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## Survey of Statical Conditions of Churches in Rome

Etat des conditions statiques d'églises de Rome

Statischer Zustand römischer Kirchen

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Historic public buildings have often undergone limited spot repairs, following the emergencies rising time by time. Such maintenance is in the end poor and expensive.

Ancient architectures were often built over the remains of former buildings, or taking advantage of existing structures; seldom at once or according to one design, but rather in multiple phases, due to changes in available cash, sponsors and taste. Their overall statical conditions are not well known, in lack of information about construction materials, soil and foundations, modifications and repairs made in the past, state of conservation and even drawings showing the exact geometry of the structure. Thus, investigations are needed in order to understand and to assess these essential aspects of the life of the buildings.

The objective of the authorities concerned with monumental buildings is now to set organic plans of preservation, foreseeing the needs of the building in a global view and assigning the priorities, in order to pursue a logical and economic sequence of maintenance and upgrading, despite fragmented funding.

In this context, the writers have been commissioned by the Ministry of Public Works to undertake surveys and investigations on the statical conditions of three main basilicae in the heart of Rome: St. Augustine's, St. John of the Florentines' and the Gesù.

**St Augustine's** has been called the "living room" of Rome. This church lies between the Tiber and the stadium of Domiziano (piazza Navona) and was built by the Augustinian hermit order who, in the 13th century, acquired some land with a small church, S. Trifone, and started the construction of a greater one, for completing it only in 1483. The new church incorporated the older walls in its transept, but it is not yet clear where and to what extent.

In 18th century, the structure was in bad shape, with severe cracks in the central part, including the drum

sustaining the dome. Then, L. Varvittelli completely renovated it, consolidating all foundations, dismantling the whole dome and replacing the old bell-tower (both still appearing in the engraving).

In the middle of 19th century, the internal ornament work was renewed and brought to the present look.





**St John of the Florentines'** was built by the state of Florence in the beginnings of the 16th Century and completed in the following, involving several of the most important architects of the time. It lies on the Tiber left bank, opposite the Vatican. A large foundation plate was built into the river bed, then without embankments (see the engraving), giving the church a length appropriate to its importance.

Subsequent architects chose different layouts among centric and longitudinal plans, while construction was going on. Finally, the longitudinal scheme prevailed with A. da Sangallo. Some older structures were incorporated such as those of a chapel; but they are not on the same plate as the church and may suffer differential settlements, also due to the high changes in water level of the nearby river.

Later, the church underwent strengthening several times.

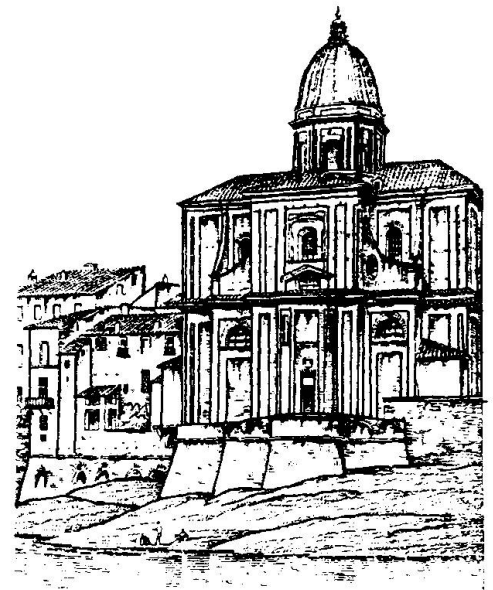
**The Gesù** (the Holy Name of Jesus'), Mother-Church of the Society of Jesus, is perhaps the most important Renaissance church in Rome. A small chapel, S. Maria della Strada, assigned to the Society on the site, was soon demolished, yielding place to the new majestic architecture. Several designs were examined,

including Michelangelo's, implying various positions, before the actual one by G. Della Porta was agreed upon, its façade rising in front of the *Papal Street* and chancel in the place of the former chapel.

Documents describe difficulties and cost of founding *in the water*.

The dome is low, not to impose upon the view of the façade; it had masonry ribs also on the inner face, that were demolished in the 17th century for frescoing the ceiling (a report says that the masonry of the vault was *good and strong*, needing no ribs!).

"Instructions" in 27 items, written by the Jesuites, codified the construction works and are testimony to the state of the art at the time.



The survey has begun with historic research on structural data, geometric measurements and visual inspections. No evidence appears on overall static weaknesses, but typical degradations are present in all buildings, namely, roof timber aging and leakings, detachings of lead plates from domes, humidity from soil, settlement cracks in masonry. Particularly difficult is checking the foundations. In fact, inside the churches the underground space is filled with historic graves and, outside, streets and buildings hinder inspections. The survey will proceed by sampling the structural materials and monitoring the deformations, where needed. Finally, a maintenance plan will be established.