THE SCHOOL OF MATHEMATICS AT ROME'S UNIVERSITY CAMPUS

GIO PONTI, 1935

Edited by Simona Salvo | Sapienza University of Rome

SAPIENZA UNIVERSITÀ EDITRICE

University Press

THE SCHOOL OF MATHEMATICS AT ROME'S UNIVERSITY CAMPUS

GIO PONTI,1935

Edited by Simona Salvo I Sapienza University of Rome

SAPIENZA
UNIVERSITÀ EDITRICE
2022

Sapienza Università Editrice
Piazzale Aldo Moro 5 – 00185 Roma

www.editricesapienza.it
editrice.sapienza@uniroma1.it

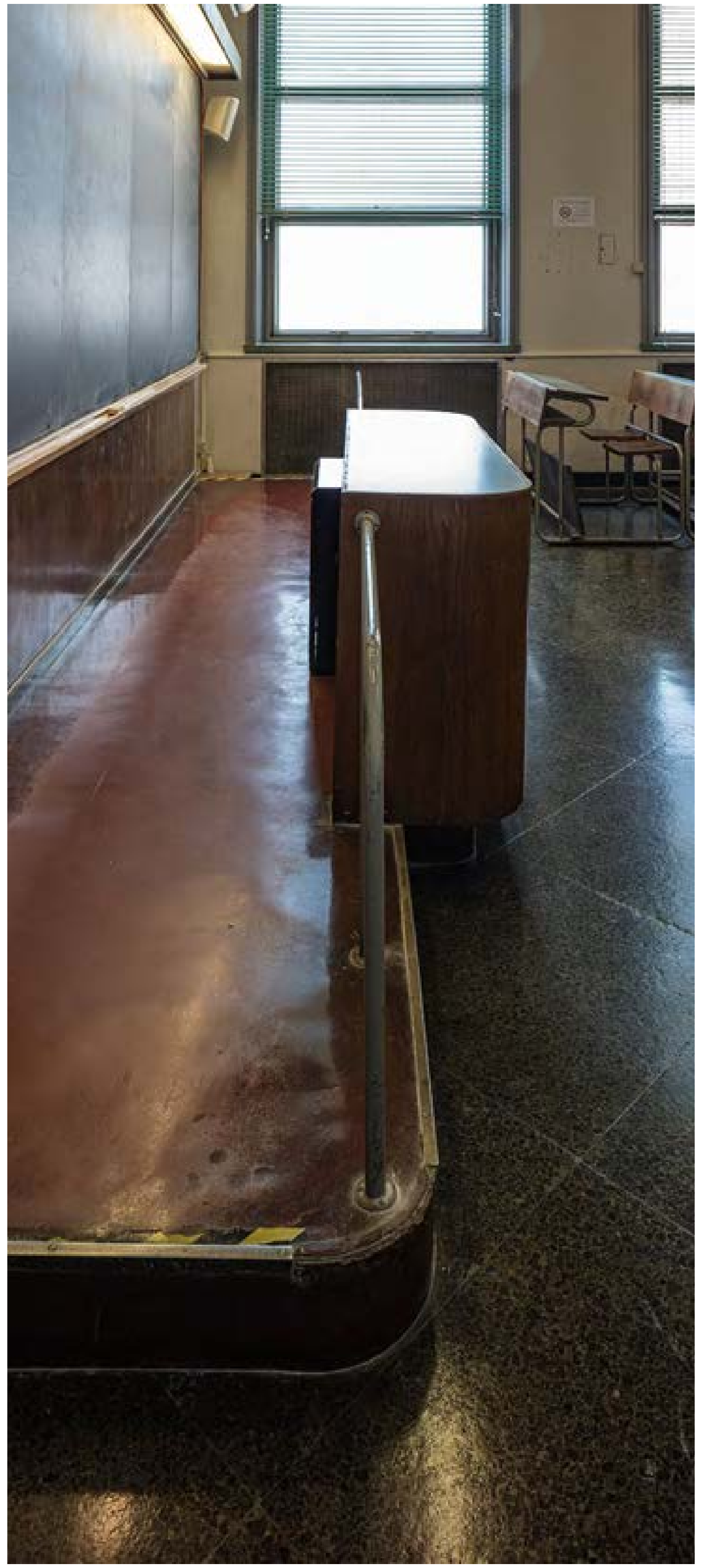
Registry of Communication Workers registration n. 11420

ISBN 978-88-9377-233-4
DOI 10.13133/9788893772334

Published in September 2022

Layout by: Yara Rizk

Cover image: Nicolò Sardo



© Nicolò Sardo

SAPIENZA UNIVERSITY OF ROME

Department of Mathematics
Riccardo Salvati Manni (2018) and Isabeau Birindelli (2019-) Directors

Department of History Representation Restoration of Architecture
Carlo Bianchini | Project Manager

Simona Salvo | General Scientific Coordinator, Conservation Management Planning

Antonella Greco, Marzia Marandola | Scientific Coordinator | History, Archival Research
Annarosa Cerutti, Alberto Coppo | Research Assistants

Flaminia Bardati | Scientific Coordinator | Interiors and Furniture
Chiara Turco | Research Assistant

Alfonso Ippolito | Scientific Coordinator | Survey and Representation
Martina Attenni | Research Assistant

Simona Salvo | Scientific Coordinator | Functions, Uses and Value Assessment
Marianna Cortesi, Simone Castellan | Research Assistants

AsTRE-LabMat | Department of History, Representation and Conservation of Architecture
Elisabetta Giorgi | Scientific Coordinator | Materials, Construction Techniques and State of Conservation
Luisa Pandolfi | Research Assistant

CISTec Research Centre in Science and Technology for the Conservation of the Historical Architectural Heritage
Maria Laura Santarelli | Scientific Coordinator | Materials, Construction Techniques and State of Conservation
Maria Carla Ciacchella | Research Assistant

Department of Structural and Geotechnical Engineering
Laura Liberatore | Scientific Coordinator
Giuseppe Lanzo | Geotechnical Investigation
Luigi Sorrentino | Structural Analysis
Ilaria Martella | Research Assistant

Center for Interdepartmental Research Territory Buildings Conservation Environment
Francesco Mancini | Scientific Coordinator | Energy Efficency
Giada Romano, Maria Rosso | Research Assistants

Consultants
Lorenzo Lambiase | GEOTER s.r.l.

Photographic Documentation
Nicolò Sardo, Giampiero Bucci

Graphic Editing
Yara Rizk

SAPIENZA UNIVERSITÀ DI ROMA

Getty Foundation

© Nicolò Sardo

ACKNOWLEDGEMENTS

Silvana Abeasis
Mathematician, academic, alumna of the Department of Mathematics, Sapienza University of Rome

Laura Armiero
Director of the Central Library, Faculty of Architecture, Sapienza University of Rome

Luigi Balis-Crema
Aerospace engineer, academic, alumnus of the Department of Mathematics, Sapienza University of Rome

Massimo Babudri
Engineer, Director of the Technical Management Office, Sapienza University of Rome

Fernando Bardati
Electronic engineer, academic, alumnus of the Department of Mathematics, Sapienza University of Rome

Giorgio Bazzucchi
Poleis Cooperativa Archeologica

Manuela Bazzarelli
Spaziofare, Rome

Elena Bernardi
Archivist, Istituto Centrale Catalogazione e Documentazione, Gabinetto Fotografico Nazionale

Marco Bonaventura
Department of Structural and Geotechnical Engineering, Faculty of Architecture, Sapienza University of Rome

Sergio Bozzetti
Engineer, Former employee of the Technical Management Office, Sapienza University of Rome

Patrizia Cacciani
Archivist, Istituto Luce, Cinecittà S.p.A.

Emanuele Caglioti
Mathematician, academic, former Director of the Department of Mathematics, Sapienza University of Rome

Alessandra Cappella
Archivist, Centro Ricerca e Documentazione Arti Visive, Rome Municipality

Maristella Casciato
Getty Research Institute, Los Angeles

Pier Vittorio Ceccherini
Mathematician, academic, alumnus of the Department of Mathematics, Sapienza University of Rome

Orietta Ceiner
Archivist, Historical Archive, Belluno, Feltre and Cadore

Francesco Citti
Director of Library, University of Bologna

Giorgio Ciucci
Architecture historian, academic, University Roma Tre

Renata Codello
Architect, Cini Foundation, Venice

Roberto Dallago
Master woodworker

Maria Rosaria Del Ciello
Current Director of Library of the Department of Mathematics, Sapienza University of Rome

Roberto De Rose
Central State Archive, Rome

Federica D'Orazio
Architect, HBIM expert

Roberto Dulio
Architecture historian, academic, Polytechnic of Milan

Michele Emmer
Mathematician, academic, alumnus of the Department of Mathematics, Sapienza University of Rome

Fortunato Faga
Director of the Central Library, Faculty of Architecture, University of Florence

Glenda Furini
Library, University of Bologna

Eugenio Gaudio
Academic, former Rector, Sapienza University of Rome

Fabio Gibilaro
Upholsterer at the Vatican's 'Floreria'

Carla Giovannone
Conservator

Dina Ghinelli
Mathematician, academic, alumna of the Department of Mathematics, Sapienza University of Rome

Margherita Guccione
Architect, Former Director of MAXXI, Architecture Section

Francesco Guerra
Physic, academic, former Director of the Department of Mathematics, Sapienza University of Rome

Gianmario Guidarelli
Architecture historian, academic, University of Padua

Beniamino Iezzi
Caretaker, School of Mathematics, Sapienza University of Rome

© Nicolò Sardo

Angela Iori
Engineer, Technical Management Office, Sapienza University of Rome

Fulvio Irace
Architecture historian, academic, emeritus, Polytechnic of Milan

Lamberto Lamberti
Mathematician, academic, alumnus of the Department of Mathematics, Sapienza University Sapienza University of Rome

Alessandro Lanzetta
Architect, Departement of Architecture, Sapienza University of Rome

Salvatore Licitra
Gio Ponti Archives, Milan

Giovanni Longo
Cartography, Faculty of Architecture, Sapienza University of Rome

Daniela Loyola
Archivist, Central State Archive, Rome

Massimo Mantovani
GEOTER s.r.l., Geotechnics and Geological Engineering

Giovanna Masciadri
Architect, specialist in fire safety planning, Milan

Paolo Mariani
Caretaker, School of Mathematics, Sapienza University of Rome

Paola Mazzuca
Architect

Alessandra Menegazzi
Conservator, Museum for Archeology and Artistic Sciences, University of Padua

Lucia Miodini
Archivist, Centro Studi e Archivio della Comunicazione, University of Parma

Stefania Mornati
Architect, academic, Tor Vergata University of Rome

Beatriz Mugayar Kühl
Architect, academic, Faculty of Urbanism and Architecture, University of São Paulo

Alessandra Muntoni
Architecture historian, academic, Sapienza University of Rome

Giacomo Nerozzi
Archivist, University of Bologna, Pais Archival Fond

Vincenzo Nesi
Mathematician, academic, former Director of the Department of Mathematics, Sapienza University of Rome

Silvio Oksman
Architect, Metrópole Arquitetos, São Paulo

Carla Onesti
Architect, Director of Historical Archive, Sapienza University of Rome

Pietro Petraroia
Former Executive Officer for Culture Regione Lombardia, responsible for the restoration of the Pirelli Tower in Milan

Stefano Andrea Poli
Architect, Auction House “Il Ponte”

Annalisa Pomante
Architect

Massimiliano Pontani
Laboratorio Modelli di Architettura, Rome

Chiara Porrovecchio
Conservation scientist

Claudio Procesi
Mathematician, academic, former Director of the Department of Mathematics, Sapienza University of Rome

Michele Restaino
Archivist, State Archive of Rome

Simona Riva
Archivist, Centro Studi e Archivio della Comunicazione, University of Parma

Antonio Rodi
GEOTER s.r.l., Geotechnics and Geological Engineering

Enrico Rogora
Mathematician, academic, Department of Mathematics, Sapienza University of Rome

Francesco Romeo
Engineer, academic, Departement of Structural and Geotechnical Engineering, Sapienza University of Rome

Paolo Rosselli
Gio Ponti Archives, Milan

Cecilia Rostagni
Architecture historian, academic, University of Sassari

Ascanio Sciolari
Archivist, former Director of the Palazzo della Luce

Carlo Severati
Architecture historian, academic, University Roma Tre

Elizabeth Shepherd
Archivist, Istituto Centrale Catalogazione e Documentazione, Aerofoteca Nazionale

Silvano Silvani
Department of Structural and Geotechnical Engineering, Sapienza University of Rome

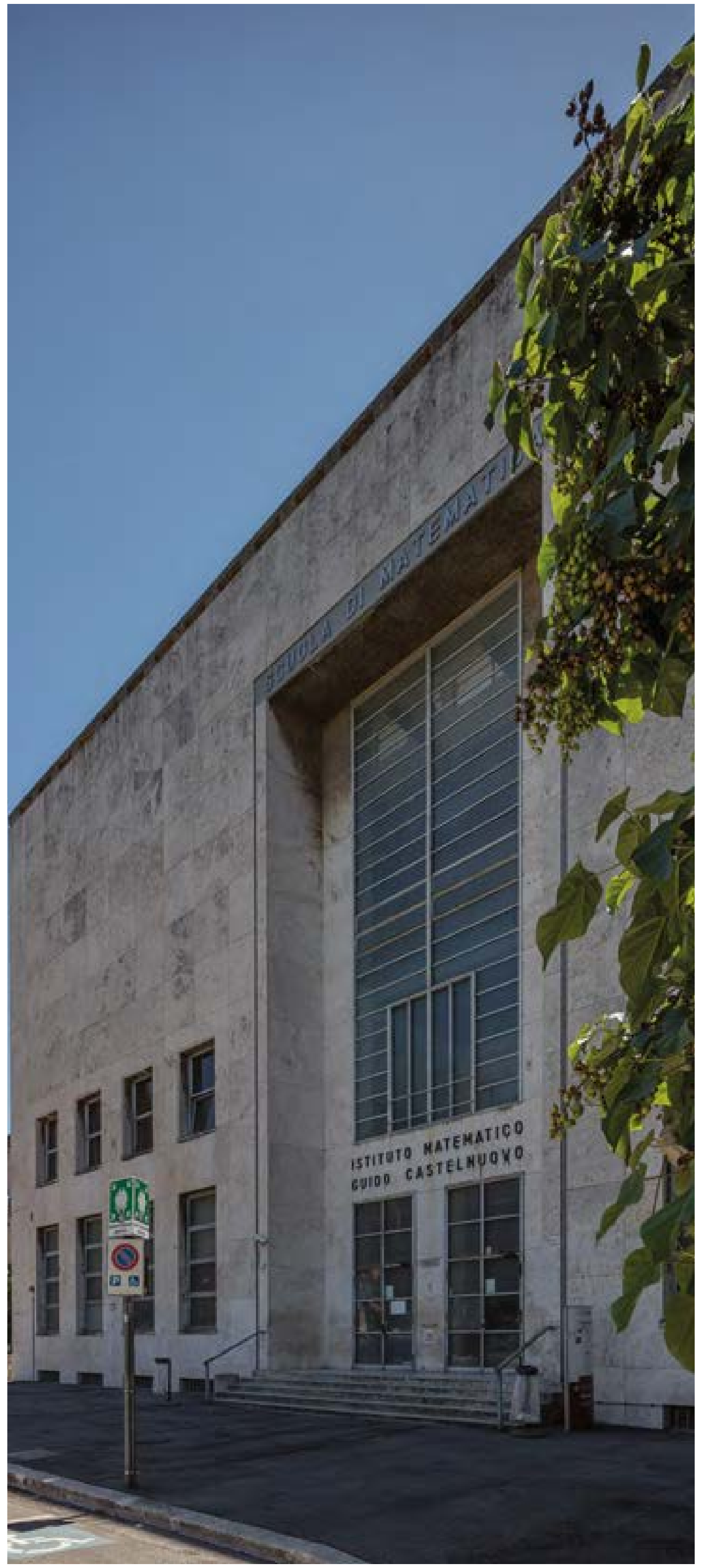
Elena Svalduz
Architecture historian, academic, University of Padua

Federica Tosini
Archivist, Historical Archive, University of Padua

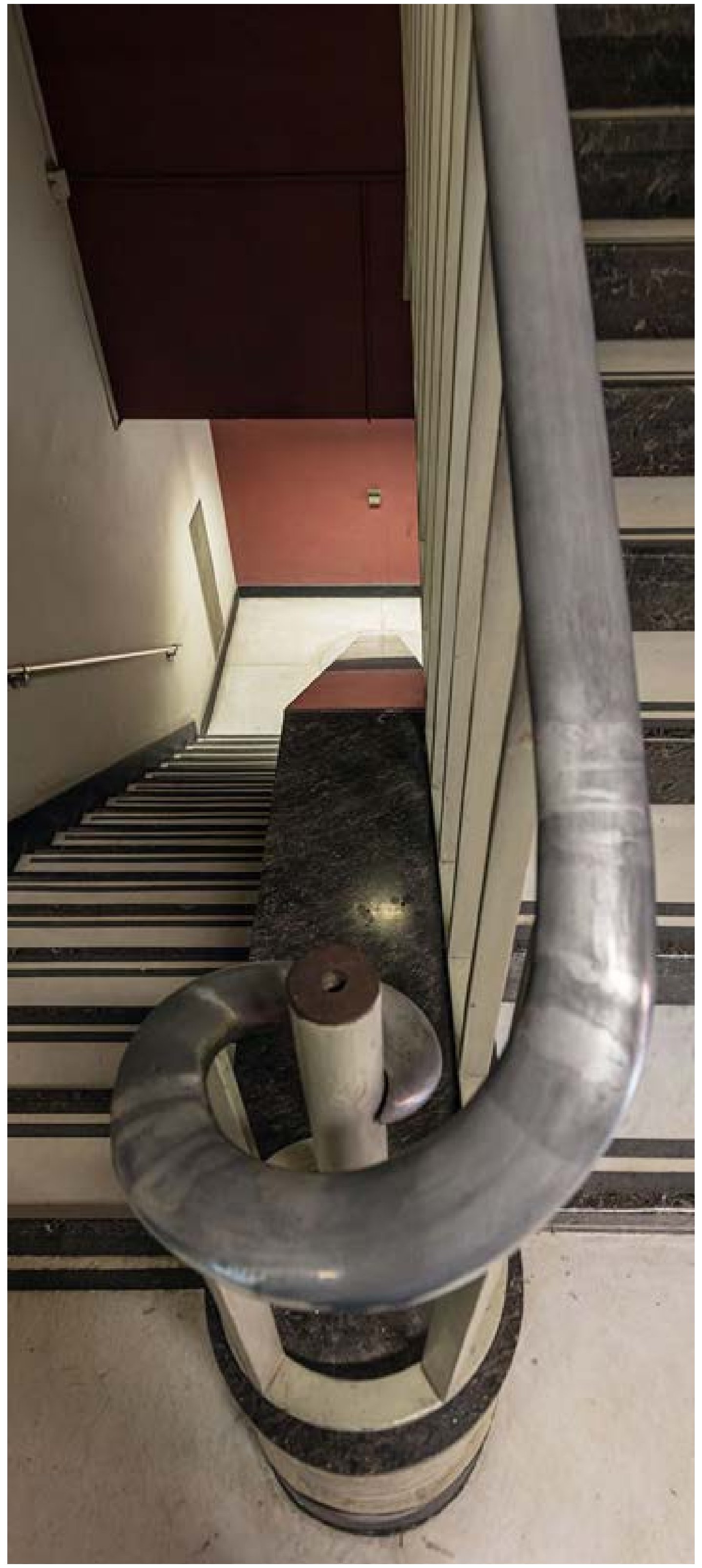
Lucilla Vespucci
Former Director of Library of the Department of Mathematics, Sapienza University of Rome

Stefano Zaggia
Architecture historian, academic, University of Padua

Francesca Zanella
Architecture historian, Former Director of the Centro Studi e Archivio della Comunicazione, University of Parma


SCUOLA DI MATEMATICA
ISTITUTO MATEMATICO
GUIDO CASTELNUOVO

INDEX



© Nicolò Sardo

FOREWORDS

Antonella Polimeni
Rector of Sapienza University of Rome

The three-year research project on the School of Mathematics building on Sapienza Main Campus is the result of a strong collaboration between scientific institutes and Sapienza departments. It is not the first time that this building has attracted the attention of scholars, architecture historians and specialists. It is, however, the first time that an interdisciplinary working group has dedicated energy, time, and scientific expertise to integrate the study of the building's history with a structural survey, analysis of materiality and evaluation of its current state.

A team of more than twenty-five researchers, scholars, students, consultants and experts has worked continuously – uninterrupted even by the pandemic – joining forces to afford a transdisciplinary glance at this impressive work of architecture.

The School of Mathematics is a masterpiece of the early 1930s by Gio Ponti, who is today regarded as a master of Italian Modernism. Although World War II bombings shattered the coloured stained-glass window that once adorned the balanced and harmonious white travertine façade, the building remains a striking and significant piece of architecture. Although it underwent a series of transformations over the years before its historical and artistic relevance was recognised, it can still be appreciated and admired for its magnificent expressivity. Its uniqueness derives from its complexity, such as is often found in Italian monuments of all ages: a rare synthesis of urban design, architecture, art, industrial design, historical archives and – perhaps the first of its kind – scientific production in the field of mathematics.

This illustrated report is a synopsis of the extensive technical research documents produced by the research team for each step of the work. It is also a premise for the conservation management plan proposed at the end of the full report. As in any area of science, knowledge is at the basis of future action: we need to understand today how to take care of the historical buildings of our campus tomorrow – buildings recognised worldwide as architectural and historical monuments.

We are very grateful to The Getty Foundation for its support for this initiative, which in turn depends on our researchers' expertise and commitment. We fully recognise the importance of drawing the interest of international specialists in architectural conservation to this specific building, one of Gio Ponti's most significant masterpieces of which Sapienza's community is proud.

This research project thus occupies a special place in the process of recognition of an Italian master builder, as well as in the context of the conservation of modern architecture. The care and preservation of our campus, and many other urban ensembles built in Rome during the first half of the 20th century, are part of this wider framework.

The management, upkeep, and conservation of a university campus and even more so of Sapienza's "Città Universitaria" must achieve a balance between a range of needs, from functionality to the expression of the academic community's cultural identity, while meeting safety requirements and satisfying the ever-growing demand for technological upgrading, in terms of energy efficiency and standards of communication. Today, we know that every step taken in transforming the campus buildings – particularly the School of Mathematics – deserves a cautious approach based on the awareness of their value and a thorough survey of their current condition. However, we are also confident that Sapienza can count on all the necessary expertise, skills, tools and staff needed to trigger an ethical approach, capable of responding to a variety of demands and offering advanced and solid solutions.

We herein bring together the conclusions of the work developed by the interdisciplinary working group that has collaborated on this report, with a commitment to further research this topic. The aim is to highlight that knowledge should precede and support every transformation, especially in advanced cultures that should rely on the lessons of the past to build the future.

© Nicolò Sardo

Isabeau Birindelli
Director of the School of Mathematics

Mathematical buildings, building mathematics- For many centuries Mathematics was a branch of Philosophy and at some point, it became an instrument to be used by physicists, engineers, and other scientists. Not until the XX century did it acquire an autonomy, a status of independent science. It is difficult to pin the precise moment when this happened. The fact that mathematics is a branch of science and not just a useful tool for science and engineer is by no means a foregone conclusion.

For example Luigi Cremona, a great mathematician with an essential role in the reform of the universities in the end of the XIX century, was called to the University of Rome in 1873, where he founded the "Royal School of Engineers" by unifying it with the "mathematical section" of the Faculty of Sciences, which would have been the primitive nucleus of the Istituto Matematico, later named after Guido Castelnuovo, hosted in the "Scuola di Matematica" by Gio Ponti. Until 1920, even in Göttingen, that had been the university of Gauss, and which appointed the greatest mathematicians of the world like David Hilbert and Felix Klein, there was no Department or Institute of Mathematic, as the mathematicians were members of the Philosophical Faculty. In 1926 Courant and Klein, not only created the Mathematisches Institut but, maybe for the first time in history, endeavoured to obtain a building dedicated to mathematics. However, for the construction of the Mathematisches Institut in Göttingen, Courant had to ask for funding from the Rockefeller Foundation.

The endorsement allowed not only the construction of the building but the appointment of many mathematicians. This made Gottingen the dream come true. According to those who lived there in that period, nothing before or after could be compared to that golden period. As it is well known, within a few years this miracle was destroyed by the Nazis since most of the great mathematicians there were Jews. Nonetheless, in the meantime, this incredible success led to the foundation of other "Mathematics Institutes" in Europe, as in the case of the Institut Henri Poincaré (1928) in Paris also funded by the Rockefeller Foundation.
Of course, another important pole for mathematics in Europe was the School of Rome that included Guido Castelnuovo and Tullio Levi Civita, to mention two names among many. In the vision of the new campus, the idea of dedicating to mathematics a whole building, located in a key point of the città universitaria, was the proof of an incredible foresight, considering that Italy, at the time, was dominated by the philosophical views of Giovanni Gentile, who thought that natural sciences and mathematics were second order subjects since they had no universal value and had their importance only on a professional level.

