

**PAGES**

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OFFICIAL PROCEEDINGS

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1909 C. A. JEFFERIS, General Superintendent, Consumers' Gas Co., Toronto.  
1910 J. DUGUID, Master Mechanic, G. T. Ry.

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PROCEEDINGS OF THE CENTRAL RAILWAY AND  
ENGINEERING CLUB OF CANADA MEETING.

PRINCE GEORGE HOTEL, TORONTO,

September 19th, 1911.

The President, Mr. Baldwin, occupied the chair.

Chairman,—

I am very sorry there is such a small attendance after the long holiday. However, I hope you have all enjoyed yourselves since we last met at Beaverton.

The first order of business is the reading of minutes of the previous meeting. As every member has had a copy of the Proceedings of the last meeting, it will be in order for someone to move that they be adopted as read.

Moved by Mr. Logan, seconded by Mr. Jefferis, that the minutes of the previous meeting be adopted as read. Carried.

The next order of business is the remarks of the president.

It is hardly necessary for me to make any remarks at present. I may have something to say a little later on.

The next order of business is the announcement of new members.

NEW MEMBERS.

T. B. McCrossen, Machinist, Chapman Double Ball Bearing Co., Toronto.

P. A. McCrossen, Clerk, Chapman Double Ball Bearing Co., Toronto.

J. Koiser, Foreman, Chapman Double Ball Bearing Co., Toronto.

T. Dudgeon, Machinist, Chapman Double Ball Bearing Co., Toronto.

R. R. McCree, Ticket Clerk, G.T.R. Depot Ticket Office, Toronto.

J. Anderson, Clerk, Master Mechanic's Office, G.T.R., Toronto.

G. May, Signalman, G.T.R., Toronto.

J. H. Hollingworth, Machinist, G.T.R., Stratford.

B. Dillon, Machinist Improver, G.T.R., Stratford.

G. H. Branston, Machinist Improver, G.T.R., Stratford.

F. Branson, Machinist Apprentice, G.T.R., Stratford.

R. Yemen, Assistant Storeman, G.T.R., Stratford.

- F. Slight, Steamfitter, Consumers' Gas Co., Toronto.  
 H. Biffin, Iron Worker, Consumers' Gas Co., Toronto.  
 G. Carter, Steamfitter, Consumers' Gas Co., Toronto.  
 G. H. Carman, Foreman Carpenter, Consumers' Gas Co.,  
 Toronto.  
 R. Polson, Steamfitter, Consumers' Gas Co., Toronto.  
 W. Forbes, Builder, Toronto.  
 W. Moss, Manufacturer, Moss Chemical Co., Toronto.  
 G. H. Mills, Florist, Toronto.  
 S. Turner, Sr., Manufacturer, John Turner & Son, Toronto.  
 D. A. Thornhill, Boilermaker, C. & W. Walker, Toronto.  
 W. C. Pickering, Shipper, Dominion Radiator Co., Toronto.  
 S. Wainwright, Cutter, Langmuir & Co., Toronto.  
 F. H. Moddy, Mechanical Editor, *Railway and Marine  
 World*, Toronto.  
 J. W. Jackson, Special Agent, Ontario Government, State  
 Dept., Toronto.  
 G. M. Smith, Engineer, High Level Pumping Station,  
 Toronto.

## MEMBERS PRESENT.

W. C. Sealy.	F. R. Wickson.	W. Dony.
J. Sim.	J. M. Clements.	W. E. David.
J. Adam.	F. D. Dewar.	J. W. McLintock.
J. C. Kyle.	H. B. Vivian.	F. Branston.
B. Dillon.	A. W. Carmichael.	E. Logan.
J. Herriot.	C. A. Jefferis.	T. J. Walsh.
J. Duguid.	H. G. Fletcher.	D. Ross.
J. Barker.	F. Hardisty.	T. McKenzie.
W. Dennett.	J. Kelley.	R. C. Brown.
W. W. Garton.	D. A. Thornhill.	G. McKenzie.
T. Ward.	J. McWater.	A. Taylor.
A. E. Patton.	J. Chipchase.	J. A. Disnery.
E. A. Meldrum.	F. Slade.	G. S. Browne.
J. Cave.	G. A. Young.	C. G. Herring.
Jas. Wright.	W. J. Jones.	G. Black.
W. Evans.	R. H. Fish.	J. Dodds.
G. Baldwin.	L. S. Hyde.	C. L. Worth.

Chairman,—

That is a very creditable list I think, but considering that we have had three months in which to canvass them, it is not quite so big as it might have been.

