

THE PROFESSION OF CIVIL ENGINEERING.

BY STEPHEN M. DIXON, M.A., A.M.I.C.E.,

Professor of Civil Engineering in the University of New Brunswick.

To find a definition of engineering we will go back to the year 1818, when the institution of civil engineers was founded. In the charter the institution is defined as "A Society for the general advancement of Mechanical Science, and more particularly for promoting that species of knowledge which constitutes the profession of a Civil Engineer, being the art of directing the great sources of power in nature for the use and convenience of man, as the means of production and of traffic in states both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation, and docks, for internal intercourse and exchange, and in the construction of ports, harbors, moles, breakwaters, and lighthouses, and in the art of navigation by artificial power for the purposes of commerce, and in the construction and adaptation of machinery, and in the drainage of cities and towns."

But since 1818 engineering has been revolutionized by the introduction of steam, which not only made possible works of much greater magnitude than could have been attempted before, but added to the already numerous branches of the profession one that has now for many years taken the foremost place—railway engineering. Later still we find the field of work of the engineer much increased by electricity and its applications.

It is important to remember that, as the engineer was at first a man skilled in working engines of war, the term civil engineering was used first, and should still be used, to embrace all engineering other than military. This is contrary to the general use which divides engineering into three groups

—civil, mechanical, and electrical. Indeed we often find such subjects as surveying or sanitary engineering distinguished from civil engineering, which in this case means structural engineering.

Before enquiring, what kind of education an engineer should have, let us glance at the state of the profession before the founding of the institution of civil engineers.

We find that engineering has been practised from the earliest times, and, as Herbert Spencer has pointed out, the members of the clerical profession were first skilled in it; for at first we had only one educated class, the clerical. And so we find that the priests of Egypt led the way, followed in later times by the Roman Pontifex, the chief of the priests and the bridge-builder, and then in the middle ages came the builders of the great cathedrals.

In Egypt we find some notable examples of engineering work, principally in hydraulics. About 1385 B.C. Lake Moeris was completed. This lake is said to have been 450 miles in circumference and to have attained a maximum depth of 300 feet. The object in excavating it was to regulate the flow of the Nile, which previously had caused much damage by its floods. For six months in the year the Nile flowed by a great canal into the lake and then for the remainder of the year at low-water Lake Moeris flowed into the Nile. The canal, which was thus one of the earliest works in the regulation of rivers and irrigation, may still be seen. The Pyramids, whether merely tombs or astronomical observatories, as the late Mr. Proctor so ingeniously urged, are at least lasting