The Training of Special Apprentices on the Ceylon Government Railway.

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The Ceylon Government Railway controls a larger staff than that of any other Government Department or industrial concern in the Island employing, even under the present abnormal conditions, almost 17,000 men. It is essential that this staff should be competent, reliable and efficient, for the travelling public demands from the railway, and rightly so, a degree of safety and reliability far higher than that generally expected from other public utility undertakings. The training of staff must always constitute a most important function of all railway administrations, but local conditions, peculiar to Ceylon at the present day, render the problem one of particular urgency and difficulty. It is proposed in this paper to describe in detail the methods adopted in the training of but one of the many grades employed in the Department, but it is hoped to convey thereby an impression of the care with which all grades are trained to enable them to render efficient service to the public in accordance with the best traditions of the railway service.

The mechanically-trained staff of the Railway Department may conveniently be considered under the following three main heads:

(a) Skilled workmen, such as Fitters, Turners, Boilermakers, Moulders, etc.

(b) Supervising Grades, such as Minor Supervisors and Shop and Shed Foremen.

(c) Executive Officers, such as Assistant Mechanical Engineers and Assistant Transportation Superintendents (Mechanically Trained).
For each of these divisions there is in existence an appropriate training scheme, those in training being designated "Trade Apprentices", "Special Apprentices" and "Apprentice Works Probationers", respectively.

Trade Apprentices are recruited from among the sons of skilled workmen employed in the Department. They serve an apprenticeship of five years to a specific trade, and on satisfactory completion of their training, they are appointed Tradesmen in the workshops or running sheds. The methods of recruitment, training and control of lads in this grade are similar to those in operation in Europe and India and call for no further comment.

Apprentice Works Probationers correspond to "Pupils" or "Premium Apprentices" on British Railways and "Special Apprentices" on the Indian State Railways. These are young men in training for the executive grade of the Railway service. The training given to them is a comprehensive one covering all the various aspects of railway mechanical engineering, but, as it follows closely the practice obtaining on the British and Indian State Railways, it is not proposed to consider it further in this paper. The details of such training are familiar to most mechanical engineers and particularly to those connected with railway administrations.

The designation "Special Apprentice" is used on the Ceylon Government Railway to describe a young man undergoing direct training for the supervising grades in the workshops and running sheds. This grade is more or less peculiar to Ceylon, the nearest approach to it being the grade of "Apprentice Mechanic" on the Indian State Railways from which, however, it differs in many important respects. In Europe it is not the practice to train men directly for supervisory posts. Shop and Shed Foremen on British Railways are usually selected for appointment from among the skilled tradesmen employed, but occasionally such posts are filled by young men who have been trained for the executive grade and are gaining further experience. On the Indian State Railways Foremen are appointed
largely from among those who have served as Apprentice Mechanics and have had subsequent experience as Tradesmen. On the C.G.R., however, Special Apprentices receive direct training for supervising work, and on satisfactory completion of their apprenticeship, are appointed direct to the Minor Supervising Grade.

Because of the fact that this system of training young men directly for supervisory duties in Railway workshops and running sheds is more or less peculiar to Ceylon, it is felt that a description of the methods employed may be of interest to engineers in other Government engineering departments, particularly at the present time when the problem of replacing supervising officers, previously recruited from abroad, by locally-trained men is engaging the earnest attention of the Heads of Departments. It is primarily for this reason that the present paper has been prepared, but the hope is expressed that the details given may be of interest also to the managements of commercial engineering firms in Ceylon whose administrative problems are very similar to those of the Government Departments.

Special Apprentices are recruited for the Railway Department under two distinct schemes designed to provide training for supervisory posts in the Mechanical Department Workshops and the Transportation Department Running Sheds. These two schemes will be referred to throughout this paper as the "Shop Scheme" and the "Shed Scheme", and those under training in each will be designated "Shop Apprentices" and "Shed Apprentices", respectively. The educational qualifications, physical standards, conditions of service and rates of pay under the two schemes are identical, and full particulars of these will be found in the appendices to this paper. Shop Apprentices serve their full period of five years in the Workshops, but Shed Apprentices serve for only three years in the Workshops followed by two years training in the Running Shed. Applicants for employment indicate in the first instance the scheme under which they wish to serve, and apprentices are in no case allowed to transfer from one scheme to the other, once appointed.
The present authorised establishment of Special Apprentices is fifteen in the Shop Scheme and nine in the Shed Scheme, but these figures are constantly under review as the demand for supervising staff fluctuates. All Apprentices under the Shed Scheme receive exactly similar training, but under the Shop Scheme specialization is necessary owing to the great diversity of work carried out in the different shops. Shop Apprentices are trained for one of the following shops or groups of shops, the actual number trained in each depending on the probable future demand for supervisors as assessed by the Mechanical Engineer:—

- Machine Shop
- Fitting and Erecting Shops
- Boiler and Tube Shops
- Tool Shop
- Foundries
- Smithy
- Electric Power and Light Shops
- Millwright Shop
- Inspection Staff
- Carriage and Wagon Shops (Wood-work)
- Carriage and Wagon Shops (Steel-work)
- Paint Shop
- Sawmill

When vacancies occur for Special Apprentices under either of the schemes, a number of young men possessing the necessary qualifications from whom applications have already been received are interviewed by a board consisting of the Deputy General Manager (Administrative) and the Mechanical Engineer with a view to selecting the most suitable candidates. At this preliminary interview an effort is made to gauge not only the general intelligence of the candidate but also his interest in and general aptitude for mechanical work. The candidates finally selected are in the first instance appointed on three months probation and sent to the Mechanical Workshops to commence their training.

The probationary period in the Workshops is designed to give the Mechanical Engineer an opportunity of deciding whether or not the
Apprentice is likely to repay the trouble and cost of training and to make an efficient and reliable officer. In general, the Mechanical Engineer will base his decision on the Apprentice's ability to stand up to eight hours hard physical work per day and to demonstrate his possession of that innate combination of manual dexterity and specialised intelligence which is known as "mechanical sense". These are essential qualifications for training; there is no place in the workshop for the weakling or the slacker and in their own interest as well as that of the Department they should be rigidly excluded. Without the possession of "mechanical sense" the Apprentice has no chance whatever of becoming a useful and efficient officer and it is much better that he be told this at the outset so that he can turn to some other avenue of employment in which he will have some prospects of success. As methods of control improve and competition for these posts increases, the number of rejections at the end of the probationary period will probably increase and this may be taken as a healthy sign of improved standards.

If, however, it is considered that the Apprentice is suitable for further training, his appointment is confirmed and he is required to sign an indenture with the General Manager of the Railway to which his guardian is also a party. This indenture, a copy of which is given in Appendix No. 5, binds the Apprentice to serve for a period of five years and to conform to the rules and regulations of the Department. The General Manager, on his part, agrees to have the Apprentice trained for a post in the Minor Supervising Grade at stated rates of pay for five years. The agreement may be determined by the General Manager at any time if, in his opinion, the Apprentice's conduct or progress is not satisfactory or if it is considered that the continuation of his training is not in the best interests of the Department.