I might say that these have been passed on by the Executive, and are therefore elected as members of the Club.

The next order of business is the reading of papers or reports and the discussion thereof.

The paper that has been prepared for us to-night is by Mr. Sealy, General Foreman of the G.T.R. Shops, Toronto.

Mr. Sealy, like myself and several other of the gentlemen present, is proud to call himself one of Mr. Patterson's boys; I know I am. There are several in the room, I know, who cannot help looking back on the time when we worked here in Toronto Shop, some of whom have advanced to high positions on other roads, and are now superintendents of Motive Power, Master Mechanics, and Foremen. This, I think, speaks well for Mr. Patterson and the fact that Mr. Sealy is one of Mr. Patterson's boys is sufficient recommendation to us for the paper we will have to-night, and as Mr. Sealy is present, I have much pleasure in introducing him to the members present.

The thanks of the Club are due to the following who so kindly donated prizes, which were competed for at the Fourth Annual Picnic held at Beaverton, on June 19th, 1911.

Philip Carey Manufacturing Co., Toronto.  
 The Garlock Packing Co., Toronto.  
 Rice Lewis & Son, Limited, Toronto.  
 Baines & Peckover, Toronto.  
 Polson Iron Works, Limited, Toronto.  
 The Lunkenheimer Co., Cincinnati, Ohio.  
 Watson Pattern Works, Toronto.  
 Mr. A. H. Reid, of Reid & Brown, Toronto.  
 Gutta Percha & Rubber Manufacturing Co., Toronto.  
 Downer Pattern Works, Toronto.  
 Jas. Morrison Brass Manufacturing Co., Toronto.  
 Canadian Rubber Co., Limited, Toronto.  
 Central Electric and School Supply Co., Toronto.  
 Dunlop Tire & Rubber Goods Co., Limited, Toronto.  
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 Bennett & Wright, Toronto.  
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 The Canadian Fairbanks Co., Limited, Toronto.  
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R. Bigley Manufacturing Co., Toronto.  
N. L. Piper Railway Supply Co., Toronto.  
C. & W. Walker, Dommington, Salop, England, per Mr.  
Gardner.  
Murray Printing Co., Toronto.  
The John Inglis Co., Limited, Toronto.

### EDUCATING APPRENTICES.

BY W. C. SEALY, GENERAL FOREMAN, G.T.R., TORONTO.

In the following you will not hear very much new information, it will deal mostly with the apprenticeship system of the Grand Trunk Railway. I am very much interested in apprentices and in their instruction, as it is only a short time since I was an apprentice under this system, and since that time I have been instructing classes for a couple of years. Most of those who take up the trade of a mechanic are boys that have not been able to procure a technical education to any extent. Some of them even have not been able to stay to get through the public schools, also a great many of them have been working as delivery boys, messengers, or at some work earning a little money to help to support themselves, so that they have lost a great deal of the knowledge they knew when they left school, having had very little necessity to use it at the work they have been doing.

There is also the difficulty to get them to apply what they have learned. When going to school they have not been able to value the practical side of what they were learning, especially in the line of mathematics and drawing.

We have a number of boys apply for work who are not able to do very simple work in vulgar fractions or decimal fractions, and even have great difficulty with simple multiplication and division, although claiming to have learnt all these at school. It is necessary, therefore, to start right at the bottom to teach these boys the technical side of the trade. For a time it was hard to get them to realize the use this would be to them and that they must understand practical mechanics, drawings, and blue prints before they would be able to hold their own with the present-day mechanics. With this problem before them the Grand Trunk Railway started a class for apprentice boys who were eager to learn, and taught subjects which at one aroused interest among the boys, bearing as it did on the

every day needs of mechanics. This soon made it necessary to start more extensive classes as the apprentices took hold of it, until at the present time these apprentice classes are held at all the important centres on the system.

The subjects taught are graded to suit the student's ability, from simple arithmetic to higher mathematics, machine design and mechanical drawing. The entire cost of education at these classes is borne by the Railway Company, who furnish all the equipment and engage the instructors, who must themselves have had a thorough technical and practical training, so as to be able to anticipate the needs of the apprentice. The boys are supplied with individual desks and drawing boards and have to take care of them. Every year advances are being made in the equipment of the class rooms making it more comfortable and interesting for the boys. For two evenings per week during the fall and winter months the apprentice must attend mechanical drawings classes, study of practical mechanics and elementary electricity, the most competent instructors procurable being provided. On the staff are two graduates of American and Canadian engineering colleges, Purdue and McGill. The work in the drawing classes is outlined in a special text-book written by the Company's chief draughtsman at Montreal, who is also the author of the book used on practical mechanics. During the term frequent examinations are held, and the points gained by each boy are posted so that they may all keep advised as to just what progress they are making, and thereby be able to brush up the weak spots that the examinations have disclosed.

