mills, his sieves and separators, and pigs and puddles, and shaking-tables, and concentrators of all kinds and descriptions. If it is gold he is after, he requires amalgamators and chlorination plant, etc., etc., *ad libitum*. Then there are the smelting furnaces and all that belongs to that department in the shape of furnaces, both reverberatory and blast, for roasting, smelting, and refining. Then all the shops, smithies, and storehouses, and the whole place has to be lighted. There is a young town to build, and drainage to look after, besides roads, bridges, dams, canals, and sluices for his water power. If he is going to have electricity, the mining engineer has to design and erect his electric plant, and teach his men how to look after it, and, above all, he has to manage 1000 men or more on the minimum of wages, by no means an easy thing in these days of agitators and strikes; while above and beyond all, he has his directors in London to humor and satisfy.

This is a rough outline of part of the work of the mining engineer. He may also be expected to undertake geological surveys, or to report on new mining districts, which means geology, mineralogy, paleontology, etc., in no small measure. Then there are mining engineers for coal, which is a branch entirely separate from metalliferous mining, and yet "Civil Engineering (including Mining Engineering)."

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Young students in the commencement of their studies, as they see in the outside world more and more of what is expected of the engineer in actual work, when they see bridges, and railways, and machinery being constructed, and consider that they will be called upon to do the same sort of thing, begin to ask when and where they are going to learn how to do this; this, which, being the most prominent result of engineering work, fills up their idea of engineering. They are anxious to be doing this kind of thing, and are apt to get uneasy at so much time being spent upon Algebra, and Euclid, and Conic sections, and such like mathematical speculations, especially when they see the "practical" side of the question handed over to the uncertainties of "vacation notes." And so does one, on first looking at it, wonder how Civil Engineering, in contradistinction to mechanical and other engineering, is going to include Mining Engineering, and, still more, how any building within four walls can pretend to teach engineering, be it civil, or mechanical, or mining—to teach men in three short years of seven months each to cope with all the various forms and conditions of nature in ways and means suitable to the conditions and requirements of modern circumstances. But does any institution in the world pretend to teach engineering "practice" in its entirety? No; it cannot.

Facts and formulæ, methods of nature and methods of reasoning, are