

Government of Madras.

EDUCATIONAL DEPARTMENT.

Recd.

Regd.

} 1912.

Enclosures

Spare copies

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

DESPATCHED

Industrial and Technical Education

Accepting generally the recommendations made by the committee appointed to consider the question of improving — in the north of Madras, and requesting the Superintendent of Industrial Education to formulate and submit definite proposals for the establishment of State apprenticeships and the opening of a technical school on the lines advised by the committee.

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GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following papers :—

I

G.O. No. 28, Educational, dated 16th January 1912.

ABSTRACT.—Appointing a committee to consider and report upon the improvement of industrial and technical education in the north of Madras.

II

Letter—from A. CHATTERTON, Esq., Officer in charge of Pumping and Boring Operations.

To—the Secretary to Government, Educational Department (through the Director of Public Instruction).

Dated—the 1st March 1912.

No.—11-G.

In reference to G.O. No. 28, Educational, dated 16th January 1912, I have the honour to submit the report of the committee appointed to consider the question of improving Industrial and Technical education in the north of Madras. Appended to the report is a brief resumé of the discussions at the four meetings held by the committee: also a note submitted by Mr. Bamford regarding the proposed courses of instruction to be started at Perambur by the Madras and Southern Mahratta Railway Company.

2. In the seven resolutions the committee formulated definite replies to the points submitted by Government in their No. 2558-1, dated 11th November 1911. I should add that I invited Mr. K. T. B. Tressler, the Acting Superintendent of Industrial Education, to be present at meetings, and I am indebted to him for valuable assistance rendered in the capacity of Secretary to the Committee.

3. If Government decide to take any action upon the report of the committee I presume they will call upon the Acting Superintendent of Industrial Education to formulate a definite scheme and in the following remarks I propose to only deal with certain general considerations. It will be seen from the resolutions that the committee unanimously approve of the proposal to establish a system of State apprenticeship among the Engineering shops in the north of Madras and from the fact that they recommend that the instruction should be given in English it is evident that they contemplate training a class of men considerably superior to the ordinary artizans and suited to ultimately become maistries, contractors, charge-men and foremen. It is only very rarely that an ordinary artizan has received sufficient general education to enable him to take advantage of any courses of instruction to which the term technical may be fitly applied. Apart from the railway workshops at Perambur which attract a very large Anglo-Indian element and a superior type

of Indian artizan, a fairly large percentage of whom have received a tolerably good general education, the other workshops in Madras have few men or boys at the present time for whom it will be worth while to propose the establishment of technical classes. The recommendations of the committee therefore assume that the scheme for the establishment of State apprentices will be given effect to. If that scheme is not carried out I am personally of opinion that it will be scarcely worth while to attempt to establish a technical school in the north of Madras. The railway company will provide for its own needs at Perambur and will provide also for the fifty State apprentices if ultimately so many are sent to their workshops.

4. Although the natural resources of the Madras Presidency preclude the possibility of industrial development on a large scale, yet there is evidence that in the future there will be a very considerable demand for the services of a superior class of mechanic to supervise the working of a large amount of labour-saving machinery which will be employed to prepare agricultural products for the market. A recent investigation shows that there are at present about 150 rice mills, 400 irrigation plants and 100 cotton presses and gins in operation in this Presidency and that the majority of these have been established during the last few years. The working expenses are in many cases much higher than they should be owing to the careless way in which the machinery is run. It will take at least five years to train a mechanic fit to look after such machinery and in five years' time we may safely calculate on at least double the number of machines and plants now in existence. Rice-hulling machinery so far has only come into general use in the Kistna and Godāvāri deltas. The people in Tanjore are now taking to it and in time its use will spread to other irrigated tracts. Cotton ginning is possibly in a more developed state, but there is still room for a considerable expansion in those districts where Cambodia cotton is being grown whilst as regards irrigation by pumping probably not 1 per cent. of the possible number of pumping plants has yet been installed. In other directions the use of machinery is likely to extend. There is therefore no reason to apprehend that the appointment of 100 or 150 State apprentices will lead to the turning out of more foremen mechanics than the Presidency can readily absorb. Allowing 25 per cent. for wastage, which, I hope, will be sufficient, about 40 apprenticeships per annum might be offered. My idea is that boys should be brought to Madras from all parts of the country to be trained at these mechanical engineering works and at present, till the scheme is put in operation, I am quite unable to say whether any special inducements will have to be offered to get people to put their sons to such a course of training. Obviously, only the minimum amount of inducement necessary should be offered. The railway company pay to each of the apprentices a minimum wage of As. 3 a day, but it will be advantageous, if possible, to attract a better class of apprentices than the average of those now at Perambur and the minimum wage, I think, might be fixed at As. 4 a day rising to As. 8 a day by annual increments of one anna. This would mean that each boy would be to some extent dependent on his relatives, but that from the outset he will be able to pay from one-third to one-half of his expenses.

5. The question of training in the workshop will have to be left largely to the managers of each workshop as it is perfectly certain that they will not allow any interference from outsiders, though they may be quite prepared to accept suggestions if they consider them reasonable. It seems to me necessary that it should be made quite clear that in all but a few exceptional cases the apprentices are to receive an all-round mechanical training and not be confined to one shop for the whole period of five years. It is true that good moulders, fitters and smiths are badly needed, but there is an even greater demand for all-round mechanics who can take charge of running machinery but who are not specialists in any part of the shop work.

6. The recommendations of the committee in regard to the technical school are sufficiently clear and I would suggest that if, and as soon as, Government have decided to carry out the scheme the first step should be the appointment of a committee to manage it as proposed in resolution 6. I am distinctly of opinion that at the outset the school should be under the superintendence of a European Officer who need not necessarily take any part in the actual teaching work. If it were practicable to acquire the premises and buildings lately occupied by the Government

Harness Factory at Perambur it would, I think, be a convenient site for the proposed leather trade school and for these technical classes. It will not add greatly to the duties of the superintendent of the leather trade school to look after these classes provided suitable technical assistants are given for the teaching work. During the first two or three years the work will necessarily be of a very elementary character, but I should expect considerable developments in course of time and the addition of classes not solely intended for apprentices from the mechanical engineering shops. The immediate question of importance is the procuring of a sufficient number of instructors to carry out a programme of work which will not differ very greatly from that proposed for the railway school at Perambur. Although each apprentice will only spend three afternoons a week in the school it will not be practicable to have all the apprentices there at one time and it may be assumed that the classes will be held every afternoon throughout the week. No instructor will probably find it necessary to attend more than three times a week and I imagine that if a fairly liberal remuneration is offered to the teachers there will be no difficulty in getting the right class of men.

ENCLOSURES.

(i)

Letter—from the Committee for improving the Industrial and Technical Education in the north of Madras.

To—the Secretary to Government, Educational department.

Dated—the 26th February 1912.

We, the members of the committee constituted in G.O. No. 28, Educational, dated 16th January 1912, to discuss the question of providing further facilities for Industrial Education in the north of Madras, have the honour to submit the following report.

2. The committee held four meetings, on the 29th January, 2nd, 6th and 20th February 1912, respectively. On the points which the committee have been invited to discuss the resolutions appearing at the end of the present report were arrived at.

3. The committee recognise that during recent years a considerable development in mechanical engineering has taken place in this Presidency and that this movement is creating a demand for trained labour which cannot at present be met. Apart from the railway companies which occupy a special position in this matter, all other employers of labour, be they firms or private individuals requiring men to take charge of the numerous small industrial and irrigational plants that are springing up all over the Presidency, are experiencing the greatest difficulty in finding suitable labour. From the point of view of the employer, the man trained in the methods of the country possesses neither the intelligence nor the knowledge of workshop practice that are requisite. In the factories and workshops of Madras, there is a demand for moulders, pattern makers, fitters, turners, smiths and general machine men and the supply is at present inadequate. In the districts there is equally a demand for engine drivers and foremen erectors and for men capable of doing miscellaneous repair and maintenance work. For the latter class it is observed that education somewhat on the lines favoured by the committee is now being provided at the Chengalvaroya Naicker's Technical Institute, Madras, and that, although the facilities for acquiring a practical knowledge in engineering in this institute are very limited and the course of training in many ways imperfect, yet the apprentices there trained appear to have no difficulty in securing remunerative employment at the end of their course.

4. But this is merely an isolated instance and since the committee do not regard industrial schools as competent to train workmen, they consider that regular provision should be made by the Directors and Managers of existing factories for the education of a large number of engineering artizans, the bulk of whom should specialise in one or other of the trades already enumerated and they for this reason welcome the proposal of Government to establish State apprenticeships. They agree that the five-year training contemplated under the State apprenticeship scheme represents a suitable period, but are of opinion that, to benefit by the courses to be provided, apprentices must possess a sufficient previous literary education to enable them to receive instruction in English.

