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Lehigh University
Information Resources

Special Collections *Flyer*

Renaissance Engineering

Recently Special Collections obtained at a Christie's auction in New York a copy of Italian engineer Vittorio Zonca's *Novo Teatro de Machine et Edificii ...* ["New Display of Machines and Structures"] (Padua, 1607). This work, heavily illustrated with copper engravings, is one of the most important three or four books of the Renaissance relating to engineering. It joins two other volumes of illustrated engineering works of the period in our collection—Agostino Ramelli's *Le Diverse et Artificiose Machine* ["Diverse and Clever Machines"] (Paris, 1588) and Domenico Fontana's *Del Modo Tenuto nel Trasportare l'Obelisco Vaticano* ["Concerning the Method Chosen to Move the Vatican Obelisk"] (Rome, 1589)—and gives Lehigh an excellent foundation for depicting for students the beginnings of modern engineering. (And of course, although a work on physics rather than engineering, Galileo's *Discorsi e dimostrazioni matematiche, intorno à due nuoue scienze, attenenti alla mecanica & i movimenti locali...* [generally referred to as "The Two New Sciences"] (Leiden, 1638), also in Special Collections, began the process of helping engineering become a science.)

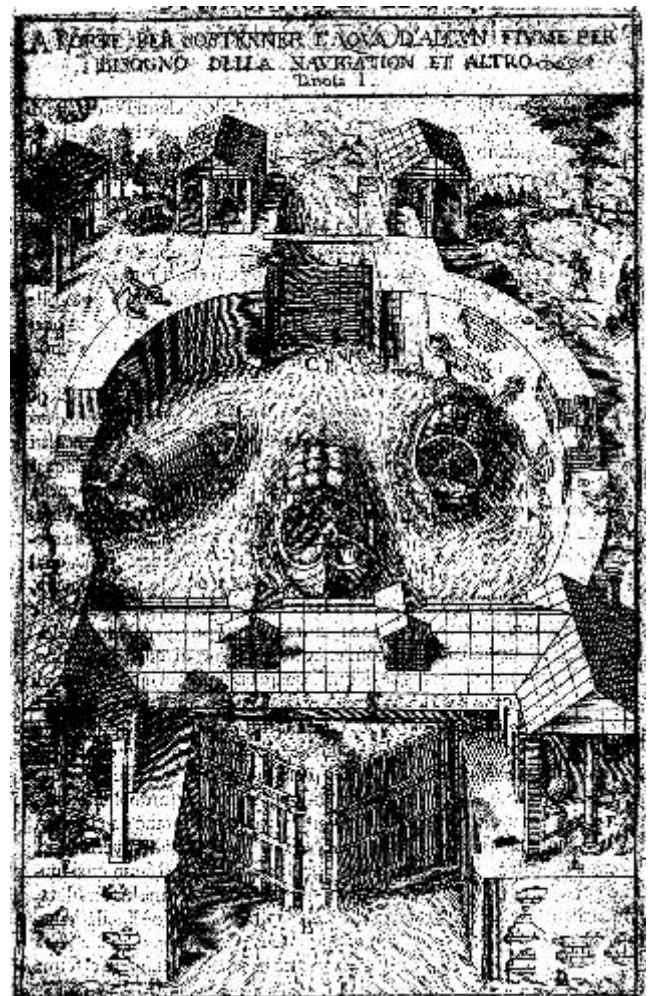
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Zonca's volume is actually the most modest in size of the three volumes examined here. It consists of 115 pages, of which 39 are copper engravings depicting all sorts of machinery, mostly real but some imagined. (The last plate, for example, seems to be some sort of perpetual motion machine.) But most of the plates depict machinery which might very well have existed. Types ranged widely, from waterwheels to rolling presses for producing engravings, to weaving machinery. Figure 1 is the fourth plate in the book, and is an early view of the lock mechanism of a canal.

In some ways Ramelli's volume (338 p. and 195 plates) complements that of Zonca's quite nicely. It also deals with machinery, but with a strong concentration on hydraulic technology and the movement of heavy weights. The somewhat fanciful device shown in figure 2 comes from Ramelli, and illustrates a mechanism for lifting heavy bodies, such as a cast bell.

However, the most well-known engineering book of this period is Fontana's, and it focuses on one parti-

FIGURE 1: ZONCA



cular task, the transportation of an obelisk from the rear of St. Peter's Church in the Vatican to the front.

The task was necessitated by an expansion of the church building. The obelisk had been moved in ancient times from Egypt to Rome, and had been in back of the church for centuries.

The Pope established a contest for a system which would move the obelisk without breaking it. Stone has very good compression strength but is weak in other ways. Nonetheless, the Romans managed to move it hundreds of kilometers over land and sea without a mishap.

A number of contestants proposed plans for moving the obelisk, for what has turned out to be the last time. Some were strange indeed. Fontana's winning approach called for constructing a cradle around the obelisk, lowering it gradually to a horizontal position and then moving it. The scene in figure 3 (of nearly 90 in 104 p.) shows the stone already lowered. (The plate, because of its size, has had to be cropped a bit around the edges.) This book is Fontana's attempt to publicize his great achievement.

