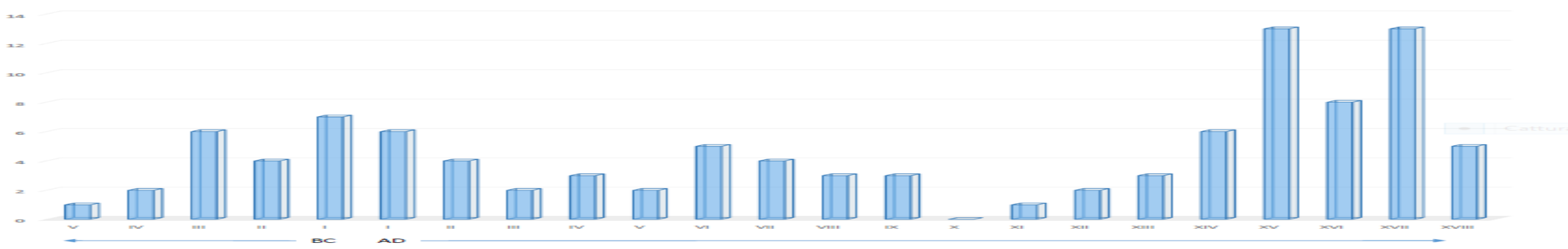
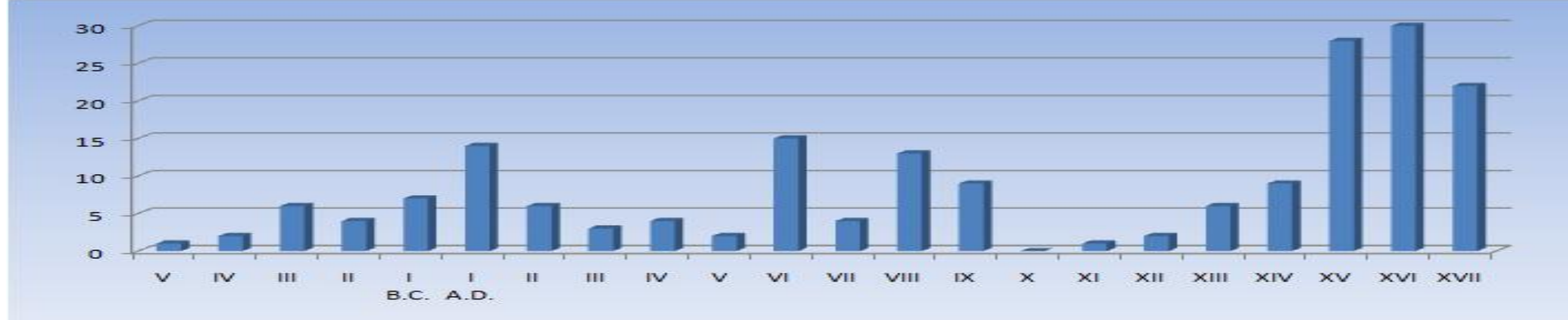


TIBER FLOODS IN ROME IN THE PAST: THE RIVER AND THE TOWN, A FOCUS ON THE LIA PERIOD

Thanks to the long history and great importance of the city, the Tiber floods series in Rome is exceptionally long and accurate. The river has always played a fundamental role in the life of the city, as a trade way, a source of energy and water supply and also a disposal site for any kind of waste. (See below: the frequency of events from V BC to XVIII AD)