As soon as the Apprentice has been indentured, he is handed a schedule which sets out exactly the course he has to follow in the shops and the dates of his examinations and transfers to the different stages of his training. In the case of Shop Apprentices, this schedule of training is
drawn up separately for each candidate, the details depending on the shop for which he is to be trained and other circumstances. In the case of Shed Apprentices, although the time spent and work undertaken in the various shops is the same in all cases, the order in which the sections are undertaken varies. This is necessary as it is obviously inadvisable to have a number of Special Apprentices on one section at the same time, and care is taken in drawing up the schedules of training to avoid this whenever possible. As appendices to this paper will be found copies of several schedules of training and also one page of the master chart used in drawing up these schedules so as to prevent overlapping. This latter chart has one page for each shop or section in the Works.

The Mechanical Engineer delegates his authority in the detail supervision of these training schemes to his deputy, but all cases of disciplinary action, increases of pay, etc., are dealt with by him personally. In addition, he receives reports of the Apprentices' progress and interviews them from time to time. On the completion of their training, Apprentices are given a final examination by the Mechanical Engineer before recommendations for their promotion are put forward to the General Manager. Reports on the work and conduct of all Apprentices are also sent to the General Manager twice yearly—in June and December.

The actual course of training laid down for Special Apprentices may be considered under three heads:—

(a) **Practical training**, aiming at producing manual skill in a selected trade and a thorough knowledge of the various mechanical processes carried out in the shop for which they are being trained.

(b) **Theoretical training**, aiming at an understanding of the physical and mathematical principles governing those processes.
(c) Administrative training, aiming at the acquisition of an elementary knowledge of the principles of administration, office system and the economics of engineering.

In general, the practical training is given in the Workshops and Running Sheds, the theoretical training in the Government Technical Schools and the administrative training in the Progress and Drawing Offices in the case of Shop Apprentices, and in the Shed Foreman's Office in the case of Shed Apprentices. Such a division is only approximate, however, as in practice the various portions of the Apprentice's training overlap to a considerable degree.

It is most essential that Minor Supervisors and Foremen should be men skilled in the particular trade practised in the shops they are called upon to control. This manual skill can only be acquired by long practice at the trade and by doing the same work over and over again until the necessary degree of dexterity and accuracy is attained. Great importance is attached to this point during training as it is found that the Apprentices are apt to imagine when they have seen a skilled man carry out a given operation a few times that they know all there is to know about it. Every effort is made to impress upon them the vital necessity of doing the work themselves and continuing to do it until they have acquired a reasonable degree of skill. There is a very noticeable tendency to trust to text books rather than personal experience among these young men, and this has constantly to be discouraged.

In addition to becoming skilled in one particular trade it is necessary that the future supervisor should obtain a working knowledge of other connected trades. For example, an Apprentice serving his time in the Fitting Shop should, apart from becoming a skilled fitter, obtain a working knowledge of machine and turning work, and an Apprentice in the Carriage Building Shop should gain some knowledge of Saw Mill work in addition to being trained as a skilled body maker. The difficulty lies in knowing just how far to carry this as there is a very real danger that if it is overdone essential skill in one trade
may be sacrificed to a useless smattering of many. To avoid this, each case is considered individually and the schedules of training are so drawn up as to provide for an adequate period of the total apprenticeship being spent at the principal trade.

There are also many processes carried out in the workshops which are not considered at present in Ceylon as separate trades, and these must be understood and practised by the man who will some day be called upon to control them. Typical examples of these are Heat Treatment, Oxy-Acetylene and Electric Arc Welding, Die-Sinking and Electro-plating. Only the Special Apprentices who are likely to be concerned with these processes later are given special training in them, but facilities are allowed to all to see them in operation and obtain a rough idea of the methods employed.

The theoretical training of the Apprentices is carried out at the Government Technical Schools where part-time courses are arranged for them. The curriculum is drawn up by the Principal in consultation with the Mechanical Engineer, and close co-operation is maintained between the staff of the schools and officers of the Railway Department. The course of study prescribed for the current year is given below, but it must be pointed out that this is in the nature of a transition course covering a change over from day to evening classes and that it is hoped to modify it considerably next year.

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject</th>
<th>Hours per week</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>Pure &amp; Applied Maths.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>(Evening)</td>
<td>Machine Drawing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strength of Materials</td>
<td>1</td>
<td>1st Term only</td>
</tr>
<tr>
<td></td>
<td>Theory of Machines</td>
<td>1</td>
<td>2nd Term only</td>
</tr>
<tr>
<td></td>
<td>Hydraulics</td>
<td>1</td>
<td>3rd Term only</td>
</tr>
<tr>
<td>2nd Year</td>
<td>Pure &amp; Applied Maths.</td>
<td>3 ½</td>
<td></td>
</tr>
<tr>
<td>(Day)</td>
<td>Drawing &amp; Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heat Engines</td>
<td>4 ½</td>
<td>1st Term only</td>
</tr>
<tr>
<td></td>
<td>Strength of Materials</td>
<td>1 ½</td>
<td>2nd Term only</td>
</tr>
<tr>
<td></td>
<td>Theory of Machines</td>
<td>1</td>
<td>3rd Term only</td>
</tr>
<tr>
<td></td>
<td>Hydraulics</td>
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</tr>
</tbody>
</table>
In addition to the above subjects which are taken by both Shop and Shed Apprentices, certain selected Apprentices are allowed to take classes in other subjects connected with their particular trade and two-third year Apprentices have voluntarily entered for the Inter. Science classes in engineering this year. Next year it is hoped to introduce a short course in elementary Metallurgy for the Shop Apprentices as it is felt that this is a subject which receives insufficient attention in Ceylon. The Technical Schools classes form a very important part of the training schemes, and the enthusiastic co-operation of the Principal and staff of the Schools is much appreciated.

All Shop Apprentices spend at least six months of their time in the Drawing Office, one month in the Stores and two or three months in the Progress Office. The Progress Office is the central technical office where the work of the various shops is co-ordinated, where operations are planned and scheduled and where estimates and work programmes are prepared. During this portion of their training the Apprentices have an opportunity of becoming familiar with office routine and the elements of the production control system. Shed Apprentices spend six months in the office of the Running Shed Foreman during the latter portion of their training for a similar purpose. In these offices, and to a lesser extent in the workshops also, the Special Apprentices are encouraged to study the economics of engineering, a subject of great importance to their future usefulness. In general it is found that the average Special Apprentice's knowledge of values—that is, of the costs of various materials, the rates of pay of different grades of labour and the time required to carry out certain specific manual or mechanical operations—is very slight. More attention is now being paid to this aspect of their training in the shops and offices, but it is felt that the problem is essentially one for the Technical Schools to tackle and it is hoped that the authorities will see their way to establishing suitable classes in the near future or at least to organising occasional lectures to students on the elements of industrial administration, costing, staff control and the economics of production.
The exact relationship of economics to technology may be called in question, but the fact that all the more important technical institutions in England now include this subject in their curricula indicates its importance.

