

regard to the nature of machinery and the chemistry of the more important industrial products.

It is not to be supposed that the student will proceed far enough, in either of the lines referred to, to justify undertaking, as an expert, either engineering or chemical work. It is desirable, however, that this business man whom we are considering should be able to understand the different elements of machinery, should appreciate the relation of different parts of an engineering plant, and should be competent to read a machine drawing. This would require a course in mathematics, including a portion of the calculus, projections, and as much descriptive geometry as would be requisite for an elementary course in mechanism. A brief course descriptive of engines might also be added. On the side of physics and chemistry it is desirable that this student should have special work in industrial chemistry, which would include the discussion of such topics as illuminants, lime, mortar, and cement, building stones, paints, varnish, oils, explosives, gas, and electro-metallurgy. It is because of these needs, as it appears to me, that this new commercial education can best be given in institutions where there is a generous provision for engineering and scientific instruction. Several colleges now undertaking so-called Commerce Departments are, I believe, making an error in placing the emphasis almost exclusively upon the economic and political studies. The commercial leaders, at least many of them, must be trained in science; and for this reason the scientific school has an obligation and responsibility which it should not shirk.

A third special department of study should include the field of commercial products and geography. Instruction should be afforded in the distribution of raw products throughout the world; and particular emphasis might to advantage be placed upon the products of the

Latin-American republics and countries with which the United States is developing an export trade. Great weight should be given to this instruction. It could well cover two years of time. It should be detailed and might become one of the culturing studies of the course, as well as an articulated portion of a professional education. In manufactured goods there should be a course of descriptive lectures in regard to the leading manufacturing industries, iron, cotton, wool, and leather.

These topics represent some of the more distinctively technical subjects of a commercial character which may be regarded as common to all kinds of business. Nothing is here said about the advantage of a knowledge of history, international and commercial law, or modern languages. Of these, and of studies of general culture, there should be as generous an amount as time affords. The course, however, should be specialized and professional in the same sense as courses in civil engineering, architecture, or chemistry. The methods employed should be precise and disciplinary. For some of the departments of instruction, specialists would have to be brought in from the active business world. In particular there would be required experts in banking, export trade, railway management and finance, and commercial law.

In the final curriculum offered there should obviously be an opportunity for following out special branches of business. The commercial side of railway management, the profession of banking in the larger sense which is so intimately associated with the establishment of new companies, and the business of exporting, all present attractive fields for specialization. The varieties of business are many, and the details must be learned by actual experience. The youth, however, who has a taste for commercial affairs, and who devotes himself persistently to a curriculum