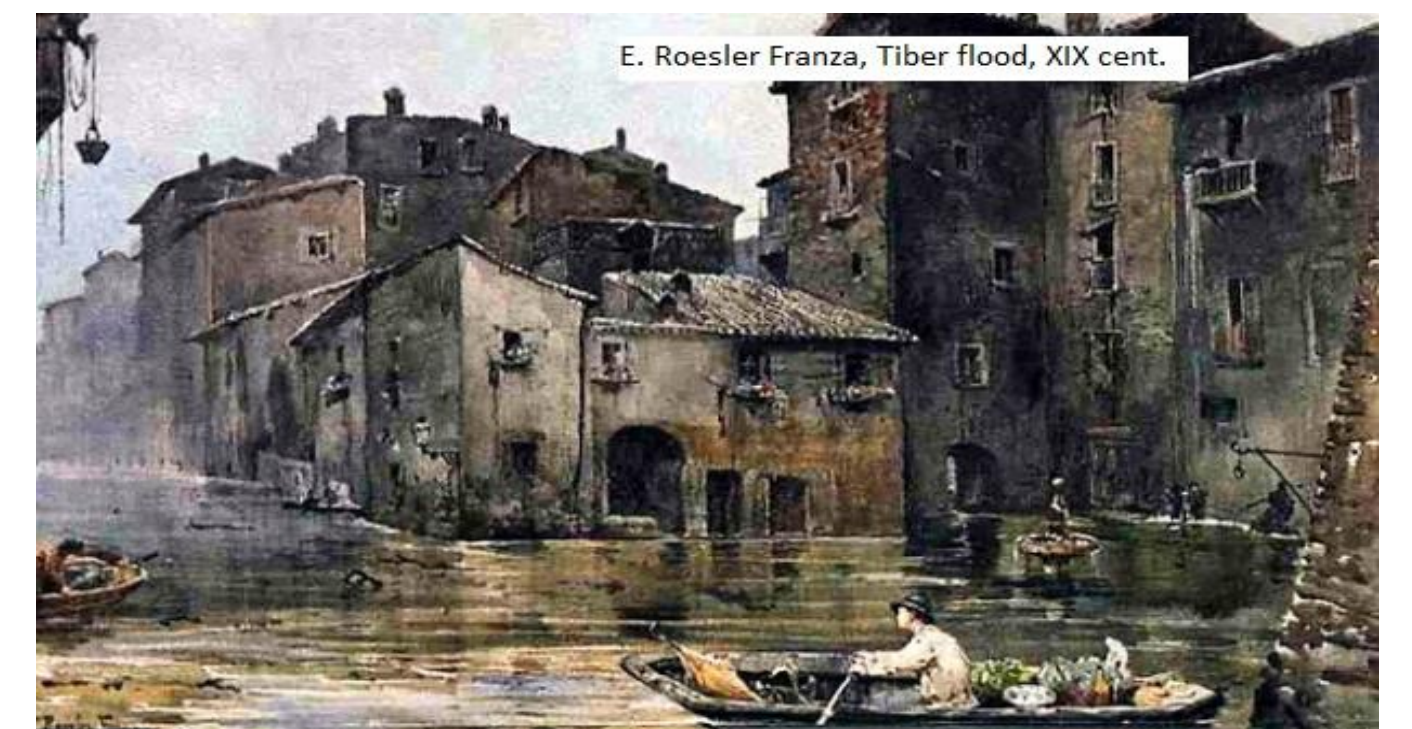
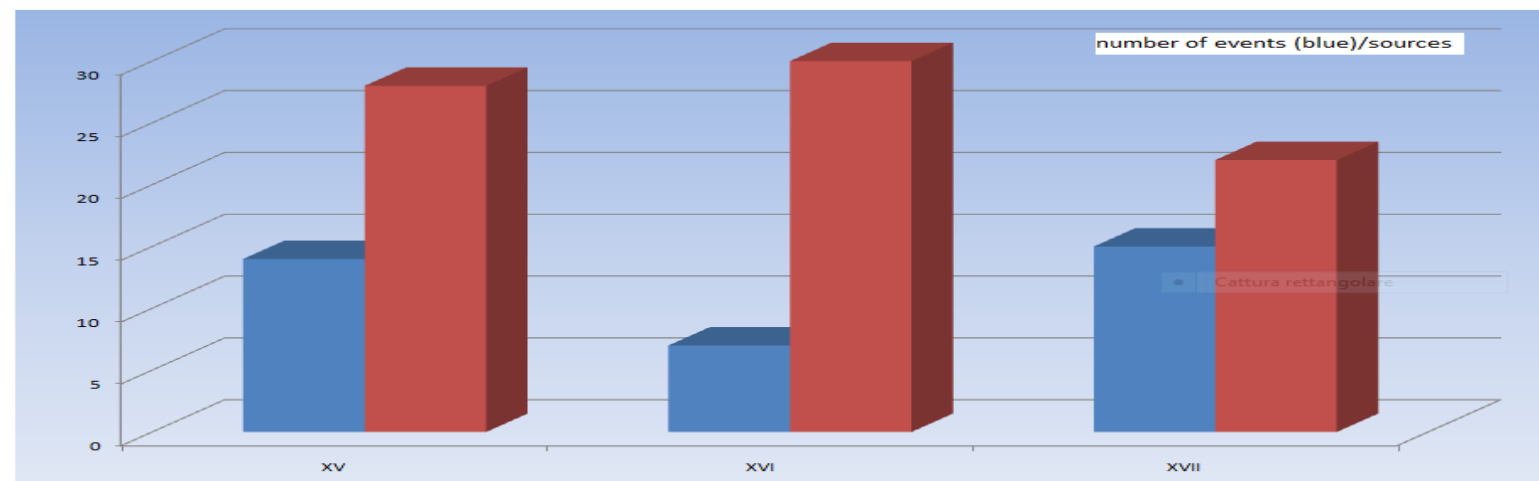


