shafts were sunk in many places along the line so that the work could be pushed forward at several places at the same time, just as in modern tunnelling. The height at which the water stood above the lake entrance must have been a serious difficulty. The construction of this so called *emissarium* displays a high standard of knowledge of the theory and practice of surveying and levelling as well as great skill in hydraulic engineering. The Fucino tunnel belonging to the later period was completed after ten years' work in 52 A.D.

After the fall of the Roman Empire we find for a long time very little done in engineering. Between 1370 and 1377, however, Barnabo Visconti constructed the magnificent Ponte di Trezzo over the Adda, having a span of 237 feet; this is the greatest arch ever built, Cabin John Bridge, Washington, span 220 feet, being next in size. No other important works were carried out except some of the great cathedrals by the clergy and some bridges by the Freemasons.

Toward the close of the seventeenth century engineering revived, and Hydraulic Engineering was energetically practised in reclaiming the flooded lands of Northern Italy; Galileo, Torricelli, and other famous philosophers and mathematicians assisted in developing the theory of hydraulics. At the same time in France Hydraulic Engineering was also studied, and Belidor wrote his "Architecture Hydraulique," which may be considered as one of the first text-books of Modern Engineering —Engineering which combines theory and practice. A copy of Belidor's famous work dated 1790 may be seen in the University library. Following Belidor's suggestion in 1720 was established the Institute of Bridges and Highways, which body had charge of all engineering work in France and also of the education of all those wishing to become engineers. In 1708 was born the first great French engineer, Perronet. Thirteen remarkable bridges were built according to his designs, some of which have probably never been surpassed in elegance of design, and they are the first examples of level bridges. Perronet was also the inventor of many mechanical contrivances, amongst which was a saw for cutting off the heads of piles under water.

In England the first piece of satisfactory work was carried out by Sir Hugh Myddleton, a goldsmith, who, in 1610, commenced the work of leading the New River to London. This work he successfully completed, and the New River still forms part of London's water supply. However, there was no engineering profession in England for many years, and, when it was determined to build a lighthouse on the Eddystone Reef, disastrous results followed on two occasions from employing men who had no training nor skill in the matter. Then, in 1756, Smeaton was chosen, and, as it turned out, the choice was a wise one. Born in 1724, Smeaton had received a good education at Leeds Grammar School, and was then apprenticed to a philosophical instrument maker. He took a deep interest in engineering works, read many papers before the Royal Society, and in 1754 made a tour of the low countries to inspect the canals. His lighthouse, as we know, was a great success and has only recently been taken down to be replaced by a higher one. In 1757 Telford, the first President of the Institution of Civil Engineers, was born. The son of an Eskdale shepherd, at fifteen years of age, he was apprenticed to a stonemason, and yet found time to study Latin, French, German, and English literature, and even to compose some verses. After successful work in London, he completed his first highway bridge in 1792, and was appointed Chief Engineer to the Ellesmere Canal