

THE AMERICAN ENGINEER.

ENGINEERING may be defined as "the science and art of utilizing the forces and materials of nature." It was formerly classed in two main branches, *civil* and *military*. Civil engineering included all engineering not directly involved in the science of war.

So rapid has been the progress of science that to-day civil engineering is understood as the science of bridges, railroads, tunnels, highways, canals, river and harbor improvements, water supply and sanitation, with all their involved details.

What was formerly civil is to-day divided into several distinct parts, each a complete and sufficient study for a man's whole life.

The numerous inventions in labor-saving machinery have advanced to such a state that mechanical engineering is a full and complete science in itself. The development of electricity in later years has shown that it is to take a prominent part in all of our arts and sciences, and bidding fair to revolutionize our present system of motive powers, demands that a thorough research into some of the deepest of nature's mysteries, guided by sound mathematical and scientific reasoning.

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 having to