

liability. It is purely an educational society, and the members spend their own money in educating themselves. An engineer can save his employer much money, and he is entitled to a share of that, and indeed, sometimes gets it. Since the object of the association is to educate engineers up to this point, we should leave no stone unturned to secure the membership of capable men, who are interested in the object. Too many men get interested for a time, and then fall out. He thought that the best way to secure interest in the general meetings would be to get live secretaries. Those who have acted have done their best, but it has been for love. Why not pay the secretary a little for his trouble? This would considerably strengthen his hands. There are 4,000 engineers in the Province of Ontario, but they are so scattered that it is difficult to get them together. Many of the towns have so few plants that there are not enough members to make a branch and rent a room. From the successes that we have made in educating young men we should naturally think that we have more good men in the organization than appear. It takes money to run a branch, and the secretaries are sometimes to blame for not looking after the subscriptions. Then the Executive secretary should keep in close touch with all the branches by writing to them every month and telling them of the progress made by other branches. We could start a set of questions to be sent to all the branches. An extra movement should be made this year to interest steam-users in the coming legislation. This could be done by inviting them to the local meetings.

As the papers to follow were likely to initiate discussions he would now give way to them.

G. B. Risler, of London, then read his paper on "The Use of the Indicator," followed by Vice-President Philip's paper on "The Use of the Tower for Condensing Purposes." Having finished reading the paper, Vice-President Philip added that he recently had the pleasure and profit of installing a cooling tower. When you have to buy water for feeding the boiler the cost renders it out of the question. Then the cooling tower is an advantage. One is used at O'Keefe's brewery. Water is pumped to the top of a tower, which has some filling, wood, tile, or wire, which spreads out the water in falling. The temperature is thus reduced, and the water can be used again. The process evaporates a certain amount of water, and this produces a reduction in the temperature of the surrounding air, which will condense another pound of water. The plant that he was most familiar with was of 500 h.p. capacity. It is a surface condenser. It has 6,400 ft. of tubing, and 1,600 stuffing boxes. The tower is 19 ft. high, and the filling is 11 ft. long. The water goes up at a temperature of 120 deg., and when it reaches the bottom of the tower it is at 68 deg. This is a subject of vital importance to engineers, for as the coal bill keeps creeping up, condensing is one of the best ways of reducing the quantity of coal.

W. F. Chapman: Is the plant expensive?

Vice-President Philip: The tower, piping and condensing cost \$7,000. Where there is a yard a jet condenser can be used, and thus lessen the cost.

H. McKay: How long does it take to show the saving?

E. J. Philip: The saving is a net 15 per cent. on the coal bill.

H. McKay: What is the loss of water during evaporation?

E. J. Philip: There is an overflow of water from the top of the tower all the time. But with the cooling tower you can use less water than when not condensing.

J. Murphy: Is not a simple-acting pump much more economical than a duplex?

E. J. Philip: A simple-acting vertical bucket pump is, because the valves close so rapidly. The ordinary horizontal pump is the least economical.

J. Murphy had had some experience with both vertical and horizontal pumps. The vertical in these cases were under some disadvantage certainly, but he had more trouble with the vertical than with six or seven horizontal. His was a Blake condenser.

E. J. Philip: That must be an exceptional experience.

J. J. York hoped that in the near future Bro. Philip would let them have some accurate data on the saving. He did not at present see much saving. Manufacturers must see a larger saving than 15 per cent. before they would lay thousands of dollars in a plant. What is the chief injury to boilers using copper tube condensers?

E. J. Philip: The best evidence is that given by the Brit-

ish Admiralty reports on the British war vessels. The chief trouble was corrosion. In some boilers it eat out along the seams, and sometimes all along the boiler.

J. J. York said he used a great many copper feed pipes and never noticed any matter in the boiler.

E. J. Philip: Well, you don't get much copper piping now. It is not pure copper, and has much brass in it.

J. Robertson, on being asked for his experience with copper piping, said it was with a cooking apparatus run by a small locomotive boiler. He noticed that after two or three months the boiler began to pit. He concluded that the copper had something to do with it, so he ran the water into the sewer and found no more pit. He asked would Bro. Philip use the condensing tower in the winter.

E. J. Philip: Yes. Though it is slightly more costly.

J. J. York moved, and J. Murphy seconded, a vote of thanks to the readers. This was adopted and conveyed.

The discussion on the recommendations of the Committee on the Good of the Order was then resumed.

Chas. Mosely proposed, and J. C. Mooring seconded, that the conventions be held bi-annually. J. Robertson sympathized in many ways with the proposal, but two years was too long. A quorum would not be obtained after so long an interval. J. J. York agreed. Each year the attendance is less satisfactory. As it is, there is not enough business done. It would be better to continue as they were. He was much in favor of a paid secretary with defined duties, for this very reason, C. Mosely moved and J. C. Mooring seconded, that the conventions be held bi-annually, unless the laws now before the Ontario Legislature be passed this session. Motion lost.

During an interval the Committee on Mileage presented their report. The actual sum expended was \$191.55. The adoption of this report was moved by A. M. Wickens and seconded by C. Selby. The secretary's and treasurer's report showed the finances to be in a very healthy condition, having a larger balance than in any previous year. The adoption of this was proposed by J. C. Mooring, and seconded by J. Murphy.

President Devlin, who had returned to the chamber, proposed a vote of thanks to the Royal Oil Company, who had presented the C.A.S.E. with the sum of \$10, per D. Reeves. J. Robertson then presented the auditors' report. Everything had been found satisfactory, and the book-keeping a credit to the organization. Its adoption was proposed by J. J. York and seconded by J. Huggett.

President Devlin then brought up the question of the souvenirs. This, it will be remembered, was to take the form



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of an engineer's pocketbook. Letters were read by the secretary from two or three publishing firms who had been invited to tender for the same. E. J. Philip moved, and J. Murphy seconded, that this matter be left in the hands of the Executive. and that it is expected to have taken practical form by the next meeting.

J. J. York moved that the present secretary, F. W. Chap-