his luck is a friendly sprite, not the grinning devil that sits by the roulette wheel. Every business involves one or more indeterminate factors and, therefore, contains an element of risk. Without risk there is no gain; but a large gain usually involves a large risk. There are people in mining, of course, that take big odds, that like reckless bet, they are real gamblers, even if they are unaware of it! but the risks taken in ligitimate mining are under some measure of control, they are met by scientific knowledge and by trained intelligence. A blend of pluck and judgment is required. You will recall a line in Kipling's poem, "The Merry Gloster': 'And I took the chances they wouldn't and now they're calling it luck.' That is why I insist that mining, properly conducted, is not a gamble. On the other hand, no man of experience in these matters would expect to escape all the risk. The idea of eliminating risk from mining is both contrary to the spirit of the business and false to the history of it. To understand mining—to appreciate the principles guiding legitimate and successful speculation in mines—which is my subject—you must revert to the old Cornish word for shareholders; they were called 'adventurers,' that is, men willing to make a venture.

"Indeed the idea of avoiding risk in mining is a pathetic fallacy; a purile endeavor to escape the inevitable. The attempt to find mines that would involve no risk to the capital sunk in them has tended to cripple the industry; the refusal of sundry so-called exploration companies to incur risk has stultified their operations and paralyzed development. And I may add that this policy has warped the judgment of some otherwise brilliant engineers. The story is told that Marcus Daly sent a mining engineer on a scouting expedition; he examined many prospects, without finding anything worth while. Daly became impatient; he slapped the engineer on the shoulder and exclaimed: 'For God's sake, man, go out and spend some money." There is too much of a desire to play safe by buying mines with large blocks of proved ore, and to make money by means of an enlarged scale of operations, increased skill, or improved methods of metallurgy. The finding of ore, which is the real adventure, is relegated to the background; it is not only the chief attraction of mining, but the one that wins the greatest reward. When the ore-reserves of a mine are at a low ebb it may be the most speculatively attractive time to buy the property. There are those who say that the mining of the future will be the economic harvesting of known ore deposits of low grade, the benefication of masses of mineral already discovered, but heretofore regarded as too refractory for successful metallurgic treatment, that is, the utilization of the visible supply of skimmed milk instead of the finding of the metallic cream concentrated by the patient operations of nature. I doubt that; the world is still young, and but half-explored, as is suggested by such discoveries as those of Nome, Cobalt, Porcupine, Tonopah, Goldfield, the United Verde Extension, the Bawdwin mines in Burma, and a host of other bonanzas during the last 20 years.

One does not need to be venerable in order to recall great changes in the philosophy of mining economics. In 1905 I published a book on this subject, in which was included a discussion upon various aspects of mining finance. Among those contributing, besides myself, were C. H. Hoover, J. H. Curle, and W. R. Ingalls. Mr. Curle, at that time the leading London authority on such matters, a man of wide travel and stalwart independence of mind, advised his countrymen to stick to gold mining as being the safest, because gold had a "fixed value." We know to-day, by unpleasant experience, that gold can so depreciate in terms of other commodities that the gold miner is placed at a decided disadvantage. Mr. Curle insisted that the only correct kind of gold mining was based upon a careful estimate of the ore in reserve, and that at least 60 per cent. of the price of the mine ought to be represented by net profit from the developed ore. He even went so far as to lay down the rule that gold mines should yield 10 per cent. of their market valuation. Later he put the interest at 15 per cent. We have travelled far since then. Most of these obiter dicta served a purpose in their day, fifteen years ago, as a means of educating the British shareholder, who is a simple-minded person, because Mr. Curle accompanied them with much straight information and trenchant criticism, but all such attempts to compress mining into a formula are a failure. They were based largely on the experience—then incomplete—of the Rand, in South Africa, where continuous beds of bold-bearing conglomerate were being exploited on the largest scale known to the modern world. These beds of 'banket' as they were called, after the Boer name for almond-cake, were comparatively uniform in their gold contents and were mined and milled so cheaply as to yield handsome profits. Their uniformity of grade and persistence in depth caused them to be regarded as the basis for 'investments' of the safest kind, suitable for widows and orphans. Later experience has shown that they were neither so uniformly nor so persistently rich as had been expected, the result being to turn the 'investments' into 'speculations,' out of which a comparatively few made a great deal of money and comparatively many lost more than they could afford. The Rand proved to be the greatest goldfield in the world, in extent and yield, but I am making the point that it did not escape the vicissitudes latent in mining, and the successful effort to persuade the public that it would escape those vicissitudes led, in the end, to a tremendous and widespread loss of money, which passed from the pockets of the public to those of the promoters. Money was made honestly on the Rand during the development stage, when adventurous spirits risked a total loss of their stake in order to make a big gain; but when the operators and promoters turned to the man of small means and persuaded him that the latent risks were eliminated and that a gilt-edge investment was available to him in the stock of over-capitalized mines, they deceived him. Some of the operators and promoters knew no better; others were advised by good engineers, and simply victimized the unsuspecting by unloading their holdings upon them at a handsome premium. To illustrate how the public was victimized, I can state that the market value of the shares in the three principal companies representing consolidations of groups of mines, declined $203,931,610 between 1911 and 1918. That huge loss was due to ignoring the common ex-

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