

a novel and effective contrivance for dividing the final ground sample.

The hot blast system, designed by Mr. Kiddie and only lately introduced, was carefully examined. In the operation of this system, which is based upon the principle of long travel of the air at comparatively low temperature, as against the short travel at high temperature in the ordinary hot-blast stove system, the waste heat of the blast furnace is utilised in heating the air blast. At the time of the visit Mr. Kiddie's system had only been a few days in practical use, following earlier experiments on a small scale, but it had already demonstrated its effectiveness, the visitors having been informed that the advantages gained included a substantial reduction in the quantity of coke used, an increase in the proportion of raw ore charge in the smelting, and a general betterment of conditions in the blast furnace. Further, a cleaner slag was being produced than when cold air blast and more burnt ore were being used. Several improvements in details of the furnace fittings were also noted.

The water-jacketted furnace is 42 by 120 in. at the tuyeres, of which there are 14 of about 6 in. diameter. There are two water-jacketted fore-hearths. The slag is granulated by water. A brick dust flue, 8 ft. by 11 ft by 165 ft. long leads to an iron smoke stack 7 ft. diameter and 90 ft. high. The engine and boiler-house is 60 ft. distant from the smelter building. An 80-h.p. return tubular boiler supplies steam to a 14 by 36-in. Reynolds-Corliss engine which drives a No. 7 Connersville blower and, by means of a rope drive, operates the matte crushers and elevators in the smelter. A separate 17-h.p. engine runs a 200-light dynamo for electric lighting the works and offices.

The inspection of the works having been concluded, an adjournment was made to the grounds adjoining the manager's house, where the visitors were introduced to Mrs. Kiddie. Here, in a gaily decorated marquee on the lawn, a similar bountiful luncheon to that provided for the mine contingent, was served. The keen appetites of the numerous guests having been satisfied, Mr. Kiddie proposed the health of the King and President Roosevelt, speaking in this connection with feeling of the loss of ex-Secretary Hay, whose death was deeply felt by the British as well as by the Americans. Capt. Hunt responded in a felicitous and well-received speech. The Mayor of Ladysmith, Mr. J. W. Coburn, then extended a civic welcome to the visitors, expressing the hope that the trip of the party of distinguished mining men might not be without benefit both to themselves and the sections they visit. Of Ladysmith he spoke hopefully. Col. Rowe next sang "Ten Million Miles Away," and Major Leydecker proposed a toast to the ladies. Col. E. G. Prior spoke eloquently of American and Canadian institutions, making reference to the fact that there was good feeling between Canada and the United States. Speeches were also made by Colonel Rowe, Dr. Struthers and W. F. Robertson, provincial mineralogist, the last-mentioned speaking with confidence of the future of the mining industry in British Columbia.

After the health of Mr. Kiddie, and success to the

Tyee Copper Co., had been drunk, the gathering dispersed. Later afternoon tea was served, and then the return trip to Victoria was begun. At Somenos the visitors to the mine were taken on the train, and a quick run was then made to Victoria. At the railway station hearty cheers were given in acknowledgment of the generous hospitality of the Tyee Copper Co., and the kind courtesy and attention of Mr. Livingston and the mine and smelter officials.

#### THE DEUTSCHMAN CAVE, NEAR GLACIER.

On Wednesday morning, July 5, the business session of the Institute was resumed. This was opened by a very interesting address by Mr. W. S. Ayres, of Banff, Alberta, on the Deutschman cave, at Ross Peak, near Glacier, and about 10 miles on the British Columbian side of the boundary line between this province and Alberta. A preliminary examination of this cave was made five weeks previously for the Dominion government by Mr. Ayres, who took a number of photographs, both of the cave and the neighbouring mountains, canyons, and creeks. The address was illustrated by limelight views from some of the photographs, and an excellent idea of the physical conformation of the locality, and of the wild beauty of the scenery was thereby conveyed. Mr. Ayres' examination was made in company with Mr. Chas. H. Deutschman, the discoverer of the cave.

In the lengthy report made to the government, Mr. Ayres described the ascent to the cave as an arduous climb along a steep mountain side, over rock, snow-slides, and through a tangle of black alders. The ascent is 1,900 ft. above Ross Peak water tank, and 8,000 ft. distant from the railway. The report continues:—

"Pools of water, more or less filled with ice, were encountered, which greatly impeded our progress, and finally a very deep one at a distance of 237 ft. from the surface barred further progress until a raft could be prepared. Retracing our steps to the surface we sought an entrance in the canyon by means of a rope. The passage was about 70 ft. below the natural surface and about 100 ft. above the bottom of the canyon was very small and blocked with ice. I have designated this opening as 'Entrance No. 3.' Here, by crawling on hands and knees and then descending a steep narrow water groove for about 50 ft., the brink of a very large cavern was reached that was estimated to be about 256 ft. deep, but its length and breadth, owing to their extent and the insufficiency of the lights at hand, were inestimable. It was observable that several openings led off from this great cavern. The plunge and roar of the great waterfalls somewhere down in the depths of the cavern reverberated in every inch of space and produced in the listener sensations so weird that those who have not elsewhere met its counterpart are at first startled.

"No further attempt was made at this time to explore the cave at this entrance, for the reason that the 300 ft. of rope sent by Mr. Ford, resident engineer of the C. P. R., for our use had not yet been brought up from the water tank. On the following day another obstacle presented itself. The rapidly melting