Considering that when the Scuola di Matematica was planned, there only existed two buildings dedicated to Mathematical Institutes in Europe, in Göttingen and in Paris, it is important to consider how these had been shaped. The building in Gottingen was designed by Werner Seidel but under strict control of the mathematician Neugebauer. Neugebauer insisted on the importance of the presence of a great library where mathematicians could study and find the necessary references. This was also true for the Institut Poincaré that had a very rich library having inherited the part of the Sorbonne library dedicated to mathematics funded by Darboux and Appell.

The great novelty of the Scuola di Matematica by Gio Ponti consists in the fact that the architect prevails on the mathematicians. Nonetheless, also in Rome, Ponti dedicated a great part of the building to the library around which the entire building is conceived.

Another similarity is in the fact that the library has inherited a great part of the books of the library of the Royal School of Engineers, in particular its historical collection which included about 2500 works published between 1482 and 1830. The most valuable editions are those between the XV and XVIII centuries: nine incunabula, 140 XVI century, and precious editions of the XVII and XVIII centuries.
In conclusion, as Head of the Mathematics Department "Guido Castelnuovo", I wish to emphasise that, albeit the terrible laws against jews had destroyed most mathematical schools in Europe, and had wiped out the Scuola di Roma, Sapienza's Mathematical Institute has somehow recovered after the Second World War. The Department now includes more than 80 professors and researchers, many visiting scholars, it publishes the journal "Rendiconti di Matematica" and organises regularly international conferences and colloquia. The professors of the department teach in the whole of Sapienza and are invited in the most prestigious universities and research institutes. The department is usually the first or second mathematical department in Italy in the international ranking, such as QR ranking or Shanghai ranking.

I deeply believe that the beauty of the building where our research in mathematics takes place has contributed to its success. I therefore rejoice in the fact that the Getty foundation has financed this important research, which is hopefully the first step to maintain the beauty of Ponti's building without destroying its original aim: giving a beautiful home to mathematics and mathematicians.

© Nicolò Sardo

Carlo Bianchini
Director of the Department of History,
Representation and Restoration of Architecture

The School of Mathematics in the Città Universitaria
There are moments in life in which what has always been impossible suddenly becomes possible. Generally referring to the lives of human beings, this remark can occasionally fit also the life of a building like the School of Mathematics by Giò Ponti in the Città Universitaria of Sapienza University of Rome.
It would not be appropriate (and far too long) describing here in detail the evolution of such a masterpiece of rational architecture also because these pieces of information would be found in other sections of this paper. Nevertheless, I would like to explain how and at what level the mentioned impossible is turning into possible.

After the end of World War 2, for many decades, the whole compound of the Città Universitaria has undergone a sort of cultural and political rebound. Any reference or symbol to the fascist era that had designed and implemented the campus' project must be either obliterated through overwriting or removed or consciously ignored. This unspoken directive, while on one side has determined "re-arrangements" (as in the case of Sironi's fresco in the Aula Magna), on the other has somehow demoted the value of many buildings inside the Città Universitaria. This cultural (and in some cases even ideological) program appears now clear and even reasonable at a certain extent: the buildings had to be regarded as buildings. In other words, they had to lose their symbolic and cultural reference to fascism and become physical containers of educational and research functions. The 60's, 70's and most of the 80's of last century represent the "golden age" of this way of re-thinking the Città Universitaria.

The result of this long and troubled period crossing the '68 and the so-called Years of Lead, has been a substantial loss of any reference to the original architectural value of the original buildings that paved the way to incoherent, uncontrolled and sometimes damaging interventions either for adaptation or extension reasons. These wounds can be easily appreciated just walking around the Città Universitaria and looking at the flourishing emergency stairways around the Aschieri's (Chemistry) and Pagano's (Physics) buildings or the unapparent destruction of Capponi's (Botany) masterpiece.

In the same period in which most of these "adaptations" were performed, the seed for a change was starting to sprout. The strong, sound and original Italian way to restoration of architecture was in fact growing fast and in a short while was able to provide a consistent theoretical and operational approach not only for ancient buildings but also for "modern" ones. The term "restoration of modern architecture" born around the end of the 90's intended to embrace in fact a special category of buildings being on one side the product of the modernist culture, on the other artefacts built using the "new" steel and concrete technology.

Even if an increasing number of researchers and scholars have chosen rationalist buildings for studies in the last three decades, this cultural/operational preparation was not enough though to determine effective changes on the buildings of the Città Universitaria. The actual situation was in fact very tangled: on one hand the responsibilities were too spread among different offices not so inclined to share information, on the other there was not enough coordination between the inputs of the University Governance and the technical implementation of activities.

This phenomenon was not necessarily a responsibility of the different actors involved in the process but more the result of the many (sometimes contradictory) changes that have affected the Italian university structure at least in the last 20 years and especially after the 2010 reform that has strictly separated the academic functions from the managing ones.

For these reasons, when supporting prof. Simona Salvo in the application of the project for the "Keeping It Modern" initiative, I was pretty sure that many of the foreseen results would certainly display "on paper" the consistency and value of the method applied to the School of Mathematics but have very little chance to come out of the drawer were they would have been stowed.
On the contrary, while writing this presentation at the end of the project, I must acknowledge that "impossible is turning into possible" if not even to "probable".

Once hardly to even conceive, the status of monument of the Città Universitaria compound and of its buildings is now to be considered commonplace both for Sapienza community and its Governance. Such so, that we do find in the Governance board a Deputy Rector for the Patrimonio Architettonico (Architectural Heritage). This new approach has also influenced the "intervention/managing workflow" actually establishing a strict coordination between the technical structure of Sapienza (Area Gestione Edilizia – AGE) and the Deputy Rector and his supporting group of experts. The sensation is like as everything was ready for rearrangement, accomplishing a process that has been growing for decades. The School of Mathematics project funded by the Getty Foundation has been for sure one significant driver for this movement to begin.

In this framework many projects are starting and others are about to start but the School of Mathematics' one is definitely the first of the list. The Getty Foundation funding has in fact worked in this case as a trigger: on one side it has demonstrated the feasibility of the knowledge/assessment workflow needed to deal with modern monuments; on the other, thanks to the Conservation Management Plan, it has outlined a clear and sound framework for appropriately considering the different issues coming from the living body of the building.

But, more than all the remarks presented so far, one "detail" must be considered as the more outstanding result of this complex project: Sapienza has decided to invest more than 1 Mln € for further investigations and first interventions: what a best result for the School of Mathematics, Gio Ponti, 1935 Project?

I.
RESEARCH AS A MEANS OF CONSERVATION

BACK TO INDEX

©Nicolò Sardo

MAKING SCIENTIFIC RESEARCH POSSIBLE. THE GETTY FOUNDATION FUNDING AWARD AND THE “KEEPING IT MODERN” PROGRAM

Simona Salvo

We only have our civilization to save our civilization.
Gio Ponti, 1940

As part of the 2018 “Keeping It Modern” program the Getty Foundation of Los Angeles funded a two-year research project on the School of Mathematics at Sapienza University in Rome. The grant was an unprecedented opportunity to perform interdisciplinary research on the building and identify the guidelines for its conservation over a period of time. The scientific and cultural support provided by the philanthropic North American institution, together with its generous economic incentive, made the cross-disciplinary and multiscalar investigation possible, quite apart from other contingent situations, placing this research and case study within the international scenario of the conservation of modern architecture.

The results of this research are probably neither groundbreaking in terms of historical discoveries – no unexpected document or historical drawing was discovered in the archives – nor did it identify dramatic vulnerabilities or damages to the building, peculiarly resilient given its almost 90 years of intense working life. Instead, the research has highlighted the little attention paid so far to this building (and to the entire University campus), treated pragmatically and considered only for the possibilities it offers for transformation, adaptation and development, rather than for its historical, artistic, and cultural importance. Conservation, preservation, and respect for this and other buildings on campus are undoubtedly a goal for the academic community, but remain wishful thinking without producing any substantial progress because they clash with the ever-growing requirements of intensive use and functional adaptation.

Figure 1 - The professor’s lounge, now ‘Aula Ponti’, partially restored after interventions in 2011-2013 (© Sardo 2021)

As a result, apart from the scientific achievements and in-depth data collected during this research, the study was an opportunity to measure the discrepancy between the historical and artistic importance of the building and the interest rate incurred by public institutions on the sums borrowed for its conservation- including the University, the Municipality of Rome and the Ministry of Culture; the discrepancy also reflects the distance between the propensity to support the mere use of this building instead of its preservation and conservation, in view of its best and complete fruition.

Rome's University campus is not an isolated case. This kind of treatment is also reserved for other modernist urban ensembles in the Capital, namely the E42 district (now EUR) and the former 'Foro Mussolini' (now 'Foro Italico'), that play a crucial functional role within the city, but are also heritage sites in the full sense of the word. Yet, in the case of the University campus, it is a burning issue for us academics. The goal of researchers and scholars- especially those who perceive the historical value and architectural qualities of the university buildings and are willing to perform scientific research to preserve them- clashes with the mission of public and governmental institutions which has been based, at least till now, on a free, pragmatic, and uninformed approach. Hopefully the data gathered by this research will trigger a change, leading to a better future and optimal collaboration at all levels in order to conserve, preserve and enhance our common heritage.

Scholars in the field of architectural conservation, especially those based at Sapienza University, have always shown enormous interest in the School of Mathematics. This research continues, develops, and broadens a previous study triggered in 2010 by the Director of the Mathematics Department, Vincenzo Nesi, in support of limited interventions on the building based on historical data[1]. At the time, the objective was to gather scientific data with a view to reorganizing the building's interior and provide the best possible use of spaces whose architectural significance had become indecipherable due not only to continuous adjustments and transformations over a period of time, but also to the accumulation of files of documents and other furnishings everywhere in the lobbies and corridors. Archival research, surveys, and specific studies were performed between 2011 and 2013; the skylight above the library reading hall was waterproofed, the roof underwent general maintenance, and the layout of the corridors, offices and other spaces were rearranged, first and foremost the so-called "professors' lobby", which had been radically altered in the Fifties[2].

The link between research / knowledge / appreciation / intervention in that early experimental project heralded a conscious and respectful approach to the building, sensitive not only to a reinterpretation of its original condition, but also to a critical assessment of the alterations to Ponti's design. It is worth emphasizing that this early initiative, respectful of the building's architectural quality, was prompted by the academic faculty. Professors, scholars, and students who spent every day of their working life in the building, were able to perceive and understand its value perfectly. Surprisingly enough, decades earlier the Department of Mathematics had established a special commission for the décor of its headquarters, an initiative that no other Sapienza department has undertaken, until now. At that time, the authorial value of the project for the building to Gio Ponti certainly had less influence on the daring initiative to rationalize and reduce the office spaces in order to revive the monument.

The focus on the School of Mathematics undoubtedly increased thanks to that initiative; it highlighted new important cultural initiatives, e.g., the international conference held at Sapienza University marking the 80th anniversary of its foundation (Azzaro, 2017, 2018, 2019). During the conference, specifically on the evening of November 24, 2017, the lost stained glass window designed by Ponti and made by Fontana Arte in 1935 for the main façade of the building, was re-created by projecting its image on the current blank window[3]. This should be considered a pivotal event along the path to reappropriate and preserve the building: a performance that moved the audience, thus emphasizing the power of art and culture[4].

This is the viewpoint with which we look to the future, exploiting the long wave of fame lately regained by Ponti; we are fortified by the data collected in the past two years of research on the School of Mathematics, and hope that- in Ponti's words- *our civilization will save our civilization.*

Figure 2 - The re-creation of Ponti's stained glass window obtained by projecting the original image on the current window (© Lanzetta 2017)

RESEARCH ON THE SCHOOL OF MATHEMATICS AT THE TIME OF GIO PONTI'S REVIVAL

Simona Salvo

A first spotlight had been shined on Ponti's works two decades earlier when the Pirelli Tower was restored in Milan, sparking interest in the master's artistic and architectural production, especially during the post-war years. Its conservation between 2002 and 2004 was undoubtedly a turning point in the re-evaluation process, not only because it was aesthetically and technically innovative, but also because it triggered many historical findings. Above all, that experience reaffirmed the strong cultural link that critical assessment establishes between architectural history and the scientific analysis of the built fabric, in view of its appreciation and conservation. The unprecedented opportunity of working 'with an open heart' and dismantling a stretch of the building's curtain wall envelope piece by piece, was a crucial step in order to motivate and support the decision-making process, and consequently the material conservation of the curtain wall. This opportunity once again proved that direct, scientific and hands-on knowledge is vital to initiate a process of disclosure and appreciation of cultural properties, and establish a positive cycle.

In fact, the history and restoration of the Pirelli Tower is directly linked to our research on the School of Mathematics, not only because it involves two of Gio Ponti's most important works, but because that first experience led to the cultural recovery of his works in Italy and abroad. In April 2002, the Pirelli Tower- with its wounded and mutilated façades and structure due to a dramatic accident- captured international attention. It was then that the final decision was taken to preserve the original curtain wall. A meticulous study had revealed the extraordinary historical and technological importance of these façades, thus helping to critically understand the "object" and provide scientific data for the decision-making process. The urgent and politically relevant project was followed by a very broad national and international public: but the stakes were obvious, and the historical value of the façades was undeniable at that point.

Scientific knowledge, appreciation, urgency, and a certain pragmatism magically merged and evolved into a virtuous experience. The work performed thanks to the very courageous choice to preserve the original metal and glass curtain walls- a completely new and untested intervention- involved an exciting, pioneering experience that welded traditional Italian restoration theory to ultra-modern construction technology. Apart from the many intriguing aspects of that work- ranging from a strict analysis of the residual efficiency of a late Fifties curtain wall system to the very difficult and unprecedented regeneration process of the metal frame of the building envelope (Salvo, 2007, Salvo 2014)- the project highlighted Ponti's magnificent and ingenious architecture, encouraging both specialists and the public to focus on the figure and work of a master of Italian architecture, who had so far been underestimated as an industrial designer.

Notwithstanding this renewed attention towards Ponti's production, the works he did in the Thirties were still on the backburner and, of all the projects he designed during the years of the fascist Regime (1922-1943), the School of Mathematics was the least considered, despite the fact it was a high point in Ponti's production: it was his first non-residential building, his first important, publicly commissioned project, his first important commission in Rome, his first work for the Regime, his first construction in a newly-built urban context, and his first professional opportunity after the end of his partnership with Emilio Lancia, which took place in a certain cultural context; this development allowed Ponti to occupy a nationally and internation-

Figure 3 a,b - The Pirelli building in Milan in 1960, and after restoration work (© Paolo Monti, BEIC Milan; © Salvo 2006) ally acknowledged role. The project was undoubtedly a turning point in the career of the forty-four year old Ponti.

Despite the fact that historiography (and public opinion based on historiography) has not considered them in the same way, the Roman School of Mathematics and the Tower in Milan are equally representative of his architectural poetics, notwithstanding the fact they are considered in an antithetical position within the current critical interpretation of Ponti's work. The School of Mathematics has been protected by law since 1989, while the Pirelli Tower has never had monumental protection; the former belongs to an apparently specific historical period, while the latter is part of an architectural era that is still under-explored; the former is largely ignored by specialists and by the public and has been subject to multiple alterations, while the latter is considered an icon of the Sixties. And yet, the two buildings express just one idea of artistic creativity, namely Ponti's architectural concept developed in XX century Italian culture.

Rome's School of Mathematics has remained one of Ponti's least considered works and certainly the least studied, until this research5. This fact testifies to the complicated historical-critical positioning of Ponti's early works, probably due to his unclear cultural role during the years of the Regime and his ambiguous relationship with the fascist commission. Although this situation has constantly evolved, and his work is today superlatively appreciated and considered a cult, his projects in the Thirties and Forties, especially the public commissions he received from the fascist Regime, continue to be underestimated and sometimes ignored, leaving the critical issue unsolved. The decades during which the Duce held sway over the fate of the country- the so-called 'Ventennio'- have represented a "hard rock" for Italian architectural historiography, which has long been influenced by a political and ideological interpretation of the architectural production of that period.

Moreover, except for several studies based on the visual analysis of the building and a rather repetitive bibliography, this architectural work has been set aside due to a rather "Milan-centric" historiography of Ponti, as well as by Ponti himself, who rarely mentioned his Roman projects[6].

Ponti and his artistic production have certainly gained a key role within the powerful current, ongoing cultural process that has sparked broader interest in the man and his artistic and architectural works, as well as his cultural role in XX century Italian culture. Lately, attention for his work has grown exponentially, accompanied by a flourishing series of cultural initiatives celebrating his profile as a refined artist and multifaceted intellectual, and his extraordinary skills as an architect, urban planner, writer, artist, etc.

Appreciated for his intellectual versatility and his open, optimistic and dialogic nature, Ponti lived through the XX century and made himself an interpreter of his age by imbuing his works with an all-Italian creativity. Contemporary culture inevitably tends to mirror itself in his dialogic nature, the search undertaken by a generation that gave its best by investing in ingenuity and creativity in the years after World War II.
Consideration of Ponti's work and its critique was pushed to a point that was ostensibly the exact opposite to previous architectural historiography. The harsh criticism of the late Seventies opposed to his nature and his works, especially those of the Thirties, seems to have been put aside7. In fact, previous critical positions have been truly revised only recently; this is due to the wider chronological gap that separates today's scholars from the years of the dictatorship, allowing for a more detached and objective judgment. Monographic research currently underway on some of Ponti's most important works- and naturally this research on the School of Mathematics- represents an indispensable scientific and philological reference to which critical judgment should be anchored, within the ongoing historiographical re-evaluation process.

Ponti's exuberant revival in the last decade is documented in many exhibitions8, books, studies, and initiatives of all kinds, including an initial conservative attitude towards his works9; they are therefore to be considered a cultural phenomenon of our times, a sort of 'revival' that has also triggered a broader and deeper understanding of Ponti's production and, perhaps, also of its 'survival'.

When we applied for funding to The Getty Foundation in Los Angeles in 2018, the 'Ponti revival' had already begun in earnest, indicating that it was time to focus on his other works, even the more uncomfortable ones. The Getty Foundation's interest in Ponti's building in Rome is, one way or another, probably related to the conservation work on the tower in Milan; it is also inspired by a cultural objective: to shed light on an architectural episode that can be considered a pivotal moment in Ponti's entire career.

Today, historians of architecture consider Gio Ponti and his works as a very important subject; they have focused on the many different considerations inspired by the Master’s exuberant nature. Ponti and the arts, Ponti and design, Ponti and architecture, Ponti and the city10, Ponti the demiurge who, nevertheless, continues to elude a focused definition and a comprehensive and final historical-critical interpretation: Ponti artist, Ponti designer, Ponti architect, Ponti urban planner, but also poet, writer, publicist, theorist, and practitioner. We are therefore idealizing this figure, perhaps attributing responsibilities and merits that Ponti deserved only in part, shifting the axis of critical consideration to an extreme that is the opposite of what it was two decades ago.

The materiality of most of Ponti’s buildings have not yet been analyzed, and may be therefore considered ‘unexplored’. On the contrary, those built in the Thirties have fallen even further behind the others, especially the ones commissioned by the fascist Regime, such as the School of Mathematics.

This research has therefore made the most of the experience accrued with the Pirelli Tower, placing material data at the center of the scientific-analytical interpretation. Notwithstanding the very different conditions of the two projects- an urgent intervention due to a dramatic accident in Milan, and a study to draft a conservation plan in Rome- both share the same theoretical and methodological approach based on a cross-disciplinary value assessment directly applied to the materiality of the building. In both cases, the urge for a conservative approach stems from the scientific awareness of the complexity and beauty of these artifacts, considered not only to be two of Gio Ponti’s most beautiful works, but also historical documents, precious architectural pieces of Italian modernism produced in the first half of the XX century and the expression par excellence of the culture of that age.

This is why the focus of our work is the School of Mathematics- not Gio Ponti.

The current condition of the building, compromised but also enriched by its 85 years of intense life, history and memory, offers us the measure of times gone by; it forces us to hold onto the truth of constructed reality, to avoid clichés and the inaccuracies of remote interpretation and, as far as possible, to stop projecting contemporary cultural on memories of the past. Of course, this research is nourished by the critique and interpretation of Ponti since his death, but it primarily deals with construction; it takes note of the original physical consistency of the artifact, and its current condition, with all the possible limitations, given the fact that our understanding is far from absolute.

All in all, the greatest assumption acquired through this research is how much has not yet been understood of this- albeit ‘recent’- building, and how much knowledge and material substance we have lost and will never be able to recover. For instance, it is certainly impossible to retrieve the ‘original color’ and original urban environment around the building, once metaphysically isolated and dominant in the context of the University campus.

We believe that research and knowledge about our past are the greatest means we have to encourage appreciation and awareness of the values at stake, for us as scholars and for anyone interested in this subject.

Figure 4 - Entrance lobby to the front building (© Sardo 2021)

This new experience has opened avenues of scientific and cultural interest that are worthy of being investigated further.

The achievement of a cross-cultural research to scientifically assess the importance of the building, beyond its authorial recognition- i.e. not only as one of Ponti's creations- is one of the objectives of this study. In redefining Ponti's profile as an architect it is therefore of primary importance to consider specific aspects tackled during the study. Ponti's project for the School of Mathematics provides clear evidence of the architect's genius, but it also bears witness to the expertise of many engineers, architects, clients, entrepreneurs, craftsmen, workers, artists, and technicians, etc., who contributed to shaping a cultural mosaic that allowed the "Ponti phenomenon" to take place.

This cultural, historical, and human mosaic requires careful analysis and evaluation and should be considered part of the hermeneutic process that will hopefully lead to a correct historicisation and appreciation of the building and, indirectly, to its protection and conservation.

We have invested more than two years of collective work in this cross-disciplinary research, exchanging points of view and information, but the building- its material truthfulness- has always been our focus and we have never ignored the 'human factor'. Appreciation, or misappreciation, embodies what the building currently means to society and individuals; it measures their respect and understanding, or their disrespect for, and sometimes even their rejection of this architecture, today, yesterday, and possibly tomorrow. Therefore, we have always tried to frame the School of Mathematics within the imagery of the students, the academics, the administrative staff, and the public in general, as we consider them the true stakeholders of our work.

On the other hand, in the words of Cesare Brandi11, we have always concentrated on the building's "physical subsistence" and this has led us to new interpretations. By adopting an interdisciplinary approach, comparing the construction with archival documentation- drawings and projects as well as technical and administrative records- we have begun to understand what the design drawings alone do not say, but also what mere observation of the artifact cannot reveal. Again, in Brandi's words, we have aimed at the philological interpretation of the form and the scientific analysis of matter, in order to operate a fully cognizant recognition of value.

The ultimate goal of our research has been to raise awareness of the values at stake, first of all in its 'inhabitants', academics, and students in Mathematics, and then Sapienza university as a whole, including the staff of the Technical Office responsible for the maintenance of the buildings, and of course Rome's residents and its national and international tourists. The focus has been to show that this admirable building may be enjoyed not only from a functional point of view, but also for its extraordinary architectural effects

Figure 5 - The School of Mathematics during the pandemic (© Sardo 2021)

GIO PONTI (MILAN 1891-1979)

Giovanni - called "Gio" - was born in Milan on November 18, 1891, son of Enrico Ponti and Giovanna Rigone. After completing his classical studies he enrolled in Milan's Royal Higher Technical Institute and graduated as a "Civil Architect" at Milan's Polytechnic in 1919, despite his much stronger passion for painting. The opportunity to visit the Palladian villas during World War I sparked his fascination for classical architecture, and prompted him to start a new architecture magazine called "Domus" in 1928, as well as entertain close contacts with the 'Novecento' artistic movement founded by Margherita Sarfatti and supported by Mario Sironi and Giovanni Muzio. After an intense apprenticeship in industrial design, to which he dedicated much of his life, Ponti began to collaborate with important firms that produce household objects; from 1923 to 1933 he was the artistic director of the Richard-Ginori company. This collaboration gave rise to a renewed production of very successful ceramic objects, proposed during international decorative arts exhibitions, the first of which was held in Monza in 1923. At the Paris Exhibition in 1925, Ponti was awarded the Grand Prix for porcelains.

At the end of Twenties he began to collaborate with the Venini glass factory in Murano, and in 1932 became creative director together with Pietro Chiesa of the Fontana Arte company, one of the main producers of artistic glass in Italy, a sector that was gaining momentum during that period. Starting in the Thirties glass windows played an important decorative role in Ponti's works, including in the School of Mathematics, and testifies to his tendency to merge all artistic expressions in a Gesamtkunstwerk. At this stage his interest in architecture was imbued with close connections to the manufacturing production.