5. As the representatives of the Madras and Southern Mahratta Railway Company have explained that the company contemplate making provision for the education of their own apprentices separately and as the majority of the employees of other companies in Madras work in the neighbourhood of Washermanpet, the committee, after carefully comparing the relative merits of different situations, have come to the conclusion that the most convenient site for a school would be one as near as possible to the Basin Bridge station.

6. The committee have fully considered the question of curriculum, school hours and staff. On the first point they are of opinion that it is impracticable at present to lay down a definite programme as the character of the teaching must be largely decided by the ability of the apprentices which has still to be ascertained. Roughly speaking, however, they consider that about one-third of the time should be allotted to arithmetic, mensuration, elementary mathematics and mechanism, one-third to mechanical drawing. The committee do not think that evening classes would prove successful as it is hardly to be expected that apprentices after a full day at the works will exhibit that interest in the teaching which is essential to success. They also hold that early morning classes would probably cause too great a dislocation of the ordinary works routine and they conclude therefore that the classes should be held every afternoon, each apprentice receiving instruction for three afternoons a week.

7. As regards staff, the committee find that none of the firms in Madras possess a sufficiently large European staff to make it possible for them to spare men for industrial purposes. It is considered, therefore, that the staff will have to be provided by Government.

8. On the probable number of students, the committee is not in a position to pronounce a definite opinion. Whilst of the view that the proposed school should be open to all, they do not think that any one should be admitted who is not at the time going through a proper course of practical training, or is not practically engaged in the exercise of his trade. It appears to the committee therefore that, at any rate to begin with, the attendance will probably be limited to State apprentices. Further, in view of the separate facilities to be provided by the Madras and Southern Mahratta Railway Company they do not think that the attendance will amount to much more than 50.

9. The committee consider that the interests of the school would be best served if it were placed under the management of a representative committee. They accordingly suggest that the committee should be composed of one Railway officer, two representatives of the firms in Madras, one officer of the Educational department and the General Superintendent of the Public Works Workshops. They are of opinion that the committee of management should determine the character of the teaching to be given and all other practical details connected with the working of the school.

10. If the railway company establish a school of their own they will naturally not be prepared to contribute towards the support of the institution, but the remaining companies represented by the committee are inclined on principle to furnish assistance. They would, however, point out that in default of definite proposals they are not in a position to make any promises and would submit that, in any case, the amount of support which it may be possible for them to give will necessarily be small compared with the total cost of carrying on the institution work.

11. The committee agree with the principle of levying fees and consider that small contributions should be taken from each apprentice attending the school. The exact amount to be thus charged, they leave to the Managing Committee to settle, but consider a sum of about As. 8 a month to be a reasonable fee.

12. In conclusion, the committee desire to express their general approval of the proposals submitted for their consideration by Government which they regard as calculated to meet a real and definite want. They are convinced that industrial education can only be given in commercial workshops where the elements of cost and time, which are dominant factors in practical work, receive adequate recognition.

The resolutions arrived at are as follows:—

(1) That it is desirable to establish a system of State apprentices among the engineering shops in the north of Madras.

(2) That it is necessary to make some provision for technical training in a school outside the workshops.

(3) That instruction be given in the school to each boy on three days a week in the afternoons.

(4) That the instruction be given in English and that the boys should possess such educational qualifications as to enable them to take advantage of it.

(5) That the school be established as near Basin Bridge station as a convenient site can be found.

(6) That the management of the institution be vested in a committee to be nominated by Government and to be representative of the various interests concerned.

(7) That the committee recommend that a fee should be charged to all apprentices.

(ii)

The first meeting of the Committee, dated the 29th January 1912.

PRESENT:

A. CHATTERTON, Esq. (President).
 A. WILLIAMSON, Esq.
 R. G. BAMFORD, Esq.
 J. W. ANDERSON, Esq.
 A. C. TWEEDY, Esq.

H. B. PEIRCE, Esq.
 A. CARNALL, Esq.
 HARIDAS VISONJI, Esq.
 K. T. B. TRESSLER, Esq. (Secretary).

Mr. Chatterton in opening the meeting explained briefly the present position of technical education in Madras and the reasons why the committee had been called. There was, he said, a considerable development of minor mechanical engineering going on in this Presidency. Numerous rural factories such as sugar mills, oil mills, ginning factories, etc., were springing into being and it was extremely desirable that such industries should be encouraged. There were also signs of a large impending development in the direction of irrigation by pumping. In all work of this kind there was a demand for trained mechanics, which could not under existing conditions be met. It was accordingly essential that steps should be taken to provide extended facilities for the training of the class of men required. Having come to this conclusion, the question of ways and means arose: to provide the necessary educational facilities, should a special school be established or should arrangements be made with private works for a system of State apprenticeships.

The members then entered upon a general discussion on the subject of training. Regarding the necessity for extended educational facilities there was a general unanimity of opinion, but Mr. Peirce pointed out that in his experience a necessary preliminary to any scheme of technical education would appear to be the establishment of some sort of control over the apprentices to be trained. At present he found that apprentices, in most instances, just waited for the first chance of outside employment to run away and that only a small minority ever actually finished their training. The opinion was generally endorsed by the majority of the members, considering that the only way to ensure complete training was by introducing something of the nature of indentures and by restricting employment to men who could adduce evidence of having served their complete time in the ordinary way.

In regard to the Madras and Southern Mahratta Railway Company, both representatives were of opinion that the company experienced no difficulty in getting labour for its own requirements.

As regards technical instruction, Mr. Bamford read a note explaining the efforts made at Perambur to establish extension classes. These efforts proved abortive owing to lack of support on the part of the apprentices. A second attempt was, however, now to be made. Previously classes had been conducted in the evenings and Mr. Bamford was of opinion that this was the reason why they had failed. His experience showed that though apprentices might attend lectures in lieu of workshop practice, they could certainly not be persuaded to do anything of the nature of unpaid overtime and it was accordingly now proposed to hold the classes during working hours.

Mr. Chatterton explained that one of the principal difficulties connected with technical schools was that of supervision and staff. There was now a proposal on foot to establish a tanning school at Perambur and if a technical institute were constructed on an adjacent site the principal of the tanning school could exercise supervision over the technical school also. As regards staff, he had hopes that the railway company would consent to selected members of their staff giving lectures. Mr. Bamford said that the railway company would no doubt give all possible assistance to a school such as that contemplated, but pointed out that as they had a scheme of their own in view he could not at present tell how far the railway company could co-operate in the present proposals.

Mr. Chatterton said that the attitude of the railway company was one of the dominating factors in the subject under discussion and that until their views have been definitely ascertained it would be profitless to discuss details. It would clearly be impracticable to run two technical schools at Perambur and if the company decided to continue their own scheme the question of another site would arise. This question was a most important one. Attempts have been made years back to provide workmen's courses at Chepauk, but the artisans found the distance to Chepauk much too great to cover daily and the attendance at the lectures was accordingly confined to the office clerks.

Taking all things into account, the meeting was of opinion that the best central site would be somewhere in the neighbourhood of the Basin Bridge Railway station. Such a site, as Mr. Bamford explained, would probably be just as convenient to the railway employees at Perambur since a special train service could be arranged.

It was accordingly generally agreed that further educational facilities of a technical character were much to be desired but that any courses that might be arranged for should be held during ordinary working hours and not in the evening. That further possible sites for a school round Basin Bridge might be examined, but that nothing definite could be decided pending a definite statement by the railway company of their intentions.

The meeting adjourned at 9-30 A.M. till Friday the 2nd February 1912.

ALFRED CHATTERTON.

(iii)

The second meeting of the Committee, dated the 2nd February 1912.

PRESENT:

A. CHATTERTON, Esq. (President).
 A. WILLIAMSON, Esq.
 R. G. BAMFORD, Esq.
 J. W. ANDERSON, Esq.
 A. C. TWEEDY, Esq.

H. E. HARRIS, Esq.
 H. B. PEIRCE, Esq.
 A. CARNALL, Esq.
 K. T. B. TRESSLER, Esq. (Secretary).

Mr. Bamford on behalf of the Madras and Southern Mahratta Railway Company stated that the company had decided to continue their own scheme for a technical school in connection with the Perambur Workshops and that they were not therefore prepared to take an active part in the matter of establishing technical schools elsewhere.

A regular discussion on the questions submitted to the conference for consideration was then entered upon.

As regards the first question—"the necessity or otherwise for provision of technical education by Government in the north of the city of Madras"—Mr. Harris did not think that technical education on the ordinary lines had much value. There seemed little object in training men unless there were openings for them afterwards.