-P.A.M.

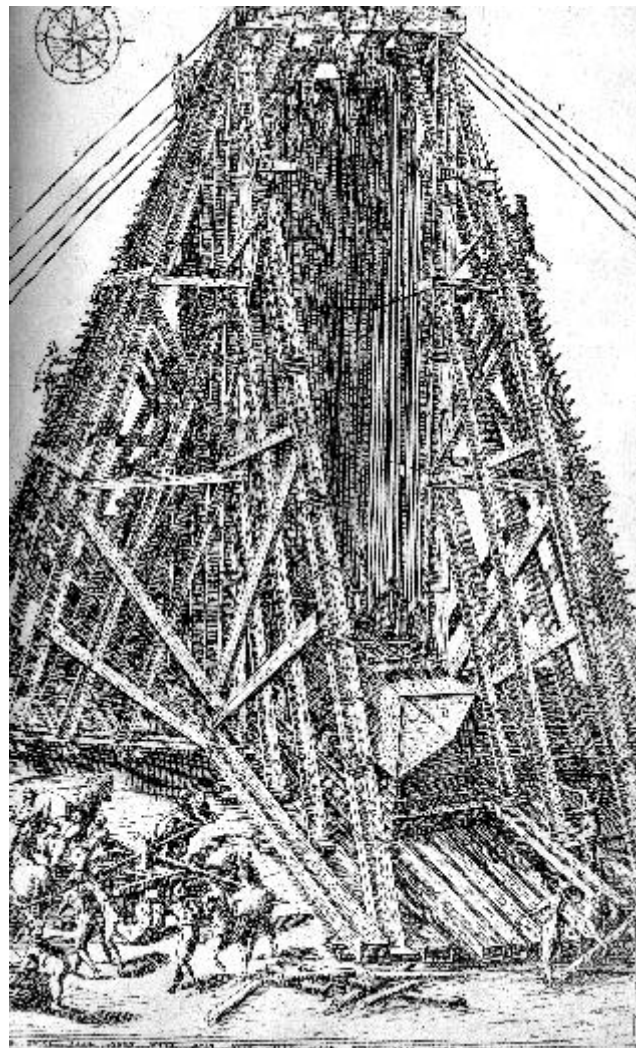
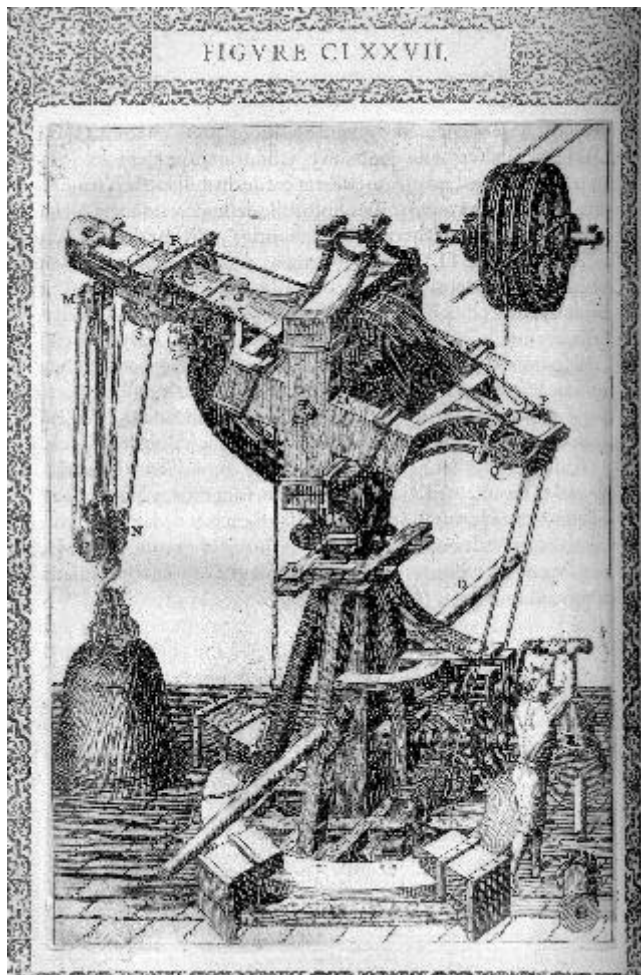


FIGURE 3: FONTANA

FIGURE 2: RAMELLI



Engineering faculty and students, as well as other interested persons, are cordially invited to visit Special Collections and view these and other significant volumes in the history of engineering.

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 EEEEE Special Collections is pleased to have an exhibition of some of its books in the permanent gallery of the newly-opened Lehigh University Art Galleries in the Zoellner Arts Center. The gallery is open from 11 a.m. to 5 p.m., Wednesday through Saturday, and 1 to 5 p.m. Sunday.

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 EEEEE Special Collections materials are available for research and consultation without restriction. For further information contact Philip A. Metzger, Special Collections Librarian, or Marie Boltz, Special Collections Assistant. Reading room hours are Monday through Friday, 1 p.m. to 5 p.m. or by appointment. Telephone: (610) 758-4506; fax (610) 974-6471; e-mail: inspc@lehigh.edu.