In 1926, he began working with Emilio Lancia, obtaining commissions for many projects, mainly residential buildings mostly located in Milan. These domus or typical houses of the high-ranking Milanese bourgeoisie are the focus of Ponti's architectural research before the war, embodying the idea of dwelling as a means of aesthetic, social, and cultural expression through architecture. This early "Ponti idiom" developed between 1927 and 1933, merging painting with Milanese neoclassical architecture, thus defined a new architectural language strongly influenced by classical tradition linked to Vitruvius, Palladio and Serlio, and was renamed 'Novecento'. Villa Bouilhet, the "typical houses" and projects by the atelier "Il Labirinto", proposed a new idea of Italian design to Milanese clients. In the pages of "Domus", Ponti promoted a vision of architecture based on classical language, but ideated using advanced construction techniques and materials - such as concrete, steel, glass, and rubber - in search of an Italian way to modernity.

Ponti's popularity was at its peak at the end of the Thirties, when dictatorship became even stronger in Italy (1922 - 1943). He initially shared the Regime's initiatives by first joining the Fascist Union of Architects in 1933, and then in 1936 the Commission for the "Littoriali di Architettura", a national competition showcasing the best design achievements of young Italian architects. He participated and indirectly contributed to shaping fascist ideology, but kept his political distance from the Regime by adopting an independent architectural language marked by classical themes, defined as "Mediterranean" by Edoardo Persico (Persico 1934a); in fact he withdrew from the architectural controversy between traditionalists and rationalists.

In 1921 he married Giulia Vimercati, from a well-known Milanese family, who gave him four children: Lisa, Giovanna, Letizia, and later Giulio. In 1927 he completed his first house in Milan, in via Randaccio.

After breaking with Emilio Lancia in 1932, Ponti accepted public clients and began to design service buildings. The task to design the School of Mathematics arrived in 1932 from Marcello Piacentini - indirectly from Mussolini - and kept him busy for three years, together with a myriad of other commitments, probably due to Ponti's official enrolment in the National Fascist Party that same year. During that period, Ponti began to work with Eugenio Soncini and Antonio Fornaroli with whom he designed and built other typical houses and public buildings. Among these, Ponti alone designed the project for the "Liviano", the Faculty of Letters at the University of Padua, having been commissioned by the Rector who also entrusted him with the decoration of the main entrance to the Rector's Office. His artistic contributions are clearly visible not only in Padua, where he worked with Massimo Campigli on the huge fresco at the entrance of the "Liviano", but also in Rome where he constantly tried to sell the idea of merging art and architecture to clients, such as the government and the Vatican.

In 1930 Ponti joined the IV Biennale in Monza, becoming a member of its steering committee; he directed the Milanese edition in 1933 which became a "Triennale" from that year on. This prestigious role probably won him the "Mussolini Prize" (1934) for his contribution to Italy's production of manufacturing art as a result of the convergence between art and industry. But the most important commission Ponti received was in 1936, offered by a leading figure in Italian industry, Guido Donegani, who entrusted him, Fornaroli, and Soncini, with the prestigious project for the new Milanese headquarters of the Montecatini company, considered an example of functional efficiency and formal elegance.

During that period Ponti's activities branched out into various fields. Between 1941 and 1947 – when he distanced himself from "Domus" - which he was to direct almost uninterruptedly until his death in 1979 - he focused on "Stile," another magazine about architecture, industrial design, and artistic culture. He also designed costumes for the Teatro alla Scala in Milan and in 1936 became tenured professor of Interior Design at the Politecnico di Milano, maintaining this position until he retired in 1961.

Ponti trusted completely in progress and firmly believed that the future can only be better than the past. He was spontaneously open to any form of artistic collaboration, and was interactive by nature, promoting true cultural osmosis: the pages of "Domus" and "Stile" clearly serve as a venue where intellectuals could meet to exchange ideas. He stands out not only for his artistic and architectural production, but also for the extensive cultural activity he engaged in with extraordinary dedication and coherently with industrial development in Italy. Such qualities originate in his strong artistic sensibility, his outstanding intellectual skills, and a profound religious faith that marked his everyday life, together with proverbial optimism, freedom from partisanship and sectarianism, and absence of prejudices.

At the end of World War II he threw himself into the reconstruction of the country, with a theoretical, practical, and social commitment illustrated in Verso la casa esatta, written with Adalberto Libera and Giuseppe Vaccaro.

In 1952 he founded a new office with Antonio Fornaroli and Alberto Rosselli, his son-in-law. In 1954 Ponti invented the "Compasso d'oro" award for Italian Design and fine-tuned his theory of the "finite form", described in Amate l'Architettura (1957), a key element in all his projects. In 1957 he began to produce the "Superleggera" chair for Cassina, and in 1954-1960 he designed and built the Pirelli tower in Milan, considered his XX century masterpiece. His projects in the late Fifties are currently considered icons of Italian modernism.

Thanks to the powerful dissemination of his works in "Domus", this period brought new fame to the architect, also in the international arena. Between the Sixties and Seventies he designed buildings in Holland, China, Pakistan, Iran, Japan, and North and South America. In Caracas he built Villa Planchart and Villa Arreaza, considered iconic Italian villas, thanks to the collaboration of several artists, such as Fausto Melotti, Pietro Fornasetti, and Damiano Chiesa. Designing churches and cloisters was another chance to focus on the importance of holy spaces and further develop the trend towards the dematerialization of architecture, e.g., in the Milanese churches of San Francesco d'Assisi al Fopponino (1964), San Carlo Borromeo (1967) and the convent of Bonmoschetto (1959). The ability to imbue architecture with spirituality became evident in the Cathedral in Taranto (1970).

Ponti died on September 16, 1979 in his Milanese house in via Dezza which also hosted his offices and the editorial staff of "Domus" on the ground floor. He left behind a huge number of projects and achievements, bearing witness to his status as one of the most important architects of the XX century.

Figure 6 - Padua, Palazzo del Liviano, mural painting by Gio Ponti and Massimo Campigli. Gio Ponti explains the project to the Rector Carlo Anti (© Cortesi 2019)

A TWO-YEAR RESEARCH AGENDA AND THE EFFECTS OF THE PANDEMIC

Simona Salvo

The last twelve months of activity were very productive, despite the difficulties and work overload imposed by the pandemic, due to the fact that any kind of progress was 'in remote' (i.e., meetings, scientific evaluation, correction of drawings, administrative reporting, recruitment, etc.). And yet, each task has productively achieved the research goals. There was also an added value: to work in the building and on its premises without the presence of people, activities, and without it being used.

This situation unveiled new aspects of the monument and allowed a much broader and unexpected idea about its future life, management, and conservation, as well as the importance of maintaining it functional, albeit by finding the best way to adjust and fine-tune it together with its dimensions.

Figure 1 - The "Aula Picone" on the ground floor of the front building, during the pandemic (© Salvo 2020)

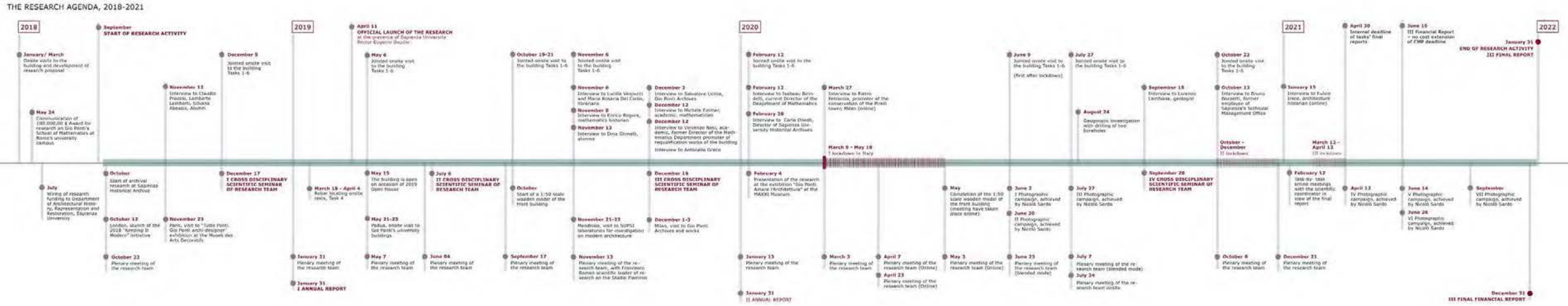


Figure 2 - The research agenda: January 2018 - December 2021 (© Salvo 2021)

OUTCOMES, CHALLENGES, AND FUTURE RESEARCH PERSPECTIVES AS A MEANS OF CONSERVATION

Simona Salvo

There is a thin red line running through the research; it starts with Gio Ponti's project and continues to the current building, sometimes along tracks that lead far from the original input, but then bounce back, continuously soliciting further reflections, including the extreme complexity of the building's spatial layout, which is a new issue. If it is true that Ponti thought of architecture as a crystal, it is also true that his buildings are neither simple nor linear.

Comparing Ponti's greatest achievements, and analyzing the construction site of the University campus in the Thirties, as well as the technical and industrial context Ponti had to deal with, it's no wonder that the culture of that age owes so much to Ponti, but also that Ponti owes so much to that age, and to all those who directly and indirectly shaped his projects.

Merging all the data and cultural stimuli gathered during the research, a thin red line emerges combining many elements of continuity in Ponti's volcanic mind, where volumes, colors and materials took shape linking one object to another: a glass vase to the façade of a building, tableware to the handrail of a staircase, a tapestry banner to a stained glass window, and a skyscraper to a table lamp.

The research objective was not only to recognize the values at stake, but also reweave the threads of a broader discourse involving Ponti himself and his work, his philosophy, and the architectural principles underlying his architectural production: transparency, visual and spatial continuity, lightness, thinness, integration with the arts, and 'finite form'. After two years of research the results consist in greater, more accurate knowledge about the building and its history, but- as mentioned earlier- they also reveal how much ignorance still persists.

In general, it must be said that the most ambitious research goal was to stimulate awareness of the importance of this building (and indeed of other equal gems in the University campus, including the Institute of Physics by Giuseppe Pagano). The objective was to prove that the building can still admirably serve its users not only from a functional point of view, but also in cultural terms, encouraging the public, inside and outside Sapienza university, to enjoy its beauty. But once again this seems wishful thinking, even though Ponti urges us to always look positively to the future. The generous funding of this research is therefore of great encouragement, helping us acquire a better un-

Figure 1 – Students of mathematics in one of the tiered lecture halls during the rehearsal of the 2018 Christmas play (usually a comedy mocking mathematicians), a tradition of the Mathematics Department interrupted by the pandemic (© Salvo 2019)

derstanding of a modernist masterpiece- the School of Mathematics at Rome's university- and a feather in the cap of Sapienza university, to be counted among the many excellent other studies included in the 'Keeping It Modern" Program.

What remains behind is the true, efficient preservation and protection of his architectural works, many of which have been systematically altered. The Pirelli experience has shown the importance of public participation regarding cultural appreciation and conservation. In fact, scientific research is not the only wheel that turns the process of knowledge and recognition of value and beauty. Informed by the same virtuous circularity that triggered the restoration of the Pirelli Tower, research on the School of Mathematics has instilled a desire in the academic community- perhaps also the opportunity, if not the moral obligation- to recover that beauty. Unlike the Pirelli Tower, whose restoration was an institutional choice with a political background, today the future of the School of Mathematics has become a prerogative of those who live in the building and, in a crescendo, of Sapienza's governance.

We therefore intend to continue the research as a way to achieve monitoring and preventive conservation, which could keep the spotlight shining on future transformation and keep people's attention focused on the interest triggered by the building.

Some aspects of the research have therefore been reported: new investigation paths, unresolved doubts and hypotheses, cultural suggestions and, above all, extending the research to the entire campus, not only to its physical artifacts, but also socio-anthropological and cultural aspects. These ideas remain in our minds, and we truly hope we will be given a chance to develop them and, above all, implement a hands-on application.

Figure 2 - On site research work (© Salvo 2019)

NOTES

1. Special scientific support had been then requested to the to the Post-Graduate School in Architectural Heritage and Landscape then entrusted to Simona Salvo, who continued independent investigation work. In 2018, she proposed and obtained the Keeping It Modern Award to further develop research on this building.
2. Archival research implemented between 2011-2013 by Salvo, has been continued, completed and systematized by Tasks 1 and 6 of this research.
3. This project was created by Emanuele Cagliotì and Stefano Catucci within the Master in Lighting Design, Sapienza University, with the scientific supervision of Marco Frascarolo, Alessandro Grassia and Simona Salvo.
4. Salvo 2017.
5. La Pietra 1988, Licitra Ponti 1990a, Romanelli 2002b; Irace 2009; Celant 2011.
6. Ponti 1957a, Aria d'Italia 1954.
7. A synopsis about Gio Ponti's biography may be found at page 16 in this document.
8. Bouilhet-Dumas, Forest, Licitra 2018; Casciato, Irace 2019.
9. Many of Ponti's buildings have been subject to interventions in the past decades, consequently to the growth of interest and appreciation in their regards, but also due to the 'physiological' need to maintain the buildings. Paradoxically, the first to receive maintenance, and sometimes renovation works, are those built in the post-war years. Among these: the church of Santa Maria Annunciata in the Hospital San Carlo Borromeo of 1969 (maintenance works in the 1985 and conservation work of the ceramic cladding in 2009), the so-called 'Trifoglio' building within the Polytechnic in Milan of 1963 (maintenance works in 2008, with changes to the ceramic cladding); the Cathedral of Taranto, 1971 (very recent maintenance works in 2020); the RAS building in Milan of 1962 (today under a radical renovation of facades and interiors); the Pirelli building in Milan of 1960 (subject to exceptional conservation works in 2004 not only as a consequence to the dramatic accident od 2002); the cloister of Notre Dame de Sion in Rome of 1965 (renewed in 2018), and many other. The buildings of the Thirties and Forties, instead, have survived with a higher degree of authenticity, as in the case of the School of Mathematics, counting more additions than demolitions, apart from some exceptions, such as the replacement of the cladding in mosaic tiles with common plaster of the Palazzina Salvatelli in Rome (1939-40). Overall, these buildings have drawn attention only recently, after major awareness of the values at stake has gained momentum. Literature on this topic is rather fragmented and not yet condensed for a synthetic evaluation.
10. We refer to the brilliant conferences on Ponti's multifaceted cultural activity organized by the MAXXI in Rome, within the exhibition "Gio Ponti. Loving architecture".
11. Brandi's writings, to which much of the Italian restoration theory owes a tribute, is rather complicated and difficult to translate. Here we refer to the very well translated extracts of the Teoria del Restauro- the transcript of Brandi's lectures edited by his research younger fellows, published by Einaudi in 1963- in Stanley Price, Talley, Melucco Vaccaro 1996.
12. The research group is coordinated by Simona Salvo and composed by scholars and professors of Sapienza University of Rome, and young researchers who have obtained scholarships for each specific task.
13. Salvo 2017.

BIBLIOGRAPHY

Ponti 1957a
Ponti G. (1957): Amate l'architettura, Genoa: Vitali & Ghirlanda.

Guidoni, Regni Sennato 1985
Guidoni E., Regni Sennato M. (eds.) (1985): 1935/1985 La "Sapienza" nella Città Universitaria, Catalogue of the exhibition (Rome, June 28- November 15, 1985), Rome: Multigrafica editrice.

La Pietra 1988
La Pietra U. (eds.) (1988): Gio Ponti. L'arte si innamora dell'industria, Milan: Coliseum.

Licitra Ponti 1990b
Licitra Ponti L. (1990): Gio Ponti. The complete works 1923-1978, London: Thames and Hudson.

Zevi 1992
Zevi B. (1992): Sterzate architettoniche. Conflitti e polemiche degli anni Settanta-Novanta, Bari: Dedalo.

Stanley Price, Talley, Melucco Vaccaro 1996
Stanley Price N., Talley M. K., Melucco Vaccaro A. (eds.) (1996): Historical and Philosophical Issues in the Conservation of Cultural Heritage Cultural Heritage, Los Angeles: Getty Conservation Institute.

Romanelli 2002b
Romanelli M. (eds.) (2002): Gio Ponti. A World, Catalogue of the exhibition (Milan, October 19- January 15, 2003), Milan: Abitare Segesta.

Irace 2009
Irace F. (2009): Gio Ponti, Milan: Federico Motta editore.

Aria d'Italia 2011
(2011): "Espressione di Gio Ponti". In: Aria d'Italia, n. 8, Milan: Electa, anastatic edition.

Salvo 2017
Salvo S. (2017): "Più di una vetrata, un concetto architettonico. Processualità storico-critica della rievocazione di un oggetto storico artistico come atto di restauro". In: Catucci, Garroni, Salvo 2017, 1-7.

Bouilhet-Dumas, Forest, Licitra 2018
Bouilhet-Dumas S., Forest D., Licitra S. (eds.): Gio Ponti archi-designer, Catalogue of the exhibition (Paris, October 19, 2018- February 10, 2019), Paris: MAD.

Casciato, Irace 2019
Casciato M., Irace F. (eds.): Gio Ponti. Amare l'architettura, Catalogue of the exhibition (Rome, November 27, 2019- April 13, 2020), Florence: Forma edizioni.

II.
AN ARCHITECTURAL GEM

BACK TO INDEX

©Nicolò Sardo

ARCHITECTURE AND URBAN LAYOUT

Simona Salvo

The School of Mathematics was designed and built taking into account the urban layout of the University campus, and establishing comprehensive integrated relations with the context. The plan of the campus, considered as an artifact where every piece is part of another on a higher scale and in a strictly related system, thus creates an open dialogue with the building. Far from being designed only as a piece of architecture, the building is therefore a system in the system, and a very fine Gesamtkustwerk. Architecture, building elements, structural inventions, decorations, furnishings, collections of ancient books, and- last but not least- the scientific mathematical acquisitions developed on its premises, generate remarkably complex and rich values that all refer to a broader context involving history, art, architecture, and urban planning.

The construction of Rome's University campus between 1932 and 1935 was a complicated and problematic affair, closely linked to the social situation and history of Italy at that time, as well as to the many cultural transformations that took place, especially in architectural practice, higher teaching, and the urban layout of Italy's major cities, especially Rome. As we all know (this will be the subject of a broader discussion in the next chapter), Benito Mussolini, the "Duce", commissioned Marcello Piacentini with the overall design of the campus and supervision of its construction, entrusting him with technical, political, administrative, and economic tasks; Mussolini also awarded full autonomy and remarkable funding to the Agency entrusted with this venture. The dictator intended to revive the splendor of ancient Rome using fascist ideology and the myth of his personality; Piacentini, aligned with Mussolini's political and cultural program, proposed a regular and quasi-symmetric urban layout for the campus. The design was based on a Latin-cross plan, with a main central alley cut by a perpendicular axis along which the buildings were to be placed. Piacentini kept the design of the Rector's Offices for himself and entrusted very young architects with the design of the others: the project for the School of Mathematics, located in a very important position at the head of the main transversal axis, was entrusted to Gio Ponti.

Although many of the buildings' architectural features had been established by Piacentini, who had selected materials, construction techniques, building materials, and the overall appearance of the buildings, Ponti's building resulted rather complex and sophisticated in comparison to the abstract forms of the others, proving that he retained freedom of expression in that context.

The construction of the Mathematics building began in February 1934, much later than the other buildings on campus; Ponti continually changed the architectural and constructive details of his design even after the inauguration of the campus in October 1935. Still, from the very first drawings (1933), Ponti's project consisted of three juxtaposed volumes, different in shape and size, corresponding to the main functions requested by the mathematicians. Research activity was located in the front prismatic volume facing the central public square of the campus. It hosted classrooms with 50 and 100 seats, offices for faculty members, a boardroom, and a magnificent library for 100,000 volumes. Large and well-lit drawing classrooms dedicated to the teaching of descriptive geometry were placed in the

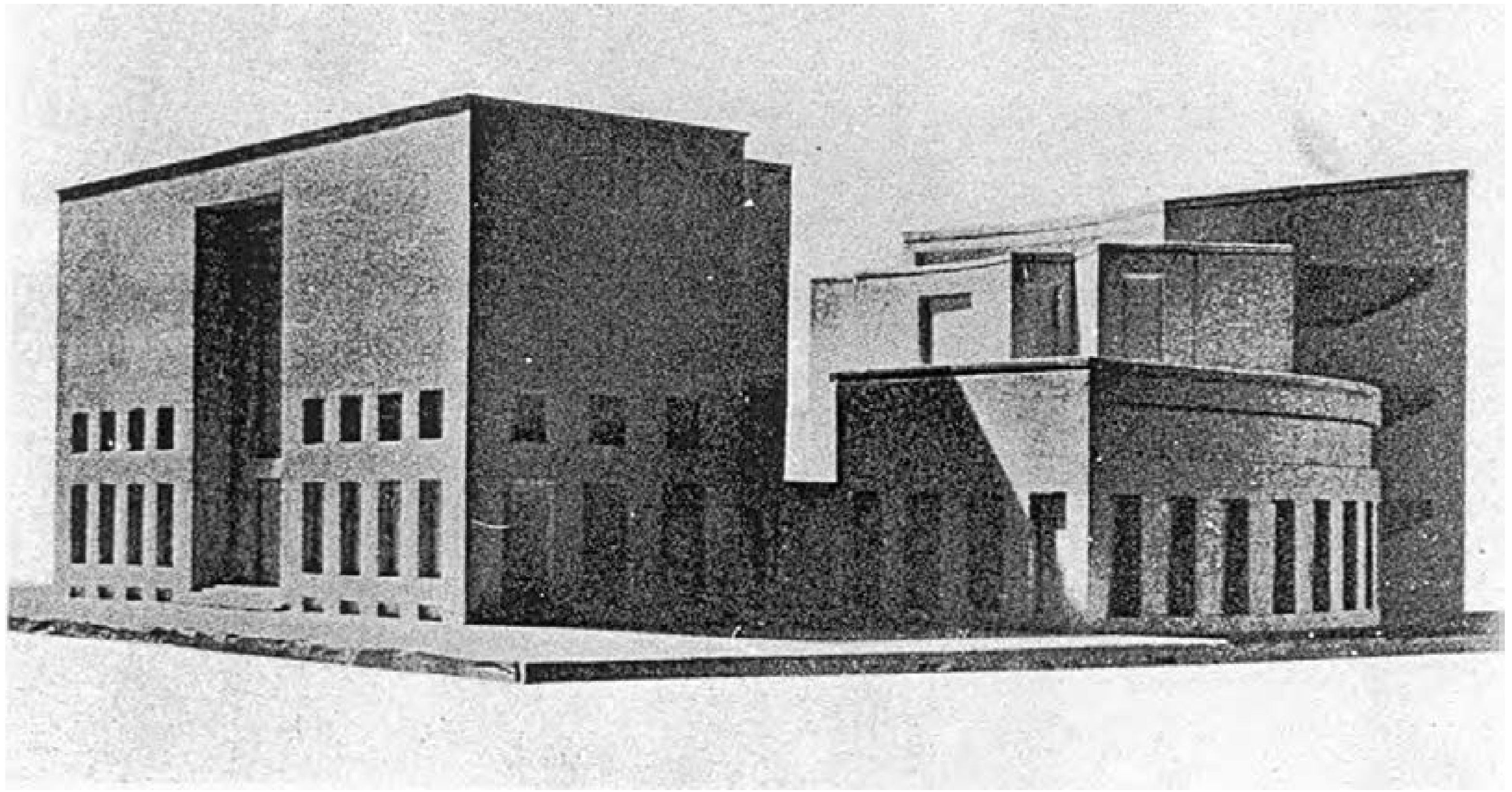


Figure 1 - The first and only model of the School of Mathematics, published by Ceccherini in 1933; the building's shape and architectural features are already perfectly outlined (BBL_pht_06)

curved wings embracing the central theater-shaped courtyard; they were characterized by completely glazed elevations and by a non-traditional 'open space' layout based on the arrangement of the furniture. Large, tiered lecture halls, designed to host the most crowded mathematics courses for students in Mathematics, Physics, and Engineering, were instead stacked on the three floors of the massive tower placed at the rear.

The building's very characteristic windows, different in shape and size depending on the function and vocation of the three blocks, revealed the layout of the interior and made it possible to see right through the building, along horizontal visual axes penetrating the architectural space from one side to the other. This solution enhanced perception of a continuous, fluid inner space. Space fluidity and continuity were further enhanced by the reinforced concrete structure made up of an inventive network of trusses and columns resting on drilled poles and amplified by an excellent, accurate architectural configuration, organized around the courtyard intended as a centripetal void and as the focus of the visual axes crossing the entire system.

Left free to select materials for the outer finishings and cladding, Ponti opted for a cladding in quasi rectangular travertine slabs for the three main façades of the front building, instead of the expected Litoceramica cladding used in almost all the other buildings on campus. He chose a rather precious white Carrara marble and black Italian marble for the entrance hall, and rather "irregular" materials for the interior finishings compared to t used to build the University campus.