Mr. Chatterton was of a different opinion. In the Chengalvaroya Naicker's Technical Institute courses of instruction for mechanics were being provided and such of the ex-students of the school as were employed in the Pumping department he had found to be fairly satisfactory. As regards the demand for more highly trained labour, there were already about 1,000 internal combustion engines in use in this Presidency. Further, that the development of agricultural and industrial enterprise—in connection with which the Pumping and Boring department were erecting a large number of engines—was entirely dependent on the supply of trained mechanics, whilst, on the other hand, it provided remunerative employment for properly qualified men. A man could earn from Rs. 30 to Rs. 100 according to his ability.

Mr. Williamson considered it essential that the apprentices to be trained should be able to read and write English, without a knowledge of which they could scarcely benefit by the instruction.

Mr. Chatterton pointed out that the question of State apprentices was not the one now under discussion, but that perhaps it would be as well to deal with it here although it had not been specifically mentioned as an item in the agenda. He explained that whereas it was proposed to throw State apprenticeships open to all classes of artisans their award would be made conditional on the candidates possessing the necessary preliminary elementary education. According to his original proposal he hoped to get 200 apprentices, of which number the railway company promised to take 50. What he should like to know now was how many apprentices the firms represented by other members of the conference would be prepared to take.

Mr. Carnall said that he would take 12 to begin with and afterwards four a year.

Mr. Peirce said that he could take quite a large number of apprentices, say from six to ten a year, as he had plenty of work for them.

Mr. Tweedy said he could take four or five and Mr. Anderson, three.

Mr. Harris remarked that he would be prepared to take on some apprentices also, but he had no intention of paying them any wages during the first year's course. This was the principle on which he was acting now and he considered that if a boy was not sufficiently keen to work under such conditions he was not worth training.

Mr. Williamson supported this view, but Mr. Chatterton said that it was not altogether a question of keenness. In industrial schools it had been found that owing to domestic circumstances it was impossible for the majority of the pupils to work as unpaid apprentices however much they might wish to do so. He was convinced that, at first any how, it would be necessary to pay the apprentices and he had suggested an allowance to be paid to the Superintendents of the workshops in which the boys were undergoing training and spent as found necessary. An Inspector appointed by Government would visit the works at intervals to see how the apprentices were getting on.

Mr. Williamson thought the idea of inspection an excellent one and suggested that it be carried still further: that the inspector should take an active part in the education of the apprentices where possible.

The commercial members of the conference, however, strongly objected to any interference of this kind.

Mr. Harris again questioned the value of apprenticeships—at least from the point of view of the works manager. He had tried the experiment for years and he found that whenever he got a good man he was always taken away by some other employers of labour.

Mr. Chatterton thought this was a question of professional morality rather than of technical education and thought that the training of a larger number of apprentices would ultimately do away with such “regrettable incidents” as those mentioned by Mr. Harris.

As regards the class of apprentices to be selected, Mr. Harris strongly objected to Anglo-Indians (Eurasians or the domiciled community) as he found no use for them.

Mr. Peirce said he had started a system of apprenticeship and by careful selection had now got five Anglo-Indians and four Indians who were doing excellent work.

Mr. Chatterton said that his experience showed Indians, on the whole, to be the better workmen.

Replying to a question as to what would be done in the event of apprentices proving unsatisfactory, Mr. Chatterton said that he supposed they would, in the first instance, be appointed on probation for three months within which time they could be summarily dismissed if found unsatisfactory. After that they would of course still be subject to the orders of the works manager and subject to dismissal for any specific reasons.

Mr. Chatterton then suggested the following resolution:—

“That it is necessary to establish a system of State apprentices among the engineering shops in the north of Madras and that provision be made to provide elementary technical education in a Government school to be established near the Basin Bridge Railway station.”

Mr. Williamson did not wish to commit himself to the latter part of this resolution as it had not yet been properly discussed. He suggested that the resolution be taken in two parts.

The resolution was therefore re-stated as follows:—

Resolution 1.—“That it is necessary to establish a system of State apprentices among the engineering shops in the north of Madras,” and in this form was accepted *nem con.*

The second part of the original resolution was then taken up.

Mr. Peirce wanted to know whether the education provided in the technical school would be limited to apprentices or whether it would be open to all: also where the apprentices were to be secured from.

Mr. Chatterton presumed that any one who wished to do so could attend. As regards apprentices Government would undertake to furnish a supply.

The second part of the original resolution—

Resolution 2.—“That it is necessary to make some provision for technical training in a school outside the workshops” was then submitted.

Mr. Williamson wished to substitute the word “desirable” for “necessary.”

Mr. Harris pointed out that the second resolution followed from the first. If apprenticeships were desirable then technical education was necessary.

After discussion the second resolution was adopted in the above form.

The nature of the education to be given in the school and the hours during which it should be opened was next considered.

Mr. Chatterton said that in the previous meeting the members had accepted the principle that the classes would have to be held during working hours and had been in favour of early morning lectures, say from 7 A.M. to 9 A.M.

Mr. Harris was of opinion that the arrival of a contingent of apprentices in the works two hours after opening time would be most demoralising to the other labour employed.

Mr. Peirce did not think that the fact of apprentices coming late to works would cause much dislocation. After all, it would be well-known that they had been attending lectures and not loafing and they would all arrive in a body.

On further discussion it was eventually agreed that the best time for lectures would be from 2 to 5 P.M. and the following resolution was passed:—

Resolution 3.—“That instruction be given in the school to each boy on three days a week in the afternoon.”

Regarding the nature of the instruction, Mr. Harris emphasised the fact that what was wanted, in practice, was maistries rather than skilled workmen. He thought it essential also that apprentices should specialise and should be brought under rigid discipline.

Mr. Chatterton said that the idea was to train competent workmen, which was the class of men that he thought there was the greatest demand for.

Mr. Bamford pointed out that the two things were really the same—after all maistries were usually chosen by a process of selection from amongst the workmen, so that the better the workmen the better the maistry.

As regards the subjects to be taught, Mr. Bamford was requested to furnish the meeting with a copy of the proposed curriculum in the Perambur scheme. This he promised to do.

Mr. Chatterton thought that the teaching should be somewhat as follows:—

One afternoon devoted to arithmetic and elementary mathematics, one afternoon to drawing and the third afternoon to mechanics and steam engines.

Mr. Bamford said that the educational qualification demanded for admission to the Perambur school was one corresponding to the Lower Secondary.

On this point the following resolution was adopted:—

Resolution 4.—“That the instruction be given in English and that the boys should possess such educational qualifications as to enable them to take advantage of it.”

The question of site was then raised.

Mr. Chatterton said that he had inspected sites near the Basin Bridge station and that the only suitable one he had been able to find were the premises formerly occupied by the Government Harness and Saddlery Factory. These were now vacant and possibly permission to use them at any rate for the time being could be obtained. The question of site was rather an important one and had to be decided with an eye to the future. The possibility of the Madras and Southern Mahratta Railway, ultimately joining in the scheme had also to be considered.

After further discussion it was decided that the general locality suggested in the first meeting was, all things considered, the best and the following resolution was adopted:—

Resolution 5.—“That the school should be established as near Basin Bridge Railway station as a convenient site can be found.”

Mr. Chatterton considered that the discussion of the remaining questions of the agenda could, with advantage, be postponed until the next meeting so as to give the members of the conference an opportunity of thinking them over. So far as management was concerned he was anxious to see the same vested in a mixed committee. He thought one Railway Officer, two representatives of firms and one Educational Officer would make a representative and useful board.

Then there was the question of staff to be considered. This, he thought, was really the crux of the whole problem. It would have to be decided whether the staff was to be European or Indian, and he would be glad to hear the views of the members as to the extent to which they could find instructors from amongst men of their own staff.

Mr. Williamson pointed out that the discussion had now narrowed down to mechanical engineering. He thought that the word technical education had a more comprehensive meaning and accordingly suggested that at the next meeting other forms of trades or crafts might advantageously be considered.

The meeting adjourned at 9-30 A.M. until Tuesday the 6th February 1912.

(iv)

The third meeting of the Committee, dated the 6th February 1912.

PRESENT:

A. CHATTERTON, Esq. (President).	H. E. HARRIS, Esq.
A. WILLIAMSON, Esq.	H. B. PEIRCE, Esq.
R. G. BAMFORD, Esq.	A. CARNALL, Esq.
J. W. ANDERSON, Esq.	K. T. B. TRESSLER, Esq. (Secretary).
A. C. TWEEDY, Esq.	

The minutes of the last meeting having been read were adopted.

The committee proceeded to discuss the remaining subjects on the agenda.

As regards the probable number of students for which provision should be made in the Institute, Mr. Chatterton was of opinion that, in view of the separate arrangements made by the Railway Company the attendance would, at any rate to begin with, not exceed 50 or so.

Mr. Harris thought that the number of apprentices might be 75 to begin with, but the views of other members of the Committee inclined towards the lower estimate and it was generally considered that the attendance would at first be confined to State apprentices, though Mr. Carnall thought that, in time, other persons would be attracted when it was found that the instruction given conferred some tangible benefit on the pupils.

