

man who has the requisite technical knowledge to become his own engineer has as great an advantage over the non-technical business man as has one speaking a certain foreign language over his less fortunate competitor, who must obtain the services of an interpreter in the conduct of negotiations in that tongue.

In other words, where the engineer himself has the direction of the financial, the commercial and the technical departments of an industrial enterprise, there is a prevention of what I might call the lost motion that obtains under the present system.

Following the procedure indicated, not only would there be greater opportunities for the engineer, but there would also be introduced into the financial management of industrial enterprises a conservatism and an honesty of purpose which unfortunately does not always now obtain.

This suggestion may seem somewhat visionary to those who have followed the conventional lines of the past; but, having observed the success that has rewarded the efforts of the mining engineer in this direction, I am emphatic in advocating the extension of the principle to all branches of engineering.

Until recently the mining engineer has also submissively borne the employer's yoke, and accepted whatever compensation was vouchsafed to him by the not always liberally disposed capitalist. Latterly a new era has dawned.

The mining engineer has at last struck for more equitable treatment, and as a result is now able to look forward to become eventually a partner, rather than to continue indefinitely as an employee in the enterprise under his direction.

This he expects to accomplish by serving at first his apprenticeship strictly in the position of an engineer, and by subsequently rendering his professional services for an interest in the profits of the business.

Obviously, all engineers do not possess the qualifications requisite for commercial success. But they will not, I believe, be found more generally lacking in these essentials than is the average man of affairs. You quite naturally might ask how this plan meets the views of the employer. Does he regard it as antagonistic to his interests and to be resisted by him? Having in mind the experience of the mining engineer, I answer decidedly not, but, on the contrary, that the plan is one which strongly commends itself to the employer, for the reason that such a business arrangement not only assures the loyal co-operation of the engineer, but secures his undivided and constant endeavors in furtherance of what thus becomes the mutual interest of the employer and engineer. This phase of your professional opportunity is, in my judgment, of paramount importance, and I commend its favorable consideration to those to-day embarking on their career. Verbum sap.

The question is often asked, What are the essentials of professional success, and whether a special aptitude in mathematics, mechanics, or other branches should not ensure a successful career? To this question I have always replied that, while those who have exceptional ability in the mastery of the studies of the curriculum are greatly favored, and while, further, a technical education is in itself indispensable, I would nevertheless rate these qualifications far lower in the scale of relative importance than the individual character of the engineer.

First, then, and above all other considerations, I would place the possession of character. An honest, clean-cut, straightforward, conscientious young fellow, ambitious, persevering, and last, but by no means least, level-headed, would, to my judgment, possess seventy-five per cent. of the essentials of success; while in relative importance I would not attach more than twenty-five per cent. to the possession of a technical education. And I say this without in any degree depreciating the inestimable value of a technical education.

Without character the monument of the engineer would be as unstable as an edifice where the mortar is deficient in lime. Therefore, I urge you to persevere in the develop-

ment of character in its widest sense, and especially ever to be jealous of your reputation for integrity.

Where ye feel your honor grip,
Let that aye be your border.

There are two critical epochs in a man's career. First, when he graduates and starts on his life's work. A start in the right direction is all-important. The Germans have a proverb illustrative of this:—

Gut begonnen:
Halb gewonnen.

One of the greatest enemies of success, as you have been told times innumerable (but this fact should not deter me from repeating it) is conceit—that kind of conceit which manifests itself in what is aptly, if not elegantly, called "the big head." It is not the dolichocephalous nor the brachycephalous kind, referred to by phrenologists, for, in spite of the paradox, it comes rather under the category of the "pinhead." Whatever the shape may be, a small quantity and inferior quality of brain matter is characteristic of the disease.

There are many "big heads" graduated from college every year, but when the disease is not eradicated or checked, the victims are soon "sized up" by the discriminating public and forthwith relegated to the category of mediocrity, and thenceforth are but laggards, soon lost sight of in the race of life.

The disease is sometimes also latent, and does not develop in a dangerous, nor even to an obnoxious, degree until later in life—usually at the time of some transient success, commonly of the financial kind, whereupon it often develops with extraordinary rapidity. This is the second critical epoch.

It was the inimitable "Touchstone" who said: "Call me not fool till Heaven has sent me Fortune."

The "big head" that has attained this temporary, or more likely merely fancied, success has reached the highest point of his self-conceded glory, and, like Lucifer, falls, never to rise again. For the rest of mankind it is a very fortunate effacement.

This disease is fortunately rare among the graduates of scientific schools, for there the subjects taught provide in themselves correctives of conceit.

You may rely upon it that the demeanor of the successful man is the absolute index of his mind and character. The really great man who achieves genuine success is of all men the most modest as to his accomplishment. He has, of course, which is proper and desirable, a self-respect, and also pride in his achievements, but he is not the least conscious that this success has been due to any greatness



Quebec Bridge.—South Cantilever Arm.

on his part, ascribing it rather to that kind of genius that is synonymous with honesty of purpose and indefatigable endeavor.

The truly great man knows how insignificant are his achievements compared with the work before him, and would say, as did Cecil Rhodes on his deathbed—a truly