be held in Winnipeg, jointly with the G.A.C. The date for the Winnipeg meeting will be either the end of August or the beginning of September.

The possibility of annual field trips, midway between annual meetings, was discussed, and obtained general approval. A Field Trip Committee was constituted to investigate this proposal, Dr. W. Petruk was named Chairman.

The technical sessions were held on 31 August to 2 September at Queen's University. The abstracts of papers of a mineralogical nature are given below. Seven field trips were held before and after the technical sessions, all open to members of the M.A.C. Particular thanks are due to the field trip leaders, W. Petruk, J. Gittins, D. H. Gorman, H. R. Wynne-Edwards, J. M. Moore, G. Perrault, and others who assisted, for their success.

The M.A.C. Annual Dinner was held at 6:30 p.m. on Thursday, 31 August, at the La Salle Hotel. The many members and their wives in attendance enjoyed the excellent buffet dinner, and the interesting address given by the Past-President, Dr. M. H. Frohberg. The President presented scrolls to the three Honorary Life Members, Dr. L. G. Berry, Mr. S. Kaiman and Mr. H. R. Steacy, and awarded the Centennial Prize to Dr. E. H. Nickel. The co-authors of the award-winning papers, Miss E. Mark, Mr. J. F. Rowland and Mr. D. J. Charette were given honorable mention.

Those in attendance at the Kingston meeting were provided with a fine social program as well as the technical sessions and the field trips. All registrants were invited to the Annual Meeting Dinner, held on Friday evening, 1 September, at the 401 Inn, sponsored by the Government of the Province of Ontario.

PRESIDENTIAL ADDRESS

M. H. FROHBERG (President, 1966)

Mr. President, Honoured Guests, Ladies and Gentlemen:

In addressing you tonight, I must confess that I feel under a great handicap. Those of you who attended last year's meeting at Halifax will remember that Professor Moorhouse, my predecessor, gave his speech in the form of elegant rhymes. I find myself unable to express myself in such high flying style and have to resort to simple prose. I admit that on my professional travels I have been many a time on the back of a horse or mule, but I fully realize that I would cut a poor figure trying to mount Pegasus, the mythical flying horse of the poets. Fundamentally, I am merely a simple mining engineer who became enamoured with minerals. This happened to me before mineralogists came up with the great idea of getting the public at large interested in mineralogy, thus starting countless laymen on a rampage of mineral collecting. Due to this formidable enthusiasm, mineralogy professors and museum curators are now facing stiff competition in their efforts to acquire mineral specimens. In a way, this ever-growing interest of the laymen reminds me of Goethe's poem *The Sorcerer's Apprentice.* According to the story of the poem, the master sorcerer—before leaving his place—instructed the apprentice to fetch water for his bath from a nearby creek. Having picked up some of the magic formulas from his master and being loath to do the carrying, the apprentice decided to convert some old brooms into servants and ordered them to bring water from the creek. To the apprentice's surprise, the magic formula worked, and soon the broom-servants were busy carrying water from the creek to

the sorcerer's house. In no time at all, the bath tub was filled, but then to his horror the apprentice realized that he did not know the right magic words to stop the brooms from carrying more water. Very soon, the sorcerer's place was inundated and the water began to threaten the whole neighbourhood. In his desperation, the apprentice expressed his concern with the often quoted words: "The ghosts I called, I can't get rid of them". The comparison with the plight of the mineralogists ends here because Goethe's poem has a happy ending. The master sorcerer returned in time to speak the right magic words before the whole country was drowned.

However, my personal concern is not so much about the overwhelming enthusiasm of the amateur mineralogists and collectors but about the lack of interest in mineralogy of many members of the mining profession. Having received my training as a mining engineer at the old Mining Academy Freiberg in Saxony, where mineralogy for more than 200 years has been treated as a very important subject in the training of mining students, I have oftened wondered why so many mining engineers as well as geologists in this country and in the United States show a deplorable lack of interest in this branch of science although minerals in a manner of speaking provide their bread and butter. This attitude seems strange if we consider that as late as the middle of the eighteenth century before mineralogy and geology were officially taught as academic subjects, all mineralogical knowledge was the privileged heritage of the mining fraternity. At that time only about one-tenth of the now recognized mineral species was known and in many cases the chemical composition and physical properties of this fraction were far from being understood. By all accounts most mining men in those days were keenly interested in finding out something about the nature and possible usefulness of the many unknown minerals occurring in close association with the then identifiable species. Similarly, men in charge of mining operations during that period made serious efforts to explain how minerals were formed and what governed their deposition. Considering this background it is not surprising that some of the well known early mineralogists such as Breithaupt, Daubrée, Mohs, Naumann and Weisbach originally studied mining or in some way were connected with the mining industry.

Since those early days, mineralogy and the technique of winning minerals from Mother Earth have made remarkable progress and in doing so appear to have drifted apart. Mineralogy has added to its scope several specialized fields such as crystallography, petrography, and geochemistry which have advanced our knowledge of minerals and rocks, but are perhaps of less interest to the mining engineer of today. The question arises as to whether today a knowledge of minerals is an asset to the average mining engineer. Some managers of established mining operations are inclined to belittle the value of mineralogical training and indeed in many mines the mineralogical character of the ore offers neither problems nor inspiration to the mining engineer or geologists. In case of trouble with the ore, the mine manager is apt to remember his dear old mineralogy professor and ship some of the nasty stuff to him for free advice. As an alternative he may try to enlist the help of the Government or of a private research laboratory. More recently, several large mining companies have established their own research institutes which include full-fledged mineralogists among the scientific staff.