The Master Mechanic is constantly in touch with each boy's progress and standing, and if necessary he frequently calls a boy up, and in a kindly manner points out to him the necessity of applying himself more consistently to bring his rating up to the required standard.

The annual competitive examination is always conducted by the Company's Chief Draughtsman from Montreal, and has just been completed at all the large shops along the system. Prizes are awarded to the apprentices obtaining the highest averages in their respective years. These prizes amount to \$40.00 for each shop, and are distributed over the different years of the apprenticeship, thus:—The apprentice obtaining the highest average for his first year in mechanical drawing gets \$4.00, and the one obtaining the highest in practical mechanics gets \$4.00 also. There it is quite possible for one apprentice to obtain both prizes. A keen interest is taken in this examination which takes the form of a contest between the various shops.

In addition to the prizes as stated above there is a capital prize offered of \$25.00 for each subject. This is competed

for by the apprentices obtaining the highest averages in drawing and practical mechanics at their respective stations. These apprentices are given a trip to some point on the system where the final examinations are held, and the one receiving the highest number of points in each subject receives the amount stated. This, in addition to what he has already received at his station, will make a total of \$29.00, \$33.00, or \$58.00 if he has been successful in all subjects.

After the season has closed, the boys at some of the large shops hold what is termed "Apprentice Night." This is the social event of the season. Each one makes a drawing, which is neatly gotten up and inked in. This is placed on exhibition, and the prizes are awarded for each year of apprenticeship. The prizes amount to \$2.50 for the first prize and \$1.50 for the second prize. There are also prizes offered for special colored drawings amounting to \$3.00 for the first, and \$1.50 for the second. This may be competed for by any apprentice, irrespective of his year and considerable interest is manifested by those of artistic ability.

The form of apprenticeship which has been adopted by the Grand Trunk Railway System has been in successful operation for a number of years, and has been the means of supplying the company with skilled mechanics in the most satisfactory manner. All apprentices are indentured to machinist's trade for five years, and to the blacksmith's, boilermaker's or other trades for four years. Five cents per day is deducted from the wages of each apprentice, and the total amount is returned to him at the expiration of his apprenticeship with an addition of \$25.00 as a bonus if services have been entirely satisfactory.

The first requisite in employing an apprentice is to know that he is morally, physically, and mentally capable of filling the requirements of a mechanic. To ascertain this the apprentice is required to make his application direct to the Master Mechanic or the General Foreman, and not be under fifteen and not over eighteen years of age. He is required to undergo a medical examination so as to assure the head of the department that he is healthy and likely to be able to follow up the trade after he has completed the term of apprenticeship. This information being satisfactory, he has to pass an examination in the Master Mechanic's or General Foreman's office. This is usually conducted by the Chief Clerk or some person specially appointed for that purpose, as follows:

To be able to read extracts from instructions from end of employees' train time table, standing thirty inches from same.

Hearing. To be able to hear the ticking of an ordinary open-face watch a distance of four feet.

Writing and spelling. By writing a letter from dictation, applying for employment in the shop as per sample.

Mr. ....

Dear sir,—I am desirous of entering the service of the Grand Trunk Railway as an apprentice in the shop at Toronto. I am fifteen years of age and in good health and free from bodily defects. When I left school at fourteen I was in the high 4th grade or form. Since then I have been employed as ..... Should you accept this application, I will promise faithfully to conform to the rules and regulations of the Grand Trunk Railway and try and become a first class mechanic.

Yours truly,

To be able to work out correctly similar examples to the following:

Multiply 122,983,672 by 527,001.

Divide 723,643,978 by 365.

The foregoing examples are sufficient to show whether or not the applicant has a general knowledge of the simple elements of arithmetic. The applicant is required to write this examination out on foolscap paper, and if satisfactory it is copied by him into the record book kept in the Master Mechanic's or General Foreman's office, so that a complete record of the boy's ability is on file from the day he first enters the service.

