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A NEW DAY OF ENGINEERING

By DEAN EMBURY A. HITCHCOCK

A NEW first-year class, more than four hundred, has been welcomed to the College of Engineering. By the time you read this greeting in the OHIO STATE ENGINEER you first-year men will have encountered some of the problems of University life, and will have begun to modify your impressions of the world of engineering by some of the information that you have obtained here. You will be a trifle nearer your goal, attaining membership in the company of men who are known as engineers.

It was, I assume, about 1918 when the great majority of you began to realize that you were in a world of great activity in many lines. About that time you began to disturb your father by asking innumerable questions as to what made the automobile go, etc. You did not know, however, that it was engineering and science that had entered so intimately into your everyday lives. You accepted things as a matter of course, and for years gave very little thought to the many developments of the past fifty years that so completely affected you. You had never known what it was to do without those comforts that you enjoyed and that are the work of the engineer.

Now you have lived long enough to see some new inventions grow from nothing to everyday affairs. The radio is a good example. So is the talking picture. In just a few years, within your lifetime, the work of engineers has brought great changes.

Let us think of some of the ways in which you are indebted to engineering. On a cool morning this fall "when the frost is on the pumpkin" and you have a "math" quiz at eight o'clock, you roll out of your comfortable bed about 5:30, and shiver for a moment. But only for a moment. You have relief at hand. You simply step to the grate, turn a key, strike a match, and there you are, toasting yourself in heat in beautiful form, flames playing over the asbestos surface or transformed into radiance by special radiant "candles." That automatic servant of yours, the gas, has been there all night ready to warm you. He has traveled many miles through his own private right-of-way. For thousands of years this servant of man was imprisoned under layers of rock at a depth of half a mile below the earth's surface. The mining engineer was responsible for capturing this valuable fellow and saying to him, "Here now, you have had a long rest; hustle through this pipe and make yourself useful."

Other engineers assisted the mining engineer in bringing gas to your study room grate. Civil engineers surveyed the pipe lines. The pipes themselves are made of metal produced by metallurgical engineers. Mechanical engineers invented the machinery. Ceramic engineers made the radiant candles. The gas service is a fine example of the team work of engineers.

Warmed by your gas fire you next summon another servant by flipping a switch. The bright light that immediately floods your room is a fine "good morning." You can see to attack the math



book vigorously. You little realize, or perhaps never gave it a thought, that the energy you have demanded in producing that light was, just a few minutes before, resting quietly in some pieces of coal where it had been for many thousands of years.

Water for a good drink and for a shower is right at hand when you turn a key. Every faucet is a spring of pure sparkling liquid. It didn't just happen that way. The engineer was responsible for building dams to store up the river water, for making the muddy fluid drop its sediment and bacteria, and for pumping the purified liquid through pipes ready for your instant use.

At breakfast you are surrounded on every side by the products of the ceramic, chemical, electrical, and mechanical engineers. You eat a delicious California grapefruit, brought to your table by the swift transportation of the engineers.

Now you are ready for classes at the University. If you happen to live several miles away must you walk? No indeed! The application of electrical energy through the trolley or the use of the energy in a little gasoline gets you there in short order.

During the day in class and laboratory you are in comfortable quarters and have every convenience for your work. All are products of engineering. In the evening you decide to have a little chat with your family; while you hold the line the call is made, and you talk with them as easily and distinctly as if they sat at your study table. It makes no difference, so far as results are concerned, whether they are in Ohio or California, but of course the cost is different.

Because of the work of the electrical engineers you may hear Amos and Andy, speaking in their

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New York studio, regardless of where you may be, just so you are near a reliable radio set.

Although you are sure that you should enter the field of engineering, or, because you get along well with mathematics, physics and chemistry, that field would be a logical one for you to select, you may have your doubts about the future opportunities. "Why," you may say, "what is left for us to do? It looks as if our fathers and grandfathers have finished the game."

Fifteen years ago I had some doubts as to the future opportunities in engineering, but my views have entirely changed. During the lives of many of us—say in the past fifty years—there have come into practical use the electric light, the telephone, the trolley car, the internal combustion engine, the steam turbine, the transmission of electrical energy long distances, the electric locomotive, the automobile, the airship, the airplane—inventions making possible a speed of travel not dreamed of twenty years ago. I believe that the next fifty years will witness just as great, though perhaps not as spectacular, changes as have been made during the past fifty years.

I am now going to refer to just one field that has lately attracted my attention to a considerable extent—aviation. Because reference is made to this engineering activity, don't jump to the conclusion that there is greater opportunity here than in any other field. In fact, present conditions indicate the reverse, the supply of aeronautical engineers is above the demand.

The Goodyear Zeppelin Corporation of Akron, Ohio, has just completed the largest and most complete airship ever designed and constructed. The beginning of a battleship or big ocean liner is usually accompanied by ceremonies at the initial laying of its keel. With the U.S.S. Akron it was different. The ceremonies consisted of the driving of a golden rivet in the master ring. The transverse rings are of triangular cross section, about five feet on a side, and made up of structural duraluminum so light that the total weight of one complete ring is only 1800 pounds. The master ring is located amidships and has the greatest diameter, namely 132.9 feet. The design of the whole structure is based upon minimum lightness with maximum strength. It was my fortune, with several of my engineering colleagues, to be present and to witness Admiral W. A. Moffett of the U. S. Navy, drive that rivet in November 1929. In February, 1931, when structural work was completed, and covering began to be placed, a group of about 300 Ohio State students, mostly engineering, was privileged to visit the airship dock, listen to talks upon its design and construction, and inspect the exposed structure from stem to stern.

The climax in the building of this wonderful airship, known as the ZRS 4, came on August 8 when, in the presence of two thousand invited guests and many thousands of others, Mrs. Herbert Hoover christened this engineering product "Akron." It was my privilege to be one of the two thousand. Although it was terribly hot, nevertheless such discomforts were many times offset by the wonderful opportunity afforded to inspect this latest addition to our Navy.

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ENGINEERS

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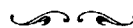
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This experience, and also that of another later in the summer in the City of Detroit when I sampled some commercial air travel of 150 miles, at one hundred miles per hour, confirmed my belief that there is much ahead for the young engineer, and fortunate is that young man who is sure that in the field of engineering is where he belongs.
