

Abstracts

PAOLA DEGNI

*The restoration of the Complex of San Carlino alle Quattro Fontane in Rome.
From the project to its implementation: criteria and phasing*

The article describes, with the help of images and the findings of investigations and research, the implementation of the project for the restoration of Borromini's monumental complex built for the Trinitarian Fathers at San Carlino alle Quattro Fontane. By the late 1980s the complex was in a state of dilapidation and its conservation at risk.

The restoration was spread over some twenty years, from 1986 to the end of 2006, according to a comprehensive project, consisting of consecutive homogeneous phases. The objective was the recuperation of the original architectural connotation of the whole complex through a recovery and reinstatement of its original decoration: whether in stucco, in fresco, in pastiglia, etc. A significant factor was the need to correlate the various operations with the funds allocated to the project from 1986 onwards, first by the Ministero per i Beni Culturali e Ambientali (now Ministero per i Beni e le Attività Culturali), supported in sequence by the funds raised by a subscription promoted in Switzerland, in particular in Canton Ticino, homeland of Francesco Borromini (Bissone 1599 – Rome 1667), then by EEC funding in the years 1995–1996 for a pilot project of conservation of the European architectural heritage, followed by contributions from the GNS Trust, from the Ufficio Italiano dei Cambi on the occasion of the celebrations marking its fiftieth anniversary, and by some private donations.

No systematic restoration of the San Carlino complex had been conducted since the Sixties, when some partial maintenance work was undertaken. This had been preceded by various interventions in the Twenties and Thirties that had in part altered some of the original surfaces.

The restoration project began in 1986 with a preliminary survey of all the roofs and terracing of the complex, followed by measures of reclamation and refurbishment aimed at halting the process of deterioration. This first phase was completed in the early Nineties.

Specific aspects aimed at recovering the original architectural features of the complex were tackled in the second phase: more particularly, the restoration of the extremely dilapidated exterior of the lantern (1987–1988), the façade of the church (1993), long obscured by grime, and the crypt (1995); all these works were financed by the Ministry.

A third phase of the programme consisted of the restoration of the cloister (1995–1996) and of the two façades of the convent (1997), the first adjacent to the façade of the church on the Via del Quirinale, the other consisting of the first part of the long elevation on the Via delle Quattro Fontane. These parts of the restoration were funded by the subscription opened in Switzerland. The contribution of some Swiss companies then permitted the renovation of the campanile (1999).

The restoration of the church interior was conducted between 1997 and 2000, with funds allocated by the Ministero per i Beni e le Attività Culturali, and completed in 2001.

Another phase in the restoration project followed in 2003. This was aimed at the renovation of another part of the convent, the façade of the dormitory quarter, and more recently the restoration of that of the eighteenth-century addition on the Via delle Quattro Fontane.

During all these interventions constant reference was made to archival documents. The contribution of all the documentary evidence, including the original contracts, transformed the building site into a laboratory for the proper study and elucidation of the monument. The fact that only recognized experts in the field, leading professionals, specialized firms, graduate restorers of the ICR, skilled craftsmen, artisans and building workers were involved in the project should also be emphasized.

MARINA BONAVIA

Borromini rediscovered. Historiographic retrospective ... as premise for the restoration with Index of documentary sources

*The article presents the results of a fresh study of the already known documentary sources in the Archive of the Convent of San Carlino, supplemented by the findings of a new research project that placed particular emphasis on the building techniques and materials used by Borromini with a view to their restoration and conservation. A systematic catalogue of the source material is presented in an appendix; it brings together the documents relating to the construction of San Carlino, essentially those relating to the activity of Francesco Borromini at San Carlino between 1634 and 1644 (the documents already published by Oskar Pollak in 1928 are supplemented with a revised edition of the original manuscript *Relazione e Fabrica del Convento di San Carlo alle Quattro Fontane*, written by Fra Giovanni di San Bonaventura, and with the transcription of the papers of a bound folder, recently rediscovered in the archive, containing a series of estimates and receipts for the work, signed by the site foremen, presumably the original documents only in part cited in the *Fabrica*).*