In order accurately to observe and record the progress made by Special Apprentices in training several methods are adopted. In the first place the schedules of training provide for *viva voce* examinations by Shop Officers at intervals of from three to six months, the results of which are advised to the Mechanical Engineer on a special form (Appendix No. 11). These are usually followed by an interview with one of the Executive Officers when the Apprentice is encouraged to discuss his work and any difficulties he may encounter. Twice yearly all Special Apprentices are examined by an Executive Officer in order to furnish a report to the General Manager on their work, conduct and progress. Written examinations are arranged during their training if and when considered necessary and the final examination before promotion to the Minor Supervising Grade is always a written one. Great importance is attached to the system of work diaries instituted by the Mechanical Engineer early last year which has proved very successful. Two note books are issued to each Special Apprentice one of which is with him each week while the other is being corrected. In these note books the Apprentices record the work carried out by them each day with descriptions of the materials and tools used, time taken and methods employed. Sketches are made of the various components handled and of machines and tools. Text book matter is rigidly excluded from these books which thus form a permanent record of the Apprentice's progress in the practical side of his training. The books are corrected by an Executive Officer who adds notes pointing out mistakes and elaborating and extending the information given where necessary. These note books, considered in conjunction with the reports of the Principal of the Technical Schools, form a very reliable index of the progress an Apprentice is making. They also teach the Apprentice to express himself in clear, concise English, a training that will prove its usefulness later when he is
called upon to prepare reports on technical matters.

In considering any scheme of training, the class of man to be trained must be taken into account. All the Railway Special Apprentices have passed the Senior Cambridge Examination so that the standard of general education is good. A strict medical examination before appointment ensures a high standard of physique and eyesight. Of the twenty four lads at present in training in the Workshops, seven are the sons of clerks, three the sons of teachers, two the sons of postmasters, two the sons of landed proprietors, two the sons of traders, and the remainder are the sons of a notary, a doctor, a broker, a minor headman, a draughtsman, an ayurvedic physician, an estate conductor and a cultivator, respectively. The fact that only one Apprentice is the son of a man in technical employment is not without significance. As regards race, thirteen are Sinhalese, six Tamil, four Burgher and one a Ceylon Moor.

One of the difficulties of dealing with educated youths of this class in Ceylon is that they have an instinctive dislike of manual work which is hard to overcome. Realising this it is usually arranged that the probationary period is devoted to work that is both arduous and dirty, so that the prospective Special Apprentice may, clearly understand at the outset what he may expect in the future. This difficulty is usually surmounted to a certain extent as the Apprentices become more accustomed to shop work and realise that the engineers and foremen they are working under have had similar experiences, but it will ever remain a factor to be reckoned with. Another difficulty is the tendency of the Apprentices, and others outside the Department, to assume that once they have signed their indentures they are assured of permanent service under Government for the rest of their lives on a rising salary scale. Such a conception militates very seriously against effort and initiative and should be discouraged. The termination of the indentures of several Apprentices who were not benefitting sufficiently by the training provided has produced a more reasonable attitude of mind in this connection,
but the absence of severe competition will always be somewhat of a bar to the best results being obtained.

It must be borne in mind, however, that, although all Special Apprentices are promoted to the Minor Supervising Grade on satisfactory completion of their apprenticeship, they must compete for posts as Shop and Shed Foremen with other Minor Supervisors who have been promoted from the grade of skilled tradesman. With the gradual raising of the standard of education this competition, which is at present almost negligible, will steadily increase, and this should greatly improve the standard of efficiency.

The success of such a scheme of training as this rests very largely on the ability and sincerity of the men administering it. The most perfect scheme on paper will fail completely in practice if it has not the enthusiastic support of the administration and of an adequate and qualified training staff. In this connection the following extracts from the "Recommended Practice" of the American Master Mechanics Association (now the American Railway Association—Mechanical Division) may be of interest:—

"A competent person must be given the responsibility of the apprenticeship scheme. He must be given adequate authority and he must have sufficient attention from the head of the department. He should conduct thorough shop training of the apprentices and in close connection therewith should develop a scheme of mental training having the necessary assistance in both . . . It is of the greatest importance that those in charge of apprentices should be most carefully selected. They have the responsibility of preparing the men on whom the roads are to rely in the future. They must be men possessing the necessary ability coupled with an appreciation of their responsibility . . . Interest must begin at the top and it must be enthusiastically supported by the Management."

The code from which these extracts are taken was drawn up in 1908 in connection with the
training of American Trade Apprentices, but it applies with equal force to the training of Ceylonese Special Apprentices today. It cannot be too definitely emphasised that the quality of the Apprentices now in training and their future usefulness to the Department depend almost entirely on the goodwill and technical ability of the executive and shop officers in charge of their training.

It is recognised that there is always a risk of these schemes of training developing along more or less academic lines and producing, eventually, Minor Supervisors and Foremen entirely lacking in that practical outlook which is so essential in railway mechanical work. The high initial educational standard and the insistence on success in the Technical Schools examinations tend to encourage a theoretical bias in the training of the Apprentices and the fictitious value so often attached in this country to diplomas and membership of learned institutions is also a powerful factor in this respect. Foremen in British Railway shops are essentially practical men, selected for promotion from the ranks of the skilled workmen for their mechanical skill and capacity for leading and controlling men. They receive their technical training at evening classes conducted by part-time teachers who are themselves practical men employed by day in workshop and drawing office. Foremen selected and trained in this way have proved themselves most valuable units in the British system of industrial organisation, indeed that system is built up on the conception of the foreman as a superior skilled mechanic capable of intelligently directing and controlling the work of other skilled mechanics under the supervision of an executive engineer. Present-day conditions in Ceylon do not permit of the same methods of selection or training, but it is necessary, nevertheless, that those appointed as Supervisors and Foremen should be men with an essentially practical habit of mind and great care is taken during the workshop training of Special Apprentices to emphasise this point. By every possible means the apprentices are encouraged to rely on their own shop experience rather than on text book instruction in the solving of problems arising
in their work and to subordinate the purely academic side of their training, important though it is, to the essential practical side.

On appointment as Minor Supervisors the ex-Apprentices enter upon what is, in effect, a second period of training. During their five years apprenticeship they have been trained to handle materials; now, as supervisors, they must learn to handle men. It is true that as Minor Supervisors they are carrying out useful work for the Department and are considered as part of the regular staff, but they are now essentially apprentice-foremen, though not so designated, and are treated as such. In general it is considered that a man should serve as a Minor Supervisor for five years before he is considered for appointment to the fixed establishment as a Foreman. This means that he will be appointed between twenty-six and thirty-one years of age, which is in accordance with the usual practice elsewhere. The appointment as Foreman of men incompletely trained is to be deprecated. If the exigencies of the service permit a Minor Supervisor may be appointed Acting Foreman after serving for three or four years in his substantive grade. While acting in this capacity his ability to undertake the increased responsibilities of a Foreman's work may be observed by the officers of the Department and acted upon. It is difficult to overestimate the harm that may be caused by undue haste in such a matter as this. To promote an inexperienced man to the responsible post of Foreman is unfair both to himself and the Department and may result in grave disorganization and trouble in the shops or sheds.

The only fair criterion of the value of any training scheme is the quality of the men it produces. Unfortunately, it is yet too early to discuss final results as the schemes outlined in their present form have not been in operation for a sufficient length of time, but it can be confidently asserted that the results obtained so far give cause for satisfaction. Another three or four years must elapse before the success of the methods adopted for the training of supervising officers may accurately be assessed and modifications of these methods may become necessary
in the light of future experience, but it will be seen from the foregoing description that the schemes are reasonable, based on sound principles and suited to the special conditions obtaining in Ceylon. Given careful and sympathetic administration there seems no reason why they should not justify the hopes of their originators and produce a body of trained and reliable supervising officers of whom the Railway Department will have cause to be proud in the future.

