African war. Two others-Major Cartwright, R.E., and Lieut.-Col. Kirkpatrick, D.A.Q.M.G.-are now in the Halifax garrison, and a fifth is Sir Percy Girouard, the famous Canadian engineer who has distinguished himself in South Africa. After leaving college Mr. McCall went into railway work, and was employed on various provincial railway surveys. His first important work was in the construction of the C.P.R. short line through Maine, in which he was associated with his class-mate, Girouard. He was subsequently in charge of the Middleton end of the Nova Scotia Central Railway, and resigned that position to become



Roderick McCall, Provincial Engineer, Nova Scotia.

engineer for the New Glasgow Iron, Coal & Railway Company, now the Nova Scotia Steel & Coal Company. In 1890 he became Deputy Provincial Engineer, in which position he gave such satisfaction that in 1902 the duties of the Engineering Department were divided, and Mr. McCall was given entire charge of the roads and bridges of the Province, with the title of Assistant Provincial Engineer, while Dr. Murphy retained control of the railways. At the last session of the Legislature provision was made for the superannuation of Dr. Murphy with an annual allowance of \$2,000, Mr. McCall's salary being \$3,000. He has made a special study of bridge and highway construction. Last summer he made a tour of the Good Roads States of the Union, and investigated the methods there employed. The results of his investigations were embodied in a valuable report presented to the Legislature, and indirectly led to the appointment of C. C. Coutlee, C.E., of Aylmer, Quebec, as Good Roads Instructor for Nova Scotia. In addition to his valuable work in connection with the construction of bridges in this Province, he made a survey in 1890 for the proposed widening and deepening of St. George's Harbor, Bermuda, and in 1894 visited the New England States to report on the two-foot gauge railways in operation there.

AN EMERGENCY BRASS FURNACE.

While visiting a small repair shop and foundry recently. the writer saw a small brass furnace that was characteristic of the place. They started to build a furnace for using crude oil as fuel, but before the furnace was completed a hurry-up order came in for a heavy brass casting. There was not sufficient time to send to the nearest foundry, so a half-finished furnace was hurried into condition for a coal fire and charged. An air pipe for furnishing blast to the furnace had already been placed in position and the shell was simply placed over this and lined with fire brick, the fire was started and anthracite coal packed about the crucible. The blast was then turned on, and in an unusually short time the metal was ready to pour. The results were so satisfactory that all thought of further improvement was abandoned and the furnace is still in use as it was so hurriedly pressed into service. A description of the construction of the furnace may be of interest to others who require some device for melting small quantities of brass occasionally. Fig. I shows a section of the furnace. It

consists of an outer shell A, lined with firebrick, as shown at C. The bottom of the furnace is all composed of firebrick. The cast iron cover F is provided with an iron handle G. The products of combustion escape through nicks cut on the edge of the brick work, as shown at H. Dimensions are shown on illustration. The blast is taken from a small centrifugal blower which supplies the blast for the forges



Fig. 1.-An Emergency Brass Furnace.

in the smith shop, and is introduced through a one and onequarter-inch pipe, shown at G. This pipe extends about four inches above the bottom of the furnace. The fuel consists of anthracite coal of about grate-size. A bed of about 8 to 12 inches thick, depending upon the charge to be melted, is placed in the bottom of the furnace and the crucible E, set on top of it; coal is then filled in around the sides of the crucible up to the top, as shown. Fig. 2 shows



Fig. 2.—An Emergency Brass Furnace.

the general appearance of the furnace as installed in the shop. The crucible can be seen standing at the right and the cover at the left.

Charges of from 200 to 350 pounds can easily be melted in this furnace and by having a second crucible charged, ready for introduction into the furnace as soon as one is removed, it is possible to melt from three to four charges in succession. In the latter case the coal filled in about the first crucible falls down to form the bed for the succeeding one.—C. B. A. in Foundry.

-A party from the British Antarctic expedition ship Discovery penetrated to the 82nd degree in December, 1902. This is the most southern point ever reached.

-By arrangement with brown, Boveri & Cie., electrical engineers, of Baden, Switzerland, the Crocker-Wheeler Co., of Ampere, N.J., have secured their alternating current designs, patents and rights to manufacture in America, and have retained them as consulting engineers.