*The materials contained in the still unpublished graduate dissertation (a case study in the restoration of historic monuments), *San Carlino – ricerca storica e proposta di restauro* edited by M. BONAVIA, R. FRANCUCCI and R. MEZZINA (Facoltà di Architettura di Roma, 1982), were also drawn on and formed the basis for all subsequent investigations. The materials in question consist in particular of a series of unbound manuscripts (Ms. 77b) relating to the second phase of Borromini's activity at San Carlino (1644–1667), the interventions for the completion of the building conducted by the architect's nephew Bernardo Borromini (1670–1680) and the loose documents in folders relating to the work of completing Borromini's project, its maintenance and alterations made to it in the following centuries.*

The study describes the process of comparing and correlating the findings of research on the archival sources and the observations made during the various restoration phases from 1990 to the present day. Through analytical interpretation of the source material the author has tried to separate the various structural and decorative elements to permit their identification during the phase of restoration and thus to provide the restorers with an immediate corpus of information on the type of materials used in the building, the methods with which they were used and their dimensions, useful also for ascertaining any alteration that may subsequently have been made to the building; this practice often suggested and guided the investigations and interventions to be conducted during the work.

*The analytical records and the freehand sketches furnished with annotations made in situ are an integral part of the study. The text itself is divided into sections, according to the chronological succession of the interventions. It presents the main new findings that emerged from the research conducted during the work on the restoration of the lateral façade of the church on the *Via delle Quattro Fontane* (1996), the façade of the Convent on the *Via del Quirinale* (1997), the church interior (1998), the campanile and corner block (cantonale) (1999), and the façade of the convent wing of the dormitory quarter (2000).*

CARLA GIOVANNONE

The recovery of the chromatic "facies" of the lateral façade of the church of San Carlino alle Quattro Fontane and of the convent façade on the Via del Quirinale

The article presents the results of an analysis of the materials and surfaces of the two facades of San Carlino built by Francesco Borromini and recently restored. The restoration in the years 1996–1998 brought to light and preserved the original architectural surfaces of the facades. These are extraordinarily

well preserved. Realized with pozzolana-based plaster whitewashed in fresco, they were then buried, but at the same time preserved, below thick stratifications of later 'maintenance' coats of distemper and by the alterations produced by urban pollution. "The restoration site as opportunity for interdisciplinary knowledge" is a definition that can perfectly be applied to the phase of restoration of the facades of San Carlino. It provided an occasion for the study of the techniques and materials used in Borromini's buildings and for a detailed correlation between the existing state of the fabric and what is reported in the documentary sources, thanks also to the splendid opportunity to work with an experienced team of technicians and scholars. The results of early interventions on the buildings are also analysed. The first of these were conducted only a few years after the death of the illustrious architect from the Ticino by his nephew Bernardo Borromini. These were followed by the first eighteenth-century restorations presumably supervised by Alessandro Sperone; by later interventions linked to nineteenth-century maintenance, identifiable by a striking change in the colours used in the facing materials; and lastly by those of the last century characterized by the abandonment of traditional materials and by the use of industrial products.

CARLA GIOVANNONE

*The restoration of the campanile and corner block of the church of San Carlino alle Quattro Fontane:
the recovery of the original architectural connotation*

The restoration of the campanile of San Carlino was prompted by the compelling need to safeguard and restore its seriously degraded architectural surfaces. The work of consolidation permitted the conservation of what had been preserved of its original fabric. But that in itself was not enough: the erosion of the surfaces of the campanile and the clumsy renovation of some of its decorative features risked depriving the monument of its original architectural connotation. So the intervention was characterized by the re-integration of the original architectural mouldings through profiles obtained from the few well-preserved zones and the integration in fresco of the lime-based colours. This approach was inspired by a revival of the same technique that had been ascertained in the building sites of Francesco Borromini. Its aim was to ensure the greater durability of the restoration, given that the surfaces of the campanile are strongly exposed to the risks of pollution and environmental degradation.

In this case too the restoration site was an occasion for study of the documentary sources and for the documentary ascertainment of the techniques originally used by Borromini and those adopted by the many successive restorations. The study of the early integrations and restorations helped to elucidate the transition from the traditional eighteenth- and nineteenth-century technology, which used lime and gypsum, to the industrial technology of the twentieth century, which used cement and synthetic products.

PAOLA DEGNI

*Chronicle of the restoration of the church interior of San Carlino alle Quattro Fontane,
with Appendix I-II*

During the restoration of the church interior between 1996 and 2000, and its completion in 2001, a diary/chronicle was kept, describing the techniques and materials adopted, and evaluating the various processes, technical analyses and scientific investigations combined with constant reference to the archival documents. The whole process was aimed at achieving the project objective, namely, the recovery of the original stucco finishes.