The apprentice after having passed a successful examination is provided with a text-book for his instruction and guidance. This book contains examinations for the apprentice for each promotion he takes while serving his apprenticeship, and if he fails in any of these examinations he is set back to his old position for another term and the next apprentice in turn is promoted ahead of him, provided the next apprentice passes a satisfactory examination. When another promotion is necessary the apprentice who failed is given another opportunity to qualify. If he fails the second time he is either dismissed from the service or given some minor position he is capable of filling outside of the trade, as it is concluded that he is either not sufficiently intelligent or too indifferent to make a mechanic. After passing the first entrance examination in the Master Mechanic's or General Foreman's office the apprentice is sent out to the boiler, blacksmith, or coppersmith shops, or other shop as may be required. He stays there from six to nine months and is taught to be active and obedient, and to

prepare himself for future promotions. When a boy is to learn one branch of the business only, for instance boilermaking, blacksmithing, steamfitting, etc., he is only required to serve four years, but if he is to learn the machine work, and fitting he is required to serve five years and all the machinist's apprentices are indentured for five years. In the case of any apprentice learning boilermaking or blacksmithing he is required to pass an examination in the Master Mechanic's office and the first examination in the apprentice rule book, as it is deemed necessary to have the information contained therein for any branch of service, and in the case of the four-year apprentices being few in number after the first examination, in comparison to the machinists' apprentices, they are instructed in their business by the foreman in charge, and each year they are required to pass an examination in drawing before receiving their advance in wages, the same as machinists' apprentices. The following are a few examples of the contents of apprentices' text-book to be answered by first year apprentice:

What is the weight of a standard shop-hammer (machinist hand)?

At what point should hammer be held for efficient service?

What is the standard length of hammer handle?

How many class of drills are in general use in the shop?

At what degree is cutting end of twist drill ground?

Name the speed for drilling brass, cast iron, wrought iron, and steel, different size holes, with carbon steel drills, and air hardened steel drills.

Give the correct speeds for 1" carbon steel drill in iron or steel or brass.

Give the correct speed for a high speed steel drill iron or steel or brass.

What size should holes be drilled for tapping various sizes of bolts and studs?

What size should holes be drilled for tapping various sizes of U.S. threads (gas threads)?

What lubricant is used for drilling wrought iron or steel?

What is a centre punch used for?

What is a roundnose chisel used for at drilling machine?

Which side of a belt should be run next to the pulley or cone?

What are the general rules to be observed regarding cleanliness and care of machines?

Explain the reading of an ordinary standard measuring rule.

How many, and what are the different classes of callipers in general use on drilling machine?

What tools are necessary for laying off or measuring work at drilling machine?

What is a jig?

What are its advantages?

Make a drawing of a mogul crank pin, half size, drawing to be inked in.

The apprentice is required to make an inked in drawing of some part of locomotive, further advanced each year.

The object of the text-book is to have the boy theoretically conversant with the work that is going to be done by him after his next promotion. For instance, a boy going from the blacksmith shop to the machine shop has to pass his examinations before he is accepted in the machine shop, which is called, "Examination for promotion of Apprentices from other shops to the machine shop." As he is usually put on a drill to commence with, by studying his text-book, he learns considerable about it, and also the tools he is to use in connection with it. The same practice is followed throughout the whole term of apprenticeship, and while the apprentice is working at one he is studying as much as possible about the machine he is to go on to next. One of the great advantages of this system is that it gets the apprentice thinking, and leads him to reading up in line with his work.

The indenture system has been found to be of great advantage both to the company and the apprentice. It has a tendency to keep the apprentice satisfied, and steady his energies along the required lines. It also prevents him from being tampered with by outside firms or corporations who desire to obtain the services of the boy as soon as he has become useful to the company who has instructed him. At the completion of his term each apprentice receives a certificate showing that he has served as an apprentice and as a mechanic in the branch of the trade that he was apprenticed to. An apprentice is required to serve five years at the following rates, 8, 10, 12, 15 and 17 cents per hour. Before he is granted each year's advance he is required to pass a written examination on shop work, also make a drawing of some detail part of a locomotive, as specified in the apprenticeship book, which examination and drawing must have the approval of the Master Mechanic and Superintendent of Motive Power before his advance is allowed.

The above system insures thorough education in all details of the trade, and while some of the work may be specialized it is not done by the apprentice until he becomes a journeyman. For instance the apprentice comes from the boiler shop to the machine shop, from the machine shop to the motion bench, to the side rod bench, to the axle box gang, to the steam pipe gang, to the valve gang, and finally to the erecting gang, so that after an apprentice is out of his time he is a specialist in any of these branches. This system of apprenticeship on the Grand

Trunk has also been found to be the means of parents giving their sons who desire to enter the service a better education than formerly. Before its adoption the only requirements was that the boy had to be fifteen years of age. It was found that parents took their boys away from school at twelve and thirteen years of age, and put them at some other work until old enough to enter the Grand Trunk shops. When the examinations were first inaugurated quite a number of the boys were turned down, and had to go back to school again before they could qualify to enter the service.