The building was therefore designed based on very "Ponti-style" principles[1]- further refined by Ponti later in his career- such as the idea of "architecture as a crystal" and "finite form" (Ponti, 1957, pp. 68–69). The design and construction of the School of Mathematics was probably Ponti's own invention after ending his collaboration with Enrico Lancia; it marked an important change in Ponti's style which, in this case, shifted from the Milanese classicism he had experimented with in the early Thirties to a more explicit modernism.

Moreover, the very characteristic architectural elements present in this project were to appear again in the next project, with more developed technological features. They include the beautiful crowning cornice of the front building, a dark perforated concrete balustrade with clear white travertine sills; this solution was to appear again in many other projects, such as the Liviano in Padua (1934), first Montecatini building in Milan (1936), the Palazzina Salvatelli in Rome (1940), and the Columbus Clinic in Milan (1948). In all these projects, the glass-block skylight used in the library is a very interesting and recurring architectural element with specific architectural importance and material and constructive quality.

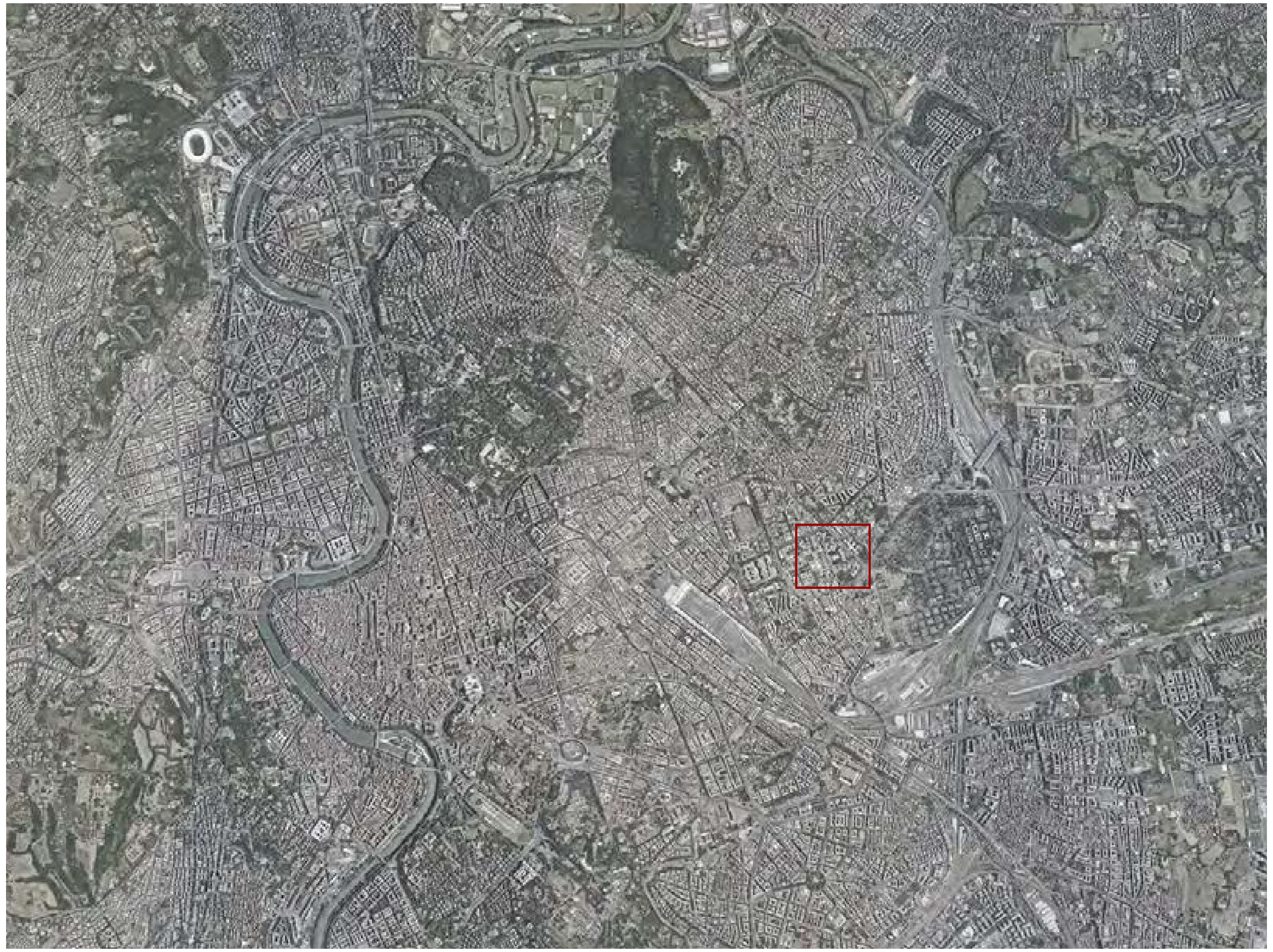


Figure 2 - Sapienza University campus within Rome's urban context (© Google Earth 2022)

THE LIBRARY
Simona Salvo

Unlike his colleagues engaged in the design of the other university buildings, Ponti placed the library at the center of his composition and designed it as the Institute's most unique architectural space.

The triple height library had a large reading hall with four tiers of open bookshelves along the perimeter walls; galleries granted access to the bookshelves. The longer sides were cross-featured by the wide, full height vertical windows in the center of the main façade, permeated by a modulated, colored light, and by a series of corresponding windows on the other side- the end of the aforementioned visual axes - repeating them all the way to the other side of the building, through the courtyard, and all the way across the classroom tower. A huge skylight on the ceiling of the main reading hall let natural soft light fall from above. This consisted of a long prismatic volume made of prefabricated reinforced concrete vaults and glass blocks, with windows that could be opened along the sides. The spatial and light effects must have been incredibly beautiful.

And yet, the library was also a cultural and academic solution, hosting a precious collection of manuscripts, books, and journals which were the pride of the Italian School of Mathematicians at that time, a branch of the broader scientific field headed by the faculty of Sciences and Engineering. The collection originated from the less-than-a-hundred books belonging to the Pontifical School of Engineers of Rome, established by Pope Pius VII motu proprio on 23 October 1817. The School was later moved to Palazzo di Sant'Ivo alla Sapienza, while the book collection was transferred to the Alessan-

Figure 1 - The library (© Sardo 2021)

drina Library, although with a separate catalogue. It became an important technical and mathematical library only after 1870 thanks to the initiative by Luigi Cremona, at that time the director of the Royal Application School of Engineers, who reorganized it after a Royal Decree dated October 9, 1873. The School of Engineering was later moved to the convent of San Pietro in Vincoli[2], and in 1876 the former refectory of the friars was rearranged to be used as a library.

The book collection was considerably enriched, initially by Valentino Cerruti (1878-1904) and then Lucio Silla (1904-1921); their careful purchasing policy aimed not only at acquiring specific, scientifically updated physical-mathematical publications, but also entire book collections of historical and bibliographic interest. Donations from important mathematicians also contributed to the affirmation of the library (Antonio Stefanucci's collection in 1882, Eugenio Beltrami's collection in 1900 donated by his widow, and Luigi Cremona's in 1909), as did the acquisition in 1878 of the publications of the Italian Society of Sciences (so-called 'XL'), which chiefly included proceedings of the most important Scientific Academies and Societies in the world (Sinestrari, 1979-1980). In the early decades of the XX century the library expanded even further thanks to personal donations by renown scholars including, Castelnuovo, Volterra, Levi Civita, Severi, and Enriques. With the shift to the University campus in 1935 the intention was to create a space where the book collection could be exploited by its main users, i.e., an appropriate space in the new building of the School of Mathematics. At this point the collection was mainly made up of mathematical books acquired from the library in San Pietro in Vincoli, and by several books and journals focusing on physical, chemical, and human sciences.

Ponti's architectural project was- and still is- considered avant-garde among contemporary Italian universities; it is one of the few examples of a space specifically designed as a library within University campuses. The true novelty of Ponti's project consisted in providing a special space for this use- usually relegated to one of the rooms of the institute buildings, as in the case of Giuseppe Pagano's Institute of Physics- and in inventing the 'ideal' type for an academic library, i.e., a big, naturally lit reading room with completely open bookshelves (840 square meters) and a huge storeroom (roughly 640 square meters) where the books were kept on the three tiers of shelves made of a lightweight, built-in metal structure. And yet, the library was 'exclusively' open to academics and graduate students with special permits. Only after the Eighties was access gradually extended.

In the following years the library specialized even further in the fields of pure and applied mathematics; however, it always maintained its specific focus on the history of mathematics and sciences, shaping what is now the most complete collection of mathematical studies in Italy and one of the biggest in the world. Today the collection roughly comprises 106,650 volumes (56,910 volumes, 31,276 periodicals, 7,000 anthologies) and 1,326 titles of current and discontinued journals of specific interest, as well as several hundred modern manuscripts and autographed correspondence by mathematicians from the most important international scientific communities; the collection of precious texts consists of about 4,998 pieces, of which 1,650 published between 1482 to 1830 (updated data, 2020)[3].

The library, currently considered still functionally and aesthetically valid, has hosted an average of 100 frequent users every year up until March 2020 when closures and restrictions were imposed due to the pandemic. After that, attendance by students and academics has been restricted. The library maintains its original arrangement, mobile and non-mobile furniture, light fixtures, and heating system, as well as the original layout of each artifact: very little has changed, apart from a few alterations, e.g., two corridors have been eliminated. The introduction of digital devices and the collection of e-books and electronic journals has been made available to the public without any drastic changes to the arrangement which, on the contrary, have been an indirect consequence of changes to the electrical and heating systems and safety equipment.

Figure 2 (next page) - Graphic reconstruction of the library in 1935 (© Cortesi 2018)

THE STAINED-GLASS WINDOW

Simona Salvo

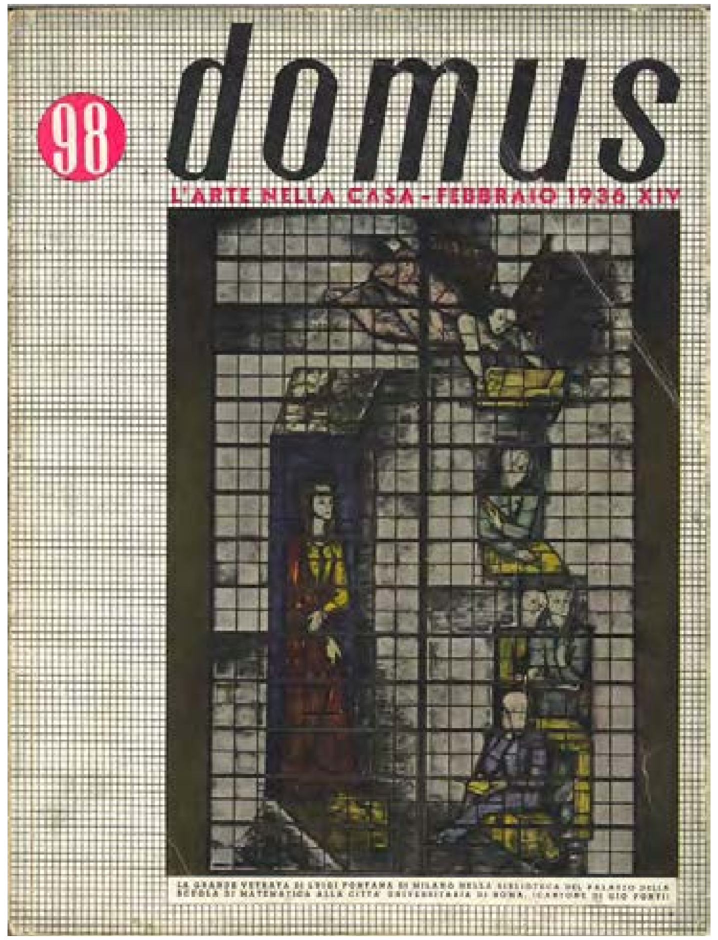


Figure 1 - The only existing photograph of the stained glass window of the School of Mathematics colored in post-production, was published by Ponti on the cover of "Domus", 1936 n. 98 (BBL_pht_32)

Figure 2 - Graphic reconstruction of the original stained glass window, corresponding to the triple height of the library reading hall (© Cortesi 2018)

The element revealing a strong cultural combination of art and architecture, one of Ponti's foremost compositional principles, was the huge, colorful stained glass window on the main façade of the front block, made by the firm Fontana Arte based on Ponti's preparatory drawing.

The relationship between Gio Ponti and the Luigi Fontana & C. company started in Milan in 1881 and rapidly grew also thanks to the diffusion of the Saint Gobain glazing system for production. In 1931 Ponti was appointed artistic director by Luigi Fontana, and the following year he was joined by Pietro Chiesa. The industrial success of those years allowed Luigi Fontana to divide his firm into two: the original company continued producing building elements, while "Fontana Arte", founded in 1934 as an offshoot of the former, was to focus on the production of artistic objects.

Stained glass windows had become part of contemporary architectural language. During this period Ponti worked with Pietro Chiesa and Luigi Fontana on the design of another stained glass window for the pavilion of the International Catholic Press Exhibition at the Vatican in 1936; since this was a temporary exhibit it has unfortunately left no evidence behind, apart from the black and white exhibition pictures.

Perhaps the only contemporary artistic stained glass window, comparable to the one for the School of Mathematics in terms of size and spatial, light, and chromatic effects, is the one depicting the "Charter of Labour", again produced by Fontana Arte based on Mario Sironi's preparatory drawing, under the artistic direction of Pietro Chiesa. This artwork luckily survived, and still acts as a backdrop to the grand staircase in the atrium of Palazzo delle Corporazioni in via Veneto in Rome; it was designed by Marcello Piacentini and Giuseppe Vaccaro in 1932.

The story of the stained glass window for the Mathematics building began in July 1935 when Luigi Fontana was commissioned the work; Fontana designed and built the work at a cost of 3,500 lira based on Ponti's drawings which were mentioned in the test report dated December 1937, but are unfortunately unavailable today.

The iconographic program, colors, and detailed conformation of the work are therefore difficult to deduce based on a few random documents. They include: the black and white photographs taken in October 1935 during the inauguration of the campus; the many publications that briefly illustrated and followed the event; and the picture on the cover of "Domus", issue 98 of January 1936, and in "Rassegna" published in June of that year. All these images only provide a vague idea of the chromatic structure of the window with its dark shades of red, yellow, blue, pink, and gray glass pieces.

Instead, archival documents informs us that the work was 10.8 high and 4.56 meters wide; it was supported by an aluminum frame supplied and mounted by the "Curti" company. Fontana Arte then assembled the 30 panels of historiated stained glass pieces, completed on the sides of the central opening with plain colored glass pieces without figures, thus maintaining the overall chiaroscuro.

The recto of the figures portrayed on the window faced the interior of the library; the effects they created could be seen during the day due to natural lighting. At night, instead, an inverse but certainly powerful effect was caused by the dim artificial lighting inside; the refined chromatic effects were visible on the white façade from outside the building. Considered as "self-illuminating" architecture, it was a forerunner in Ponti's production throughout the following decades; the façade of the School of Mathematics is an inescapable precedent of the Master's post-war architectural poetics, based on the twofold life- day and night- of buildings.

More than a window, it was an architectural element representing a concept hinged onto a spatial vision that only a Master of Architecture likes Gio Ponti, gifted with a masterly sense of space, color and light, could have invented.

Ponti's drawings between 1933 and 1935 offer proof of his firm architectural intentions: the huge opening placed on the axis of the building, facing the main central public space of the campus, was the key element behind the entire architectural composition.
It not only impressed axiality and symmetry on the entire composition, but also spatially and visually interlinked the parts, based on permeability to light and fluidity of space, organized along horizontal and vertical visual axes.

Despite the complex layout of the blocks that make up the building, classical hierarchy dominates and orders the sequence of spaces. The stained glass window coagulates the criteria of functional gradualness, subordination in the representative nature of the rooms, classrooms and halls, and distributive separation.

This work of art cannot be considered as a mere decorative element since it establishes more than profound links with the surrounding space and its own architectural elements, acting as a filter to light, color, and visual perception. It was a masterpiece of artistic mediation at material, metaphorical, and perceptive level, resulting from a composition of features: the daring overall height of the window highlighted the involvement of the whole interior intended to be used for studies in "Advanced Mathematics"; the various shades of the chromatic composition, necessarily darkened to calibrate the access/excess of light into the reading hall and avoid the glare phenomena; the highly symbolic- albeit enigmatic- iconographic program of the figurative composition intended to attract the attention of the observer.

In terms of size, color and light effects, the stained glass window provided the library interior with a very special atmosphere. However, this was not the true source of light in the library reading room which was kept dark to avoid the over-lighting phenomena and glare that naturally occurred despite facing north; so much so that blackout curtains had to be installed.
Natural light was ensured by a skylight, a parallelepiped equal in length to the width of the hall, covered with prefabricated reinforced concrete vaults and cement glass blocks, and surrounded by iron-framed ribbon windows that could be opened. This wide slit allowed natural light to fall from above, flooding the reading room with homogeneous and suffused light, while only oblique rays entered from the side windows so as to avoid directly hitting the reading tables below.

The reading hall of the library was thus a mystically illuminated space, with colored light effects refracted everywhere on the surfaces: an aquarium of light and brightness well suited for reading. The spatial and light effects were so beautiful that the library of the 'School of Mathematics' was considered to be one of the most beautiful in Italy and Europe, especially by international critics.

Unfortunately, archival documents offer no information regarding the production of the stained glass window. It indirectly describes the production technique by referring to the argument between the site manager and "Luigi Fontana" caused by "a copious outflow of water on the internal faces of the glass surface, partly coming from the leaded joints between the glass pieces and chiefly from the gap between the window and the frame to which the window itself is joined".
We do not know whether the argument was created on purpose to postpone payment of the work, due to the economic difficulties encountered by the Consortium building the campus, but it is true that the company had to repair some damages before being paid.

The stained glass window probably went lost on July 19, 1943 when the San Lorenzo district was bombed by the Allies; a bomb fell on the adjacent Institute of Chemistry causing a displacement of air that probably shattered the fragile glass pieces assembled using slender lead joints. Without any documentation, we can only guess that the detonation proved fatal. As it was broken, even if not completely destroyed, it was probably so badly damaged it had to be dismantled. The aluminum window frame, on the other hand, was saved, and is still in place today.

THE INTERIORS: FURNISHINGS, DOORS AND LIGHTING FIXTURES

Flamina Bardati, Chiara Turco

In Gio Ponti's project for the School of Mathematics, as in many of his projects, the design of the interiors and of the furniture represented an important matter, equal to architectural design. His drawings indicated precise instructions about the shape, the colours, the materials and their finishes, sometimes asking to modify the models proposed by the furniture suppliers who were entrusted with the work. Such an attention to every detail of the furnishings has left traces in the archival documentation. The companies often asked to adjust the agreed price per item in consequence to the supplementary of work and the major quantity of materials required by Ponti's modifications.

The systematic investigation on furniture and doors, both the original and the ones added later, helps to understand the entire project for the interior- and therefore of the architecture in its entirety- as well as the building's story. In fact, new furnishings were produced for the School of Mathematics in occurrence of the phases of its life, already before the deep transformations from the 1960s onwards.

Therefore, the first step of this research was a preliminary survey of the furnishings and doors existing in the building in 2020 (Figure 1)[4]. The survey immediately revealed the coexistence of objects from different periods and provenience in almost all rooms; thus, contextualization of each item with respect to the main construction and transformation phases was a prior step in view of the identification of each item. For this reason, the analysis of the building's history, based on the archival sources also concerning the entire campus, has been carried out in close collaboration with

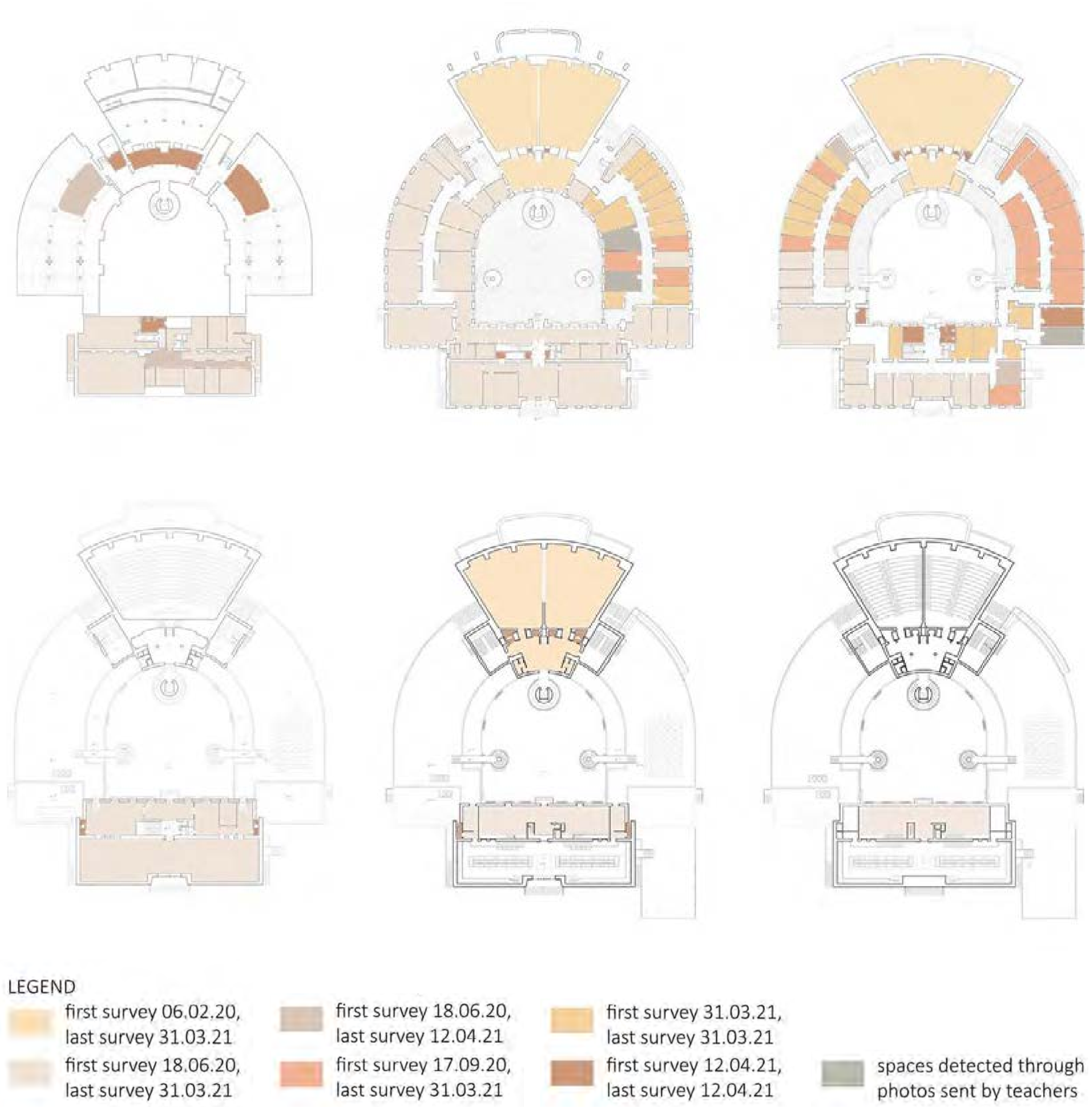


Figure 1 - Chronology of on-site survey of furniture and interiors (© Turco 2021)

the historical critical investigation and developed with a cross disciplinary strategy.
Within the chronological span that frames the life of the building's furnishing- 1935-2020- six major phases have been identified, ranging from the first supply of furniture pieces to their integration, additions and varied alteration;

- Phase 1- 1935-1938
  Design of the first furniture and doors supply.
- Phase 2- 1939-1942
  Transformations, new furnishings, and new doors due to the introduction of the seat of IndAM in the upper floor of the west curved wing.
- Phase 3- 1943-1949
  Completion of furnishing after the war damages due to the occupation by the German troops, then by the allied bombing, and further by the allied occupation.
- Phase 4- 1950-1974
  Integration of furnishing due to major architectural transformations.
- Phase 5- 1975-1980
  Introduction of new furnishings and doors due to further main architectural transformations concerning the front building and the curved wings.
- Phase 6- 1980-2020
  Adaptation furniture to safety standards and new supplies.

The data derived from the analysis of archival sources relating to furnishings and doors (supplies contracts, reports, drawings, photographs, videos) have been compared with the objects identified during the survey, in order to recognise which piece was attributable to the original project and which one to following periods.

During this step of the research, several methodological issues specifically linked to furniture emerge, concerning the dating, the materiality and state of conservation of each item.

The most important is referred to the numerous alterations
- repairs, relocation, dimensional adjustments
due to safety reasons, painting etc.- suffered by the objects over time. In general, furniture is subject to considerable wear, which can involve both its replacement and restoration or maintenance (i.e. loss of the item or modification of its original state), while doors have been very often adequate to safety standards (phase 6, 1980-2020), sometimes replaces or moved, in particular during the phases 3 (1943-1949) and 5 (1975-1980).

