt. of India,
Department of Education.

Sir,

I am directed to reply to your letter No. 2225-Education, dated 27th September 1912, referring for the remarks of this Government the report made by Colonel Atkinson and Mr. Dawson on their enquiry regarding the possibility of bringing technical institutions into closer touch with employers of labour.

2. The enquiry has reference rather to those Provinces in which industries are already widely developed than to Madras where neither coal nor iron are mined; agriculture and the preparation

Draft approved.

P.

24.8.13.

26/8/1913

For the Secretary to the Govt. of India,
Department of Education.

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26/8/13

para. 2 of 1885 report on 1884-85.

19/10/21
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preparation for the market of agricultural produce, with some hand-loom weaving, are the chief industries; factories (except cotton spinning and weaving mills) are few; and the natural resources of the country (excepting perhaps its forests and its leather) do not invite industrial enterprise on any large scale.

3. Generally speaking, however, His Excellency the Governor in Council is in accord with the recommendations of ~~Colonel~~ Colonel Atkinson and Mr. Dawson and many of these have indeed already been adopted as part of the set policy of this Government with regard to industrial education. In Madras, for example, training for the profession of Civil Engineer is given only in the Central College at the Presidency town (recommendation (1) in para. 48 of the report); except the lower subordinates, the students trained therein are required to undergo a year's practical course after passing out (recommendation (2)) and arrangements for widening this practical training are now under consideration; the production of high grade mechanical and electrical engineers with purely theoretical attainments (recommendation (3)) is not aimed at - though it appears doubtful whether, if these men could be taught to be more practical

para. 48, 1885 report;
para. 48 (a) of note.

para. 48, 1885 report;
para. 48 (a) of note;
substantive note on para. 48 (a).

para. 48, 1885 report;
substantive note on para. 48 (a) of note.

no transfer note as industrial
education - Current note linked.

Report 2 report.

Report 2 report.

no transfer note as industrial
education - Current note linked.

Form 4682/4-2-3-11 (F)

Form 4682/4-3-13 (M)

Form 4682/4-7-12 (J)
54-2-22-1-13 (S)

Letter no. 3852 Rev (8)
30.12.12

11 21/198 138

are encouraging by grants and other assistance a selected number of privately-managed industrial schools in different parts of the Presidency. The scheme for the provision of technical training and State apprenticeships in the manufacturing quarter of Madras City, which follows the lines laid down in the last two clauses of para 196 of the report, is referred to in paras. 130 and 226 thereof. It is a part of the Government's policy that all this instruction shall be essentially practical and capable of being applied commercially and the present Superintendent of Industrial Education is thoroughly alive to this fact.

In addition, to advance the needs of the hand-loom industry an English expert in dyeing, who is also to control a dyeing school attached to the Madura Technical Institute, has been appointed and a peripatetic party is travelling through the weaving districts to demonstrate the advantages of improved machinery, while to further the trade in leather a European expert has been entertained and a tanning and leather school, to be under his charge, has been sanctioned for Madras City. Further developments may be hoped to follow the orders of the Secretary of State, which have been asked for, regarding

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the establishment of a Department of Industries, and in organizing these the Government will profit by a consideration of the recommendations made by Colonel Atkinson and Mr. Dawson.

5. This Government are in complete agreement with those gentlemen as to the need for bringing into closer touch the industrial student and the employer, but they doubt whether in this Presidency the controlling officer and central employment bureau recommended in para. 48(12) of their report would be of any real use in effecting this object. Technical education must vary in scope and ideals with the varying needs of different Provinces, and any attempt to control it throughout India at the bidding of any one officer would be unlikely to succeed; while at present the number of trained students here who are unable to find work in their own Presidency is so small that there would be no field for any but a Provincial employment bureau. Such a bureau is already in effect maintained by the Principal of the Madras Engineering College, who takes much pains to procure situations for students who have passed out of that Institution.

I have etc.

para 48 to 50 note, para
of note.

para 51 to 52

para 53 to 54

para 55 to 56 note,
para 57 to 58

para 59 note.

22/8/05

23/8

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779 URGENT (a).

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