Mr. Chatterton thought that it was unnecessary for the committee to bind itself down to a definite number, and the next question—that of management—was then brought up for discussion.

Mr. Chatterton said that at the last meeting he had suggested a committee consisting of one Railway officer, two representatives of firms and one officer of the Educational Department. The idea was to keep the school in touch with the workshops and ensure business-like and practical control. If a suitable Educational officer were on the committee the work of the rest of the committee would be comparatively light. The committee could meet once in a quarter or whenever necessary and their duties would be mainly to decide the practical details of the course of training now proposed, such as the length of time which apprentices should remain in each shop and so on.

Mr. Williamson thought that it was proposed to make the apprentices specialise.

Mr. Carnall agreed with specialisation but thought the apprentices would have to go through a general course first.

After further discussion the committee passed the following resolution:—

Resolution 6.—“That the management of the institution be vested in a committee to be nominated by Government and to be representative of the various interests concerned.”

The next question in the agenda was the amount of support which the interested companies would be prepared to give to the proposed school.

Mr. Harris said that he was prepared to forego the grant proposed on account of the training of apprentices, but

Mr. Chatterton pointed out that this grant was intended for payment to the apprentices and not the employers.

Mr. Anderson remarked that the practical proof of their support lay in their allowing apprentices to attend during working hours. He did not think that the direct pecuniary support that the firms could give would amount to much as compared with the total cost of maintenance of the school.

Mr. Chatterton said there was no intention of binding any one down to a definite promise; all he wished to ascertain was the feeling of the committee on the matter. The Railway Company, seeing that they were making their own arrangements, could scarcely be expected to make a contribution, but he assumed from what had been said that the representatives of the other companies were on principle inclined to give some sort of support to the school.

This was assented to, the members however, pointing out that they did not wish to commit themselves to anything definite on this point.

Mr. Harris pointed out that the whole scheme was at present still more or less of an experiment and that it did not appear in the present stage necessary to discuss matters such as those of financial support.

Mr. Chatterton agreed that things of this kind might well be left to the Managing Committee.

The question of fees was next discussed.

Mr. Chatterton pointed out that it had previously been resolved that no fees should be charged to apprentices.

Mr. Williamson thought that there should be something of the nature of Bursaries started, and in this case thought that all pupils in the school might pay fees.

As regards outside pupils, Mr. Carnall presumed that no outside pupil would be admitted unless he had some practical training in a workshop. Such pupils might perhaps be charged fees, but he personally was rather against fees of any kind at the beginning.

Mr. Anderson, however, remarked that, on the principle of anything worth having being also worth paying for, he thought that apprentices should pay a small fee, the more so as they were to be paid and could therefore afford fees.

Mr. Peirce agreed with fees and suggested that the apprentices might be asked to pay 5 per cent. on the sum they would get.

Mr. Chatterton suggested fee of As. 8 a month but explained that the question was not a financial one. It was not a matter of income, but a question of whether the levying of fees was likely to improve the character of the school or not. He thought it would and considered that, on principle, all pupils should pay something.

Mr. Williamson suggested that scholarships should be given on the results of examinations similar to those of the science and arts in England. These lectures were very cheap and he thought that the fees charged in the school should be low.

Mr. Anderson said that a course of Mathematics cost 2/6.

The committee finally decided that a fee should be charged to all the apprentices and passed the following resolution:—

Resolution 7.—“That a committee recommend that a fee should be charged to all apprentices.”

The amount of the fee to be charged was left to be decided by the Managing Committee.

In introducing the last item—the question of staff—Mr. Chatterton hoped or rather anticipated that the firms represented at the meeting would assist in providing a suitable staff.

Mr. Peirce said he might be able to do something in this direction.

Mr. Harris said that he had no time to attend to any other work besides his own legitimate business and had no one else to spare.

Mr. Chatterton stated that if there was any probability of getting a proper man suitable remuneration would be given.

Mr. Bamford said that he had discussed the question with the Locomotive Superintendent of the Madras and Southern Mahratta Railway, but was afraid that the railway company could not possibly spare any members of their staff for three afternoons in the week.

Mr. Chatterton agreed that three afternoons a week was perhaps too much to expect, but wished to know whether it would be unreasonable to ask private firms to send somebody for one afternoon in the week.

Mr. Harris said the fact of the matter was that none of the firms in Madras had a large enough European staff to be able to spare any of their men.

This view was generally accepted.

Mr. Williamson suggested that the Rev. W. Brown of Perambur might be approached as he could take the mathematical side, and further pointed out that the discussion had so far been limited to Mechanical Engineering. As the matter under discussion had been termed Technical Education and not Engineering, he thought the committee should discuss other industries also, such as spinning, weaving and other mill industries.

Mr. Chatterton said that it was open to any members to make suggestions although he considered that the present conference had been called mainly with the idea of discussing Mechanical Engineering. As a matter of fact, however, a good deal was being done in other directions besides engineering. He had alluded to the proposed tanning school already. Besides this, Government were considering proposals for the establishment of a weaving and dyeing institute in Madura where courses of instruction would be given in modern processes. Madras was not a centre for textile industries and he did not therefore consider that facilities for this kind of work were necessary there in addition to those to be provided in Madura. Then again, one of the principal indigenous industries in Madras—metal work—had already been taken up and the Indian Aluminium Company, which represented the result of Government action in that direction, was one of the largest and best equipped factories of its kind anywhere. So that there appeared to be little necessity for any further steps with regard to metal work.

Mr. Anderson said that the teaching in the school might be limited to mechanical engineering to begin with and if that proved a success then other industries might be taken up.

Mr. Peirce alluding to the scarcity of plumbers in Madras, thought that plumbing might be included in the subjects taught at the school.

Mr. Chatterton did not regard this as necessary. He thought that if the right class of man were taken he would quickly pick up all that it was necessary for him to know.

Mr. Anderson suggested Electrical Engineering, but Mr. Chatterton thought that questions of this kind could best be decided by the Managing Committee when appointed.

The Committee then proceeded to consider the form of report.

Mr. Chatterton explained that there were two courses open to them: either to send up the resolutions arrived at without further remark, or else write a separate report.

Mr. Bamford thought the latter course preferable and suggested that a draft report be circulated.

Mr. Chatterton suggested that, if any member had any special remarks to make, they might be communicated to the Secretary for inclusion in the report.

Mr. Bamford thought it better that the minutes and draft report be sent to all members who could then make their remarks thereon. A final report could then be drafted at the next meeting.

This procedure having been agreed upon the meeting adjourned at 9-45 A.M., until Tuesday the 20th February at 8 A.M.

(v)

The fourth meeting of the Committee, dated the 20th February 1912.

PRESENT:

A. CHATTERTON, Esq., *President.*

A. WILLIAMSON, Esq.

R. G. BAMFORD, Esq.

J. W. ANDERSON, Esq.

H. B. PEIRCE, Esq.

A. CARNAL, Esq.

HARIDAS VISONJI, Esq.

K. T. B. TRESSLER, Esq., *Secretary.*

The minutes of the third meeting having been read some verbal alterations were proposed and these being made the minutes were accepted.

The Committee then proceeded to consider the draft report to be submitted to Government.

The representatives of the Railway company suggested that the opening sentence of paragraph 10 would be better expressed in a modified form as follows:—

"If the railway company establish a school of their own they will naturally not be prepared to contribute towards the support of the institution."

The amendment was accepted.

Mr. Chatterton then read a joint memorandum by four of the other members in which various alterations were proposed. In the first place, objection was raised to the mention of the Chengalvaroya Naicker's Technical Institute in the report on the ground that this might lead to that institute being turned into the proposed technical school.

Mr. Chatterton explained that this was precluded by its situation. Moreover, it was evident that had such a thing been contemplated, the committee would never have been summoned. He did not think that there was any danger whatever to be apprehended in that quarter.

The amendment was accordingly withdrawn.

The second point raised was the question of holding classes in the morning.

Mr. Peirce explained that he and several of the other members still considered that the morning would be a better time for classes than the afternoon.

Mr. Chatterton thought the question had already been decided, but it could of course be reopened. Personally he was in favour of afternoon classes: for one thing, apprentices would get their dirty work over once for all by midday and could dress themselves properly for the afternoon; for another, he thought that it would be difficult to get teachers to work in the early morning.

Messrs. Anderson, Carnall, Peirce and Haridas Visonji preferred morning classes whilst Mr. Williamson preferred afternoon classes.

Mr. Bamford pointed out that there had been some diversity of opinion on this point when previously discussed. He preferred afternoon classes: at the same time if the whole of the morning were devoted to industrial work (and not only a part as originally contemplated) Mr. Harris' objection which had previously turned the balance in favour of afternoon classes fell away.

