CANADIAN SOCIETY OF CIVIL ENGINEERS, OCTOBER 7th MEETING.

Interesting discussion followed the paper on Stave Falls power development which was presented before the Canadian Society of Civil Engineers at Montreal, October 7th, by R. F. Hayward, general manager of the Western Canada Power Co., Limited. A summary of Mr. Hayward's paper appeared in *The Canadian Engineer*, October 7th issue. R. A. Ross, consulting and electrical engineer, Montreal, spoke concerning the difficulties encountered in the Stave Falls work, and Mr. J. C. Kennedy, consulting engineer, Montreal, who had charge of the preliminary work done by the Stave Lake Power Co., told of some of the storage problems encountered.

Walter J. Francis, who presided at the meeting, stated that the papers presented to the Canadian Society of Civil Engineers regarding water power developments, were greatly increasing in number, in interest and in value. In looking through the records of the Society, he found that Mr. R. A. Ross had said in 1898 that electrical engineers were beginning to think over long distance electrical transmission; that in 1894 no such plants had been constructed, but that by 1898 a few plants had been built, and that more would undoubtedly follow. In view of the developments undertaken in every portion of Canada, it is remarkable what rapid strides this branch of engineering has made, when one recalls that the subject was discussed in the above manner so recently as only seventeen years ago.

Mr. Hayward, in reply to a question, stated that the cost of the Stave Falls plant would be \$72 per h.p. when the four units will have been completed and the dam raised to full height. Of this amount, the storage works cost \$25 per h.p.

Only two units are installed now. The power house will be extended and two more will be added. The third unit will likely be installed this season, but the fourth unit will probably not be installed for some months yet.

The third turbine is in Customs at Vancouver, and the fourth has been constructed but has not yet been shipped from the Escher-Wyss works in Switzerland.

The plates for the third and fourth penstocks are in Vancouver. These plates were brought from Scotland and laid down in Vancouver at a cost of 2 cents per pound. The structural iron work for the extension of the power house is on the ground at the plant.

Mr. Hayward stated that rapid advances had been made during the past few years in water turbine design and construction. The horizontal double runner turbines which they have at Stave Falls, although built only a few years ago, have an efficiency of only 83%, but at the time these were constructed that was considered excellent. The vertical single runner turbines at Cedars Rapids, however, have an efficiency of 90%, which represents so great a saving as compared with the turbines at Stave Falls, that the latter may some day have to be modified.

Regular Meeting, October 14th, 1915.

For nearly two hours Mr. J. A. D. McCurdy, the aviator, held the rapt attention of a very large and appreciative audience at the headquarters of the Canadian Society of Civil Engineers, 176 Mansfield Street, Montreal, at a meeting of the General Section on the evening of the 14th instant. In introducing the speaker, Mr. Walter J. Francis, who presided, said that the thrills of satisfaction which the United States and particularly Canada felt when Mr. McCurdy made his famous flight from Florida to Havana in 1911 were no greater than the thrills of satisfaction which now exist in Mr. Mc-Curdy's success in the training of aviators at Toronto for service with the Allies, mentioning the fact that already fifty-three of Mr. McCurdy's graduates have crossed the ocean, and all have been accepted.

In opening his address, Mr. McCurdy gave a brief historical sketch of the efforts of man to navigate the air, concluding that the first scientific interest was aroused only when Professor Langley and Mr. Chanute showed their great interest. Following on, he traced the dedevelopment of the science through the preliminary flights of the Wright Brothers and the efforts of Alexander Graham Bell, which resulted in an association that included Mr. Baldwin, Mr. Curtiss, Lieutenant Selfridge and Mr. McCurdy. After describing in a general way the machine used in the Havana flight of 1911 with a lifting capacity of 140 pounds, Mr. McCurdy went on to describe the biplanes now being built by the Curtiss Aeroplanes and Motors, Limited, for Great Britain. These biplanes weigh about three tons and have a lifting capacity of over 2,000 pounds. They can fly at 86 miles an hour and are capable of rising to a height of 4,000 feet in 9 minutes. Provision is, of course, made for gun mounting, wireless and all the latest devices. The most recent engines are of the fixed base, 8-cylinder, 5-in. x 7in., water-cooled, V-type with a capacity of 170 h.p. each. Two such engines are fitted in each machine. These engines have largely replaced the well-known re-volving cylinder, air-cooled, Gnome type of engine where power in excess of 80 h.p. is desired, owing to the difficulties in cooling large Gnome engines. Attempts have been made to place two Gnome engines side by side on the same shaft giving a maximum of 160 h.p., but the newer type is simpler and more powerful. An interesting fact is that the engines now in use weigh less than four pounds per horse-power of capacity, which is a most remarkable development in engine construction.

In concluding, Mr. McCurdy expressed the view that on the conclusion of the war the hydroplane, owing to its speed and convenience, would become popular as a pleasure and sporting craft. The school of flying at Toronto, now about to be moved to Bermuda for the winter season, is the largest school of aviation in the world. It is equipped with nine machines in charge of seven pilots. Three hundred students are now enrolled. Candidates must be British born and are accepted between the ages of 18 and 30, after passing a rigid medical examination and the approval of authorized officers of the British Admiralty and Navy. The beginners are first taken in hydroplanes and the course is completed in the regular land machines. When the pilot considers the student fully qualified the student is subject to a rigid performance examination by officers of the Army and Navy. He is required to take a machine by himself and describe a figure eight five times around two fixed points on the ground, at the conclusion of which he must alight within 150 feet of a predetermined point. He is then required to immediately repeat this performance. Next he is called upon to rise to a height of at least 350 feet, shut off his power and glide to the earth, alighting at a point within full view of the observers. It is interesting to note Mr. McCurdy's statement that no accidents have occurred at the school. Mr. McCurdy prophesied that one of the results of the war would be the giving to Canada of an efficient corps of trained fliers such as will be possessed by no other country.