

trained engineer occasionally found among mining employers by whom they are sometimes unfavorably compared with the so-called "practical miner." Rule of thumb methods, however, in either mine valuation or exploratory and development work can never command success; indeed, the unschooled miner often enough realizes the value of geology and sets about acquiring such a working knowledge of its principles as will enable him to tackle the more prominent tectonic troubles met with in sinking or drifting. But men of this stamp are the exception rather than the rule, and it is clear that, *ceteris paribus*, the trained man, who brings to mining problems a sound knowledge of the principles underlying their engineering and geological aspects, not only starts with a pronounced advantage, but is enabled to assimilate practical details with far greater rapidity and certainty when once his mining career has commenced.

The feeling amounting even to suspicion with which geology is in some quarters regarded, is, perhaps, attributable to the following causes: First, there are the nonsensical reports on mines and mining prospects—such as most of us can recall—made by charlatans who, by the use of an obscure geological phraseology, seek to impose their trite conclusions on the credulity of their employers; then there are the wearisome lucubrations of the irresponsible faddist who uses the columns of the local press to ventilate his absurd geological theories. However, geology is not the only science to suffer from the ignoramus and the bore. A more serious disability perhaps lies in the employment in mining work of the academic geologist who has had no previous experience of mines and is unacquainted with mining conditions and economics. Imagine such a one—in his own province possibly a distinguished scientist—taken underground for the first time, groping his way in a murky atmosphere but dimly illumined by the miner's lamp or the glimmer of a candle, amid unfamiliar and occasionally unpleasant surroundings; imagine under such conditions his being asked to unravel the intricacies of a fault or to prognosticate the downward extension of an ore body. In fact, the lavish natural indications, which at the surface attract the attention of the geologist, tend at first to elude him when he penetrates beneath it; since there the exposures are few in number, and, such as they are, small; moreover, they are, as a rule, covered with dust, begrimed with soot or buried in mud. Even to overcome initial difficulties, such as these, is not enough; to achieve a real success the work of the miner must be followed step by step, since in his progress he effaces the facts almost as soon as they are disclosed.

Mining geology.—It must be abundantly clear that mining geology is a branch of the profession distinct from pure geology, and that proficiency in this specialized department cannot be attained without a proper training underground.

In the United States there is a growing tendency to differentiate the functions of the mining man; thus we find there an increasing use of the term "mining geologist" to designate a mining engineer strong on the geological side, or, what in practice amounts to the same thing, a geologist who has specialized in mining work. On the other hand, the term "mining engineer" is occasionally used rather in the restricted sense of a mechanical engineer who has specialized in mining machinery. Thus, Professor Munroe of the Columbia University, in contributing to the discussion of a

paper read before this institution, said the mining engineer was called upon to design machinery for mining purposes and to superintend its construction and operation. He "should be able," he continued, "to test, among other things, the efficiency of boilers, steam and gas engines, air, hydraulic and other motors, pumps and compressors, electric lighting and power plants, telephone and telegraph systems, crushing, concentrating and amalgamating machinery and metallurgical plant, and to determine in each case whether the motive power, coal, gas, water, air or electric current, is economically used and the machines and mechanical devices are working to the best advantage. Or if this is not the case, he should be able to diagnose the trouble and indicate the remedy, and determine the conditions of maximum efficiency and economy." Surely in writing this Professor Munroe must have had in mind the application of mechanical engineering to mining, neglecting for the moment its exploratory side, for it is clear that mining consists of two distinct parts: (1) The exploration and development of the ore body; and (2) the extraction and bringing to the surface of the ore, the first being essentially a problem in which geological principles are dominant, while in the second, mechanical engineering plays the chief part.

It is evident that the examination of a supposed mining field, or of a lode or ore-body on which nothing but prospecting work has been done, is essentially the work of the mining geologist; and it may also be conceded that, provided he has served the requisite apprenticeship underground, understands the art of sampling, and can gauge with some approximation to accuracy the costs of mining and treatment, the inspection of a partially developed or "young" mine may also be properly entrusted to the mining geologist.

In the case of a fully developed mine, in which the whole, or practically the whole, of the available ore is blocked out for stoping, or at any rate is developed by drifts extending from end-line to end-line at the lowest levels permitted by the dip boundary of the property, the requirements are somewhat different. Here what is wanted is not so much the drawing of inferences from the geological environment of the ore, but a correct appraisalment of the net profit obtainable by its extraction with due regard to the economic conditions prevailing. In this case, apart from the estimation of ore reserves, a consideration of the most suitable methods of extraction and treatment and questions of finance are of paramount importance. An actual apprenticeship in mine management, supplemented by a long experience of mine examination under the most varied conditions, are here the prime requisites for a successful valuation.

ALBERTA OIL COMPANIES.

Forty Alberta oil companies, incorporated since the discovery of oil in the Dingman well last week, have a total capitalization of \$35,820,000.

The Board of Trade of Grand Forks, B.C., is urging the Provincial Government to repair the wagon road and bridges between the end of the railway at Lynch creek and Gloster camp, some 30 miles or more, a contract for hauling 1,000 tons of ore from the Union mine to the railway terminus having been let.