It was also suggested that half the classes might be held in the morning and half in the afternoon.

Mr. Chatterton did not see any necessity for changing the report. After all, it was always open to the Managing Committee to introduce changes if found desirable. He thought perhaps the introduction of the word "probably" in paragraph 6 would meet the case. This view was accepted.

The third point raised in the joint memorandum was the clause occurring in paragraph 8—"those practically engaged in the exercise of their trade"—, it being held that the expression was too vague and might lead to all sorts of "undesirables" securing admission, or rather obtaining the school certificate.

Mr. Chatterton explained that it was proposed that each apprentice should have a service register in which the firm by which he was employed would enter the details of his work in the shops. This register would constitute the apprentice's certificate, so that people who were not receiving regular training could not secure a certificate.

Mr. Peirce pointed out that there were a number of petty employers of no standing whatever who could, as paragraph 8 ran at present, always claim to be entitled to fill up registers and by so doing would entirely nullify the value of the register or certificate.

Mr. Chatterton thought that the fact of instruction being given in English would keep out undesirables, besides the school would be under the supervision of a responsible education officer. He suggested that the substitution of the word "proper course" for "period" would make the views of the Committee clear.

This amendment was accepted.

The fourth point raised was that of management. It was considered by the signatories of the memorandum that as the railway company intended to run their own technical school, there was no necessity for them to be represented on the managing committee and that the committee should be composed of three representatives of the firms in Madras, of which the Public Works Workshops may be considered one for the purposes of this committee, and an officer of the Educational Department.

Mr. Chatterton explained that, as indicated by the alteration in the report suggested by the railway representatives, it was not definitely known that the company would establish a technical school. Even supposing they did, he thought that Government would be glad of the assistance of a railway officer on the committee and for that reason he was not in favour of excluding railway representatives altogether.

Mr. Peirce said that there was no intention of excluding the railway, only the firms would like to be better represented.

Mr. Bamford thought that in this case the best thing to do would be to give the firms an extra representative and to put on the General Superintendent of the Public Works Workshops also.

Mr. Chatterton suggested that the General Superintendent of the Public Works Workshops might be put on permanently and the composition of the Committee otherwise left as before.

This amendment was accepted and the necessary addition made to the report accordingly.

The fifth point in the memorandum dealt with paragraph 10.

The representatives of the firms had some hesitation in committing themselves to a promise of pecuniary support.

Mr. Chatterton explained that the paragraph in question had been worded very vaguely and could scarcely be interpreted as implying any definite obligation. As a matter of fact, he could state with some assurance that the firms would not be called upon to contribute. But what Government wanted to know was whether the firms would take an active interest in the school and this is why he thought the question of support should be touched upon. He presumed that the firms were prepared to do what they could to make the experiment a success.

Mr. Carnall said that he personally was very anxious to see the school established and he had no doubt that his colleagues also would be glad to show their interest in the venture in such minor ways as offering prizes, etc. The only thing was that he did not care to make definite promises. In view of Mr. Chatterton's explanation, however, he thought the paragraph might remain as it stood.

This opinion was accepted.

The last point raised was the question of appointments.

The members wished to know what proportion of the apprentices should be available for employment by Government after they have completed their articles, as employers were naturally not willing to train apprentices merely for the use of Government.

Mr. Chatterton explained that, so far as he knew, Government did not want any of them. All the institute intended to do was to train a better class of men and its object was completely served if the apprentices obtained suitable employment.

Mr. Carnall pointed out that firms had much difficulty now in getting men owing to the better wages offered by Government. He also regretted that so much Government work was sent home for execution. So long as local firms did not get a better chance, engineering in this Presidency could not develop properly.

Mr. Chatterton, in replying, said that the latter point was one with which he could not deal; as regards the former, he explained the procedure followed by the department of Industries in dealing with ryots and said that the position of the Department in this matter was only that of a Consulting Engineer. The ryots were perfectly free agents.

Mr. Carnall said he was under the impression that the idea in starting the technical school had been partly to obtain Government drivers for the installations put down by the department of Industries. He now understood from Mr. Chatterton's remarks that Government did not supply the drivers and the point raised therefore fell away.

As there were no other remarks offered, Mr. Chatterton, on behalf of Government, thanked the members of the Committee for the trouble they had taken in being present at the meetings and the sitting terminated at 9-30 A.M.

(vi)

NOTE.

(By Mr. R. C. Bamford, Madras and Southern Mahratta Railway.)

In March 1907 the Locomotive Superintendent addressed the agent with a view to obtaining formal sanction to the opening of Technical classes in the Perambur Workshops during working hours and the grant of an allowance for those who conducted the classes.

The proposals put forward by the Locomotive Superintendent were approved and sanction was accorded in G.O. No. 1057 Railway, dated 6th July 1907, to the grant from Revenue of Rs. 100 *per mensem* towards the maintenance of technical classes for apprentices serving in the Perambur Workshops.

2. In April 1908 definite arrangements in connection with these technical classes were made by the Locomotive Superintendent and the following draft instructions and curricula were drawn up:—

It is compulsory that first-class European and Eurasian apprentices shall attend the technical classes and such first-class native apprentices as are required so to do must also attend the classes. The training for the native apprentices, unless they shew exceptional ability, will be such as will be useful if they are promoted to Maistries or Chargemen.

The classes will be held during working hours but the students will be required to do a certain amount of home work as a preparation for their class work.

Until further instructions are issued, classes for different subjects as under will be held on the days and at the times stated:—

MONDAYS.

(7 to 8-45 A.M.)

Advanced Arithmetic and Mensuration. Elementary Applied Mechanics and Steam.

TUESDAYS.

(7 to 8-45 A.M.)

Physics and Chemistry and Advanced Geometry and Drawing.

(On alternate Tuesdays.)

WEDNESDAYS.

(7 to 8-45 A.M.)

Elementary Arithmetic and Mensuration. Elementary Geometry and Drawing.

THURSDAYS.

(7 to 8-45 A.M.)

Advanced Mechanics and Steam. The Locomotive, its failure and remedies.

(On alternate Thursdays.)

FRIDAYS.

(7 to 8-45 A.M.)

Advanced Arithmetic and Mensuration. Elementary applied mechanics and steam.

SATURDAYS.

(7 to 8-45 A.M.)

Locomotive practice.

A certain number of text books for the use of technical classes will be in the custody of those taking the classes and such books can be lent to the students for the purpose of helping them in their home work.

In promoting apprentices in the several shops preference will be given to such lads as take an intelligent interest and show marked progress in the technical classes.

The syllabus that will be worked to for the present is as follows:—

Arithmetic.

Elementary course I.

Advanced.

Multiplication, Division, Vulgar and Decimal fractions, their meaning and application for practical purposes. Percentages, averages, the use of Decimals. Contracted methods of multiplying and dividing numbers omitting all unnecessary figures.

Course I and exercises in areas, weights, volumes, mental arithmetic, calculation of numerical values from formulæ. Extraction of square and cube roots. The meaning of a common logarithm, the use of logarithms in making simple calculations involving multiplication, division, involution and evolution using four figure tables.

Algebra.

Elementary course I.

Advanced.

Meaning and use of Algebraic symbols. Addition, subtraction, multiplication, and division. Use of brackets, substitution of numerical values, for letters in formulæ. Easy fractions, factors.

Course I and easy equations of the first degree in one and two unknowns. Plotting of points and the construction of simple graphs on sectional paper with application to the solution of simultaneous equations of the first degree.

Mensuration.

Elementary course I.

Advanced.

The simple properties of a triangle, parallelogram and circle. Mensuration of simple, plain and solid figures, Rectangle, Triangle, Circle, Cube, Prism, Pyramid, Sphere, Cylinder and Cone.

Course I and exercises with special reference to Engineering Trade, such as weight of bolts, rivets, pipes, boiler tubes, steel plates, beams and simple forgings.

Geometry.

Elementary course I.

Advanced.

Formal demonstrations of the Euclidean type are not required but pupils must be able to state in clear language the experimental evidence for the substance of book I. Forms of simple solids, straight lines and angles. Symmetry of figures. Constructions of triangles with given parts. Sum of angles of a triangle.

Course I and properties of the circle deduced from symmetry. Angles at centre on equal arcs. Tangents to circle. Intersection by two circles. The measurement of areas, rectangle, triangle, parallelogram, trapezium. Euclid 1-47 and Geometrical illustrations of equations.

Drawing.

Elementary course I.

Advanced.

Use of instruments, degree of accuracy attainable, setting out angles by various methods. Methods of dividing lines and angles. Geometric loci.

Course I and scales. Projections of points, lines and solids. Engine and machine details.

Mechanics.

Elementary course I.

Advanced.

Composition and resolution of displacements, velocities, accelerations and forces. Methods of estimating and measuring work and H.P. Laws of friction modulus of machines. Mechanical properties of air and gas.