Fixed furnishings may also need to be adapted to current safety regulations or to changing needs with consequent modification of the original state, as in the case of the formidable curved rows of integrated desks and chairs of the 3rd floor of the Tower of classrooms, cut to adapt to two smaller teaching space obtained by the division of the 434-seat classroom in 1960 (Figure 5). If this kind of intervention could be dated, other actions as the small, continuous, undocumented maintenance works relating to locks, handles, studs, coatings, glass etc. keep the object 'alive' and usable but alter its original state, making the dating and recognition more difficult. In fact, generally the archival sources only allow to date 'original' doors and furnishings belonging to phase 1 (1935-1938), while, for the following ones, materials and artisanal or industrial processing of the original pieces could help to hypothesize a plausible dating: the "do-it-yourself" actions make often impossible this kind of analysis.

The documents conserved in Sapienza's historical archive, within the section of the CERUR Consortium, and the historical pictures and shootings of 1938-1939, represent valuable sources that allow a scientific analysis of the original doors and furnishings (phase 1, 1935-1938), strictly linked to Ponti's vision of interior architecture. Nevertheless, there are gaps in this systematic reading of the archival sources, such as the presence of lists of furnishings with pairable drawings which do not correspond to any survived furniture, or

Figure 2 - A row of desks in the tiered lecture hall at the third level supplied by the firm Liporesi; note the chromed steel tubes, sheared in 1960 to adapt the display of the furniture as the room was divided into two (© Bardati 2021)

vice versa the presence of furniture stylistically datable to phase 1- that is the one to be considered original- which is not mentioned in the documents.

Another critical factor concerned the initiative to furnish the rooms modified in 1939 with items similar or identic in shape and materials to the original ones, as in the case of the doors supplied to reorganize the spaces destined to IndAM, explicitly produced following the originals designed by Ponti (Figure 6), or of the teachers' desks for the new tiered lecture hall at the third floor of the tower of classrooms.

Furthermore, it should be noted that not all archival drawings of the 1930s concerning furniture correspond to items effectively purchased. The industries that supplied them often proposed several models and solutions on catalogue, among which the architects made their choice, some of which could also be rejected by the Administration. Similarly, the archival sources mention furnishings that have gone lost during the transformations undertaken from the 1960s onwards, as in the case of the drawing tables placed in the curved wings (ASS_drw_81; ACS_pht_14 and 15; GPA_pht_03) and of the sofa in the Council Hall (ASS_drw_80). Another difficulty has been encountered with the identification of the modifications required by Ponti, as the furnishing sometimes appears quite different from the drawing, as in the case of the coat hangers (ASS_drw_107).

Yet, the greatest difficulty concerns the supply of furniture dating back to phases 4-6 (1950 to today), which has left almost no trace in the archives. These pieces of 'anonymous' furniture represent the most conspicuous part of the building's furnishing, not always of historical or artistic interest, mostly produced in recent times.

Therefore, after a first bibliographic and archival investigation, the corpus of furnishings datable between 1935 and 1980 has been revised, excluding what was subsequently introduced into the building. These chronological limits have been identified as follows: spring 1935 is the date of the first documents related to the inner doors and furnishings of the Mathematics building (ASS_dcm_51; ASS_dwg_75; ASS_dcm_53 and ASS_dwg_76); 1980 is the terminus of several events that subvert the internal organization of the building. The transformation of the professors' lobby into two minor rooms in 1954 and the subdivision of the major tiered lecture hall at the third level of the Tower in 1960, mark the beginning of deep functional changes; the students' protests and occupation of the campus buildings in 1968 and in 1977 contributed to the dispersion of various pieces of furniture (and probably to the shift of pieces from one building to the other); the campaign of further extensive functional modifications of the curved wings dates to the years 1974- 1980. Last but not least, Gio Ponti passed away on September 16, 1979.

Once the chronological limits were established, the following step consisted in drawing up a catalogue of furnishings and doors, in separate series.

Figure 3 - Entrance door supplied in 1939 for IndAM offices in the east wing, replicating the original design of Model B2 produced in 1935 by firm Cantieri Milanesi (© Bardati 2020)

Targeted inspections allowed to further define the items to select for the catalogue and to discover several chairs, armchairs, benches, stools, tables and even blackboards and shelves, stocked in the basement of the Tower of classrooms, and reduced to very bad conditions. Following these surveys, seven main categories of furniture were identified: chairs, tables, lighting fixtures, leaning furniture, suspended furniture, platforms and more, each including specific under categories and types. The catalogue also provides a localization of each specific piece of furniture to its location (as of 2021, at the date of the survey) marked with an identification code on the survey drawings[5]. The mapping resulting from this survey in 2021 was then compared to the original location of the pieces in 1935, when possible[6].

Concerning the doors, a selection of the ones attributable to the original design and following periods, including the transformations of the 1960s-1970s were included in the catalogue. Again, the story of the building was a useful reference to propose dates and relative phases for the doors: 1935-1937 (first project); 1939-1940 (creation of INDAM headquarter); 1954 (transformation of the open lobby on the 1st floor to create two professors' studios); 1969-1980 (extension of the curved wings and subdivision of drawing classrooms into five teaching spaces and in many offices). As in the case of the furniture, an identification code was linked to each door, to allow a precise mapping of the doors on to the survey drawings (as of 2021 at the date of the survey), again compared to the original location or to our hypothesis.

The aim of these catalogues is to allow a more precise knowledge of the furnishing, intended as a specific heritage of the School of Mathematics, very representative of Ponti's idea of architecture where space, interior design and furniture are always considered as a one, but also featuring the aesthetic of the Thirties and of the development in terms of taste, functions and functional needs since then until the present day.

Figure 4 - Chairs, armchairs, tables, blackboards and other old furnishing dating back to the 1930s stacked in the basement of the building (© Salvo 2020)

III.
THE STORY OF THE BUILDING, 1932-2021

BACK TO INDEX

© Nicolò Sardo

MAPPING OF ADDITIONS AND REMOVALS
Marianna Cortesi


©Nicolò Sardo

IV. ARCHITECTURE AND MATERIALITY

BACK TO INDEX

THE LOAD-BEARING STRUCTURE
Laura Liberatore, Luigi Sorrentino, Giuseppe Lanzo, Ilaria Martella

Figure 1 - The building under construction in a picture of 1935 (BBL_pht_10)

DESCRIPTION OF THE STRUCTURAL LAYOUT
Laura Liberatore, Luigi Sorrentino

As mentioned, the building is composed of three juxtaposed volumes, all of which founded on concrete piles connected by footings. The load-bearing system consists of reinforced concrete frames, infilled with unreinforced masonry walls.

In historical documents, the building is described as one of the smallest of the university campus but characterized by a "complicated reinforced concrete structure", referred to both the curved wings and the tower of classrooms. It is worthwhile reminding that an unreinforced masonry structure was envisaged at the beginning of the design process, subsequently replaced by a reinforced concrete one. The continuous support that would have been provided by unreinforced masonry walls was therefore replaced by point supports (columns), with obvious modifications of the load paths and of the way in which loads are transferred to the soil.

With time, the building has gone through several modifications. In 1939 the curved wings were partially raised; in 1954 a slab was introduced to divide the triple height of the library reading room and separate the so-called "professors' atrium" at the lower level; during the 1970s two new blocks were built as an extension of the curved wings close to the front building; in the 1980s three cylindrical fire-escape staircases were built inside the courtyard. The addition, removal and replacement of partition walls have also contributed to the continuous transformation of the building.

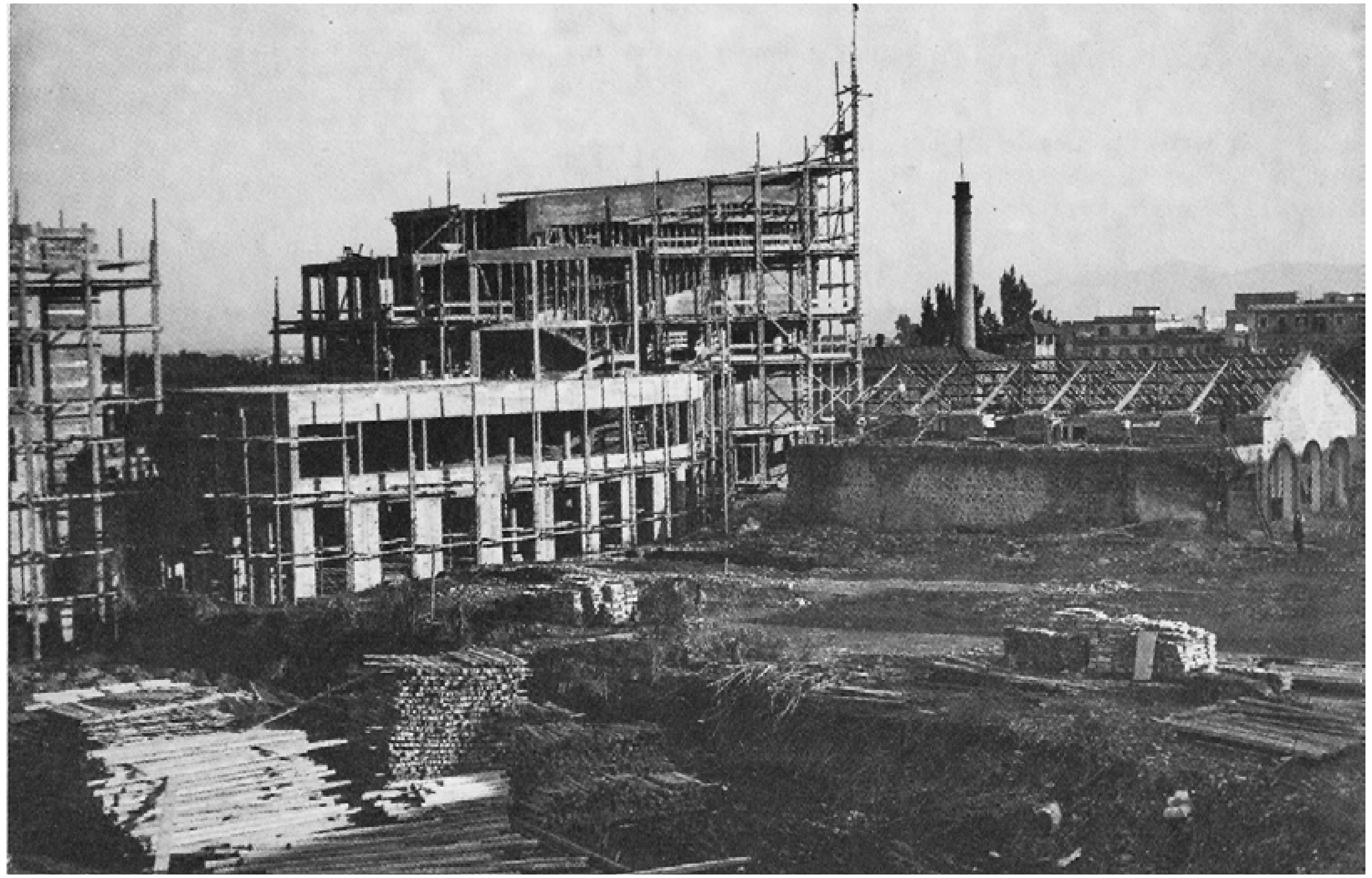
Albeit the entire structure mainly consists of reinforced concrete frames, each block – front building, curved wings and tower of classrooms – has its structural peculiarities. In the following, the foundation system and the structural layout of each block are described. Some details on additions, fire-escape staircases and infill walls are also given.

Foundations

During the design process, the use of different foundation systems was discussed, including timber piles and pier foundations. The latter were considered a more reliable system not requiring highly specialized skills. And in fact, a number of buildings in the proximity of the university campus are built on piers. Nonetheless, their use was set aside due to the poor soil characteristics encountered, i.e. the low stiffness, the significant inhomogeneity and the presence of the water table at about 12 meter depth from the ground surface.

The foundation was finally built with cast in place concrete piles and footings. Three types of piles were adopted, namely "Simplex" (simple or tamped), "Duplex" and "Triplex".

The Simplex pile is formed by driving a casing with a shoe (driving tip) into the ground down to the required depth. The concrete is cast into the shell, which is then slowly withdrawn. The shoe can be either left

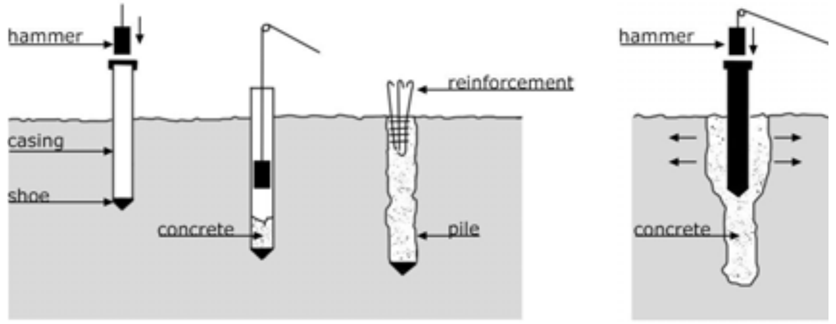


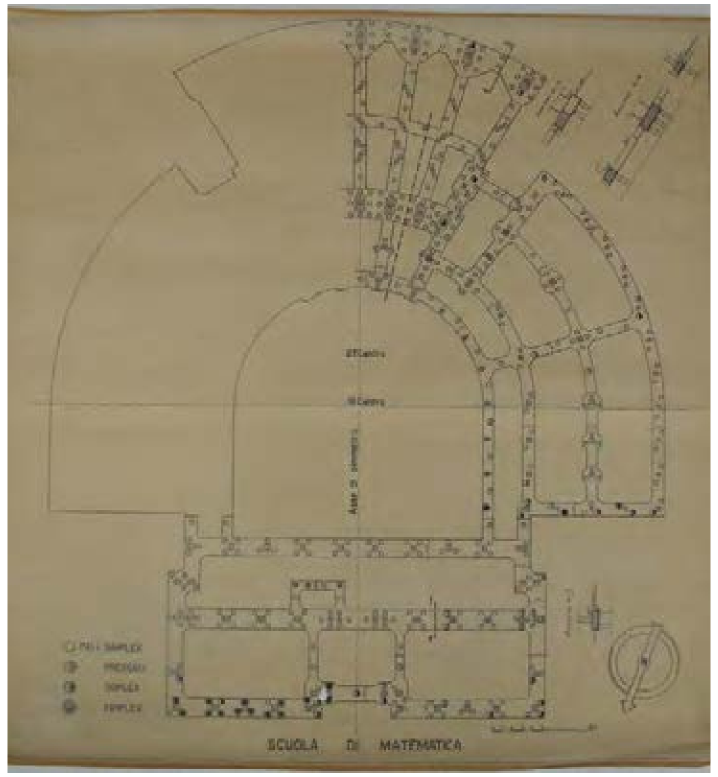
in the ground or retrieved together with the casing according to the shoe type; it is unclear which type was adopted in the School of Mathematics. In the tamped Simplex pile, the casing is struck with a hammer at short intervals as it is withdrawn, thus vibrating and tamping the concrete. The Duplex pile is produced by driving again the casing into the concrete. In this way, the concrete is forced to expand, thus compacting the ground laterally. Finally, the Triplex pile is obtained by repeating this operation once again. Steel bars may be inserted in the concrete for the entire pile length or for a portion. According to historical documentation (ASS_dcm_16), the upper 2,5 meters of the piles were reinforced with steel bars.

Based on a drawing dated 1934, the total number of piles is 580, distributed as reported in Table 1. The pile lengths vary between 14,0 meters to 17,5 meters. The location and type of piles were set based on both the intensity of gravity loads (larger under columns, stairs) and the inhomogeneity of the soil mechanical characteristics. A thickening of the Triplex piles is observed at the north-northeast side of the building. Detailed calculation of the concrete quantity used for the pile construction, which is provided in the “Costs analysis” developed by the firm Adriani entrusted with the construction of the building (ASS_dcm_26), allows to determin their diameter, which is equal to 400 millimeters for the Simplex piles, 570 millimeters for the Duplex and 700 millimeters for the Triplex.

Footings connect the columns and spread their load to the piles. The lying depth of the foundation of the front building is about 1.3 meters below that of the rest of the building. In fact, the basement level of the front building once hosted technical and storage rooms (today partially converted into IT laboratories). In some historical pictures a portion of the building footings is visible (BBL_pht_08). Width and depth of the footings change according to the column layout and to the applied loads. Minimum width is 1 meter, while maximum width (under the columns of the tower of classrooms) is about 3 meters. The depth is 0.6

Pile type	Front building	Curved wings	Tower of classrooms
Simplex	123	170	247
Tamped Simplex	12	14	0
Duplex	10	10	4
Triplex	14	6	0





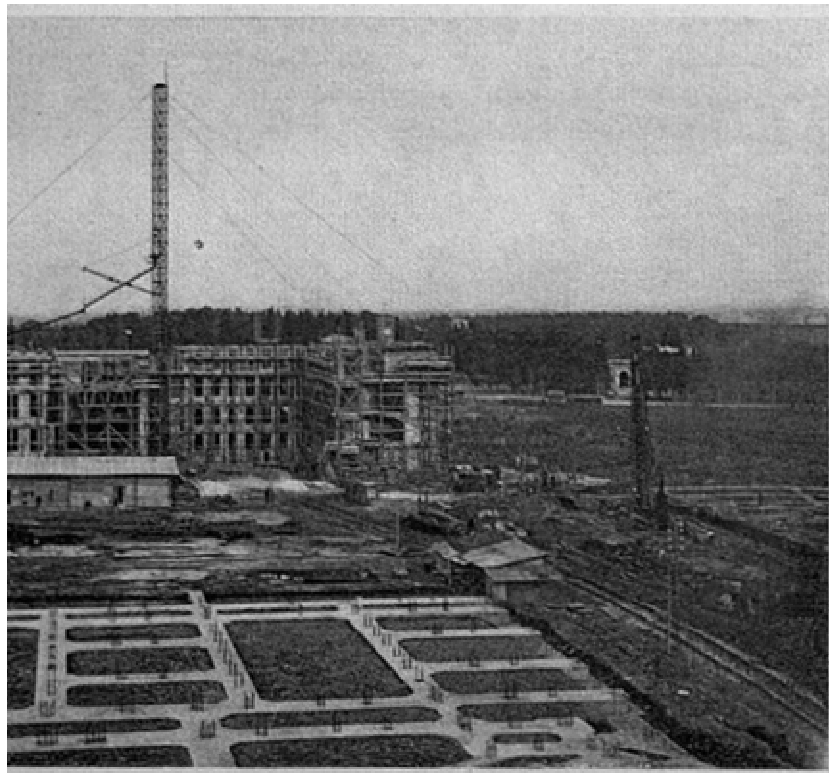


Table 1 - Number of foundation piles according to drawing ASS_drw_41 dated 1934

Figure 2 - Foundation piles: a) tamped Simplex; b) Duplex (© Martella 2020)

Figure 3 - Plan of the foundations as of February 21, 1934 (ASS_drw_41)

Figure 4 - The construction site of the university campus in a picture of the time; a portion of the footings of the School of Mathematics is visible on the right (BBL_pht_08)

meters except for the footings under the big columns of the tower, which are 0.8 meters deep.

Concerning the additions, deep reinforced concrete footings and beams are visible. Moreover, according to available documentation (ASS_dcm_299), drilled piles (diameter of drill 800 millimeters) were produced. No data were retrieved on the foundation of the three staircases placed in the courtyard in the 1980s.

Front building

Notwithstanding the apparent simplicity of the front building, which at first sight could seem regular both in plan and in elevation, several structural peculiarities characterize this part of the architectural composition. First of all, the presence of misaligned beams- i.e. beams not converging to a column- is observed at the basement level. This peculiarity may be ascribed to the different arrangement of the columns of the main façade, of the central alignment and of the courtyard façade, which is due to the different location of the windows on the two opposite façades.
Another structural specificity concerns the double height of the library reading room. The central part of this room consisted of a triple-height until 1954, when a slab was inserted to isolate the underlying atrium.

The wide skylight placed on the roof represents another distinctive trait of the building. It was built in reinforced concrete linear elements supporting a glass brick vault. The structural layout of the roof slab is still uncertain due to presence of a false ceiling, which does not allow direct inspection of the situation. However, according to the historical documentation, this was built as a ribbed reinforced concrete slab, while hollow block ribbed reinforced concrete slabs were built at the intermediate levels.

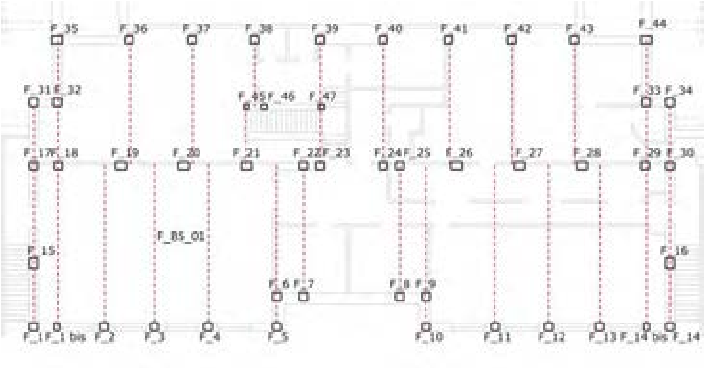


Figure 5 - Basement level of the east addition (© Liberatore 2020)

Figure 6 - Basement level of the front building, room F_Bs_01 (© Sorrentino 2020)

Figure 7 - Basement level of the front building, red dotted lines represent the presumed disposition of transversal beams (© Martella 2020)

Figure 8 - Slab between the "Atrio dell'appartamento dei professori" and the library reading room (© Salvo 2020)

Figure 9 - The skylight of the library reading room: view from a lateral window (© Liberatore 2020)

Curved wings

The curved wings consist of two levels above ground, the upper one having a narrower width than the lower. The slabs are supported by columns having rectangular or circular cross sections. More specifically, the external columns, i.e. those along the perimeter of the wings, have a rectangular cross section while the internal columns, arranged along two alignments, have a circular cross section. At the basement level, all the columns have rectangular cross section.

In a drawing dating back to 1933, five circular columns are reported for each internal alignment. While the pile foundations were designed and built accordingly, only four columns were actually built, as shown in a 1935 drawing. To limit the stress increase on the soil under the columns close to the missing one, a cruciform column was added in the basement where the upper levels column is missing. This reduction of the number of columns might explain their slight vertical misalignment between basement and ground level highlighted in Figure 12 a and b. Probably, in order to compensate the lack of alignment of the columns an additional beam runs parallel to the one centered on the basement columns.

