What Is Industrial Engineering

By John Younger

INDUSTRIAL ENGINEERING is seemingly a new term and one which is not often understood and indeed occasionally misunderstood. Yet it represents a branch of engineering which is very old, going back in fact to our earliest forms of manufacture when the Israelites made bricks and when Tubal Cain forged weapons for the chase.

For industrial engineering should really be called manufacturing engineering, as it deals with that science. If you are interested in how to make things, how to manage men, how to understand the cost of manufacturing, or in management generally, then you are clearly destined to be an industrial engineer. If you like to work around tools, if you like the smell of hot metal and the smell of hot oil as the tool runs over the metal, then you are interested in Industrial or Manufacturing Engineering.

It is only recently that there has arisen a science of manufacturing. Formerly things were made any old way, the important thing not being the way they were made but the final result after they were made. Let us illustrate. At one time Henry Ford of Walter Chrysler said, "Build me a car." He didn't care how it was built, the important thing was to obtain a car. But today a significant change has come about. These two manufacturers are saying to their staff not, "Build me a car," but "Build me a $450 car," which means that the car has to be manufactured to a price and you know what that means. It means that every step in the manufacturing process has to be scrutinized—that the cost of each step has to be analyzed and that the one best way of manufacturing has to be selected and only the best way. Manufacturing has become scientific and now demands men who are trained to think straight and clearly. It demands more and more college graduates who are trained in factory processes, and in cost analysis. It wants men who have a background of general engineering, with a special study in economics and in cost accounting and in shop processes. All of this work this University is prepared to give.

What is economics? We read in the paper a lot about economists helping the government, but how can economists help manufacturers? Let me give you a simple illustration. Some of you may know what a planer is—a tool for cutting materials in which a table reciprocates under a single-point tool which shaves off the material laid on the table. Now, you may also know that a milling machine is a machine having the same result but doing it in a very different way. Well, the planer is found in tool rooms and the milling machine is found in mass-production shops, rarely do they interchange. Why? Because each has its logical place, due to the economics of the situation. And so the science of economics teaches us whether to use a large machine or a small one, or one type or the other. A knowledge of economics allied with a knowledge of engineering is a tremendous asset to the young engineer who wishes to be a successful manager. Similarly there goes a knowledge of cost accounting and of materials of construction and of mechanics. All of which are in the curriculum of the Industrial Engineer.

There is another branch of engineering closely allied to manufacturing and that is sales engineering. Here again there is a tremendous field for the young man who is fond of traveling, of keeping out of the rut, of meeting people, and of rarely having routine jobs. The sales engineer is likewise a new product of the century, and demands are now for men college trained in engineering and in business.

It is easy to design an article or product. It is relatively easy to manufacture it, but it is a difficult thing to sell it. Just suppose you are in a steering gear business making gears for the automotive industry and you want to sell your new steering gear to Ford or Plymouth or Chevrolet. You must know its weight and its reduction rates and its available power or torque at the steering arm. And you must know its length and inclination—all engineering facts, before you can sell it intelligently. The sales engineer of today is more than an engineer; he is an engineer plus business man occupies a responsible position with a good salary. Many of our Industrial Engineering graduates are sales engineers and obtained their preliminary college education here in Industrial Engineering by taking special courses in salesmanship and marketing. Some of them are with the General Electric Company selling their specialties. Some are at the Goodyear Tire and Rubber Company selling power belts and fleet installations of truck and tractor tires. Some are in the machine tool business selling milling machines and grinding machines. Others are with Frigidaire selling air conditioning equipment, and so it goes.

The last few sentences illustrate the places where graduates in Industrial Engineering go. They first of all go anywhere there is something to be manufactured or where an engineering product is to be sold. They go to the rubber industries, the metal working industries, the glass industries, the automotive industry, the machine tool industry, and the electrical industry. This broad field ensures that we will have a demand for our men and this

has proved to be the case. Throughout the depression years we have always been able to place our best men. True we have not placed all our men, but all have had a chance.

It is interesting to note that our work leads to management positions. It usually takes years to be a manager, but the groundwork we give you in Industrial Engineering is a distinct asset. This ground work largely revolves around the handling of men, and in some of our courses we try to give you an education which will be helpful in this field.

We are too young, only eight years old, to be able to point to any outstanding men who have graduated from our department, but we can point to several who are on their way. Otto Winter graduated some six years ago and went as an apprentice sales engineer to the Cincinnati Milling Machine Company. He advanced rapidly and because of his ability was given the post of representative in Russia. He spent a year there and did splendid work in introducing and revealing the mysteries of milling machines and cutters to the Russians. He returned to America and was made Assistant Manager of the Detroit office. He entered into the work of the city of Detroit and took up membership in several of the local engineering societies. This work brought him to the attention of the Whitman and Barnes Company, an old-time concern of high standing making drilling machines and other tools. He is now their Chief Engineer.

Our two first graduates—we had only two men enrolled when we started—are doing splendidly. One, Mr. H. L. Cannell, is in charge of sales of lubricating oil for the Standard Oil Company. He sells to manufacturing and similar plants. The other, Mr. W. S. Gillen, is a superintendent of one of the General Electric plants at Warren, Ohio.

Obviously there are positions open to industrial engineers regardless of the times. No company can at any time reject a capable man who understands the latest developments in equipment, the best methods of production and the most efficient basis on which to operate a company. This does not mean that we can coast through school on just enough work to get by, and expect to be offered a position as general manager; but it does mean that if we dig out the facts, learn fundamentals, and are able to apply them we can forge on to a successful career in our line of engineering.