While it may be argued that a mining engineer on the staff of an operating mine is not likely to find much opportunity for applying his mineralogical knowledge, there is little doubt that a solid grounding in mineralogy is indispensable for anybody active in mineral exploration. This applies to mining engineers as well as geologists. It is a fallacy to believe that a field man with a poor knowledge of

minerals is just as good as an expert, since theoretically the former, if in doubt, can always take samples and have them assayed later on. The point is that an exploration engineer hundreds of miles out in the bush generally takes samples only of what he considers worth assaying. From my own experience I can assure you that there are definite limits to what a man in the bush can carry on his back or what he can transport in a canoe or a bush plane. In general the field engineer is expected to give the assayer instructions on the sample slips, for what chemical elements his samples are to be analyzed. Unless imbued by sufficient natural curiosity, the exploration man may feel tempted to neglect minerals with which he is not familiar. In this connection, I should like to mention two classical examples which show that insufficient knowledge of minerals combined with a lack of curiosity can prove to be quite costly.

My first story concerns the well known uranium veins of the former Eldorado Mine at Labine Point on the east coast of Great Bear Lake. The occurrence of cobalt and copper ores on the east shore of the lake was noted and briefly described at the beginning of this century by G. M. Bell of the Geological Survey of Canada. In 1927 an exploration party of Dominion Explorers Ltd. which was looking for gold in the general region examined the vein outcrops at Labine Point. According to a personal communication of one of the members of the expedition, some of the group which included several mining engineers, recognized the pink cobalt bloom and the various shades of green due to coatings of secondary nickel and copper minerals. However, nobody was able to identify the bright-yellow and orange-colored efflorescences which coated and veined an equally unknown pitchblack mineral. And nobody was curious enough to take a sample of the unknown minerals, presumably because the main object of their expedition was a search for gold deposits. By an irony of fate the explorers returned to civilization empty-handed, after close to two million dollars had been spent in a fruitless two-year search for gold. By coincidence I saw in the Fall of 1929 two impressive specimens of pitchblende beautifully coated yellow and orange which an, at that time, unknown prospector by the name of Gilbert Labine, had sent to Mr. Hugh S. Spence of the Bureau of Mines in Ottawa with a request for identification. According to some sources, Gilbert Labine knew from the start that he had found pitchblende, which would seem remarkable for a simple prospector in those days. If not, Mr. Labine deserves a lot of credit for his curiosity, which netted him a fortune and the reputation of one of Canada's great mine finders.

My second story is of a more recent vintage and is about the discovery of North America's largest tungsten deposit, at Flat River in the Northwest Territories close to the Yukon border. Owned and operated today by the Canada Tungsten Mining Corporation Ltd. this scheelite deposit had been explored previously in the late Fifties by another company for its content of chalcopyrite, which occurs in the Flat River deposit in disseminated form in flat lying bodies of pyrrhotite. The sulphides were found to be accompanied by minor amounts of white to greyish gangue minerals to which nobody paid much attention. Since diamond drilling results failed to indicate sufficiently high copper values for a mining operation in this remote region, the earlier company ceased further exploration and abandoned its option. A short time later a mining student who had found summer employment at the exploration project, recognized scheelite (in the laboratory) as one of the inconspicuous gangue minerals accompanying the sulphides. As it turned out, the first company missed out on the opportunity of being the owner of Canada's only tungsten mine, after having spent a considerable amount of money in the search

for copper. Insufficient knowledge of minerals or, if you wish, a lack of curiosity accounted for their disappointing and costly experience.

As a positive case, I should like to mention that it was due to natural curiosity and interest in minerals, that the presence of pollucite was recognized in the large pegmatite deposit at Bernic Lake, Manitoba, now owned by Chemalloy Minerals Ltd. Examining drill cores at the property my good friend Dr. Dick Hutchinson was not satisfied that a partly translucent, partly dull greyish white mineral aggregate intersected by several diamond drill holes, represented an intergrowth of quartz and feldspar, as which it had been logged by the resident engineer supervising the drilling. Spectrographic and microscopic tests demonstrated that the material in question was pure pollucite. Subsequently additional drilling and underground exploration work showed that the pegmatite mass, apart from large quantities of spodumene, contains the largest concentration of cesium known in the world today.

I believe that these cases will illustrate the point that a practical knowledge of minerals is a valuable asset to any mining engineer or geologist engaged in a search for mineral deposits. Politicians referring to Canada's mineral wealth, like to tell us that the surface of this country has hardly been scratched. While statements of this kind have to be taken with more than one grain of salt, it is safe to predict that it will take many decades until all mineral treasures hidden in our vast northland have been discovered. In view of conditions in the hitherto unexplored regions of Canada a knowledge of geology, geophysics and geochemistry is essential in the field. Equally important is a sound training in practical mineralogy although there appears to be a tendency among mining executives and indeed among some professors to forget the usefulness of a practical knowledge of minerals.

There is no doubt that it depends upon the approach taken by the academic teacher whether or not the student preparing himself for a career in the mineral industry will take with him a life-long interest in the practical and scientific aspects of mineralogy. I was fortunate in having inspiring and enthusiastic teachers when I was a student. In closing I should like to express the hope that most of our future mining engineers and geologists now in training have the same good fortune as I did.