

however, that very few of the members would come down there. He thought the organization was hardly large enough yet.

Mr. Taylor thought the association would gain strength by going to Montreal, that a great many additional members would be secured by a visit to that city.

A. A. Wright was in favor of going to Montreal. That city had in connection with McGill College one of the finest, if not the finest electrical department on the continent of America.

Mr. Kammerer thought some consideration was due to the Montreal people for the interest they had evinced in the Association, and even if it did cost a few dollars more he was sure all would be well repaid for the extra expenditure.

Mr. Merrill said it would be two years before the plant at Niagara Falls would be in running order, perhaps three years. It would, he thought, be better to wait until a later period than next year for holding a convention there.

W. A. Johnston thought it would be better to hold the meeting in Toronto. There were a great many electric light men who had not taken the active interest in the Association that they ought, and the principal following of the Association was from Ontario.

Mr. Starr thought if the meeting was held in Montreal a great many Montreal people not now included would become members. Three conventions had now been held in the west, and he thought a meeting held in Montreal would result in the addition of more members than if another took place there.

F. Thompson said there was a little Electric Club of 25 members in Montreal, who, if the meeting were held there, might join in body. He thought the meeting ought to be held in Montreal next year, and after that at St. John, N.B., and the membership and influence of the Association would in that way be extended all over the Dominion.

The President then put the amendment—that the next convention be held at Niagara Falls. The amendment was lost.

The motion, that the next convention of the Association be held in Montreal, was carried almost unanimously.

Mr. L. B. McFarlane then read a paper on the "History of the Telephone in Canada," which will be found elsewhere.

Upon the completion of the paper, Mr. McFarlane explained that much of it had been written from memory, but that after he sent the manuscript to the Secretary he had met Professor Bell in Montreal, and had questioned him on some of the points dealt with in the paper, and had been told that as a matter of fact he and his uncle, Professor David Bell, worked the first telephone line between Brantford and Paris, that is the first practical telephone working any distance. At that time they did not know how they could work long-distance lines, and Prof. Bell went up to Paris and borrowed the lines of the Dominion Telegraph Company, taking with him a few large resistance coils, and by inserting these he found what would make a workable telephone. He said that was practically the first workable telephone line they had. It was a private test—not made publicly—and it was quite successful, although the battery was at Toronto, some sixty or seventy miles away.

K. J. Dunstan thought the thanks of the Association were due to Mr. McFarlane for the paper just read, which, valuable as it now was, would become more so as a record of facts in connection with the invention of the telephone.

Mr. Thomson asked in what year the experiments were made.

Mr. McFarlane stated it was in September, 1875, when Prof. Bell's home was at Brantford.

Mr. Thomson said he believed Prof. Bell gave his first public exhibition of the telephone in the United States, in September, 1876, in Philadelphia during the Centennial.

Mr. Kammerer seconded the motion for a vote of thanks to Mr. McFarlane, which was then carried.

The next item on the programme was a paper by E. B. Merritt, on "The Education of the Electrical Engineer." This paper will appear next month.

Mr. Nicholls having been asked to make a few remarks upon the paper just read, proposed a vote of thanks. Mr. Merrill had evidently considered the matter from the point of view of the student or university graduate. He could quite understand, indeed he had met with the same difficulties in his own business, that a student after having spent a long time at college in a scientific course, felt considerably at sea on going into employment at such an office as the one of which he was manager. They had received a valuable theoretical training, but they were completely at a loss until they had received that practical training which alone would enable them to fill the office of superintendent or to guide the progress of an electrical enterprise. It would be interesting, he thought, to hear from Prof. Rosebrugh, whose presence he noticed in the room, as to the full extent to which the electrical course was carried in

the School of Practical Science. In the company with which he himself was connected they had a student course, lasting from eighteen months to two years, during which time the student passed through every department of electrical industry, and not only in the machine shop, but in practical operation and construction on the road, because they had to spend at least three months on outside construction; and by the time they were through with that course they generally were capable young fellows. If they had had previous training in the School of Practical Science, the university, or some other technical college—the practical course was very much simplified, because they commenced with an understanding of the principles, and it was well known that where the principles are not understood of any mechanical piece of work, it is much harder to gain a proper appreciation of the undertaking.

Geo. Black said that the paper was one to which he had looked forward with a great deal of interest, and the subject was one which he thought would engage a very large share of attention on the part of members of the Association. Some three or four years ago, he had begun the collection of the calendars of the different technical colleges which engaged in teaching electrical engineering, and he had been very much struck by the difference between the various courses, no two of which exactly agreed; in fact some were very wide apart, and no two agreed upon the necessary qualifications for entering the college. There were great differences in the workshops and apparatus possessed by the different colleges. In some a fair knowledge could be obtained of the rules and working apparatus connected with engineering; others unfortunately were deficient and had no apparatus whatever, nothing even of a repair shop. Our own School of Practical Science had adopted a middle course; it supplied considerable apparatus for testing purposes, but there was no machine shop. It was thus a very difficult matter to decide from the calendars which college to attend. The courses after entering were also very wide apart. The essay stated that Lord Kelvin had laid down the rule that the electrical engineer should be nine-tenths mechanic and one-tenth electrician. Some reversed this, and held that he should be eight-tenths electrical and two-tenths mechanical. He thought the discussion of these papers at the conventions, and the consideration of them by members between the conventions, was very useful to the profession at large. Here in Canada we had two special schools for training, one at McGill College, where they have recently adopted a mechanical or workshop course, and one in the City of Toronto, where they give theoretical training and provide testing machinery, etc. Members of the Association who wished to send their young friends to these institutions would have to study the two systems up and choose between them.

Mr. Galt said he had no doubt in his mind that the question of educating electrical engineers should be from the theoretical standpoint followed in the colleges. There was danger in introducing into the college work manual or machine work. He doubted the desirability of colleges taking up this practical branch, and held that it was wrong to inculcate the idea that young students were able to gain at colleges both a theoretical and practical knowledge. The tendency of the present age was to specialize as much as possible, and he thought one who desires to become proficient as an electrical engineer should not devote two years to acquiring a smattering of mechanical engineering, or any other branch of engineering. In cases where he desires to avoid blunders the electrical engineer should rely on some expert mechanical engineer if it was a matter of a mechanical character that was being dealt with. He thought that course would be much better for all parties. He was not inclined to agree with Lord Kelvin's dictum, that the electrical engineer should be nine-tenths mechanical and one-tenth electrical. He believed that the electrical engineer must be largely electrical, having sufficient mechanical knowledge to enable him to appreciate the necessity of seeking expert help to keep him out of trouble in that branch.

A. A. Wright asked—"What do you send your boy to College for anyway, what are you going to do with him? You send him there so that he may earn a living. The question is, when he comes out of college, what is he going to do." A man who lived in England wanted one kind of an education, and a man here in Canada another kind. Here in Ontario it was necessary to know a great deal about everything. At the present time it was necessary for a man to know a great deal about everything. He needed to be able to go into an electric light station and take charge of and handle the plant and run a dynamo, and to know a good deal about everything. He thought the proper course was to send a young man to the high school until he knew a great deal about mathematics because he could not get along in electrical studies without that knowledge. Then he should learn French, because it would be of great service to him by enabling him to read