The slabs at the first and second levels are different to one another. In fact, the first level slab is characterized by a particular arrangement of skewed beams, as shown in Figure 13, whereas at the first level a more conventional slab supported by main curvilinear beams and transversal joists was built. The reason for such difference emerged from the analysis of historical documentation. At the ground level, in order to reduce the depth of the beams within the slab thickness (450 millimeters) skewed beams were used to transfer the vertical loads directly to the columns. In addition, mixed steel-reinforced concrete beams were adopted with special clay blocks of 600 millimeters (width) x 400 millimeters (depth). These blocks are also mentioned in administrative documents dated 1938 and 1939 illustrating the work of the companies “Vinaccia”

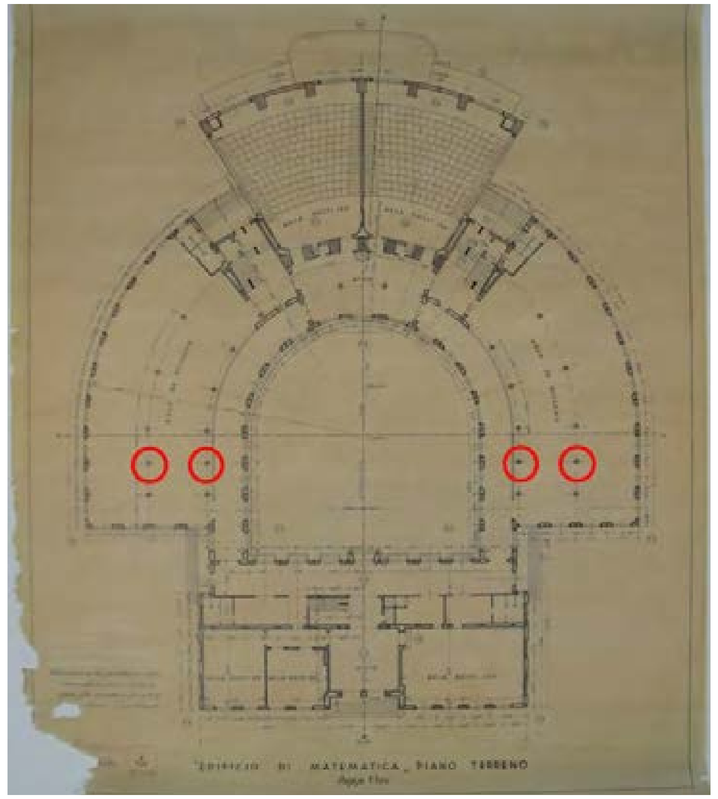


Figure 10 - Plan of the ground level as of December 18, 1933 (ASS_drw_25). Columns highlighted with red circles are not present in a drawing dated 1935 as well as in the building

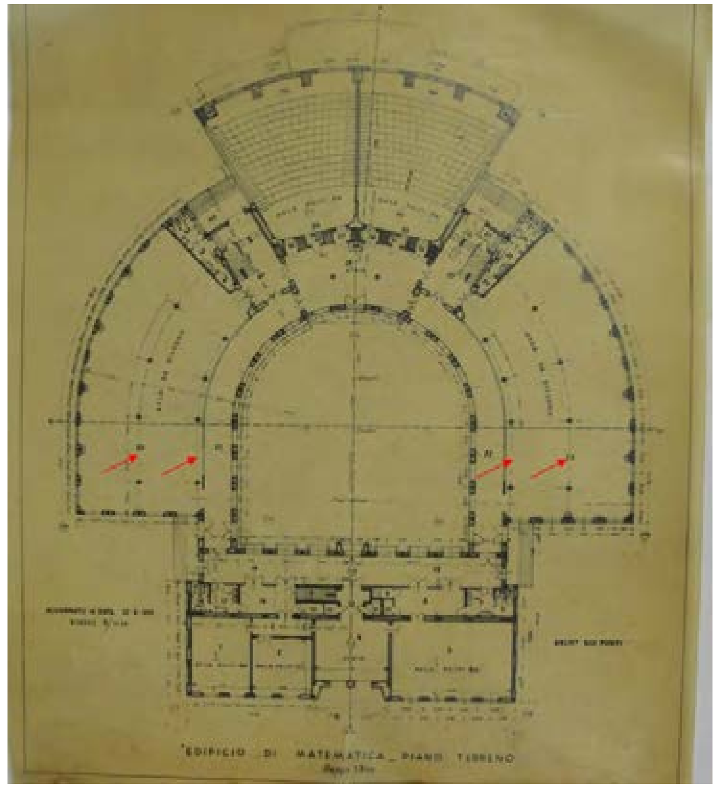


Figure 11 - Plan of the ground level as of June 12, 1935 (ASS_drw_70). Locations in which additional columns were planned in 1933 are highlighted with red arrows

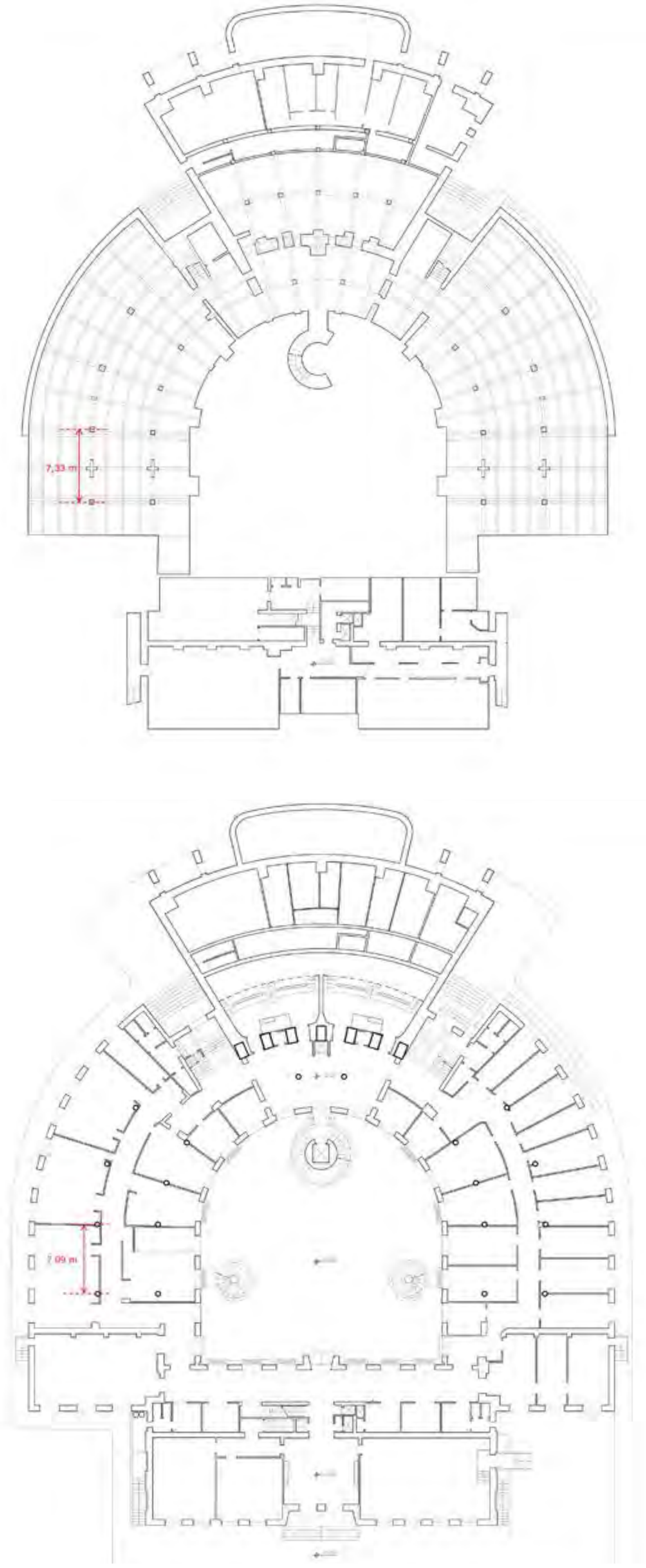


Figure 12 - Front part of the east wing: a) basement level; b) ground level (© Martella 2020)

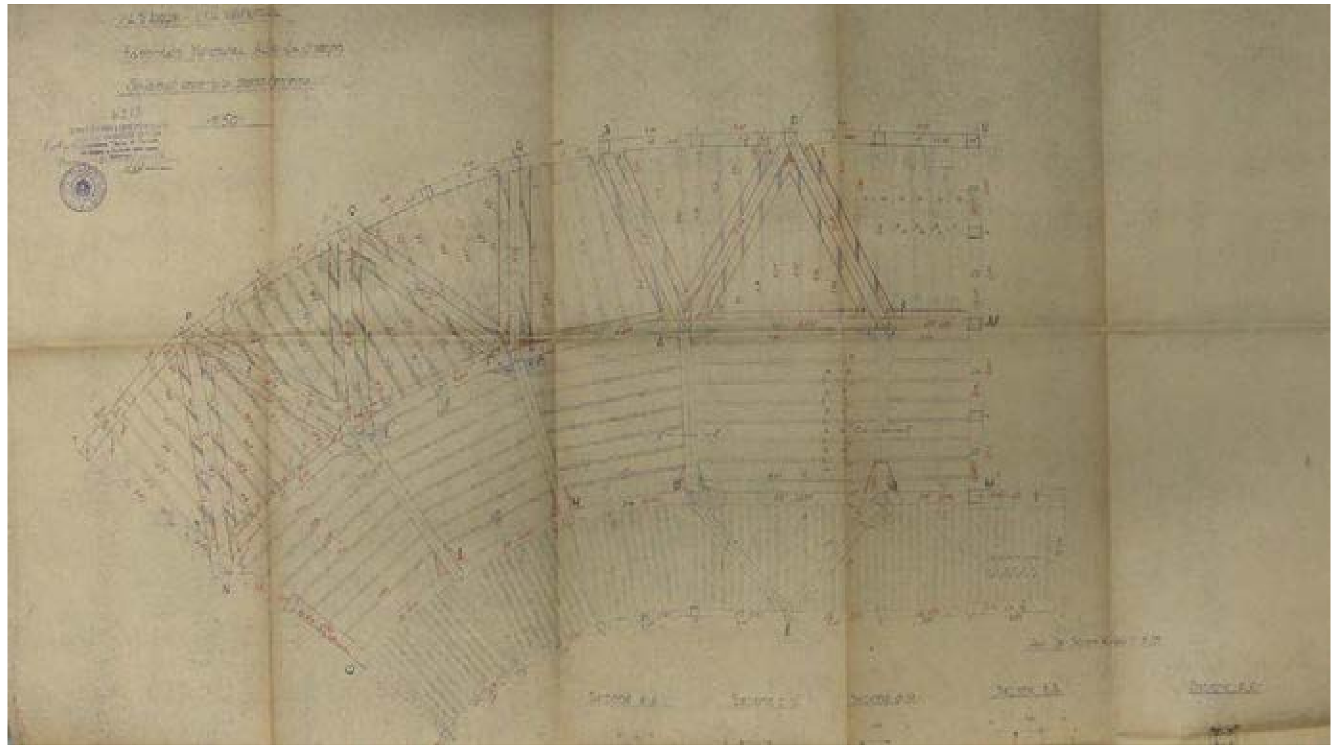
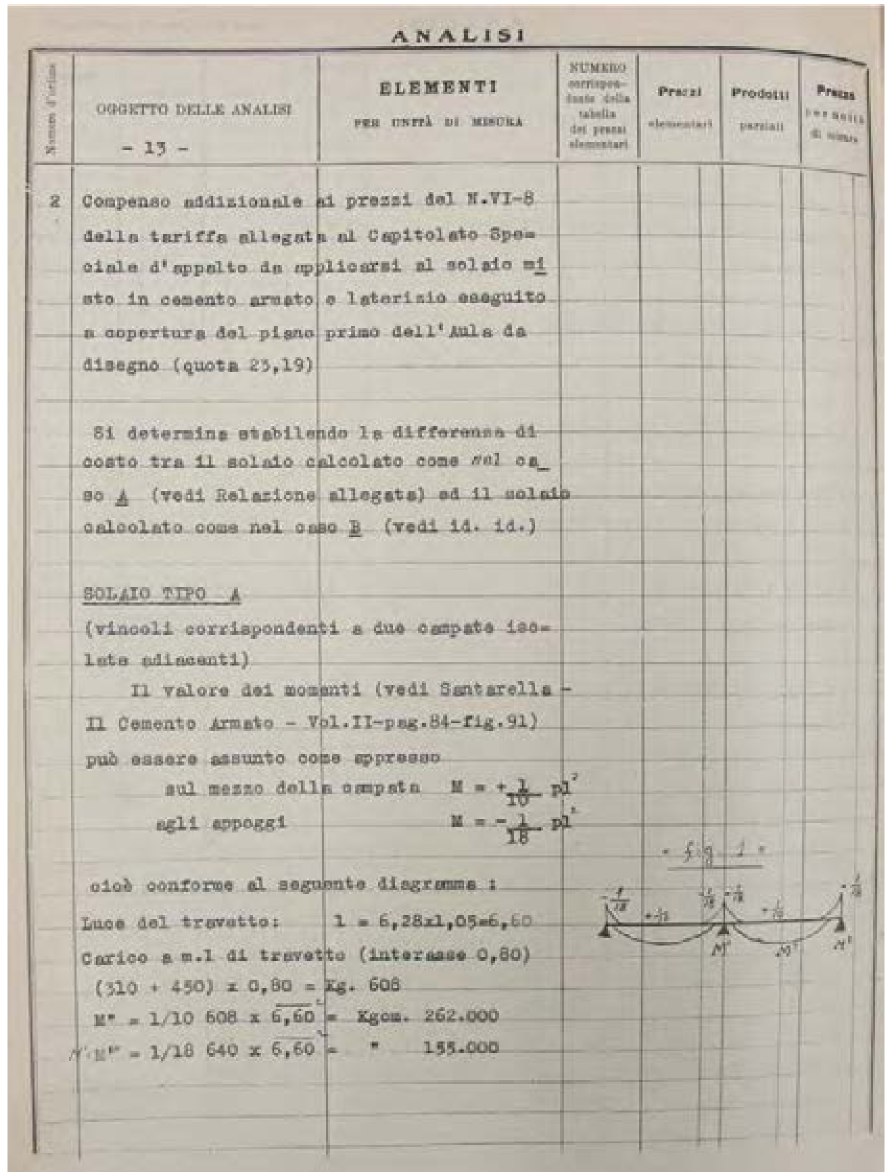


Figure 13 - Ground-level slabs of the curved wings in a drawing produced by the company Adriani as technical administrative documentation of the construction site, as of June 24, 1935 (ASS_drw_60)

Figure 14 - A view of the ground level of the west wing in the original configuration (ACS_pht_15)

Figure 15 - An advertisement of the bricks produced by the company Frazzi and used to build the slabs (BBL_pht_23)



ANALISI

Numero d'ordine	OGGETTO DELLE ANALISI - 13 -	ELEMENTI PER UNITÀ DI MISURA	NUMERO corrispondente della tabella dei prezzi elementari	Prezzi elementari	Prodotti parziali	Prezzo per unità di misura

2 Compenso addizionale ai prezzi del N.VI-8 della tariffa allegata al Capitolato Speciale d'appalto da applicarsi al solaio misto in cemento armato e laterizio eseguito a copertura del piano primo dell'Aula da disegno (quota 23,19)

Si determina stabilendo la differenza di costo tra il solaio calcolato come nel caso A (vedi Relazione allegata) ed il solaio calcolato come nel caso B (vedi id. id.)

SOLAIO TIPO A

(vincoli corrispondenti a due campate isolate adiacenti)

Il valore dei momenti (vedi Santarella - Il Cemento Armato - Vol.II-pag.84-fig.91) può essere assunto come appresso

sul mezzo della campata $M = +\frac{1}{10} pl^2$

agli appoggi $M = -\frac{1}{18} pl^2$

cioè conforme al seguente diagramma :

- fig 1 -

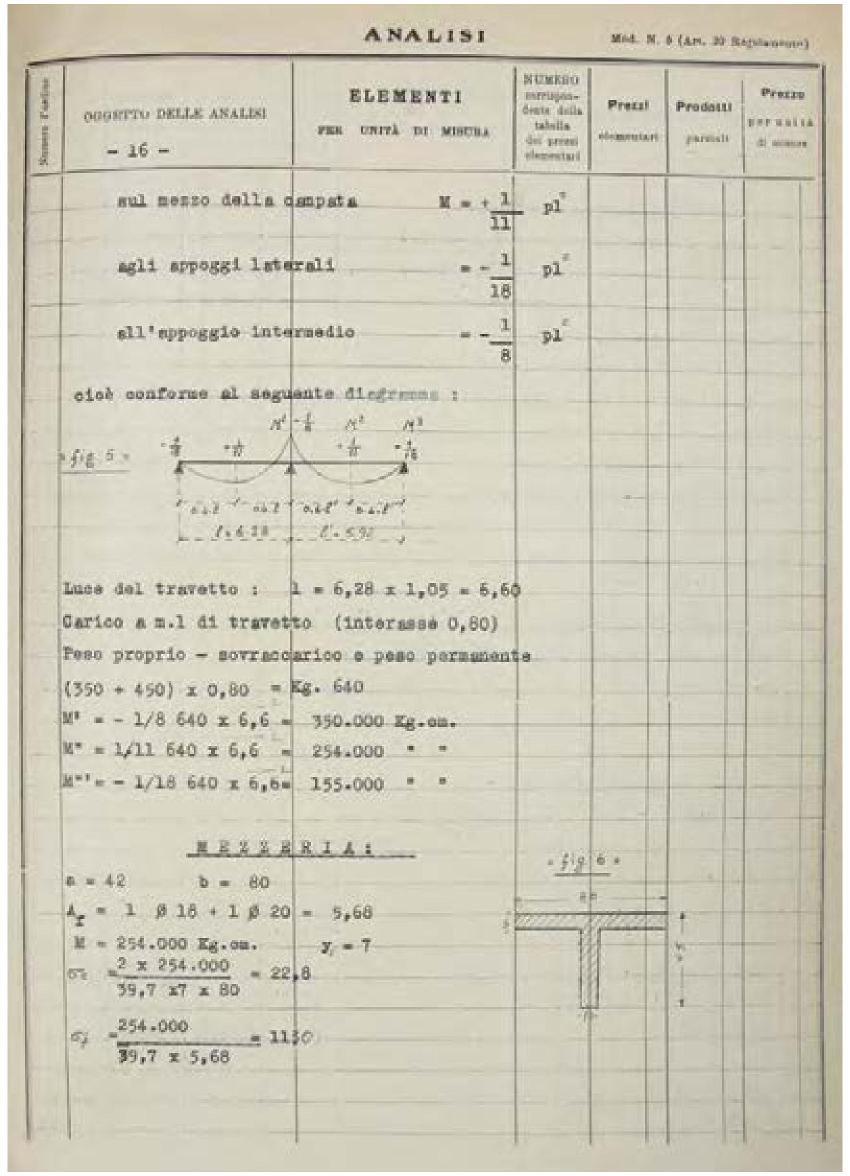
Luce del travetto: l = 6,28x1,05=6,60

Carico a m.l di travetto (interasse 0,80)

(310 + 450) x 0,80 = Kg. 608

M" = 1/10 608 x $\overline{6,60}^2$ = Kgcm. 262.000

M'·M"' = 1/18 640 x $\overline{6,60}^2$ = " 155.000



ANALISI Mod. N. 5 (Art. 30 Regolamento)

Numero d'ordine	OGGETTO DELLE ANALISI - 16 -	ELEMENTI PER UNITÀ DI MISURA	NUMERO corrispondente della tabella dei prezzi elementari	Prezzi elementari	Prodotti parziali	Prezzo per unità di misura

sul mezzo della campata $M = +\frac{1}{11} pl^2$

agli appoggi laterali $= -\frac{1}{18} pl^2$

all'appoggio intermedio $= -\frac{1}{8} pl^2$

cioè conforme al seguente diagramma :

- fig 5 -

Luce del travetto : l = 6,28 x 1,05 = 6,60

Carico a m.l di travetto (interasse 0,80)

Peso proprio - sovraccarico e peso permanente

(350 + 450) x 0,80 = Kg. 640

M' = - 1/8 640 x 6,6 = 350.000 Kg.cm.

M" = 1/11 640 x 6,6 = 254.000 " "

M"' = - 1/18 640 x 6,6 = 155.000 " "

MEZZERIA:

a = 42 b = 80

A_f = 1 ø 18 + 1 ø 20 = 5,68

M = 254.000 Kg.cm. y_i = 7

$\sigma_c = \frac{2 \times 254.000}{39,7 \times 7 \times 80} = 22,8$

$\sigma_f = \frac{254.000}{39,7 \times 5,68} = 1130$

- fig 6 -

Figure 16- A view of the first level of the west wing in the original configuration (ACS_pht_14)

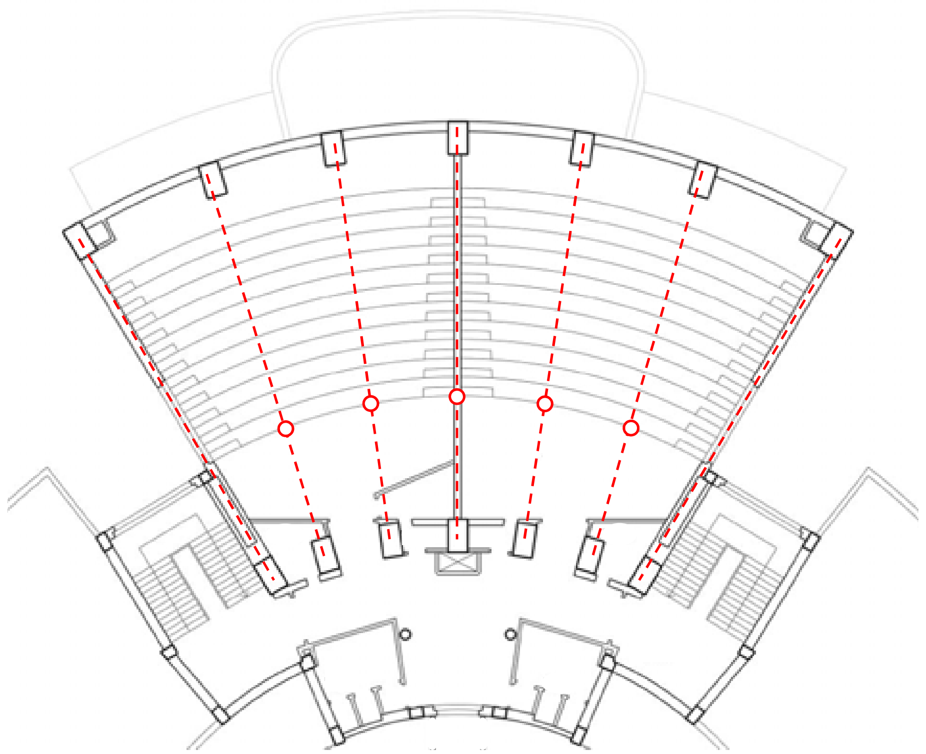
Figure 17 a/b - First level of the curved wings: a) initial static schemes of the joists; b) joists cross section and modified static scheme as reported in a historical report (ASS_dcm_56).

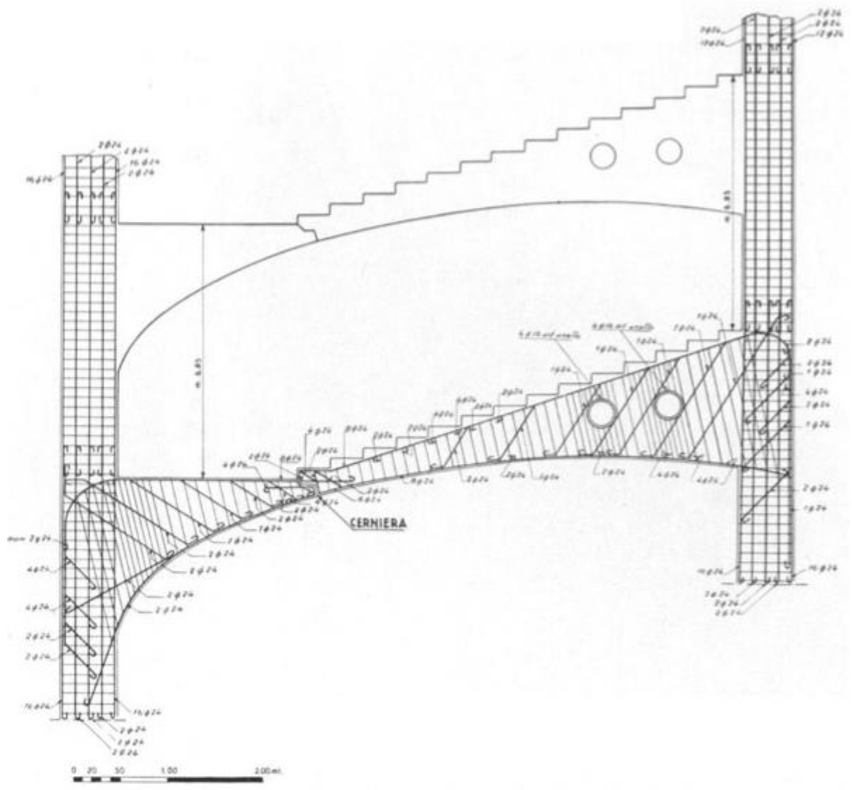
and “Frazzi”. At the upper level, a different solution is adopted. The central curvilinear beam is thicker, as clearly visible from historical photographs. The increased size allowed adopting a more conventional system with secondary beams supported by the main beams. The thickness of the slab is 450 millimeters, and the same blocks of the bottom level are used. The static schemes used to design the joists, are included in a report dated March 25, 1935 (ASS_dcm_56). For such joists, a modified hypothesis in the flexural moment calculations brought to the increase of the reinforcing steel area.
Finally, as mentioned above, in the late 1930s the ground level of the curved wings was partially raised. More specifically, small portions close to the front building and overlooking the courtyard were built, as shown in Figure 18.