In conclusion, the writer wishes to express his indebtedness to the General Manager of the Railway and to the Mechanical Engineer for permission to make use of official records and information and for helpful criticism and advice in the preparation of this paper.
Appendices.

1. Chart of Training Schemes—Mechanical Department.

2. Chart of Training Schemes—Transportation Department.

3. Scheme for Training Special Apprentices for Posts in the Minor Supervising Grades (Locomotive, Carriage and Wagon Shops).

4. Scheme for Training Special Apprentices for Posts in the Minor Supervising Grade (Running Sheds).

5. Form of Indenture.


7. Schedule of Training—Carriage and Wagon Steel Work.


10. Special Apprentice Master Chart—Tool Room.


12. Special Apprentice Record Sheet.
TRAINING OF SPECIAL APPRENTICES ON THE C.G.R.

(Appendix No. 3.)

SCHEME FOR TRAINING SPECIAL APPRENTICES FOR POSTS IN THE MINOR SUPERVISING GRADES OF THE CEYLON GOVERNMENT RAILWAY (LOCOMOTIVE, CARRIAGE AND WAGON SHOPS).

1. **Object of Scheme.**—The object of this scheme is to enlist, train and educate suitable apprentices with a view to their being specially trained for Minor Supervising Posts in the Locomotive, Carriage and Wagon Shops.

2. **Educational Qualifications, Etc.**—Candidates must have passed the Cambridge Senior with Maths: or other higher examination, and must produce a certificate of good character from the Principal or Head Master of the School which they last attended. They should also be unmarried.

3. **Age.**—Candidates must not be less than sixteen or more than twenty-one years of age, and must produce proof of age.

4. **Physique.**—Candidates must be of good physique and, before indenture, will be subject to a medical examination, including eye-sight test.

5. **Selection.**—In selecting candidates, preference will be given to applicants whose parents are or have been employed on the Ceylon Government Railway.

6. (a) **Probation.**—On selection, candidates will serve three months on probation and, if subsequently indentured, this probationary period will be considered as part of their apprenticeship.

   (b) **Indenture.**—On completion of the three months' probationary period, and if recommended for further training by the Mechanical Engineer, candidates will be required to sign an indenture with the General Manager covering a period of five years' apprenticeship.

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7. Programme of Training.—During apprenticeship, candidates will be given training in the principal shops either in the Locomotive section or in the Carriage and Wagon section of the Railway Workshops.

The shops trained in and periods of training in each shop will be laid down by the Mechanical Engineer to suit the actual requirements of the service.

Six months of apprenticeship will be spent in the Mechanical Engineer's Drawing Office.

Apprentices under this scheme cannot transfer to the course of training for the Transportation Department.

8. Headquarters.—Apprentices in training will consider Colombo as their headquarters, and outstation candidates will be required to make satisfactory boarding arrangements.

9. Hours of Duty.—Apprentices will be required to work the regulation hours in force whilst working in the workshops.

10. Instruction Classes.—It is compulsory for apprentices in this scheme to attend instruction classes when ordered to do so, and during their five years' indenture will be required to attend day classes in the first and the second year's courses of Mechanical Engineering at the Government Technical Schools. Arrangements will be made to enable apprentices to attend these classes and they will be expected to obtain a pass in the examinations held at the end of each year's course. Apprentices failing to pass will not, except under special circumstances, be allowed to take up the course a second time.

11. Discipline.—Apprentices whilst employed in the workshops will be required to conform to the Departmental rules and regulations in force. Breach of discipline, misconduct, and other offences will be met by such punishment as the General Manager or other officer authorized by him may decide.

12. Progress.—An apprentice must merit a good certificate from the immediate superior under whom he is working before he can proceed
from one stage of his training to another. Apprentices will be judged on punctuality, good disposition and willingness to work, general abilities, good conduct, and steadiness.

13. Termination of Indenture.—The General Manager reserves the right to terminate an indenture without previous notice if an apprentice's conduct is not satisfactory, or if an apprentice does not make satisfactory progress in his training, or if for any cause he considers the continuation of an apprentice in training is not in the interest of the service.

14. Leave.—On completion of one year's apprenticeship, short periods of leave with pay, not exceeding fourteen days in any year, will be granted; also two weeks' leave with pay in case of sickness supported by a certificate from a Government Medical Officer, provided service has been meritorious. An apprentice may be called upon to make up all time lost due to sickness and absence with or without leave before he takes the next step in his course of training.

15. Free Passes.—On the completion of the first year's service, apprentices will be allowed one set of second class free passes per annum. On appointment to the Minor Supervising Grade they will be eligible for 3 sets of passes per annum under R. D. I. 261 (ii).

16. Rates of Pay.—Apprentices in training will be on hourly rates of pay which will be as follows:—

<table>
<thead>
<tr>
<th>Per Hour.</th>
<th>Rs. c.</th>
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<tbody>
<tr>
<td>First year</td>
<td>0.18</td>
</tr>
<tr>
<td>Second year</td>
<td>0.20</td>
</tr>
<tr>
<td>Third year</td>
<td>0.24¼</td>
</tr>
<tr>
<td>Fourth year</td>
<td>0.29</td>
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<td>Fifth year</td>
<td>0.35</td>
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17. Increments.—Increments will be granted subject to satisfactory progress as provided for in clause 12.

18. Employment after completion of Apprenticeship.—On completion of the five years' apprenticeship, candidates, if suitable, will be appointed
to the Minor Supervising Grade in the Railway Workshops. Mechanical Engineer's Department, on an hourly rate of cents forty-eight rising to cents eighty-one in accordance with the regulations in force.

On appointment to this Grade, candidates will be required to specialize in a particular shop either in the Locomotive or Carriage and Wagon sections of the Railway Workshops in accordance with their previous training.

Normally a minimum period of five years' training in this Grade will be required to be eligible for appointment as Shop Foreman, Grade II., but special consideration will be given to those who merit same.

Minor Supervisors may be required to perform the duties of Shop Foreman, Grade II., as and when necessary, without extra remuneration, until such time as they fully qualify for promotion.

Appointment to the Grade of Shop Foreman, Grade II., as and when vacancies occur, will be made from the most suitable employees in the Minor Supervising Grade in the Railway Workshops.

Selection will be made from those who have had suitable experience and proved capabilities in charge of work in shop to which appointment is to be made.

Appointment as Shop Foreman, Grade II., will, in the first instance, be on twelve months' probation.

No guarantee is given of permanent employment after completion of training.

19. Certificate.—No certificate will be issued to an apprentice until his services have been terminated on the Ceylon Government Railway.

20. Application.—All applications from intending apprentices should be made direct to the General Manager, Colombo.
(Appendix No. 4.)

SCHEME FOR TRAINING SPECIAL APPRENTICES FOR POSTS IN THE MINOR SUPERVISING GRADE OF THE CEYLON GOVERNMENT RAILWAY (RUNNING SHEDS).

1. Object of Scheme.—The object of this scheme is to enlist, train, and educate suitable apprentices with a view to their being specially trained for Minor Supervising Posts in the Transportation Branch (Running Sheds).