Course I and strength and elasticity of materials. Testing of materials, strength of boilers, cylinders, riveted joints, etc.

Steam.

Elementary.

Advanced.

Generation of steam. Advantages and methods of using steam expansively. Condensation of steam. Boilers, their construction and operation.

Course I and steam engines. Indicator and indicator diagrams. Calculations, relations to I. H.P. and M.E.P. of engines, the amount of steam and of coal required under given conditions.

Experimental Physics.

Measurements of length, area, volume, time, matter and energy. Theories as to structure of matter, inertia, mass, weight, universal gravitation. The elastic and other properties of solids, liquids, and gases. The idea of temperature and heat, the nature of heat, effects produced by heat.

Technical Chemistry.

Fuels.—Composition, sampling and analysis of fuels. Measurements of high temperatures. Calorimetry. Production and composition of producer gas. Methods of using solid, liquid and gaseous fuels. Control of combustion.

Oils.—Testing of mineral oil. Characteristics of commonly used oils and fats, their uses. Testing of vegetable and animal oils.

Locomotive practice.

General conditions, climate, water and fuel. Railway limitations of dimensions, and weights. Tractive force. Adhesion. Resistance of trains. Estimation of weights total and distributed. Boilers, types, proportions. Framing (plate and bar) bogies, valve gears, balancing, journals, springs, etc.

N. Ref. on Cur. No. 436/12, dated 16th March 1912.

Submitted to Government.

2. The Superintendent of Industrial Education may, as suggested by Mr. Chatterton, be required to formulate a definite scheme in view to carrying out the Committee's recommendations.

A. G. BOURNE,
Director of Public Instruction.

Order—No. 776, Educational, dated 24th August 1912.

The Government have perused with interest the useful and informing report submitted by the committee appointed in G.O. No. 28, Educational, dated 16th January 1912, to consider the question of improving industrial and technical education in the north of Madras. They thank the members of the committee for the service which they have rendered.

2. The Government accept generally the recommendations made; and the Superintendent of Industrial Education will be requested to formulate and submit as early as possible definite proposals for the establishment of State apprenticeships and the opening of a technical school on the lines advised by the committee, together with an estimate of the cost involved. As regards the question of accommodation for the school, the Government await the report called for on the point in paragraph 5 of G.O. No. 613, Educational, dated 10th July 1912.

(True Extract.)

L. DAVIDSON,
Ag. Secretary to Government.

To the Director of Public Instruction.
" Members of the Committee.
" Revenue Department.
" Financial Department.

EDUCATIONAL DEPARTMENT.

NOTES CONNECTED WITH G.O. No. 776, EDUCATIONAL, DATED
24TH AUGUST 1912.

[SUBJECT—*Improvement of industrial and technical education in the north of Madras.*]

Previous papers :

G.O. No. 1165, Revenue,	dated 24th November 1906.
" " 1625 "	" 18th June 1909.
" " 3072 "	" 12th November "
" " 565 "	" 19th February 1910.
" " 3459 "	" 1st November "
" " 621, Educational,	" 5th September 1911.
" " 28 "	" 16th January 1912.
" " 613 "	" 10th July "

From the Director of Public Instruction, No. 436, dated 16th March 1912.

With the chief object of providing industrial education for operatives in modern factories, mills and workshops and for indigenous artizans, Mr. Chatterton submitted a note on the subject which is printed on pages 5 to 7 of G.O. No. 274, Educational, dated 12th May 1911, and observed that, though industrial education could best be given in a workshop or factory, the training should be supplemented by special courses of instruction in technical schools. He accordingly advocated the establishment of a system of State apprenticeship for the training of 300 boys in the various industrial factories in the neighbourhood of Perambūr and the establishment of a technical school in the locality.

2. Mr. Chatterton obtained the consent of the Madras and Southern Mahratta Railway Company to admit fifty State apprentices into the Perambūr workshops on certain conditions. The Government, after obtaining a further report from Mr. Chatterton, accepted his proposals generally and appointed in G.O. No. 28, Educational, dated 16th January 1912, a committee consisting of nine members and representing the various industrial firms in Madras to consider and report on the following points:—

Paragraph 1 of letter No. 2558-1, Educational, dated 11th November 1911, on page 3 of G.O. No. 28, Educational, dated 16th January 1912.

(a) the necessity or otherwise for provision of technical education by Government in the north of the City of Madras;

(b) if it be considered desirable that technical education should be provided for the artizans in the north of Madras, to recommend a suitable site for the proposed educational institution;

(c) to state in general terms the nature of the education to be given in the institution, the hours during which it should be opened and the provision of a suitable staff;

(d) to frame an estimate of the probable number of students for which provision will have to be made;

(e) the most suitable method of managing the institution, whether by means of a committee nominated by Government or by the appointment of a permanent officer of the Educational Department;

(f) to ascertain whether the Railway Company and the firms which will be benefited by the institution would be prepared to contribute towards its support;

(g) whether any fees should be charged, and, if so, on what basis; and

(h) to ascertain whether a suitable teaching staff can be recruited from the technical staff of the various firms and companies interested.

3. The committee now submit their report on the several points referred to them. The seven resolutions arrived at are given in paragraph 12 of the report. In forwarding the report Mr. Chatterton suggests that, if the Government decide to carry out the scheme as recommended by the committee, the Superintendent of Industrial Education may be called upon to formulate definite proposals. The Director of Public Instruction endorses this recommendation. The points referred to the committee will be dealt with below *seriatim*.

4. *Necessity for the provision of technical education in the north of Madras.*—Resolutions (1) and (2) relate to this point. The committee state that "it is desirable to establish a system of State apprentices among the engineering shops in the north of Madras and that it is necessary to provide for technical training in a school outside the workshops." The committee state that in the factories and workshops of Madras there is a demand for moulders, pattern-makers, fitters, turners, smiths and general machinemen, which is at present inadequately met, and that in the districts there is equally a demand for engine-drivers and foremen erectors and for men capable of doing

Paragraph 3 of the report.

miscellaneous repair and maintenance work. They point out that, though the latter demand is met to a certain extent by the Chengalrayanaicker's Technical Institute, Madras, the facilities for acquiring a practical knowledge in engineering in the institute are very limited and the training given in it is imperfect in many ways.

The Madras and Southern Mahratta Railway Company have, however, decided to

Paragraph 5 of the report.

open a technical school of their own in connection with the Perambūr workshops and are not therefore prepared to take any part in the establishment of technical schools elsewhere. Notwithstanding this, the committee and Mr. Chatterton consider that there will be sufficient demand for trained mechanics in the other workshops in Madras and elsewhere.

5. The important point on which the whole scheme is based is the establishment of State apprentices. Though Mr. Chatterton originally referred to this question in the list of subjects proposed by him for the consideration of the committee, this point was omitted. Please see the Honourable Member's note, dated 6th November 1911, on page 1 of the Notes with G.O. No. 28, Educational, dated 16th January 1912. The question was, however, revived at the second sitting of the committee by Mr. Chatterton.

Paragraph 4 of the report.

The committee welcome the system of State apprentices, as regular provision has to be made in the existing factories for the education of a large number of engineering artizans. Mr. Chatterton considers that

Paragraph 3 of Mr. Chatterton's letter.

if this system is not carried out it will scarcely be worthwhile to attempt to establish a technical school in the north of Madras at all. It has been arranged to distribute the apprentices among the public works workshops and other factories. The Honourable Member first hesitated to accept this scheme, but on the receipt of further information from Mr. Chatterton he approved of the proposal as it might work

Page 5 of the Notes with G.O. No. 621, Educational, dated 5th September 1911.

out cheaper than an institute. It is submitted that the necessity for the institution of State apprentices and the establishment of the school may, in these circumstances, be accepted.

6. *Site for the proposed technical school.*—As the Madras and Southern Mahratta

Paragraph 5 of the report.

Railway Company propose to establish a school of their own for the education of their apprentices and as the majority of other factories and workshops are in the

neighbourhood of Washermanpet, the committee consider that the most convenient site for a school would be one as near as possible to the Basin Bridge station. Mr. Chatterton states that the only suitable site he had been able to find is the premises formerly occupied by the Government Harness and Saddlery Factory.

In connection with the proposals for the opening of a Leather Trade school, which it is proposed to locate on the same site, the Revenue Department stated that the Military Department required the site in question for their own purposes. Some other site will therefore have to be selected. For the Leather Trade school Mr. Guthrie, the Tanning Expert, originally selected the plot of land "situated to the south of the road leading from the north-west corner of the Carnatic Mill to the back of the Perambūr station and about 150 yards east of the plague camp." This site was not recommended by Mr. Tressler, as the Harness and Saddlery factory had been selected for the industrial school and as it was desirable to have the two institutions in the place. It is not known whether the original site near the Perambūr station will be sufficient for the industrial school also. Information has to be obtained from the

The committee advocates a site as near Basin Bridge as possible.