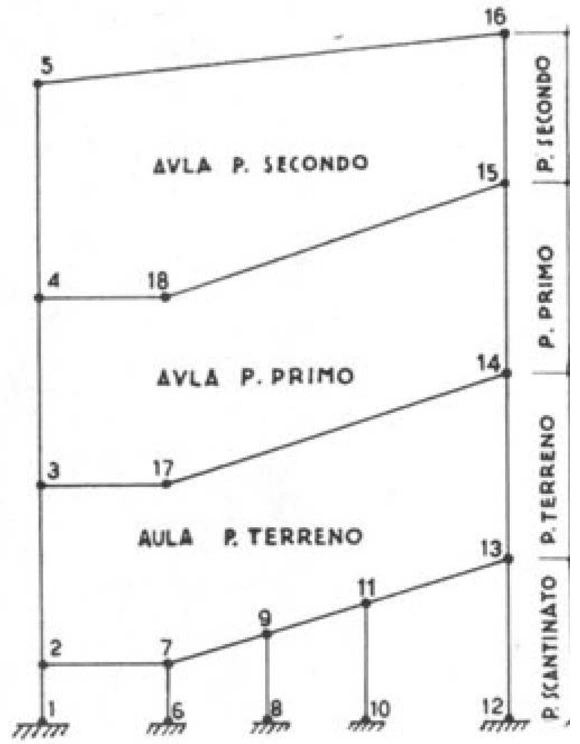
Tower of classrooms

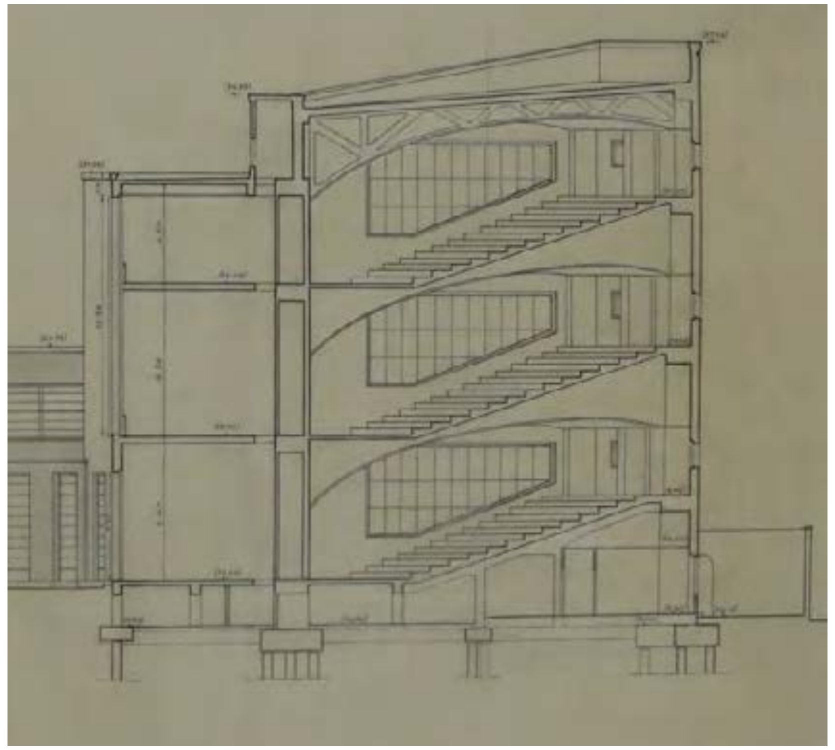
The tower of classrooms represents an interesting example of reinforced concrete structure and highlights the strong link between architectural and structural issues. This link, which is evident in this part of the building, shows the structural awareness of Ponti. For the design, the involvement of engineer Zadra- often recalled by Ponti for his contribution to the structural design of this part of the building- represents a rare case, if not unique, of collaboration during the construction of the university campus. Unfortunately, not much is known about this collaboration.
The structure is made of seven frames arranged in a radial manner. Large columns, having cross-sections dimension 0.9 meters x 1.5 meters, support 16-meters-span beams. The beams of the external frames are continuous, whereas the five internal beams of the first and second levels have an intermediate hinge at about one third of the beam length.
This solution allowed the reduction of the beams’ depth at the hinge location. In addition, it permitted to define the bending moment distribution. This type of beams was most frequently adopted for bridges (Gerber girder).

Figure 18 - A view of the courtyard in the original configuration, before 1939 (ACS_pht_10)









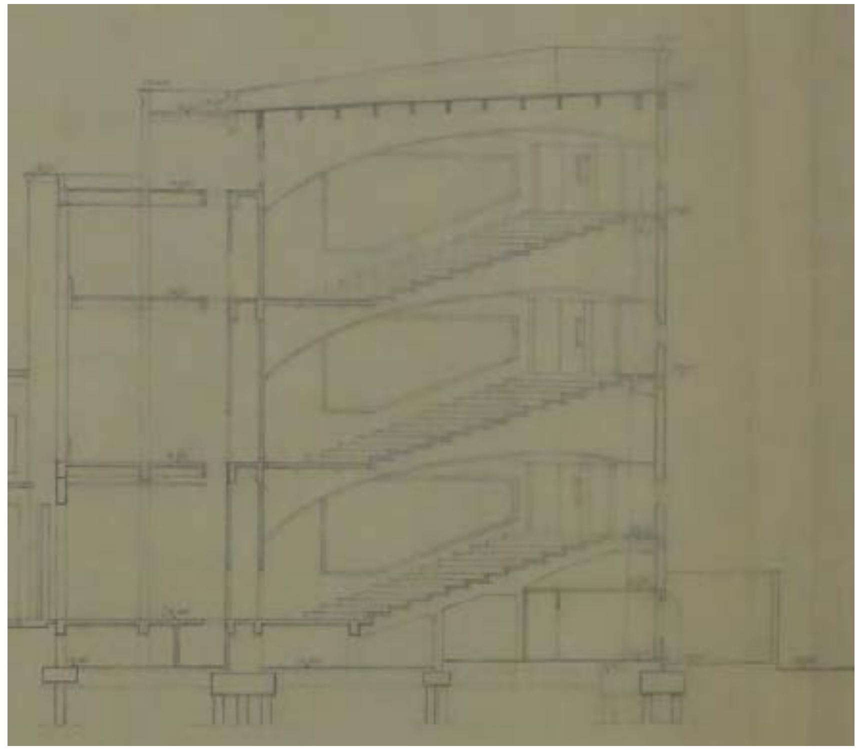


Figure 19 - Schematic representation of the beams at the intermediate levels of the tower of classrooms

Figure 20 a/b - Beams of the tower of classrooms as reported in the review "Architettura", 1935 dedicated to the construction of the university campus: a) details on the reinforcement (BBL_drw_12); b) structural model of the frame (BBL_drw_11)

Figure 21 a/b - Excerpts from the sections of the tower of classrooms dated a) January 17, 1934 (ASS_drw_33) and b) May 22, 1935 (ASS_drw_58)

A sketch of the structural model shows an internal frame. At the basement level, two central additional columns were built to support the beams. At that level as well as at the roof level the beams are continuous, i.e. without the hinge. It is interesting to mention that in a 1934 drawing, a truss beam is present at the roof level, while none can be found in the building. Figure 22 a and b show partial views of the beams of the first level, while visible parts of the reinforced concrete roof beams are shown in Figure 22 c and d. In the direction transversal to the main beams, reinforced concrete or steel joists are observed. According to the historical documentation, such elements served to hang the curvilinear ceiling of the rooms.

In the area facing the classroom entrances, two circular columns are present. They are located so as to continue the ideal curvilinear line of the column of the wings that overlook the courtyard. Finally, adjacent to the tower of classrooms, there are two staircases that join the wings with the tower. Such stairs are supported by reinforced concrete columns and beams. In Figure 22 b one of such beams, adjacent to a curvilinear beam of the tower, is visible.

Figure 22 a/d - Structural elements of the tower of classrooms as seen from: a) first level, room T_Fr_10 (© Liberatore 2020); b) first level, room T_Fr_09 (© Liberatore 2020); c) third level, room T_Tr_06 (© Martella 2020); d) roof level, room T_Rf_01 (© Sorrentino 2020)

Added bodies and fire escape staircases

Two additions built between 1976 and 1979 consist of double-level volumes flanking the front building and in continuation of the the curved wing. Initially, a reinforced concrete structure was envisaged for these bodies (ASS_dcm_262), and in fact reinforced concrete elements (footings, columns, and beams) were used at the basement level, whereas rebar location testing and visual inspections have not highlighted the presence of steel at the ground and first levels. Nevertheless, according to a document dated February 28, 1981 (ASS_dcm_299), the firm CO.MA.GE entrusted with the construction of these additions, claimed to have used steel profiles IPE and HE instead of reinforced concrete elements. Infill cavity walls produced with concrete Leca-blocks and foundations on drilled piles are mentioned in the same document.

Figure 23 shows the basement level of the east addition, where it is possible to note the presence of a hollow block ribbed reinforced concrete slab. The point of contact between a beam of the addition and a beam of the wing is highlighted in Figures 23c, where a polystyrene sheet separating the two beams is visible. From the structural point of view, added volumes and curved wings are separated, although the absence of an adequate joint may represent a source of vulnerability in case of an earthquake.

The fire escape staircases built into the courtyard in the 1980s are made of steel. The central one, bigger than the lateral ones, has a reinforced concrete core, which encloses an elevator. A specific assessment of their structural behavior is not carried out in this study. They are structurally independent from the main buildings, i.e. the gravity loads are directly transmitted to the soil, with the exception of those related to the walkways, which are partially supported by the structures of the main building.

Figure 23 a/d - Views of the basement of the additions, seen from the east curved wing: a) and b) structural elements (© Liberatore 2020); c) detail of the junction between a beam of the addition and one of the curved wing (© Martella 2020); d) junction detail between a beam of the addition and the wall of the wing (© Liberatore 2020)

Figure 24 - One of the two minor lateral fire-escape staircases in the courtyard (© Sardo 2021)

Masonry infill walls

Masonry walls are present in the building as external infills and internal partitions. In the historical documentation, more specifically in the "Progress reports" of the works dating from December 28, 1934 to October 15, 1937, the following types are mentioned:

- tuff masonry with brickwork courses (998 m^3)
- rough-hewn tuff masonry (247 m^3)
- rubble core tuff masonry (35 m^3)
- solid clay brickwork with lime mortar (657 m^3)
- solid clay brickwork with cement mortar (68 m^3)
- single wythe solid clay brick masonry with lime mortar (2937 m^2)
- single wythe solid clay brick masonry with cement mortar (25 m^2)
- vertically-stacked solid clay brick masonry (1022 m^2).

Moreover, according to the "Terms of Contract" for the partial elevation of the curved wings, dated June 6, 1939 (ASS_dcm_211), the internal partitions used in drawing room III are made of vertically-stacked hollow clay bricks. In general, masonry types used to build the School of Mathematics are quite stiff compared to the infill panels adopted nowadays in Italy, which are often cavity walls made of hollow clay bricks.

The identification of each type of masonry within the building is not straightforward because the walls are mostly covered with plaster or brick ("lithoceramic") cladding. However, the following hypothesis can be made, some of which being corroborated by visual inspections:

- single wythe solid clay brickwork and vertically-stacked solid clay brick masonry are probably used as internal partitions;
- tuff masonry and multiple wythe solid clay brickworks are used at the basement level and as external walls.

Figure 25 shows some examples: in Figure 25 a and b a solid brick masonry and a rough-hewn tuff masonry used at the basement level of the curved wings are visible; masonry wall made of solid clay bricks at the basement level of the tower of classrooms is shown in Figure 25 c; an enclosure wall at the roof level of the tower of classrooms made of tuff masonry with brickwork courses is shown in Figure 28d; the same masonry is also used at the first level.

Concerning the volumes added in the 1970s, according to the “Analysis of costs” dated September 1969 (ASS_dcm_264), and to a later document dated February 1981 (ASS_dcm_299), the use of the following types of masonry was envisaged:

- clay brick masonry to fill the openings (windows/doors) of the existing walls;
- hollow clay brick masonry at the first level for internal partitions;
- concrete-block cavity walls at the ground and first levels for external walls.

Finally, internal drywall partitions made of gypsum and asbestos were also used according to the “Agreement on new prices for additional works at the first level” signed on November 8, 1976 (ASS_dcm_284). In Italy, the use of asbestos was forbidden only in 1992.

Figure 25 a/f - Different types of masonry built as infill of the reinforced concrete structure: a) room WE_Bs_01 (© Martella 2020); b) WE_Bs_01 (© Sorrentino 2020); c) room T_Bs_01 (© Martella 2020); d) room T_Tr_09 (© Martella 2020); e) room T_Fr_9 (© Liberatore 2020); f) room T_Fr_9 (© Liberatore 2020)

WHAT'S WHAT: A CATALOGUE OF FURNITURE AND DOORS

Flaminia Bardati, Chiara Turco

FURNITURE

There are many discrepancies between the furnishings documented in the archival sources and those currently present in the School of Mathematics. Many original items are lost, while many pieces of furniture were added to the building without leaving trace in the documents. This is partially true also for elements that are present in the building from the very beginning, such as the black marble benches and the wall lighting fixtures that furnish the atrium of the front building, which are clearly visible in the historical photographs but are never specifically mentioned in the archival documentation. However, at present, every piece of furniture retaining artistic or historical interest deserves to be considered and cataloged, in view of its correct conservation, albeit its unknown origin. This also applies to the doors, which have been listed here in a specific catalogue.

Cataloguing the furniture implies, above all, to survey all the objects according to a specific methodology. This step consists in organizing the entire set of furnishing in categories and typologies, quantifying the items related to each type. In the case of the School of Mathematics, seven categories of furnishings have been identified, and associated to a color reported in the catalogue: seats, tables, lighting fixtures, leaning furniture, suspended furniture, platforms. Every category includes several types of items, characterized by different shapes and/or materials, which belong to different phases, quite often not documented.

Figure 1 - Two seater desks of the "model "Milano" at the ground floor (© Salvo 2021)

In order to systematize all the collected information, the catalogue also describes the details of all the selected objects, organized by categories and types. For each typology the catalogue registers the total number of items found, their location (at the time of the last inspection, as of 2021), the date of production (documented or hypothesized), and the state of conservation. More specifically, every single selected item is associated to a code that allows to identify its location, category, type, quantity. For example, the code "F_Sc_01_chr_a_01 / 50" identifies and item located in the front building (F), second floor (Sc), room 1 (01that is the library, corresponding to a Parma chair (chr_a), numbered from 1 to 50 (1/50).

Each sheet provides:

- macro category (color);
- type code + associated coloured symbol, instrumental to mapping;
- photograph;
- item code, which allows mapping and counting of items survived;
- state of conservation (original, modified, delocalized);
- notes;
- associated archival documentation;
- date of production (documented or hypothesized).

MACRO-CATEGORIES		FURNITURE CODES
SEAT	chr: chair	chr_a: @; chr_b: *; chr_c: |
	ach: armchair	ach_a: £; ach_b: §; ach_c: # ; ash_d: >
		ach_e: $; ach_f: ç ; ach_g: %
	stl: stool	stl_a: \ ; stl_b: /; stl_c: }
	bnc: bench	bnc_a: [; bnc_b: °
TABLE DESK	tbl: table	tbl_a: @; tbl_b: #; tbl_c: *; tbl_d: ^
		tbl_e: $; tbl_f: +; tbl_g: >; tbl_h: %
		tbl_i ç; tbl_l: ¢ ; tbl_m: ¶; tbl_n: ¤
	tsk: teacher's desk	tsk_a: §; tsk_b: "; tsk_c: &
		tsk_d: £; tsk_e: [
	dsk+chr: desk+chair block	dsk+chr_a: x+o; dsk+chr_b: X+O
LIGHTING FIXTURE	lfx: lighting fixture	lfx_a: @, lfx_b: *, lfx_c: #, lfx_d: &
LEANING FURNITURE	obf: office cabinet	ofb_a: ^; ofb_b: &; ofb_c #; ofb_d: @
	bks: bookshelf	bks_a: $; bks_b:); bks_c: £
	hdr: handrail	hdr_a: ¶; hdr_b: §
SUSPENDED FURNITURE	ntb: notice board	ntb_a: #; ntb_c: $
	cth: coat hanger	cth_a %; cth_b: ¶
	blb: blackboard	blb_a: £; blb_b: §; blb_c: ç
	ast: ashtray	ast_a: @
FOOTBOARD	ftb: footboard	ftb_a: >; ftb_b: §; ftb_c: ç

Chr_a @ (tot. 88 + undefined number in the basement floor)

LOCATION and QUANTITY	STATE	MATERIALS	NOTES	SOURCES	DATING
F_Fr_05_chr_a_01/12	01-12: original, delocalized	chromed steel tube; seat and back in polished oak	Parma Company, n. 14 of the catalog, modified by Ponti. Originally 196 objects. Perfect state of conservation, in use.	ASS_drw_83	1936
F_Sc_01_chr_a_01/50	01-50: original			ASS_dcm_115	
F_Sc_03_chr_a_01/14	01-14: original, delocalized			ASS_dcm_155	
F_Sc_05_chr_a_01/07	01-07: original			ACS_pht_16	
F_Sc_07_chr_a_01	original, delocalized			ACS_pht_30	
F_Sc_10_chr_a_01/03	01-03: original, delocalized			ACS_pht_31	
F_Tr_04_chr_a_01	original, delocalized			BBL_pht_33	
WE_Bs_01_chr_a_undefined	original, delocalized			GPA_pht_05	
				GPA_pht_06	

Figure 2 - Categories and typologies of the furniture catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati 2020)

Figure 3 - A sample of the furniture catalogue; the sample shows chair model 14 produced by the firm Parma (© Bardati 2020)

Further on, the survey and cataloguing activity has referred to materials and production processes. This phase of the research allowed to date non-documented furniture, also helping a thorough understanding of the materiality of such a peculiar heritage.
The "seats" category is one of the richest and comprises 15 typologies, including chairs, armchairs, stools, and benches; yet the origin of only four types is documented from the 1930s, while the others seem to belong mainly to phases 1- 3 (1935-1949) or to the beginning of phase 4 (Figure 4).

Chairs are of three types: The Parma model (chr_a, documented in the 1930s) consists of at least 88 items; chr_b (16 items) and chr_c (2 items) probably date both to phases 1- 3 (1935-1949).

Armchairs are of seven types, most of which probably date back to the same phases 1- 3: ach_a (14 items); ach_b (6 items); ach_d (14 items) and ach_e (4 items). As none of these is mentioned in archival sources directly related to the School of Mathematics, it is possible that they were purchased for other Institutes of the university campus and entered the building later, probably in the post-war years or after 1968. Such hypothesis is based on the shape but also on the type of materials and on workmanship, in particular padding with belts, springs, and jute. Ponti was one of the designers who participated to the industrial program of Pirelli of 1933-1940 concerning the experimentation of foam-rubber produced by Pirelli for furniture padding, as evidenced in Franco Albini's editorial "La Gommapiuma Pirelli alla VI Triennale"[1]: the use of jute instead of foam rubber could prove a dating at the end of the 1940s and, at the same time, the exclusion of Ponti's authorship.

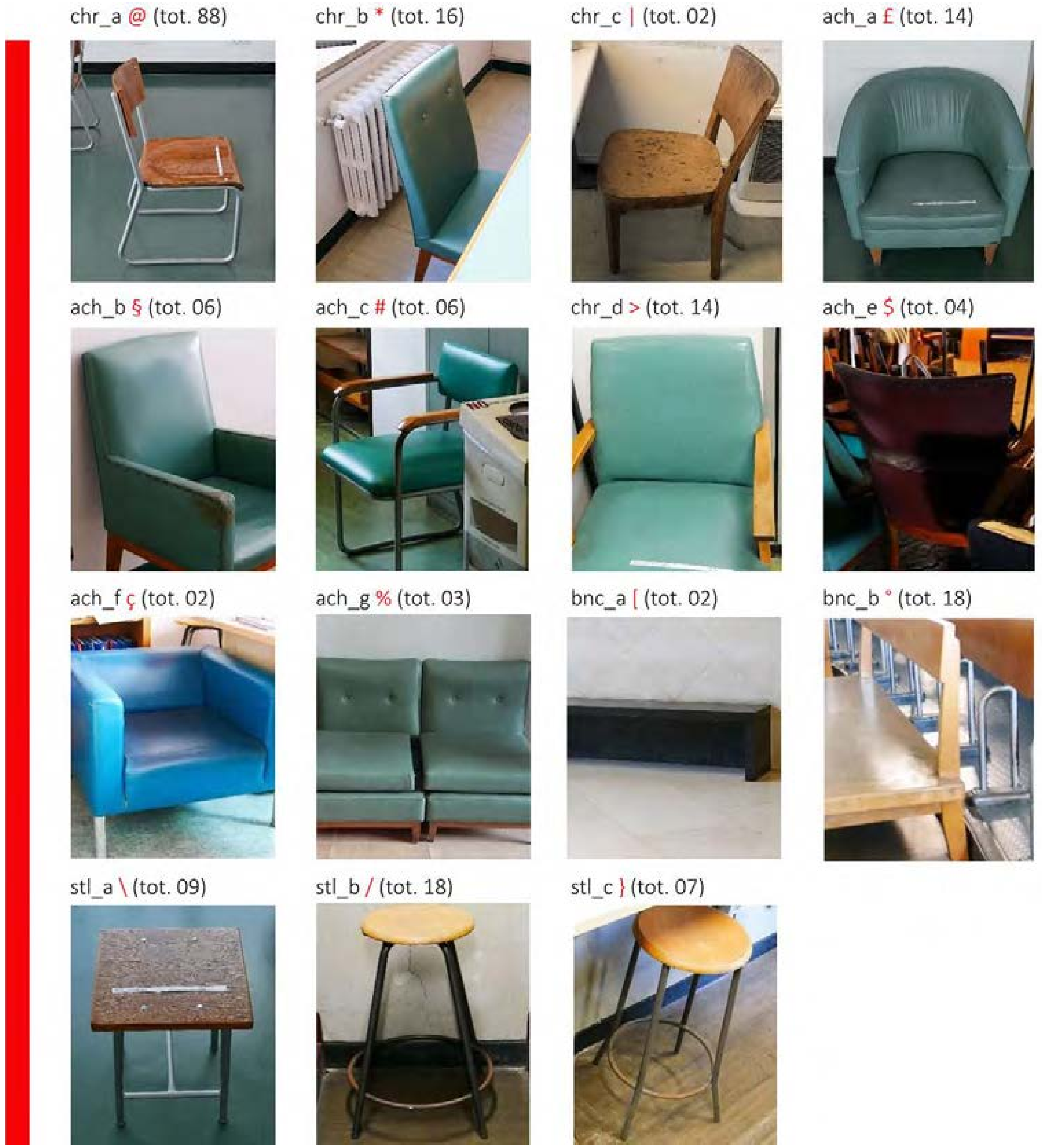


Figure 4 - General overview of chairs, armchairs, benches, and stools included in the furniture catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati, drawing Turco 2020)

For the same reasons, armchairs ach_f (2 items) and ach_g (3 items), characterised by padding in expanded polyurethane, were purchased later, probably during phases 4- 5 (1950-1980), during which the furniture of the building required to be renewed and integrated. The armchairs of the Council Hall (ach_c, 6 items) are the only documented in the 1930s.

Concerning the stools, only one type (stl_a, 9 items) is documented in the 1930s, while the two others (stl_b, 18 items and stl_c, 7 items) are probably datable to the 1950s.

Benches bnc_a, corresponding to the two black marble benches of the atrium, are visible in the 1936 photographs and certainly belong to the original design, while bnc_b (18 items), appear in a picture taken by Carlo Severati between 1983 and 1992, and are therefore datable to phases 4- 5 (1950-1980), as the increase of number of students required the supply of many more seats, probably for the tiered lecture halls of the Tower.

As shown by the mappings and by the item codes in the following chapter, many objects have been delocalised and mixed without logic, nor a criterion regarding their dating, original function and location, stylistic homogeneity with other furnishing etc. Many of them are waiting to be repaired or have been stacked in the basement, where humidity represents a true danger, especially for the wooden frames and for the paddings.