This has not only resulted in prospective applicants getting a better education, but has elevated the moral standing of the apprentices' work, and made the system attractive to the boys who have passed the high school entrance examination, and who, although well advanced along the lines of school education, adopt the mechanic's trade in preference to other pursuits. In conclusion, the success of the apprenticeship system is imperatively dependent upon the careful management of the examinations, and the compulsory attendance at the classes provided by the company for their education. Each year an apprentice, if successful, has received certificates for taking the first place in his particular year's examination, and when he has served his time and been satisfactory he receives an engraved certificate of apprenticeship. At first it is sometimes difficult to get the apprentice to realize of what great use this education will be to him, in fact that he cannot get along without it.

After a young man has finished his apprenticeship he should be in a position to take a position as a first-class mechanic and hold more than his own anywhere. In the larger shops a number of the apprentices are holding some of the best positions the shop can offer, it not being necessary, as it once was, to go away to new fields to get experience for a year or two. A boy after being trained for five years under a system like this can at once take up more important work. A number of the boys that are just out of their time are helping to instruct the classes as well as continuing to improve themselves. Encouragement is given to the boys to learn by the large number of prizes donated annually which are open to competition to all classes on the system, and include free scholarships in engineering at McGill University, as well as handsome cash prizes.

Each year shows a great improvement and new ideas are always being brought forward to help. I have with me a few of the drawings that have been done by apprentices. Some of them are really wonderful for a boy that has only received instruction for two hours an evening, twice a week, for six months. I have got most of these from Stratford, where there is a large class and where they are doing really splendid work, and showing a big improvement each year.

Chairman,—

I am sure we have all listened with a great deal of pleasure to the paper given by Mr. Sealy.

As he states that Mr. Meldrum, of Stratford, has come down and brought with him these exhibits of apprentices' work, which you see displayed about the room, perhaps Mr. Meldrum would like to say a few words in reference to these exhibits.

Mr. Meldrum,—

When invited to come here to-night I readily consented as I thought that at a meeting such as this, there must be amongst its members some individuals with ideas altogether different from ours and I am in hopes of hearing something new which I can carry back with me to help advance this class of work in Stratford.

In regard to the pictures, which the chairman has made reference to, as Mr. Sealy stated, they have all been done by apprentices who have had no instruction in drawing outside of that provided for them by the G.T.R. Company. Freehand sketches are first made from the object and later finished drawings are made to scale in their class room, similar to those now exhibited.

The apprentice after completing each year is examined for promotion and increase of pay. The examination consists, as you have heard Mr. Sealy say, of answering certain questions correctly, making a drawing satisfactory, and having to his credit a certain percentage of points given throughout the year for shop practice. Those points and examinations are given by a practical man who is known as the Apprentice Instructor.

All promotions, raise in wages, etc., pertaining to the apprentices, must be certified by him as merited, after which they must be approved of by the Master Mechanic and Superintendent of Motive Power.

The main consideration the Company has in educating the boys in the manner so fully outlined in the paper to-night is not so much that the apprentices will become Foremen, Master Mechanics or may be Superintendents of Motive Power, but that when they have completed their apprenticeship they will be first class mechanics, fully trained up along the lines the company most require. Of course there are some bright boys who cannot be held down and their natural ability assert themselves from the first.

In the examinations each successive year their names continually come up as prize winners and in this way they are brought forward to the notice of the management and are thus

self recommended for good positions. Mr. Sealy is one of those who was successful. He was top in his class from the first to his fifth year, while on two separate occasions he scored the full 100%.

The annual system examinations are a true test of the season's work. Test papers are got out by the Chief Draughtsman of the C.P.R. and Montreal Locomotive Works, and until placed before the class, no one except those persons conducting the examinations know the questions which have been set.

The class average over the system this last year was 65, showing, I think, for the boys to be successful they must give close attention to their work.

Another factor of success, at any station, is invariably traced to the amount of interest displayed by the Master Mechanic and when there is a good backing up from this quarter there is never much doubt of the results.

I do not think I can add much more to what has already been said and as there may be some here more prepared than I was and who may have good points to give, I shall be extremely pleased to hear them, thanking you for the opportunity given to add just a little to this paper.