T. E. MOIR—13-5-12.

Director of Public Instruction on this point. If it will do, steps will have to be taken to acquire it as it appears to be private land.

7. *Nature of instruction to be given and the time during which it should be given.*—

Paragraph 6 of report.

" 9 *ibid*.

It is observed in the first place that the training is to be confined to mechanical engineering. The committee consider it

impracticable at present to lay down a definite programme and that it should be left to the committee of management. They, however, state roughly that instruction should be given in arithmetic, mensuration, elementary mathematics, mechanism and mechanical drawing.

No. (4) of the resolution of the committee states that the instruction should be

Paragraph 12 of report.

given in English and that the boys should possess such educational qualifications as to enable them to take advantage of it.

This is an important matter; if the instruction were given in English and admission were restricted to English-knowing boys, the utility of the proposed school would be limited and the vast majority of the artizan class would go unbenefited. It may be noted that in the elementary schools which are intended for the education of those who do not require higher education, provision is not made for the teaching of English, and the children of artizans who were educated in these elementary schools will not ordinarily be able to gain admission into the school. It does not appear to be impossible to teach any of the subjects named by the committee in the vernacular.

8. At the meeting of the committee this suggestion was made by Mr. Williamson of the Madras and Southern Mahratta Railway and seems to have been adopted in view of the curriculum proposed for the Perambūr railway school. It is stated that in that school educational qualification corresponding to the lower secondary is to be demanded for admission; and the subjects proposed to be taught in that school include chemistry, geometry and several other subjects which can be taught only in English. But it may

Paragraph 2 of the note on page 14 of current file.

be observed that the railway school appears to be primarily intended for European and Eurasian apprentices. It may be presumed that the majority of the students in the proposed Government industrial school will be Indians. Please see the discussion on page 8 of current file. It is therefore for consideration whether this portion of the recommendation should be adopted.

9. The committee and Mr. Chatterton now, as from the beginning, recommend a

Paragraph 4 of the report.

" 5.

course of five years. The latter would give the students an all-round mechanical training and not confine them to one shop for the whole period. The question of arranging this is one for the committee of management.

It is observed that the question of training in the workshop will be left entirely to the managers. It is for consideration whether a definite course should not be laid down in order to secure that the interests of the apprentices and not only those of the firms are cared for.

Paragraph 5 of Mr. Chatterton's letter.
To a large extent these interests are identical and, as Mr. Chatterton points out, firms will accept suggestions but not dictation.

T. E. MOIR—13-5-12.

10. As regards the hours of instruction, the committee consider that the classes should be held every afternoon, from 2 to 5 p.m., each apprentice receiving instruction for three afternoons a week. This seems to be unobjectionable.

Paragraph 6 of report.

11. *Number of students.*—The committee do not give a definite opinion on this point. They consider that to begin with the attendance will probably be limited to State apprentices and, in view of the proposal of the Madras and Southern Mahratta Railway Company to open a school of their own, the committee do not think that the attendance will amount to much more than 50. Mr. Chatterton would offer 40 apprenticeships every year and provide for an outside maximum of 150 allowing for

Paragraph 4.

wastage. But as all classes will not have to attend simultaneously, provision for half this number in the school premises may be taken as sufficient.

12. *Management of the school.*—The committee state that the school should be under the management of a representative committee consisting of one Railway officer, two representatives of the firms in Madras, one officer of the Educational Department and the General Superintendent of the Public Works Workshops. This may be accepted.

Paragraph 9 of report.

13. *Assistance from the Railway Company and the firms in Madras.*—As the Madras and Southern Mahratta Railway Company are going to open a school of their own, they will naturally not contribute anything; and no contribution could also be expected from the firms in Madras. The representatives of some of the firms are inclined on principle to furnish some assistance, such as providing prizes, etc., but no definite promise has been made by them. The only assistance that could be expected from them is the training they afford to the apprentices in their factories.

14. *Levy of fees.*—The committee consider that on principle some fees should be charged from the apprentices attending the technical school and that eight annas a month would be reasonable, but would leave the exact amount to the managing committee of the school. Some members of the committee were of opinion that bursaries should be started and scholarships should be given to assist the apprentices. The proposal to charge fees from the apprentices attending the technical school may perhaps be accepted; but the fee should only be nominal.

Paragraph 11 of report.

15. *Recruitment of the teaching staff.*—Apart from the committee, Mr. Chatterton is distinctly of opinion that at the outset the school should be under the superintendence of a European officer and that the Superintendent of the Leather Trade school might look after the technical school also. The committee state that none of the firms in Madras possess a sufficiently large European staff to make it possible for them to spare men for giving instruction in the proposed technical school and that the staff must therefore be provided by Government. A full-time staff would be much better than part-time instructors drawn from the railway and other workshops. Such a staff will have ample time to prepare their lectures, to arrange for demonstrations and to correct the examination papers of the students.

But might be much more expensive.

T. E. MOIR—13-5-12.

16. In working out the details of the scheme the question of what final examination or test should be prescribed before any certificate of training is granted will have to be considered.

17. Until the scheme is elaborated in detail, it will not be possible to give any accurate estimate of the cost involved. Roughly speaking, the amount of stipends for apprentices for the first year may be taken as Rs. 3,000 ($40 \times \frac{1}{4} \times 300$) for the first batch of 40 apprentices. For the second year it will be Rs. 3,000 + Rs. 3,750 ($40 \times \frac{3}{8} \times 300$) or Rs. 6,750; for the third year it will be Rs. 11,250; and for the fourth year Rupees 16,500 and for the last year it will be Rs. 22,500, which will be the maximum amount ever payable. This calculation does not make any allowance for wastage and assumes that forty apprenticeships are thrown open every year and that in the fifth year there will be two hundred apprentices. The cost of the teaching staff as roughly estimated by Mr. Chatterton in his letter, dated 8th August 1911, was Rs. 7,200 per annum. Assuming that only one instructor will be needed in the first year and that a manager will not be required, the cost may be taken as Rs. 2,400. Thus the rough cost of the scheme will range from Rs. 5,400 in the first year to Rs. 29,700 at the maximum.

Please see paragraph 4 of Mr. Chatterton's letter.

* Number of apprenticeships which Mr. Chatterton proposes to offer.

† The minimum wage he proposes to give.

‡ The probable number of working days in a year—paragraph 1, page 2 of G.O. No. 621, Educational, dated 5th September 1911.

§ Mr. Chatterton proposes to give an annual increment of one anna.

|| Rs. 3,000 + 3,750 + 4,500 = 11,250.

¶ 3,000

3,750

4,500

5,250 ($40 \times \frac{7}{16} \times 300$)

16,500

** 16,500

6,000 ($40 \times \frac{8}{16} \times 300$).

22,500

Paragraph 5 on page 6 of G.O. No. 621, Educational, dated 5th September 1911.

A very doubtful assumption.

T. E. MOIR—13-5-12.

†† 3,000

‡‡ 22,500

2,400

7,200

5,400

29,700

18. It is for consideration whether the scheme should be approved and the Superintendent of Industrial Education should be called upon to submit definite proposals for the establishment of State apprenticeships and the opening of a technical school or technical class for the apprentices.

19. The members of the committee appear to have taken a good deal of interest in the questions referred to them and to have discussed them ably and dispassionately.

T. E. MOIR—13-5-12.

In passing orders on the report they may, it is submitted, be thanked for their services.

T.K.—8-5-12.

C. RAMANUJACHARI—8-5-12.

The most important questions are—

- (i) the system of State apprenticeships;
- (ii) the medium of instruction.

2. As regards (i) Mr. Chatterton is of the opinion that without a system of State apprenticeships it will not be worth while establishing a technical school. I am much inclined to agree with him. What the Government desire is to take steps to meet the demand for skilled mechanics, etc., which is steadily increasing throughout the Presidency and not merely to supply technical instruction to the apprentices or hands employed in the various shops in and about Perambūr. That would not necessarily increase the supply of trained men for the Presidency at large, though it would enable the Perambūr shops to secure better trained men for their own purposes. The school by itself would doubtless be made use of by the shops and might attract a number of students unconnected with the shops, but as Mr. Chatterton points out the technical school merely supplements the practical training which can only be obtained in a shop, and without some arrangement with the workshops private students might not be able to secure practical training. What is wanted therefore is a supply of Government apprentices supplemental to the normal number which each workshop requires for its own purposes, whose apprenticeship need not necessarily be confined to one shop.