2. Educational Qualifications, Etc.—Candidates must have passed the Cambridge Senior with Maths: or other higher examination, and must produce a certificate of good character from the Principal or Head Master of the School which they last attended. They should also be unmarried.

3. Age.—Candidates must not be less than sixteen or more than twenty-one years of age, and must produce proof of age.

4. Physique.—Candidates must be of good physique and, before indenture, will be subject to a medical examination, including eye-sight test.

5. Selection.—In selecting candidates, preference will be given to applicants whose parents are or have been employed on the Ceylon Government Railway.

6. (a) Probation.—On selection, candidates will serve three months on probation and, if subsequently indentured, this probationary period will be considered as part of their apprenticeship.

(b) Indenture.—On completion of the three months’ probationary period, and if recommended for further training by the Mechanical Engineer, candidates will be required to sign an indenture with the General Manager covering a period of five years’ apprenticeship.
7. *Programme of Training.*—Candidates will be given three years' Workshop training and two years' Running Shed training during their apprenticeship.

The Workshop training will consist of training under the Mechanical Engineer in the Machine, Fitting, Erecting, and Boiler Shops, or in the Locomotive section of the Railway Workshops.

The Running Shed training will consist of training under the Divisional Transportation Superintendent, Colombo, and will be as follows:—

Six months firing (Rail Cars and Engines).
Six months working as Fitter.
Six months working as Charge hand Fitter.
Six months training with A.R.E.F. & A.L.I.F's.

Apprentices under this scheme cannot transfer to the course of training for the Locomotive, Carriage and Wagon, and Paint Shops.

8. *Headquarters.*—Apprentices in training will consider Colombo as their headquarters, and outstation candidates will be required to make satisfactory boarding arrangements.

9. *Hours of Duty.*—Apprentices will be required to work the regulation hours in force whilst working in the Workshops or Running Sheds.

10. *Instruction Classes.*—It is compulsory for apprentices in this scheme to attend instruction classes when ordered to do so, and during their five years' indenture will be required to attend day classes in the first and the second years' courses of Mechanical Engineering at the Government Technical Schools. Arrangements will be made to enable apprentices to attend these classes and they will be expected to obtain a pass in the examinations held at the end of each year's course. Apprentices failing to pass will not, except under special circumstances, be allowed to take up the course a second time.

11. *Discipline.*—Apprentices whilst employed in the Workshops or Running Sheds will be required to conform to the Departmental rules and regulations in force. Breach of discipline,
misconduct, and other offences will be met by such punishment as the General Manager or other officer authorized by him may decide.

12. Progress.—An apprentice must merit a good certificate from the immediate superior under whom he is working before he can proceed from one stage of his training to another. Apprentices will be judged on punctuality, good disposition and willingness to work, general abilities, good conduct, and steadiness.

13. Termination of Indenture.—The General Manager reserves the right to terminate an indenture without previous notice if an apprentice’s conduct is not satisfactory, or if an apprentice does not make satisfactory progress in his training, or if for any cause he considers the continuation of an apprentice in training is not in the interest of the Service.

14. Leave.—On completion of one year’s apprenticeship, short periods of leave with pay, not exceeding fourteen days in any year, will be granted; also two weeks’ leave with pay in case of sickness supported by a certificate from a Government Medical Officer, provided service has been meritorious. An apprentice may be called upon to make up all time lost due to sickness and absence with or without leave before he takes the next step in his course of training.

15. Free Passes.—On the completion of the first year’s service, apprentices will be allowed one set of second class free passes per annum. On appointment to the minor supervising grade they will be eligible for three sets of passes P.A. under R. D. I. 261 (ii).

16. Rates of Pay.—Apprentices in training will be on daily rates of pay which will be as follows:—

<table>
<thead>
<tr>
<th>Per Diem</th>
<th>Rs. c.</th>
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<tbody>
<tr>
<td>First year</td>
<td>1 44</td>
</tr>
<tr>
<td>Second year</td>
<td>1 60</td>
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<tr>
<td>Third year</td>
<td>1 96</td>
</tr>
<tr>
<td>Fourth year</td>
<td>2 32</td>
</tr>
<tr>
<td>Fifth year</td>
<td>2 80</td>
</tr>
</tbody>
</table>
17. *Increments* will be granted subject to satisfactory progress as provided for in Clause twelve.

18. *Employment after completion of Apprenticeship.*—On completion of the five years' apprenticeship, candidates, if suitable, will be appointed to the Minor Supervising Grade in the Transportation Department, on a daily rate of Rs. 3.80 rising to Rs. 6.48 by twelve increments of cents twenty and one of cents twenty-eight.

Candidates, on appointment to the Minor Supervising Grade, will be attached to a division of the Transportation Department, as may be decided by the Management, and will be required to work at any station in the division as may be decided by the Divisional Transportation Superintendent concerned.

The periods required for training in any section of work of the Transportation Department will vary in accordance with the nature of the work and ability of the candidate. Transfers from one section of the work to another will be effected as may be decided by the Divisional Transportation Superintendent concerned.

Appointments to grade of Assistant Running Shed Foreman, as and when vacancies occur, will be made from the Minor Supervising Grade, Transportation Department, and selection will be made from those who have had the most suitable experience and proved capabilities for such appointment, which, in the first instance, will be on twelve months' probation.

No guarantee is given of permanent employment after completion of training.

19. *Certificates.*—No certificate will be issued to an apprentice until his services have been terminated on the Ceylon Government Railway.

20. *Applications.*—All applications from intending apprentices should be made direct to the General Manager, Colombo.
(Appendix No. 5.)

Form of Indenture.

This Indenture made this day of One thousand Nine hundred and of a minor of the age of years or hereabouts (hereinafter called the Apprentice) of the first part, and the father or guardian of the said (hereinafter called the Guardian) of the second part, and the General Manager of Railways, which expression shall include his successors in office (hereinafter called the General Manager) on behalf of His Majesty KING GEORGE THE FIFTH, His Heirs and Successors, of the third part:

WITNESSETH as follows; that is to say:

1. The Apprentice of his own free will and with the consent of the Guardian puts himself apprentice to the Mechanical Engineer, Ceylon Government Railway or to whomsoever shall be nominated by the General Manager for this purpose from time to time, to be trained for the Minor Supervising Grade (Shops) for the term of five years from the day of One thousand Nine hundred and

2. The Apprentice, with the consent of his Guardian, agrees with the General Manager as follows:

(a) That he will devote himself exclusively to the Railway service, reside at whatever place may be appointed, attend at such hours as may
be required, pay prompt obedience to all persons placed in authority over him, and conform to all the rules and regulations of the Railway.

(b) That he will not absent himself from duty, alter his appointed hours of attendance, or exchange duty with any other servant without the special authority of his superior officer; and in case of illness that he will immediately report the circumstances to his superior officer, and if necessary to leave duty, he will obtain a certificate from the nearest authorized Government Medical Officer; and that if he or any member of his family or household is taken ill with infectious disease, he will immediately report the matter to his superior officer, and will not again return to duty until he can produce a medical certificate proving that all fear of contagion is past.

(d) That he will not appropriate to his own use any article belonging to the Railway.

(e) That he will be prompt, civil, and obliging, and afford every facility for the business to be performed, be careful to give correct information, and when asked give his name.

(f) That he will not enter while on duty a station refreshment room or any other refreshment room under the control of the Railway, or any restaurant car, or obtain or receive intoxicating liquor from the same except by permission of a Chief or District Officer.