Chairman,—

I know that we have a class of apprentices in the G.T.R. shop at Toronto, and as Mr. Fred Wickson has charge of that class I would like to hear from him, if they follow on the same lines as Stratford.

Mr. Wickson,—

Mr. Sealy and Mr. Meldrum have pretty well covered the ground laid out in reference to the training of apprentices.

There is one point Mr. Sealy mentioned, which comes to me very forcibly, he said: We can get the boys who leave the public schools and teach them the mechanical side. It is remarkable, and greatly to be regretted, that a large proportion of the boys who come to us are unable to do simple multiplication and division. I cannot say why this is, but probably it is because after leaving school they go to work at something else before coming to us. There is a good deal of talk about manual training in school, and it is a hard thing to say that this manual training is a good thing for the boys, especially if this manual training is taken up in the schools to the detriment of arithmetic and other things. I consider it is a mistake that this manual training is taught in the regular school hours, if it is taught in extra time and the boys come in after school hours to study it, it is all right, but if it takes its place as a regular subject, I do not consider it of benefit to the boys. The most that they can learn in manual training would

be enough to enable them to tinker around the house. They do not teach them sufficient to enable them to become carpenters or mechanics, and as I said before, it takes up the time of the regular school work I consider it a loss.

Chairman,—

I notice we have a comparative stranger amongst us to-night. I refer to Mr. Duguid. I know for a fact they did not have classes for apprentices when he was serving his time, but still he may have something to say in reference to this. At the same time I would like him to say why he has not been to see us before this.

Mr. Duguid,—

I cannot put up a very good excuse for not being here oftener. Generally on the night I should be here I find myself down on the other end of the line. I happened to get anchored here to-day, so I attended the meeting here to-night.

In regard to the apprenticeship system, I was very much interested in it when I was in Stratford, since I have been away from there I do not seem to have had much opportunity to keep in touch with this work. It is at the large shops where you see the apprenticeship system worked to the greatest advantage. Some people think that there is no apprenticeship system at the out stations. This is a mistake, the apprenticeship system is exactly the same. At Portland we have a small shop, and there are seventeen apprentices. We carry on exactly the same system there, and I believe we have one of the best instruction rooms there that there is on the system. At Turcot, which is the terminal of Montreal, we have a number of apprentices who attend the classes at the main shop. At Belleville we have about twelve apprentices and the whole course is carried on at these points the same as it is at the main shops. The only difference at the roundhouses is that the boys do not get the same opportunity to study the different machines that they would in a large shop. At all the roundhouses we have small machine shops, but the boys do not get the instruction they do at the large shops as we do not have instructors at these places to instruct them in the work of the shop.

Mr. Baldwin mentioned that we did not have drawing classes when we served our time the same as the boys do now. This is a mistake. Quite a number of years ago when I was serving my time I served part of it here with the John Abel Co., in Parkdale, and we were sent to a drawing class, as part of our indenture. If we did not attend the drawing classes we had an opportunity of explaining why in the police court as we were not carrying out our indenture. In regard to the apprentice system, this is not the only thing we have to contend

with on the road. We have practically the same thing in connection with the firemen, and while the system is not exactly the same, the instruction given is pretty much the same. We have instructors out all the time, and the men are examined after they have been in the service six months, eighteen months, and three years, so that the instruction of firemen is being taken up and carried out in much the same way as the regular apprenticeship system at the shops. This is necessary at the present time more so than it used to be, because when business was not so heavy as it is to-day men were firing for nine, ten, or eleven years, but the advancement of a fireman to an engineer is much more rapid now, and the men have to be proficient before they can be promoted to engineers, because you cannot put a man out on the road if he cannot handle his engine, not only for the sake of the company's business, but every person watches the man on the engine, and we have also the Railway Commission to contend with, so that the education of firemen is being given almost as much attention as the education of shop apprentices.

I do not know that I can say much more in regard to the apprenticeship system as Mr. Sealy has covered the ground very fully.

Mr. Jefferis,—

I have listened with a great deal of pleasure to Mr. Sealy. There is one thing I would like to ask him. Do you not find better results with boys in the smaller towns, than you do in the larger cities? Do you not get a better class of boys and better attention from the boys in places like Stratford and Belleville than you do in cities such as Toronto?

Mr. Sealy,—

I find a great deal of difference since I came to Toronto in the class of boys we get. The boys here, if they are at all bright, their people put them to something that will show better returns for the first two or three years. I find in Stratford that we can get boys after they have had a High School education. Of course in smaller places a big shop is looked at in a different light than it is in a large city like Toronto. There it is thought to be a good thing to work in the shop. If a boy's parents think that their boys can make more money at something else, it is a difficult matter to induce them to allow their boys to become apprentices.

