

Mining engineering, not so distinct in its character perhaps, requires nevertheless a separate course of training.

American engineering differs very considerably from European engineering. The problems which have presented themselves in the one country are different from those of the other. The American engineer has been confronted by broad, deep rivers and rugged mountains which, he has had to cross. The extremes of climate, labor scarce and high, the transporting of raw materials over long distances, and what has still been a greater disadvantage to him, his having to carry on improvements in uninhabited, or perhaps desolate districts where there has been little encouragement for the success of his projects financially after completion.

He has been compelled to use the greatest economy in all the details of the construction and management of his projects, which has had the natural effect of making him inferior to no one in the planning and constructing of the most feasible and economical engineering structures.

On the other hand the European has been backed by an abundance of capital in old, thickly settled countries, and when successful has been the recipient of all possible honors and well cared for by his government in old age.

As a preparation for any of the branches of engineering a college course is of inestimable value to a person adapted to the business.

One reason that so many non-collegians have attained to such success is that they have been adapted to it, or they could never have succeeded. An engineer need not be a great mathematician, beyond having a good knowledge of the formulæ used; while the college man has in his course of mathematics unconsciously received a training in methods of thinking and reasoning, which he otherwise undoubtedly could never have received, and with which he is able to grasp quickly the

new departures of science which daily come before him; while the untrained man must needs wait to be told or shown, or possibly remains in ignorance of them. But a college graduate is by no means an engineer, for he has only made preparation for performing work in which all good reason demands that he should have some experience before he can perform it to the greatest advantage.

In the actual work one should not try to think according to the minute details of exact science, because it creates a stiffness and places a restraint upon the freedom of thought necessary to grasp the natural demands of problems at hand.

He has texts and other books of man's investigations and experiences; but circumstances may so place him that he will have to invent means of procedure through harassing difficulties, under the conditions of which he can make better progress by his own methods than by attempting to follow out any of the stricter methods of science.

The outlook for success in any of the departments of engineering is more promising than ever before, but with a decided requirement that one should prepare himself for some special line of the work of his department.

Although many of our engineers are men who have through practice become able to manipulate only parts of the work of an engineer, and are therefore not strictly engineers, still it may be safely said that in no country does the practice of engineering in all of its branches reach a higher degree of usefulness, or proficiency than in this country. The growing wants of the new parts of our country will long demand the work which can be done by the young engineer, and at the same time throw open fields which require the thought and ingenuity of the old and experienced one. As our country becomes more thickly populated and consequently more wealthy and able to furnish capital, the more able will we feel for the