(g) That he will not accept any gratuity, or enter into trade directly or indirectly for himself or others, or connect himself with any other than the business of the Railway.

(h) That he will not gamble or smoke when on duty on railway premises.

(i) That he will not marry during the said term without the consent of his superior officer.

(j) That he is subject to fine, or interdiction from duty, with loss of pay, for intoxication, disobedience of orders, negligence, misconduct, or absence from duty without leave, &c., and to deduction from his pay of such sums as may be imposed as fines, and to the withholding of his pay during the time of interdiction or absence from duty.
(k) That his services are subject to immediate termination without previous notice if his conduct is not satisfactory, or if he does not make satisfactory progress in his training, or, if for any cause it is considered that the continuation of his training will not be in the interest of the service.

3. The General Manager agrees with the Apprentice as follows:—

(a) That he will during the said term to the best of his skill and ability train or cause to be trained as an Apprentice for the Minor Supervising Grade (Shops).

(b) That he will pay as wages to the Apprentice during the first year of the said term: the sum of rupee one and cents forty-four per day, to be paid once a month; and during the second year of the said term the sum of rupee one and cents sixty per day, to be paid once a month; and during the third year of the said term the sum of rupee one and cents ninety-six per day, to be paid once a month; and similarly during the fourth year rupees two and cents thirty-two; and during the fifth year rupees two and cents eighty. Provided that the Apprentice shall have observed the covenants hereinbefore contained on his part to be performed. Provided always, and it is hereby expressly agreed, that the General Manager shall be at liberty immediately to rescind this agreement if in his opinion—and his decision shall be final—the Apprentice shall have been guilty of a breach of all or of any of the covenants on his part to be observed and performed.

IN WITNESS WHEREOF the said parties have hereunto set their hands and seals at Colombo, this day of

One thousand Nine hundred and

Apprentice:

Guardian:

Witnesses:

General Manager.
Training of Special Apprentices for the Minor Supervising Grade—Shops.

S.A. No. 15. C. L. P. De Mel.

BOILER AND TENDER SHOPS.

<table>
<thead>
<tr>
<th>Months</th>
<th></th>
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<tbody>
<tr>
<td>16·6·33–15·4·33</td>
<td>Probationary Period—</td>
</tr>
<tr>
<td>16·4·33</td>
<td>Fitting Work</td>
</tr>
<tr>
<td>16·4·33–15·7·33</td>
<td>Tube Section</td>
</tr>
<tr>
<td>16·7·33–15·10·33</td>
<td>Coppersmiths Section</td>
</tr>
<tr>
<td>16·10·33</td>
<td>Examination and report</td>
</tr>
<tr>
<td>16·10·33–15·4·34</td>
<td>Plating work—Tender</td>
</tr>
<tr>
<td></td>
<td>Shop</td>
</tr>
<tr>
<td>16·4·34</td>
<td>Examination and report</td>
</tr>
<tr>
<td>16·4·34–15·4·36</td>
<td>Boiler Shop</td>
</tr>
<tr>
<td>Staying</td>
<td>3 months.</td>
</tr>
<tr>
<td>Tubing</td>
<td>3 &quot;</td>
</tr>
<tr>
<td>Patching</td>
<td>6 &quot;</td>
</tr>
<tr>
<td>Inspection</td>
<td>3 &quot;</td>
</tr>
<tr>
<td>Marking off</td>
<td>3 &quot;</td>
</tr>
<tr>
<td>Mounting and Testing</td>
<td>6 &quot;</td>
</tr>
</tbody>
</table>

Examination and reports on 16·10·34,
16·4·35, 16·10·35 and 16·4·36.
16·4·36–15·7·36. Brass Mountings  3
16·7·36–15·10·36. Welding  3
16·10·36. Examination and report  3
16·10·36–15·1·37. Smithy—Angle-iron
work  3
16·1·37–15·4·37. Machines  3
16·4·37. Examination and report  3
16·4·37–15·6·37. Schedule Office  2
16·6·37–15·7·37. R.S.  1
16·7·37–15·1·38. Drawing Office  6

Final Departmental Examination.

TECHNICAL SCHOOLS.

Commence 1st Year Course  April, 1933
Commence 2nd Year Course  April, 1934
In the event of failure to pass an examination at the Technical Schools, no further facilities will be granted to allow of taking the year's course a second time.

A very high standard of conduct and attendance is expected both in the Works and in the Technical Schools.

After completion of five years' training, Special Apprentices will be examined for report as to their suitability for promotion to the Minor Supervising Grade (Shops).

(Signed) A. S. Bobby,
Mechanical Engineer.
(Appendix No. 7.)

Training of Special Apprentices for the Minor Supervising Grade—Shops.

S. A. No. 6.

A. D. C. L. G. LEONIDAS,

CARRIAGE AND WAGON STEEL WORK.

**Months**

16.7.32—15.10.32. Probationary Period,

Fitting ... ... 3

Report on suitability for indenture

16.10.32—15.7.33. Marking Table (Shop 12

Mda) ... 3 months.

Drills ... 1

Shaper ... 2

Lathes ... 3 ... 9

Examination and reports on 16.1.33 and

16.7.33.

UNDERFRAME SHOP (RATMALANA).

16.7.33—15.7.34. Lifting

Section ... 3 months.

Underframe Repairs ... 3

Bogie Repairs ... 3

Vacuum Brake and Repairs ... 12

Examination and reports on 16.1.34 and

16.7.34.

WAGON SHOP (RATMALANA).

16.7.34—15.1.35. Steel Wagon Repairs ... 6

Examination and report on 16.1.35.

WHEEL SHOP (RATMALANA).

16.1.35—15.7.35. Carriage and Wagon

Wheel Lathes ... 3 months.

Tyring and Axle Section ... 6

Examination and report on 15.7.35.

C. AND W. STRUCTURAL SHOP (RATMALANA).

16.7.35—15.7.36. Machines 3 months

Spring Plant ... 3
Erection ........ 6 ........ 12
Examination and reports on 16·1·36 and
16·7·36
16·7·36—15·10·36. Ratmalana Stores C.
& W. Section ........ ........ 3
16·10·36—15·1·37. C. & W. Schedule Office. 3
16·1·37—15·7·37. Drawing Office C. & W.
Section ........ ........ 6
Examination and reports on 16·10·36 and
16·1·37.
Final Departmental Examination and report
on 16·7·37.

Above programme is subject to alteration at
any time by M.E.R.

TECHNICAL SCHOOLS.
Commence 1st year course .......... April, 1933
Commence 2nd year course .......... April, 1934

In the event of failure to pass an examination
at the Technical Schools, no further facilities will
be granted to allow of taking the year's course
a second time.

A very high standard of conduct and attendance
is expected both in the Works and in the Technical
Schools.

After completion of five years' training, Special
Apprentices will be examined for report as to their
suitability for promotion to the Minor Supervising
Grade (Shops).

(Signed) A. S. BOBBY,
Mechanical Engineer.
Training of Special Apprentices for the Minor Supervising Grade—Shops.

S. A. No. 18.  J. I. C. ABÉVESEKERA,

CARRIAGE SHOP.