Mr. Jefferis,—

My experience is, that the city boys of to-day want to become stock brokers and bankers. They do not want to learn a trade. Their minds do not seem to run that way. The thought is not

"can I make something with my hands, but rather can I get money and get it quick?"

I will read you an application from an employee that I found on my desk a few days ago. The writer is unquestionably a poet, but apparently is also interested in finance.

To Mr. C. A. Jefferis, General Superintendent Consumers' Gas Co.:

Please give me your attention sir, and lend a patient ear,  
 And do not judge me harshly for what I am writing here;  
 I know that you're a busy man and have no time to waste.  
 So the point I wish to mention I will try to do with haste.  
 A recipe was given once, though now 'tis stale and old,  
 Of how a man could get along without the use of gold;  
 A little child upon the floor, was playing with his feet,  
 He stuck a toe into his mouth, thus, making both ends meet.  
 This joke we can appreciate when the inner man is fed,  
 But it doesn't keep the family warm nor does it buy the bread.  
 Did you ever stop to calculate the price of living here?  
 If not, you'll surely get a shock, things are so very dear;  
 For food, or fuel and clothing are priced away up high,  
 And rents, why bless your heart! they're soaring to the sky.  
 There was a time when the working man could afford to eat a  
 hen,

But now he's mighty thankful for a fresh egg now and then.  
 Now the point I wish to make and what I want to know,  
 Is how a man of "twelve" a week can ever make it go.  
 I've studied and I've figured and not to save my life  
 Can I see how any honest man can live and keep a wife.  
 I ask of you to solve it, who shares our sorrows and our joys,  
 For you're the "Little Father," the father of the "boys."  
 Give me just a little chance, just put me to the test  
 And you'll find that "writer" loves his "dad" as well as the  
 rest.

For your kind attention, thank you! and for favors of past  
 days,

But honest, Mr. Jefferis, I'd appreciate a raise.

Employee.

Mr. Walsh,—

I certainly have been interested in the paper that has been read here to-night. It reminds me of old times. I see that things have not changed very much since I was an apprentice in the old Northern Railway shops where I served seven years' apprenticeship.

I left school at a very early age owing to circumstances over which I had no control. The boys had to pass an examination before they were allowed to become an apprentice

and I was sufficiently well educated to pass the necessary examination. The system was practically the same although they did not educate the boys in technical knowledge the same as they do to-day. The boys were sent to the old Mechanic's Institute, and the company, I believe, paid \$100.00 for each apprentice. Most of the boys I am afraid went there more for fun than to learn anything, although I did learn something in the drawing class, but as far as the arithmetic was concerned, I did not pay very much attention to it. Of course the boys did not have the machines to work on they have now. This was before Turret lathes were in use. We had to put in so much time turning bolts and facing nuts, three months more on larger work, and from this we passed on gradually until we got on the lathe for turning tires, after that we went to the bench work, from there to the floor of the erecting shop, and at the end of the seven years we got journeyman's pay, if we were worth it, if not we were told to get out.

The apprenticeship system, such as is followed out on the Grand Trunk, is away ahead of the system in use in many of the large shops in the States. There a boy is put to one kind of work and they keep him there, and he never has an opportunity of learning anything other than the special work to which he has been assigned. Perhaps he is working on a lathe, and when he gets through he is a first-class lathe hand, but knows nothing about anything else.

When I got through my apprenticeship I tried to get a position in Crane Brother's contract shop, and asked for a job on a vise, but they had no vacancy, the foreman said, "Can you run a lathe?" and I started in on a lathe, and after a while he said, "There is a man off a large planer here." I had never worked on a planer, but I knew enough to enable me to run it, and when the planer man came back the foreman would not put him back on the planer, so that you see an all round apprentice has a much better chance than an apprentice who has only worked on one particular machine.

I understand it is very difficult to get a man who can turn his hand to any class of work. You may be able to get a man who can run a lathe, but as a general rule this man cannot go outside and do any other job, such as fitting, or anything else that may be required.