The pursuit of this objective led, where possible, to the recovery of the original surfaces, painted in fresco over a heavily compacted pozzolana-based plaster foundation on the façades of the Convent on the Via del Quirinale and on the Via delle Quattro Fontane. In the church interior an indispensable objective of the restoration was the tracing and reinstatement, through the removal of later overlays, of the original stucco surfaces, concealed by later interventions using inappropriate colours.

The various phases in the restoration, in particular the most important processes, were registered in site notebooks in which the situations revealed by the restoration were always accompanied by sketches, images and annotations specifying the measures being taken and the observations made during direct first-hand analysis of the monument. These immediate findings constituted the first cognitive approach, later supported by the necessary scientific investigations and corroborative examination of the documentary sources.

So all the successive phases in the restoration were scrupulously registered, ranging from the initial problems associated with the erection of the necessary scaffolding inside the church, of a suitable height for the restorers to be able to reach all the surfaces, and in conformity with existing health and safety regulations, to the need to accompany the work with suitable graphics to document the surveying of the fabric, and guidelines for the operations, backed up by the usual documentation and with annotations on the executive techniques.

The restoration of the church interior was concluded with the renovation of the inner façade wall. This part of the church had been altered, and the original fabric of the interior damaged, by the later incorporation of two organs, one in the early nineteenth, the other in the early twentieth century. There was therefore a need to plan a suitable restoration of this wall consonant with the architectural style ascertainable elsewhere in the interior.

LUANA BROCANI

Appendix I. - Restoration of the gilt stuccoes of the frames of the side altars in the church

The appendix describes the restoration of the two predellas of the side altars and the upper part of the two frames that enclose the large altarpieces. It explains the various interventions and the re-composition of the missing parts, where possible, by analogy with the existing elements. As regards the faces of the two cherubs (documented by the engraving) that have been totally lost, the restoration was limited to a chromatic treatment of the ground of the gap in the painting.

CLELIA SBARDELLA

Appendix II. - The restoration of the gilt wrought-iron gates

The appendix describes the methods used in the recuperation of the original gilding of the wrought-iron gates providing access to the chapels and of the grated windows overlooking the high altar.

The removal of the superimposed layers of repainting permitted the recovery of the original gilding, where this has survived. The missing parts were then re-gilded using pure gold (oro zecchino), suitably patinated.

MARIA ALESSANDRA PETRETTO

Endoscopic analysis: contribution to studies on the dome and the fabric of the church

The article describes the investigations conducted on the fabric of the church during the recent restoration. Its aim is to clarify some aspects of construction more directly linked to the static conditions of the structures and in particular to contribute to our knowledge of the physical and technical properties of the fabric. The areas investigated are of both static and architectural relevance. Their structural typologies are also elucidated. They are: the dome, the arcades, the entablature and the perimeter wall. The method of investigation chosen was that of direct and non-invasive type, implemented mainly through endoscopic inspections into the thickness of the walls and the carrying out of surface observation tests. A preliminary investigation to check on the possible presence of metal reinforcing chains within the walls was also conducted. The investigations comprised various phases: inspection, plotting of the measurements and acquisition of images on digital support. Some of the most significant data are reported in synthesis.

The findings show that, as far as the materials used in the fabric are concerned, the walls are entirely built of bricks, for the most part re-used bricks bonded together using pozzolana mortar. No presence of metal reinforcing chains was found. Particular attention was devoted to the structure of the dome and its lantern. The investigations enabled further progress to be made in the analysis of the wall structure and the technique of construction used by Borromini in building the church. The results obtained from the observation of the system of coffering of the dome, of the arcading and of the perimeter complex consisting of wall structure and colonnade are presented. Lastly, the importance assumed by the thick stratum of pozzolana rendering in the architectural configuration is emphasized. The data also help to clarify the static function of some parts of the fabric.

DANIELA LUZI

The architectural and decorative features inside the church: original finishing techniques and later maintenance work

During the restoration of the church interior, which permitted the recuperation of Borromini's original surfaces, all later overlays were removed: the superimposed layers of whitewash, the renovations in depth, and the stuccoing that had plugged or repaired gaps in the decoration. In this way the original seventeenth-century surfaces of the decorations, and the most significant traces of the later restorations referable to various phases, were thus brought back to light and analyzed.

The data presented here were deduced from observations of the surfaces made during the latest conservation measures. These were then compared with the techniques described in architectural treatises of the period and correlated with the results of scientific analyses.