Data can be limited by the lack of information of some historical periods, such as the 10th and 11th centuries AD, and depend on the total number of sources. They can be considered complete from 1500 onwards. (See below: distribution of sources per century)



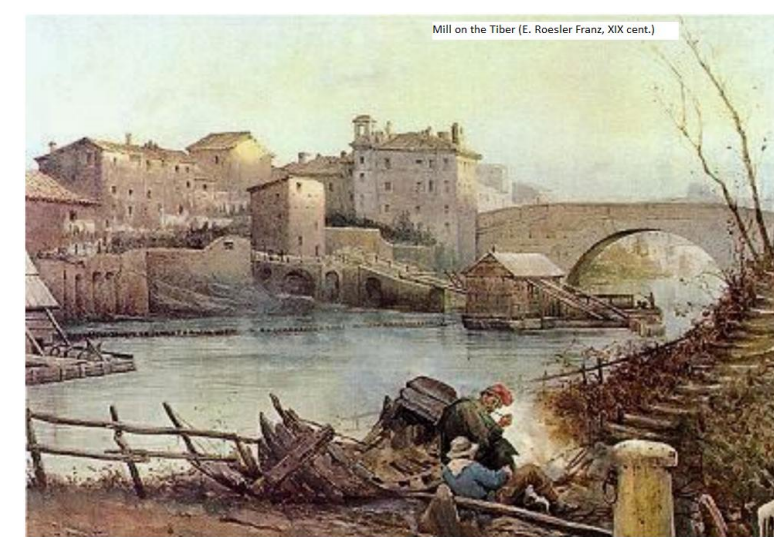
The main typologies of ancient documentary sources are: chronicles, annals, diaries, biographies of the popes, treatises on hydraulics. In this study, we analyze the information given by past documentary sources, contemporary to the quoted events, in addition to the daily instrumental measurements made by the Collegio Romano in 1781. (For an accurate historical criticism of the documentary sources of the past, see: Enzi, S., Sghedoni, M. and Bertolin C., 2013: Temperature reconstruction for North-Eastern Italy over the last Millennium: analysis of documentary sources from the historical perspective, Medieval History Journal, 16, 1, pp 89-120).

LITTLE ICE AGE - MAIN EVENTS
 (1422) – 1467 – 1472 – 1475 – 1476 – 1485 – 1488 – 1492 – 1495 – 1514 – 1528 – 1530 – 1532? – 1557 – 1571 – 1589 – 1598/99 – 1600 – 1606 – 1608 – 1623 – 1628 – 1637 – 1646 – 1647 – 1653 – 1654 – 1660 – 1686 – 1695 – 1702 – 1742 – 1750 – 1772 – 1780



NATURAL CAUSES OF THE FLOODS:

- Exceptional precipitation
- Morphology of the river course, that flows through the city forming two large bends.
- Slower water flow in the city tract, due to the low gradient of the river bed and its closeness to the sea.
- Abundance of underground water and the sewer system draining directly into the river: the particular richness of underground water in Rome led to frequent floods by effusion.