<table>
<thead>
<tr>
<th>Months</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.4.33—15.7.33.</td>
<td>Probationary Period— 3</td>
</tr>
<tr>
<td>16.7.33.</td>
<td>Report on suitability for indenture</td>
</tr>
<tr>
<td>16.7.33—15.1.35.</td>
<td>Carriage Shop—New Works 9</td>
</tr>
<tr>
<td></td>
<td>Repairs 9</td>
</tr>
</tbody>
</table>

The actual dates for each section will be arranged by W.S. 2 to suit the work in hands. Examination and reports on 16.1.34, 16.7.34 and 16.1.35.

16.1.35—15.7.35. Light-making gang 6
16.7.35. Examination and report
16.7.35—15.1.36. Door-making gang 6
16.1.36. Examination and report
16.1.36—15.1.37. Saw Mill 12
Examination and reports on 16.7.36 and 16.1.37.

16.1.37—15.7.37. Finishing gang 6
16.7.37. Examination and report
16.7.37—15.9.37. Progress Office 2
16.9.37—15.10.37. Ratmalana Stores 1
16.10.37—15.4.38. Drawing Office 6
16.4.38. Final Departmental Examination.

TECHNICAL SCHOOLS.

Commence 1st Year Course . . April, 1933
Commence 2nd Year Course . . April, 1934
In the event of failure to pass an examination at the Technical Schools, no further facilities will be granted to allow of taking the year's course a second time.

A very high standard of conduct and attendance is expected both in the Works and in the Technical Schools.

After completion of five years' training, Special Apprentices will be examined for report as to their suitability for promotion to the Minor Supervising Grade (Shops).

(Signed) A. S. BOBBY,

Mechanical Engineer
(Appendix No. 9.)

Training of Special Apprentices for the Minor Supervising Grade—Sheds.

S. A. NO. 41.  C. E. JANSZ.

<table>
<thead>
<tr>
<th>Months</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16·9·31—15·12·31</td>
<td>Wheel lathes (1 month)</td>
</tr>
<tr>
<td></td>
<td>Marking Table (2 months)</td>
</tr>
<tr>
<td>16·12·31</td>
<td>Report as to suitability for indenture</td>
</tr>
<tr>
<td>16·12·31—15·3·32</td>
<td>Centre Lathes</td>
</tr>
<tr>
<td>16·3·32—15·6·32</td>
<td>Drilling, Milling and Shaping Machines</td>
</tr>
<tr>
<td>16·6·32</td>
<td>Report as to progress in training</td>
</tr>
<tr>
<td>16·6·32—15·9·32</td>
<td>Axlebox gang</td>
</tr>
<tr>
<td>16·9·32—15·12·32</td>
<td>Brass Finishing Shop</td>
</tr>
<tr>
<td>16·12·32</td>
<td>Report as to progress in training</td>
</tr>
<tr>
<td>16·12·32—15·3·33</td>
<td>Rod Bench</td>
</tr>
<tr>
<td>16·3·33—15·6·33</td>
<td>Motion Bench</td>
</tr>
<tr>
<td>16·6·33</td>
<td>Report as to progress in training</td>
</tr>
<tr>
<td>16·6·33—15·9·33</td>
<td>Pistons and Valves</td>
</tr>
<tr>
<td>16·9·33—15·10·33</td>
<td>Electric Light Shop</td>
</tr>
<tr>
<td>16·10·33</td>
<td>Report as to progress in training</td>
</tr>
<tr>
<td>16·10·33—15·3·34</td>
<td>Boiler Shop</td>
</tr>
<tr>
<td></td>
<td>Staying</td>
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<tr>
<td></td>
<td>Tubing</td>
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<td>Mounting</td>
</tr>
<tr>
<td></td>
<td>Patching</td>
</tr>
<tr>
<td>16·3·34</td>
<td>Report as to progress in training</td>
</tr>
<tr>
<td>16·3·34—15·9·34</td>
<td>Erecting Shop</td>
</tr>
<tr>
<td></td>
<td>Stripping</td>
</tr>
<tr>
<td></td>
<td>Frames</td>
</tr>
<tr>
<td></td>
<td>Erecting</td>
</tr>
<tr>
<td>16·9·34</td>
<td>Examination and report</td>
</tr>
</tbody>
</table>

On satisfactory completion of three years training in the workshops, Special Apprentices will be transferred to the Trans. Dept. for further training as follows:

Firing Rail Cars and Engines   6
Working as Shed Fitter ... 6
Working as Chargehand Fitter ... 6
Working with A.R.E.F. and A.L.F. ... 6

TECHNICAL SCHOOLS

Commence 1st Year Course .. April, 1932
Commence 2nd Year Course .. April, 1933

In the event of failure to pass an examination at the Technical Schools, no further facilities will be granted to allow of taking the year’s course a second time.

A very high standard of conduct and attendance is expected both in the Works and in the Technical Schools.

After completion of five years’ training, Special Apprentices will be examined for report as to their suitability for promotion to the Minor Supervising Grade (Sheds).

(Signed) A. S. BOBBY,
Mechanical Engineer.
REPORT ON SPECIAL APPRENTICE

Name: ___________________________ No. __________________

Shop: ___________________________ in training for Work: ______

Period from: ___________________________ To: ___________________________

Work engaged on: ___________________________

Conduct: ___________________________ Work: ___________________________

General Remarks: ___________________________

W. S.
<table>
<thead>
<tr>
<th>Year</th>
<th>Work</th>
<th>Initials</th>
</tr>
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<tbody>
<tr>
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*GENERAL REPORT:* —
Discussion.

INTRODUCTION BY MR. W. A. SMYTH.

Mr. Chairman and Gentlemen,—The Paper which I have the honour to present to you this afternoon deals with the training of Special Apprentices in the Mechanical and Transportation Departments of the Ceylon Government Railway. The designation "Special Apprentice" is used on the C.G.R. to describe a young man undergoing direct training for the supervising grades in the Workshops and Running Sheds. The grade is more or less peculiar to Ceylon and it is for this reason that it is hoped my paper may be of some interest to the members of the Association. In Europe it is not the practice to train men directly for the supervising grades: Shop and Shed Foremen are usually selected from the ranks of the skilled tradesmen employed, but occasionally such posts are filled by young men who have been trained for the executive grade and are gaining further experience. On the Indian State Railways, Foremen are usually appointed from among those who have served their time as "Apprentice Mechanics" and have had subsequent experience as tradesmen. On the C.G.R., however, Special Apprentices receive direct training for supervisory duties and, on satisfactory completion of their apprenticeship, are immediately appointed to the Minor Supervising Grade.

All the details of the methods of recruitment, educational standards, conditions of service, system of training and subsequent employment of young men in this grade are set out in the Paper and it is not proposed to refer to them here. There are two points which I would like to draw particular attention to, however. The first of these is the necessity for having available a suitable staff of officers to attend to the training of the Special Apprentices. It is not sufficient that these lads should spend three or five years in the Workshops: they must be carefully trained by capable officers, and it is pointed out that it is on the sincerity and
goodwill of these officers no less than on their technical ability that the success of the scheme depends. The second point is the danger of producing a type of man who will not have the practical outlook so essential in railway mechanical work. It is realised that the scheme as it stands is liable to lay undue stress on the more theoretical side of the training and to counteract this every effort is made to cultivate in the Apprentices a practical habit of mind. To this end they are encouraged to depend more on the results of their experience in the shops than on the theoretical training they receive in the Technical Schools, important though this is.