Mr. Jefferis,—

The point in Mr. Walsh's remarks about the boy starting in at the shops and going right through, is very commendable, but that is sometimes very difficult to do. I am sure there is a great deal of credit due to the officials of the Grand Trunk system for the interest they are taking in the future mechanic, by taking the boy directly from school and putting him through

a first-class practical and technical course combined. In my experience I have seen many boys in the United States who came from universities and colleges to shops and when given a job, he practically tells you that it is beneath him, and that he can figure out the whole thing and design the job, but as a rule, he can neither do the work himself or handle the men who can. The boy who is taken in as an apprentice and taught both the practical and the technical parts of his profession at the same time, such as has been described in Mr. Sealy's paper to-night, you are unquestionably going to have a superior mechanic than if you sent him to college first and from there to the shop. There have been hundreds of fathers and mothers who have worked and economized in order to send their boys to college and from there to the shop, and afterwards could not understand why they were not a great success, where as if they had sent them from the high school to the shop, and after they had served their apprenticeship then to college they would have given the boy the training he needed in the order that he needed it. To my mind it is a regrettable thing that the average city boy of to-day does not want to learn a trade, and the future mechanic, I believe, will have to come from the smaller towns and villages or from a foreign country. I think I voice the opinion of a great many present, when I say that the average boy in the city of Toronto of to-day does not want to do any drudgery in connection with the engineering profession; he wants to know how to get rich quick, get money and get it now; never mind about the future. If you talk to him about night school he will not listen. Now, I do not mean by that that all boys are this way, but certainly the majority of them are.

I know of a large concern who has not received a single apprentice application during the year, but I do remember the time when mothers would bring their boys and ask for a chance to have them learn a trade. Now, what is going to be the result of all this? Sooner or later will not the country suffer unless we get enough boys from the smaller places to take the place of the city boy who does not want a trade? It is either that or foreign labor, don't forget it.

It is too bad that there are some large shops who take in apprentices and keep them on one class of work, it is not fair to the boy. I have seen many men who when applying for a situation would say he was a planer hand or lathe hand, and he is usually an artist at the one thing. If you do not happen to have a job in his particular groove he is almost helpless, but where you get a man who has had the opportunity to thoroughly learn the practical and at the same time the technical side of his business, you have a finished mechanic, who can go through

life with the feeling of independence, and he can usually secure a job and sometimes a position.

Mr. Herring,—

Mr. Walsh has been talking about forty years ago, I will talk about nearly twenty years ago. I started in a general engineer shop where they made all kinds of gas plants, hydraulic machinery, steam engines, and pretty nearly every branch of the engineering profession. I went to the shop from high school with a general knowledge of reading, writing and arithmetic, and the first three months was spent in sweeping the shop, making the men's tea, getting there at six in the morning, and through at five-thirty. I went through the shop, and learned every branch of the profession. We went through the fitting and machine pattern shop, into the foundry, from there into the boiler shop. We built all classes of machinery, including marine boilers and refrigerating plants and I can say that there is nothing like a general engineering shop to give a man an insight into all branches of the work.

In a system like the Grand Trunk Railway I can quite see that they must specialize in locomotives and all connected therewith, and the experience they obtain is not so varied as that of a general engineer. After I went to the drawing office I had three years erecting work, so that I got the whole branch of the work right from the beginning to the end.

As Mr. Jefferis said, the modern boy as a general rule wants to keep a clean shirt—that is right to a certain extent. He does not want to get amongst the grease and dirt, and wants to be away at five o'clock from the bank or office. I do not think that I could say anything more, only to thank Mr. Sealy for his very excellent paper, and I have great pleasure in moving him a very hearty vote of thanks.

Mr. Jefferis,—

I second that.

Chairman,—

It has been moved by Mr. Herring, and seconded by Mr. Jefferis that a very hearty vote of thanks be tendered Mr. Sealy. What is your pleasure? Carried.

Chairman,—

I wish to announce that the members of the Executive are requested to wait after the close of this meeting.

The gentleman who promised to give us a paper at the next meeting will be unable to do so, but Mr. Herring has kindly consented to jump into the breach. I have not got the subject

yet, but you will all be notified in due course. I think Mr. Herring deserves the thanks of the members of the Club for doing this. We are all right for the rest of the meetings for this year, at least we hope so.

I suppose we will soon have to be thinking about a social evening, but that will have to be left to the Executive Committee to decide.

Our secretary has written me a few remarks here, one of which is about the dues. I do not think our Secretary tells us about this every night for the sake of those who are present, but with more of the idea of getting it into the book, so that those who do not attend the meetings can see it.

Secretary,—

There are a good many dues outstanding, and I keep on sending out tracers. Of course we keep getting a few dollars in, but I am always ready to take the money.

Chairman,—

If there is no further business will some one move that we adjourn.

Moved by Mr. Wright, seconded by Mr. Taylor, that the meeting be adjourned. Carried.