CONSEQUENCES

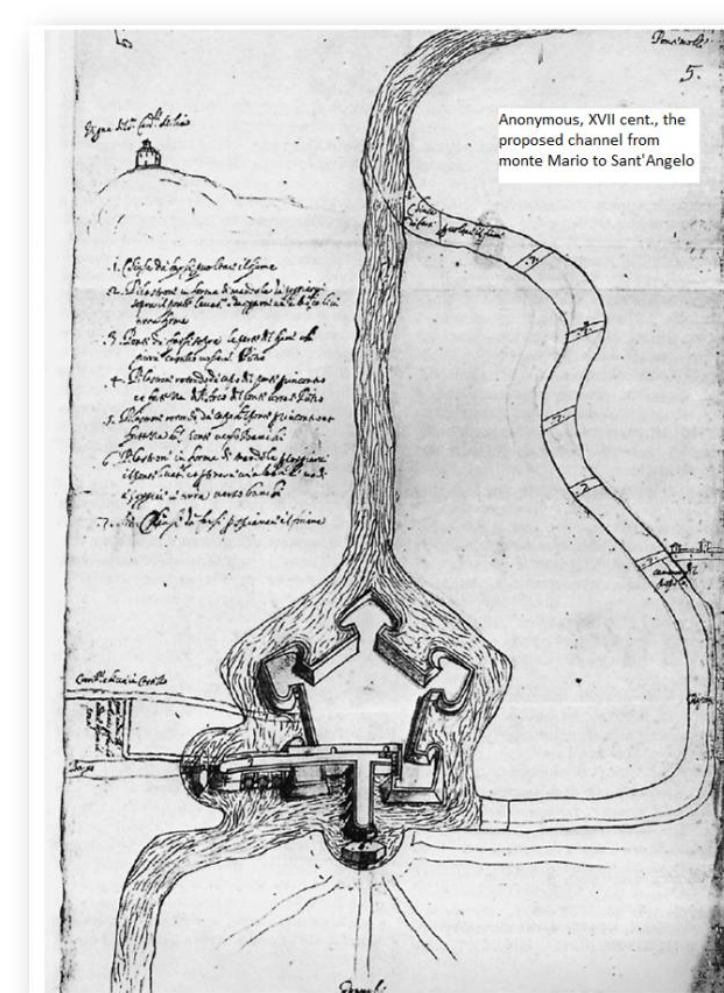
- Loss of lives and damages to the buildings: the most affected was the poorest and most disadvantaged part of the population, living in the low-lying areas near the river.
- Mills in need of repair and consequent scarcity of bread.
- Impaired economic activities and consequent poverty and charesties.
- Diseases and epidemics caused by mud and debries left behind by the flood

HUMAN RESPONSE

- Proposals to remove the mills.
- Opposed by the guild of millers on the grounds that it was necessary to continue producing bread in town
- Repeated raccomandations to change the river course through the excavation of a straight channel from monte Mario to Castel Sant'Angelo.
- Rejected because of technical difficulties, the general resistance to changes of the urbanistic aspect of the town, and the opposition of some prominent families whose palaces and gardens would have been impacted.
- Restoration of bridges
- Laws aimed to prevent the dumping of any waste into the river
- And... Pope Pius X, during the 1571 flood, orders to throw in the river a wax scapegoat. According to Bonini (Il Tevere incatenato, Roma, 1667) this act made the riverflow go back into its bed...

ANTHROPOGENIC AFFECTING FACTORS

- Obstacles to the natural flow:
- Bridges (improperly built with narrow arches and/or in an unfavorable location)
- Mills (obstructing the flow and, when detached from the anchorage during a flood, plugging the arches of the bridges)
- Ruins (of bridges, buildings, gardens...)
- Waste and garbage of all kind (no laws to prevent the centuries-old habit of dumping waste into the river were in place yet)



CONCLUSIONS:

- Rome and its river have coexisted for centuries in a relationship where utility – necessity – and troubles caused by the Tiber's floods were passively accepted. It is difficult to define the boundaries between the public and private sectors: the river was used by everyone, but no one dared or had the will to intervene to improve the situation.
- The Papacy, in charge of the river after the fall of the Roman empire, never took a firm stand. The interventions proposed over time were rejected either for technical problems or to defend private or corporate interests.
- The floods impacted most of all the underprivileged part of the population which, from the 11th century onwards, began to occupy the low-lying areas of the city.
- Only in 1875, a few years after the unification of Italy, Garibaldi was able to have the Parliament vote the draft drawn up by architect Canevari of the present day walls called "Muraglioni". The project was completed in 1926, changing forever the relationship between the city and its river.