Railway administrations have always attached the greatest importance to the training of staff and it is hoped that the brief review presented to you this afternoon of the methods employed in training young men for the supervising grades will prove that the Ceylon Government Railway is maintaining the traditions of the Railway service in the face of some rather unusual difficulties.

I shall be very glad to do my best to explain further any point which I have failed to make clear in the course of my paper.

Mr. E. R. Bartlam.

Mr. Chairman and Gentlemen,—I have read with very great interest Mr. Smyth’s paper, and I am sure that the information it contains will be of use to us at the Technical Schools for the formulation of courses in several branches in the Institution.

It may be of interest if I give a very brief summary of the proposed reorganisation of the Technical Schools in particular regard to the Engineering Courses. Like all other Departments we have been up against the money question and we have had to make use of the organisation we have here now.

There will be four departments, one of which will be Engineering, the others being Commerce, Art and Industries. The Engineering Department will be divided into three, namely, the Civil, Mechanical and Electrical Engineering branches. The standard of work will also be divided into three and classes will be held for:
I. Artisans;
2. Engineering Apprentices;
3. Students who have Matriculated and wish to take a higher training and eventually become Engineers.

With reference to the second group—the apprentices—we have tried to work in close co-operation with the Railway and other Government Departments and to formulate our courses for these students so as to give them the necessary theoretical training. There is, however, one point I wish to stress. Two years here is altogether inadequate to enable us to give them sufficient theoretical training when they attend for only two evenings a week and I consider that their Technical School training should be for at least five years.

Another important aspect which Mr. Smyth has brought out in his paper is the need for lectures in Economics. This is, I consider, necessary, as well as in Law and Accountancy. These may be considered as not being engineering subjects, but in practice an Engineer finds the need of them, and attention is being given to them in formulating our courses.

Then there is the question of educational qualifications. Too many of our students come here without any knowledge of Physics and very little of Mathematics. Some of our students have passed the Senior Cambridge, but have not included Physics or Chemistry. We are trying to improve the standard of the Mathematics as this is essential in every curriculum.

In conclusion, there is one more point; I would be very glad to have suggestions from Engineers in Ceylon as to where they consider training could be improved, and, where possible, these could be worked into our courses.

I feel we owe a debt of gratitude to Mr. Smyth for putting up this paper and I am sure his suggestions will prove useful.

Mr. A. S. BOBBY.

Mr. Chairman and Gentlemen,—It might be of interest to explain why it has been found necessary to introduce a special training scheme for supervising grade officers in the shops and sheds in place
of the more normal procedure of promoting such officers from the ranks of the artisans employed in the shops and sheds, respectively. From past experience it has been found that although an adequate supply of skilled workmen is obtainable to meet all demands the number of such workmen suitable for promotion to the supervising grades is limited and not sufficient to meet all requirements, also the introduction of modern plant and machinery and new methods of working necessitates supervising officers with more specialised training and this special training scheme was introduced to meet these conditions. This training scheme, however, does not debar the artisan of outstanding ability from promotion to the supervising grades; it is only supplementary to the normal procedure of promotion from the ranks. It is essential for the success of such a training scheme that it is not allowed to develop into an office system of reports and that the Officer-in-Charge of the training is in constant and personal touch with the youths undergoing training.

Mr A. H. NATHANIELSZ.

I challenge one statement in the paper. On page 193, Mr. Smyth states 'one of the difficulties of dealing with educated youths of this class in Ceylon is that they have an instinctive dislike of manual work which is hard to overcome'.

In 1896 I was one of the first apprentices on the Ceylon Government Railway. I liked the work although it meant going about in work-a-day clothes, much grimed. I do not believe that educated youths of this country despise manual labour.

The training scheme has great possibilities; it is training of this description that is required in Ceylon rather than University education.

Another point is the question of the future employment of the men trained. Will all these Apprentices be guaranteed employment in the Railway Department on completion of their training?
Mr. E. W. Head.

Mr. Chairman and Gentlemen,—Mr. Nathanielsz spoke somewhat feelingly of the time when he was an apprentice and when conditions were different to what they are today, and no doubt there is a good deal of truth in what he has said. Speaking as one associated with the training of the youth of Ceylon over a number of years I have not so far seen any signs of the over-production of adequately trained men in so far as the Railway Department is concerned.

Although the scheme which Mr. Smyth has presented to you in his admirable paper was launched some fifteen years ago it has been found necessary to provide the means for training to a higher degree of efficiency. With progress and development in all branches of the railway service more highly trained officers are necessary. Praise is due to the members of the technical staff on the mechanical side for bringing up the scheme of training to the high standard which is placed before you today. I should say that we have obtained about 55 per cent. of the number trained as efficient, this is about the maximum we can claim as passing out with satisfaction. I am sorry to say this has been disappointing, not only to the Management, but to the apprentice himself. We hope, however, that we shall obtain better results and better-trained men in the future. As Mr. Smyth has stated there is no distinction of caste or creed, and I feel now that youths of the best class are realising that a practical training is essential to success; it gives us the opportunity of selecting the best material. In this country it does not appear that "Tradition" for the son to follow the father's occupation is not generally looked upon as a matter of concern. It is not so in England where we find the reverse is the case. I commend the scheme.

Mr. Smyth.

Two points have been raised in the discussion to which I would like to refer. Mr. Nathanielsz challenges my statement that educated youths in Ceylon have an instinctive dislike of manual work. As far as my four years' experience with
these training schemes goes, however, I feel certain I was quite justified in making that statement and I cannot withdraw it. I am glad to be able to say, however, that there are exceptions and that some of our Apprentices seem to be keen on the manual side of their work. One of the reasons for this problem is probably the lack of tradition. As Mr. Head pointed out it is usual in other countries for lads undergoing mechanical training to be the sons of men in mechanical employment who do not object to doing the work which their fathers also had to do. Here it is different, for only one of the Apprentices at present in training is the son of a man in technical employment. No doubt as time goes on we will get the sons of railwaymen coming forward for training and this particular problem may then disappear.

The second point raised by Mr. Nathanielsz is the question of the future employment of men trained in the Department. In Europe it is not the practice to guarantee employment after completion of apprenticeship, on the contrary some railways, such as the Great Western, insist on all their apprentices leaving on completion of training and will not re-employ them till they have had experience elsewhere. It is recognised, however, that there are few opportunities outside Government employment for mechanically-trained men in Ceylon and in view of this arrangements are made to absorb all the men trained in the Department. I can state definitely that all the young men who are trained under these schemes will be employed in the grade for which they have been trained provided they have behaved themselves and profited by the training provided for them.

THE CHAIRMAN.

Our thanks are due to Mr. Smyth for his very interesting and useful Paper. The subject is one which interests all departments who have to train apprentices for special purposes. The point which Mr. Nathanielsz put forward is, I think, an important one. It is obviously necessary to accurately estimate what your future requirements of trained men are likely to be and to avoid training more
men than can be absorbed on the completion of their training, particularly in Ceylon where the amount of employment available for specially trained men outside of Government service is so very limited.

Mr. Head, Mr. Nathanielsz and Mr. Bobby made some very illuminating remarks which helped us to understand most of the points set out in the Paper.