3. As regards the medium of instruction it seems to me essential that it should be English. These apprentices are to be recruited from all over the Presidency, and apart from the suitability of the vernaculars as mediums for instruction in technical subjects, the difficulty of getting instructors capable of giving instruction in these subjects in the vernaculars would probably be insuperable apart from the expense and inconvenience involved in the necessary increase to the staff and the multiplication of classes. The opportunity for such instruction should stimulate the desire to acquire the necessary general educational qualifications.

4. The Superintendent of Industrial Education might well, I submit, be called on to formulate a definite scheme. He can at the same time work out the accommodation required, and the question of site. It certainly seems advisable to combine this school with the Leather school. As to the possibilities of recruitment the Director of Public Instruction could probably give useful information. A system of small bursaries from secondary schools might be useful. It seems unnecessary at this stage to pass orders on the other recommendations of the committee.

5. No definite estimate of the cost can be framed till a scheme is formulated, but I send the file to Financial at this stage for information and in connection with the file as to the Leather school.

T. E. MOIR—13-5-12

FINANCIAL DEPARTMENT.

In G.O. No. 28, Educational, dated 16th January 1912, Government appointed a committee to consider and report* upon the improvement of industrial and technical education in the north of Madras. The committee has now submitted a report, the chief recommendations in it being—

Resolution (1), paragraph 12 of the report.

Resolution (2) *ibid.*

ing for the apprentices by the opening of a technical school outside the workshops.

No estimate of cost involved has been furnished and the Educational Department propose to ask the Superintendent of Industrial Education to submit a definite scheme. [The eventual cost will, however, be about Rs. 30,000 *per annum*.]

2. This case has been linked with that relating to the opening of a Leather Trade school, since it is considered advisable to combine the *Technical* school and the *Leather* school by locating them in the

Paragraph 6 of letter.

Paragraph 4 *ante*.

same place, and making the Leather Expert superintend the Technical school also.

It is submitted that the proposed arrangement will depend upon the decision on the tannery question, viz., whether a *new* tannery is to be *constructed* or whether one of the existing private tanneries should be *hired*. This point has been submitted for orders in the linked file.

C.P.K.—27-5-12.

V. GOPALAKRISHNAN—27-5-12.

Submitted to Chief Secretary for orders.

C. REILLY—30-5-12.

To await orders on the linked file. (G.O. No. 613, Educational, dated 10th July 1912.)

A. G. CARDEW—3-6-12.

EDUCATIONAL DEPARTMENT.

Orders on the file relating to the question of opening a Leather Trade school in Madras, which is referred to as linked file in the Chief Secretary's note, dated 3rd June 1912, on the previous page, have been passed—G.O. No. 613, Educational, dated 10th July 1912—and a copy is being communicated to the Financial Department. This file may now be forwarded to that department for remarks.

T.K.—10-7-12.

C. RAMANUJACHARI—10-7-12.

Please put up a notes copy of G.O. No. 613, Educational, dated 10th July 1912.

M. S. MASCARENHAS—11-7-12.

A proof copy of G.O. No. 613, Educational, dated 10th July 1912, with notes is submitted.

T.K.—19-7-12.

C. RAMANUJACHARI—19-7-12.

M. S. MASCARENHAS—19-7-12.

FINANCIAL DEPARTMENT.

Please see the Financial Department notes on page 6 *ante*.

2. It has since been decided that a *new* building should be constructed to provide for the *Tannery* school, and the Director of Public Instruction has been asked to report whether the site at Perambūr proposed for that school will be large enough to accommodate also the *Technical school* for apprentices dealt with in the present case, or whether suitable land adjoining that site can be acquired for the Technical school.

Ibid.

Paragraph 5 of Deputy Secretary's note, page 6 *ante*.

3. As already noted on page 6 *ante*, no definite estimate of cost involved in—

(a) the introduction of a system of State apprenticeships; and

(b) the opening and maintenance of the Technical school for apprentices has been furnished.

Paragraph 4 of Deputy Secretary's note, page 6 *ante*.

* His Excellency the Governor's note, dated 30th August 1911, on page 5 of Notes to G.O. No. 621, Educational, dated 5th September 1911.

Submitted that the proposal of the Educational Department to ask the Superintendent of Industrial Education to formulate a definite scheme may be accepted.* Pending the receipt of detailed proposals, the item will be noted in the claims register.

C.P.K.—26-7-12.

V. GOPALAKRISHNAN—29-7-12.

C. REILLY—30-7-12.

A. G. CARDEW—31-7-12.

To the Educational Department.

EDUCATIONAL DEPARTMENT.

The file may now be submitted to His Excellency for orders.

T.K.—2-8-12.

C. RAMANUJACHARI—2-8-12.

Yes: please.

L. DAVIDSON—3-8-12.

No. 776, EDUCATIONAL, 24TH AUGUST 1912.

This paper has taken since the middle of March to get through to me, that is, five months! and there is really nothing in the notes which could not have been written in a week. I had the letter which I put with these papers from Colonel Atkinson who was in Madras in March. He seems to think that the scheme has possibilities in it. Please at once ask for detailed proposals with cost. I am of opinion that the scheme might well be given a trial. It may lead to practical training being given in an efficient way to a considerable number of boys, and it also may lead to more interest being taken in this matter by local firms.

M. H[AMMICK]—19-8-12.

Demi-official—from Colonel E. H. deV. ATKINSON, R.E., Principal, Thomason Civil Engineering College, Roorkee, U.P.

To—R. G. GRIEVE, Esq., Acting Deputy Director of Public Instruction.

Dated—Madras, the 9th March 1912.

I return the papers forwarded with your No. 44 of the 7th March and offer a personal opinion as requested.

The scheme cannot be regarded as referring to technical education but to industrial education, as the object seems to be to turn out a slightly educated class of skilled artisans, the more able of whom may eventually be able to take charge of the small installations of labour-saving machinery now springing up in the Presidency.

Every effort to turn out a higher class of skilled artisans in industrial schools has proved a failure in India except in the case of the mission schools working on a raw material of orphans. The proposed system of practical apprenticeship in workshops combined with compulsory school education seems most promising and has seemed altogether too idealistic to get a chance in India. If the practical difficulties can be got over and inspection is efficient, I think it should do very well and meet the object in view.

But unless fostered by some enthusiastic and sympathetic officer I fear it will die a natural death owing to the practical difficulties which will arise and the standard of the certificate granted will vary very much with the efficiency of the workshops in which the apprentice is indentured. This only deals with mechanical industrial training. If I may be allowed to point out, the mill industry also requires recognition. The Buckingham and Carnatic Mills are building a school-house for education of half-timers in the afternoon and night schools for their workmen. They are looking at the work in a very broad light and would be glad of sympathy from Government, and I would suggest financial support in the appointment for a Government technical teacher for the night school, who would give practical demonstration lectures in the vernacular on the theoretical side of the textile industry.

A draft is submitted for approval.

2. The explanation for the delay noticed by His Excellency will be separately submitted.

T.K.—23-8-12.

C. RAMANUJACHARI—24-8-12.

L. DAVIDSON—24-8-12.

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

G.O.No.28 Edl., dated 16--1-1912.

C.No.862, from the D.P.I., No.436/12, dated 16-3-1912.

ORDER:
P.S.

No-776 dated 24-8-12

*Desp & then send
the file to the
action CR
24/8*

V

The Government have perused with interest the useful and informing report submitted by the committee appointed in G.O.No.28, Educational, dated 16th January 1912, to consider the question of improving industrial and technical education in the north of Madras. They thank the members of the committee for ~~their labours in~~ the service which they have rendered ~~this regard~~.

2. The Government accept generally the recommendations made ~~by the com-~~ ~~mittee~~; and the Superintendent of Industrial Education will be requested to formulate and submit as early as possible definite proposals for the establishment of State apprenticeships and the opening of a technical school ~~for the apprentices~~ ^{advised} on the lines ~~recommended~~ by the committee, together with an estimate of the cost involved. As regards the question of accommodation for the school the Government await the report called for on the point in para.5 of G.O.No.613, Edl., dated 10th July 1912.

RECEIVED
26 AUG 1912

To the D.P.I.
" Members of the Committee
" Revenue Department.
" Financial Department.

T.K.
23-8-12.

24/8

24-8-12

CR

24/8

ORDINARY.

PREFERENCE.

Educational
LOCAL AND MUNICIPAL DEPARTMENT.

URGENT (a).

Current No. *862*, dated *1-3-1912*.

G.O., No. *776*, dated *24-8-1912*.

Number of MS. pages sent { Correspondence including order or orders
(b)
(b¹) Notes.....

Docket..... *Industrial & Technical Education*
..... *Accepting generally the recommendations made by the Committee appointed to consider the question of improving the technical education in the North of Madras & request the Supdt. of Industrial Education to formulate & submit definite proposals for the establishment of a technical school on the lines advised by the committee*

Number (c) of copies required when struck off (not including copies for volumes and editors' table which are retained in the Press). Complete Correspondence and orders. Notes

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