The various techniques used in the stuccoing of the interior, «stuccho lisso, variamente scorniciato» (smooth stucco, variously moulded) and «stuccho intagliato a mano o a stampa» (stucco incised by hand or with the use of moulds), cited in the documents of the Fabrica, were identified and analysed through observations of the various decorative elements. The fractures and lacunae that have been ascertained over time permitted the deeper structure of the mouldings to be observed, the stratigraphic succession of the various plaster surfaces to be analysed, and the sequence of the phases of work in Borromini's original building site to be reconstructed.

During the research, samples were removed from the fabric, with the aim of establishing the micro-analytic characterization of the materials used and the stratigraphic sequence of the layers.

The surfaces were analysed beginning with the underlying wall structure, consisting mainly of re-used bricks; then its surface cladding, consisting of a foundation layer of pozzolana-based mortar which regularized and defined the forms, and lastly a top layer of stucco, consisting of lime and powdered marble; this surface layer of stucco has a different kind of finishing and includes zones with localized colour treatment.

CLELIA SBARDELLA

State of conservation and restoration of the surfaces

The article describes the state of conservation of the surfaces of the church interior and the successive phases in their restoration. In view of the complex articulation of the architectural forms and their differing states of conservation, the text was divided into various chapters, differentiated according to architectural types and the chronology of the interventions.

In the first introductory chapter, the author describes the motivations that led to the choice of methods: the need to free all the surfaces from the thick superimposed layers of later interventions. The main phases of the restoration are then described: graphic survey of the alterations and techniques of interventions, consolidation of surfaces, cleaning and removal of whitewash, stuccoing and micro-stuccoing of cracks and gaps in the fabric.

The detailed description of the surfaces, from top to bottom, beginning from the lantern, then descending to the dome and the vaults down to the colonnade, enable us to follow in every detail, not only the state of conservation, but also the superimposition of the main phases in the interior's maintenance, alterations, whether structural or superficial, and the process and phases of construction. These conclusions are deduced from the ascertainment of lacunae, the stratigraphy of restoration stuccoes and later additions. The phases of the alteration of the windows in the lantern are reconstructed; the original colouring of their external surfaces was identified in their under-arches. The discovery of an inscription at the bottom of the lantern showed that the project had been modified during the actual building work. Analysis of the dome showed that the median cracks were already present in the first maintenance phase. Structural alterations predating the phases of maintenance were also identified in the colonnade.

The article also underlines the care devoted to the choice of the materials used in the restoration, always aimed at conformity with the original materials and at its better conservation, in such a way as to restore the architectural composition in a non-invasive way; the objective was to ensure that all the restoration measures would be recognizable when subjected to close scrutiny. The main phases of reconstruction are described, limited to serial elements that can easily be reconstructed, and only when necessary for a correct 'reading' of the fabric.

The last chapter is devoted to the dismantling of the nineteenth-century singing gallery, made necessary by the renovation of the surfaces of the inner façade wall. The destruction caused by this addition and the innumerable alterations suffered by the original surfaces as a consequence of it are described. The difficulties in reconstructing the exact curvature and projections of the original surfaces are also pointed out. Particular emphasis is placed on the study conducted on the few original fragments still in situ, indispensable for guiding every phase in the reconstruction.

A final paragraph describes in detail the materials used in some phases of the restoration.

MICHELA GOTTARDO

The restoration of the façade of the dormitory quarter

The restoration of the façade of the dormitory quarter at San Carlino alle Quattro Fontane, part of the wider project of the refurbishment of the whole complex of the Convent, represented an important opportunity to collect further historical and technical data on the work of Francesco Borromini and his craftsmen and to verify these data through comparison with those that emerged during previous restorations.

The study of the archival documents, stratigraphic analysis aimed at elucidating the technique of construction, and micro-analytical investigation represented the theoretical foundations on which the restoration of the dormitory façade was based.

The restoration comprised various phases: preliminary investigations conducted through stratigraphic tests and micro-analytic investigations on samples taken from the most significant points of the facade, permitting the original techniques of construction, the preparatory strata of plaster and surface finishes, and the successive interventions of maintenance to be established; the survey of the state of conservation, on which the operational procedures of the restoration were based; and the restoration itself, which consisted in the renovation of the morphological and material aspects of the decorative system and the chromatic re-connotation of the surfaces.