Moreover, the catalogue lists only few among the original lighting fixtures (Figure 5). At present, all 102 spherical pendent lamps produced by the firm Bianchi and supplied in September 1936 (ASS_dcm_159) with three different diameters (40 cm, 35 cm, 30 cm and 25 cm) have gone lost, and have been replaced by rectangular ceiling lights. Photos of the 1930s show their presence them in the lobbies of the Tower of classrooms, in the drawing halls of the curved wings and in the annular corridor at the ground floor; but

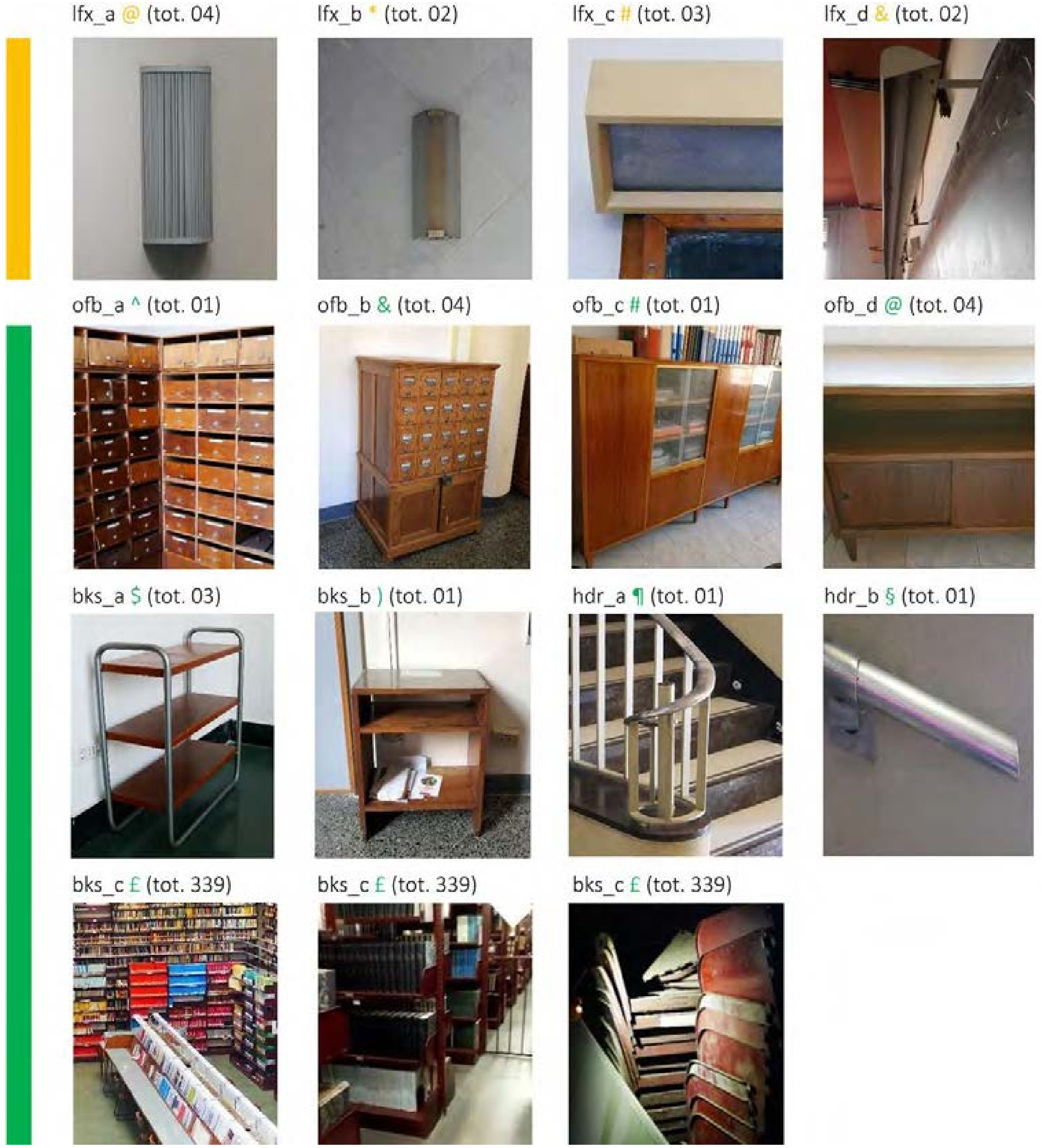


Figure 5 - General overview of the lighting fixture and furnishing included in the catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati, editing Turco 2020)

most probably they had been used in all rooms of the building, with few exceptions. This was in fact a basic model, adopted many in other Institutes of the university campus, which but Ponti seemed to very much appreciated for its shape. He adopted this same type in other projects of the 1930s, such as the reading room of the Liviano building at the university of Padua, the Italian Institute of Culture in Wien and the Vetrocoke building in Milan.

Also, the lamps that had been designed on purpose by the firm S.A.A.R to be fixed upon the big reading tables and on the shelves of the library have been all replaced, as well as the fixtures characterised by a parabolic shape, which projected grazing light on the blackboards' surfaces of the classrooms. This kind of lamps have been replaced by more modern and safe ones (lfx_c), but two items of this type still survive (lfx_d): one in a professor's office in the front building and one in the IndAM offices, where blackboards and lamps were all replaced in 1939.

Some of the most interesting original lighting fixtures were commissioned to the firm Bianchi and consisted of hemicylindrical wall lights composed by several small cylinders in opaline glass, enclosed by two semi-circular plates of painted metal (lfx_a). The supply included 6 items 90 centimetres tall, destined to the library and to the professors' lobby, 22 items 65 centimetres tall placed in the annular corridor, as witnessed in pictures and movies of 1936, and 7 items 45 cm high, whose destination is unknown. Four lamps at present in the library are copies of the originals (Figure 6). The wall lights of the main atrium (lfx_b), in place since 1935 as shown by the photos of the Thirties, are not listed among the supplies by Bianchi or by Palazzo della Luce (Figure 7). They could correspond to Ponti's specific request as a similar model is used in the atrium of the Montecatini building (1936) and placed near the elevator.

Figure 6 - Replicas of the wall light of the library supplied by the firm Bianchi (© Bardati 2020)

Figure 7 - Wall light of the main atrium in the Front building (© Bardati 2020)

The richest category includes tables and desks and includes 17 typologies (Figure 8), not considering the integrated model Milano by the firm Beltrami, which assembled desks and seats, and those for the tiered lecture halls of the Tower produced by the firm Liporesi.

Beside four types of tables documented in phase 1 (1935-1938) and supplied by the firm Santi (tbl_d), by the firm Beltrami (tbl_e and tbl_g) and by the firm Parma (tbl_n), plus one item that is attributable to the same phase (tbl_f), it is very difficult to date other tables currently in the building, especially those present in the library and in some professors' studios.

In most cases, materials (oak and sometimes Linoleum) and shape of the legs could suggest a dating span between the 1940s and the 1950s, when new furnishing entered the building whether to compensate what was lost during the occupation or to purchase new furniture needed by the increased number of students and professors. Obviously, it is possible that some of these tables were purchased for other Institutes and have been moved to the School of Mathematics after the occupation of the building by the allied troops at the end of World War II, or after 1968: yet details concerning shapes and manufacture also encourage other hypotheses. Thanks to the colour, the woodwork process, and the shape of the legs, six comfortable writing desks with drawers hanging

Figure 8 - General overview of tables and teachers' desks included in the furniture catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati, editing Turco 2021)

from the wooden structure (tsk_b), are to be linked to some large office cabinet (ofb_c) and to some smaller closets (ofb_d). Very probably they were part of the supply to the furnishing of a few new professors' studios in two main occasions, both dating to the beginning of the 1970s. These were the years when the building in via Vicenza was rented for the purposes of the Institute of Mathematics, and when the newly built additions to the sides of the front building had been completed and were ready for furnishing. Nevertheless, the style of these items appears quite too decorated for the 1970s.

The lack of archival documentation not only impedes a correct dating but also hinders any hypothesis about Ponti's possible authorship in occasion of the new supplies of furnishing or, as for phase 1 (1935-1938), about Ponti's request of small but significant modifications in the models proposed by the firms. An example is the small round table, at present in a professor's studio (tbl_l), which is very similar to the "Anna" model designed by Ponti for the Borletti family in 1932. The thin silhouette of a table without drawers, both in a rectangular and in a square version (tbl_a and tbl_b), also with a drawer (tbl_h), recalls Ponti' research. There is in fact a red thread connecting these of the 1930s, and his later works with De Poli in the 1940s,

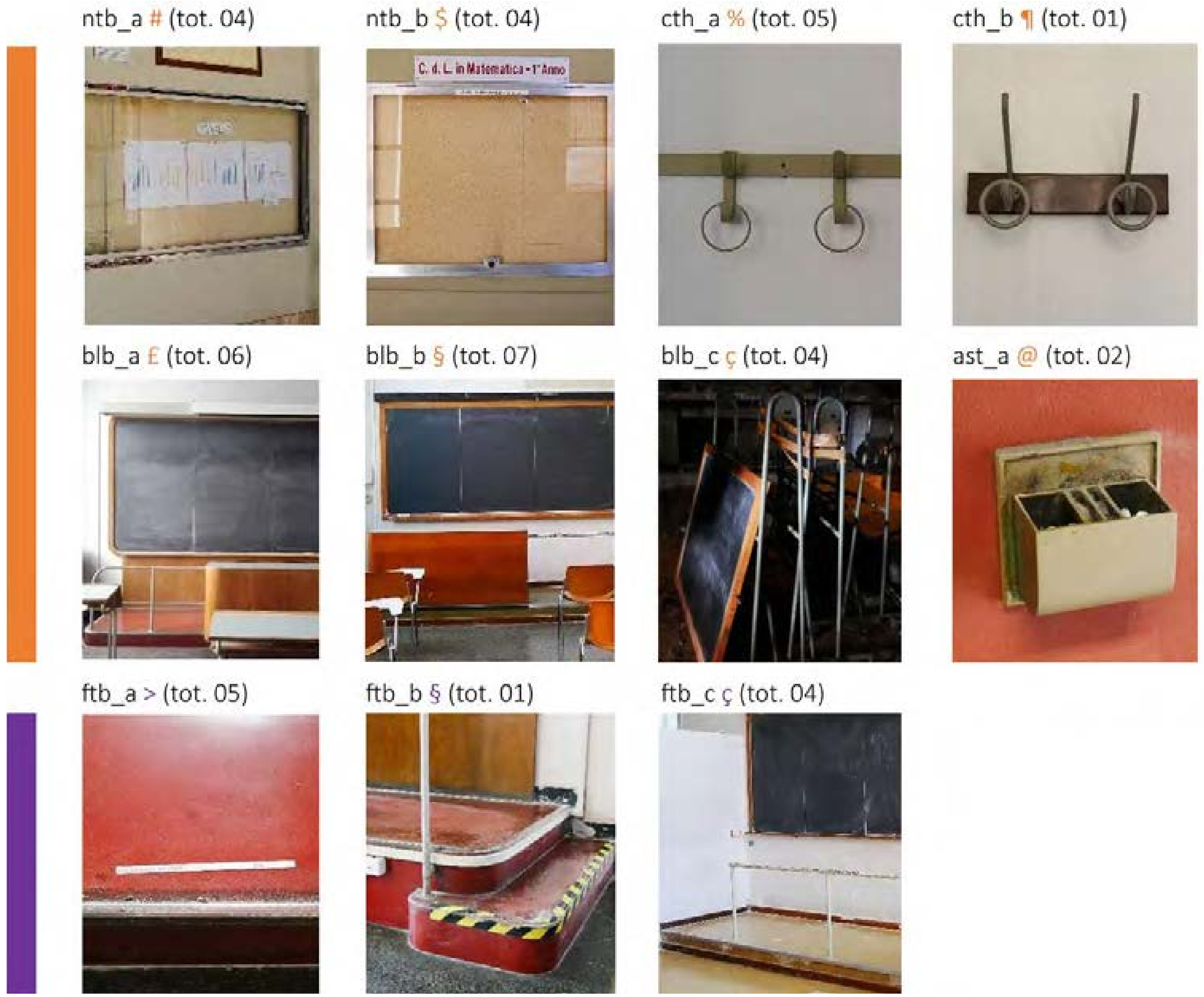


Figure 9 - General overview of suspended furnishings and of footboards included in the furniture catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati, editing Turco 2021)

up to the console designed for the hotel rooms of the Hotel Parco dei Principi (1960), although similarities are not strong enough to propose his authorship, even if limited to few modifications the firms' basic models.

The teachers' desks open another interesting chapter. As said, seven teachers' desks in spirit-polished oak (tsk_a), conceived as a one-block assembling the wooden wall veneering, the blackboard, the footboard, and the steel railing (Figure 9), were ordered to the firm Santi in October 1935. All the elements composing this block, described as *cattedra* in the documents, were ordered to Santi, except the blackboards. They all followed the same design, with the writing desk positioned sideways and the railing continuing to the end of the footboard. But there were differences concerning the dimensions- according to the size of the classrooms' dimensions – and according to the presence of a door cut into the blackboard, which lead to the professors' dressing room, as a filter between the lobby and the tiered lecture halls. This specific solution allowed the professors to enter the classrooms without using the same paths and doorways used by the students, somehow underlining a distinction between the Maths professors and the students in Engineering. In fact, no similar solution is present in the other classrooms in the front building where Mathematicians taught to students in Math.

Such a composition of elements in a unique functional block may be considered as one of the very first occasions for Ponti to design *a parete organizzata* (organised wall), a *leitmotif* of his, already present *in nuce* in a drawing of the 1920s[1]. Six of the seven original blocks survived: three are still in the tiered lecture halls at the ground and at the first floors of the Tower, while three are still in the classrooms of the Front building. Unfortunately, one large block disappeared in 1960, as the tiered lecture hall at the third floor of the tower was split into two smaller rooms. The new teachers' desks for these new classrooms are copies of the original ones, but without footboard and integrated blackboard and with relevant differences in terms of woodwork and materials. In the desks supplied by the firm Santi, the oakwood grain is disposed vertically, and a single sheet of wood draws a large quarter of a circle in correspondence of the external corners (Figure 10). The table is also a single piece with the drawers and its top consists of a thin wood frame that borders the surface, filled in with a sheet of Linoleum. The new desks copy the general shape of the models, but with very different details. They are made by several pieces of oakwood veneering with horizontal grain unless in the corners, where a smaller element with vertical grain rounds up the corners; the top- here in laminated plastic- has no frame.

The order to the firm Santi included four *cattedre* also for the drawing classrooms, but at the end of the description it is clearly specified that the supply does not include writing desks, which in other cases were accompanied by a detailed description of the desk and its joints to the other elements. Therefore, with the term *cattedra* the firm Santi indicated the one-block complete of footboard, wooden wall veneering, railing, and writing desk. Only in the case of the drawing classrooms, the desks were not supplied by Santi- probably for economic reasons- but by Beltrami (tsk_d), only one of which survives although stacked in a closet. At present, there are four footboards with railings in the east wing, which are bigger than those ordered to Santi and lacking the Linoleum finishing as in the original ones. However, it is possible that the footboards of the 1930s have been fixed to fill the wider walls of the new classrooms. All the teachers' desks that are currently in use in this part of the building are copies of the original model and are very similar to those produced in 1960.

The direct observation of the items selected for the furniture catalogue evidences that the main materials that identify the furnishings are chromed steel tubes and polished oak. This is true for the items supplied by all firms: Parma that produced chairs for the library, tables for the reading rooms; Liporesi that produced the curved desk and seats for the Tower of classrooms; Santi that produced the big reading tables for the library, the teacher desk with railing for all classrooms destined to High or 'Pure' Mathematics; and Beltrami that produced the armchairs for the Council Hall, the stools and teacher desks for the drawing classrooms, the tables for the waiting room of the Council Hall, the *Milano* desks for the classrooms of the Front building, and the whole furniture for the professors' studios. Undoubtably, these materials encountered the taste and the style of the times, and Ponti uses them in many projects of the 1930s, concerning office buildings but also residences, as in the case of the table for the Marmont House in Milan (1934-1936).

Figure 10 - Teacher's desk in spirit-polished oak and Linoleum supplied by the firm Santi. Detail of the round shaped corner with vertical wood grains (© Bardati 2020)

Experimental or autarchic materials, as Anticorodal and Linoleum, also characterize many objects belonging to the phase 1 (1935-1938). As said, Linoleum was used to veneer the surfaces of footboards and desks, while Anticorodal was used for many different objects supplied by the firm Gaggiottini. Besides the inscription “Scuola di Matematica” on the main façade, other smaller signs mark the original rooms. A hierarchy among the different rooms of the School is underlined by the use of different materials along the staircases: these are richer in the Front building where the steps and paving in marble and the handrail in Anticorodal open the way to the first floor and to the library (Figure 11).

Figure 11 - Handrail in iron and Anticorodal by the firm Gaggiottini; the helix dynamically guides the upward movement from the first to the second floor (© Bardati 2020)

DOORS

Concerning the doors, 18 typologies have been identified, often on the base of archival documentation (Figure 12). The doors catalogue adopts the same methodology as for the furniture and is organized in chronological phases and typologies. Only four main phases have been identified for the doors:

- Phase 1- 1935-1937 (the original project);
- Phase 2- 1939-1940 (foundation of the IndAM and alteration of the first floor of the west wing);
- Phase 3- 1954 (alteration of the professors’ lobby to obtain two offices);
- Phase 4- 1969-1980 (additions to the curved wings and fragmentation of the drawing classrooms in the east and west wings).

The doors supplied in occurrence of phase 1 have been the model for the following phases, with few exceptions and changes, mainly concerning the manufacturing process and the finishing materials, sometimes also the dimensions (Figure 13). Therefore, the main objective of the research was to identify the original doors, which was not an easy task as these have been thoroughly modified (surface, colour, handles, locks, hinges).

The huge metal-frame doors at the ground floor supplied by the firm Coen are clearly recognizable along the corridor (drs_c), despite the several alterations to the handles, glazing and panic bars. The firm Gaggiottini supplied the Anticorodal frame of the entrance door (drs_a, with modified opening system) and the veneering of other doors in the main atrium of the Front building, which are characterised by rounded arches (drs_b). Other doors, as those of the library (drs_h) and of the elevator (drs_e and drs_f), are also original, and the same goes for the doors that open in the blackboards of the tiered lecture halls of the Tower. Wooden doors that are mostly used in the building are those supplied by the firm Cantieri Milanesi: designed by Ponti, who required a specific wood processing (ASS_dcm_74), they are scattered everywhere in the building and are most often kept in the original condition or have been only slightly modified (drs_A; drs_B1; drs_B2; drs_C; drs_D; drs_E; drs_f; drs_G and drs_H).

The doors’ catalogue contains details of all selected items, organized by phases and types, such to provide all the collected information. The catalogue registers the total number of items of each typology, their dimensions, their location, their state of conservation. Also in this case, each item is associated to a code that

PHASES — DOORS CODES

Phase 1 (1935-1937)
drs_a: *; drs_b: ^ ; drs_c: °; drs_d: >; drs_ e: <; drs_f: " ; drs_g: |
drs_ h: \; drs_i: +; drs_ l: / ; drs_ A.: A; drs_ B1.: B1; drs_ B2.: B2
drs_ C.: C ; drs_ D.: D ; drs_ E.: E ; drs_ F.: F ; drs_ G.: G; drs_ H.: H

Phase 2 (1939-1940)
drs_ B2.: B2; drs_ C.: C ; drs_ D.: D ; drs_ E.: E ; drs_ F.: F
drs_ G.: G; drs_ H.: H

Phase 4 (1954)
drs_C. C

Phase 5 (1969-1980)
drs_m: " ; drs_n: $; drs_ A.: A; drs_ B1.: B1; drs_ B2.: B2; drs_ C.: C
drs_ D.: D ; drs_ E.: E ; drs_ F.: F ; drs_ G.: G; drs_ H.: H

Figure 12 - Phases and typologies of the door catalogue: coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati 2020)

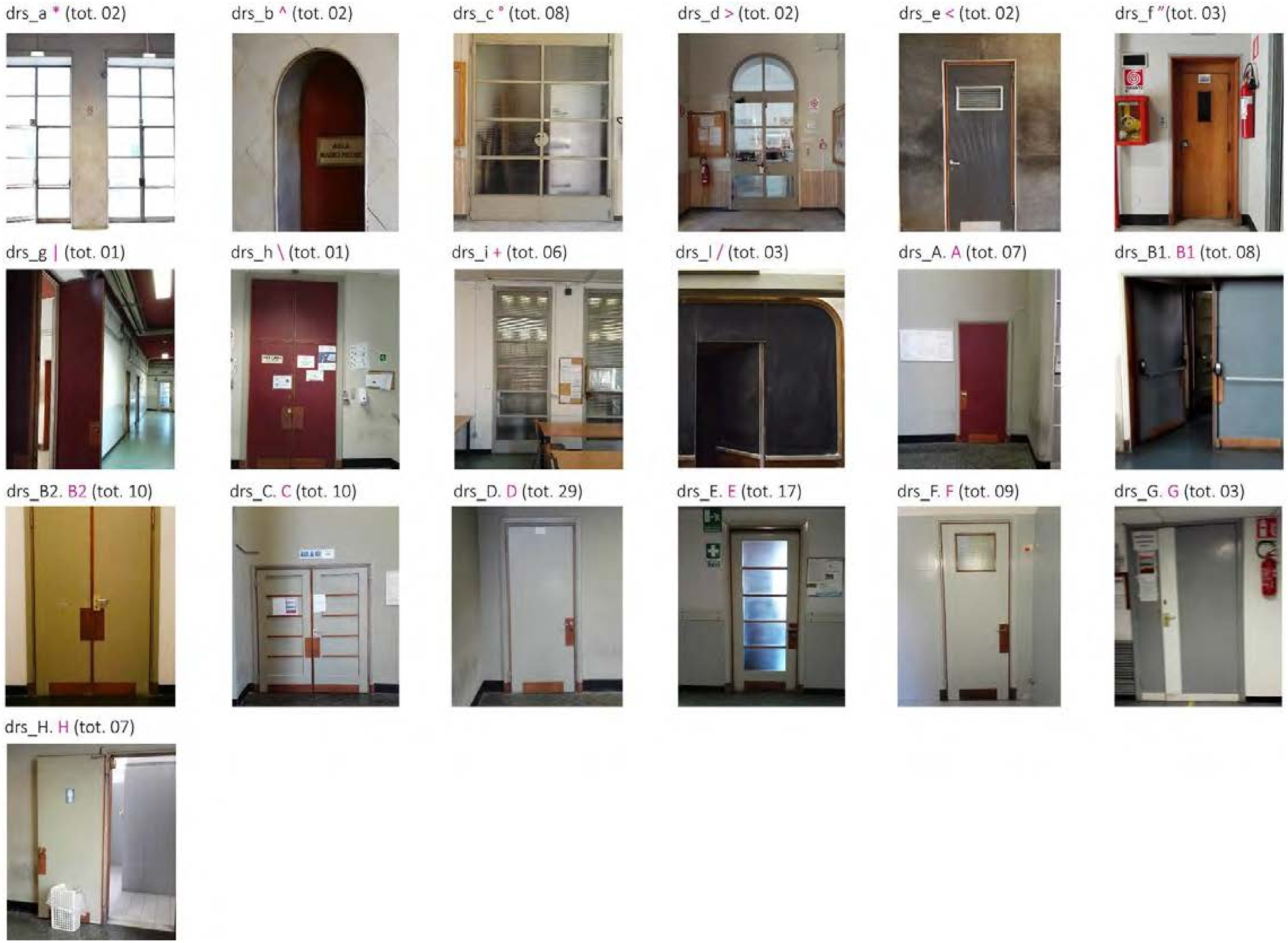


Figure 13 - General overview of the catalogue of doors produced during phase 1 (1935-1938): coloured symbols are associated to each typology, thereby allowing the mapping of each item on plans (© Bardati, editing Turco 2021)

allows to identify type and location: the item code F_Fr_19 / 01_drs_E._01 identifies items located in the Front building (F) at the first floor (fr), connecting rooms 19 and 01 (19/01), the door type “E.”.

Each card, as in the case of the furniture catalogue, provides information regarding:

- phase (color);
- type (code) + associated coloured symbol, which allows the object to be mapped;
- code, which allows its location within the building;
- state (original, modified, delocalized);
- archival documentation, drawings or picture associated with to object;
- dating;
- image;
- notes.

Ponti invested much of his aesthetic principles in the design of the doors, as in the case of the arched entrance doors and, among all, in the doors produced by the firm Cantieri Milanesi. Again, he uses this same type of door in many other projects of the 1930s, as in the case of the house model for the *VI Triennale* in Milan, in the Marmont House in Milan, in the Hotel “Paradiso del Cevedale” near Merano, in the Italian Institute of Culture in Wien and in the Vetrocoke Building in Milan, but also at the beginning of the 1940s, as in the case of the the Palazzina Salvatelli in Rome (Figure 14) and the Columbus Clinic in Milan. Yet, the idea of alternating painted wood and glass is anticipated in a sketch of the 1920s[2], showing a solution very close to type “E” later used in the School of Mathematics. Doors are architectural elements used by Ponti to underline hierarchies among different parts of the building and among spaces, by linking a specific design solution to rooms with specific functions. Apart from the doors made special in terms of dimensions or specific position- such as the elegant main entrance doors, the huge doors opening onto the professors’ offices and onto the library (drs_g), and the series of metal and glass doors that rhythmed the annular

Figure 14 - A door in the Palazzina Salvatelli in Rome (1939-1940), replicating type “E” of the same model produced by the firm Cantieri Milanesi (© Salvo 2019)

corridor of the wings' ground floor, the more common doors produced by the firm Cantieri Milanesi allowed Ponti to distinguish the rooms and their functions. The contract signed by this firm in September 1935, itemizes 9 models of doors: 4 double winged and 5 simple ones. These may be divided into two main groups, with or without glass, each of which including several types, differing in dimensions and surface finishing. Generally, the structure and the frame are in fir, painted with white *cementite*, while the lower and middle bands are in spirit-polished wood (Figure 15).

Types A and B1 are not painted but finished with a thin Linoleum sheet that assured a more compact visual effect and a good maintenance over time. Types B2 and D, supplied in several different width, are the most used. At present they are painted in grey, red or in pale green, also used to paint several walls of the building, but it is not certain if these were the original colours, as the pictures of the 1930s are in black and white. Types G and H are very similar to B2 and D, even if their lower and middle bands are not polished but painted and were used for less important rooms (as closets and the rear of the blackboard doors, or doors at the basement level). Most of the models C and E (respectively double and one-winged doors) carry glass panelling, separated by listels in polished wood; in Type F, glass is only present in the upper part of the door. Such a variety of solutions allowed Ponti to characterise rooms and functions also by using similar, yet different, doors.

Model B1 is used for the doors which give access to the tiered lecture halls of the Tower, and therefore conceived for large numbers of students (434 seats), while model C is used for exterior ones, that give access to the lobbies of the Tower, and to the offices adjacent to the drawing classrooms at the first floor of the wings. Type E identified all professors' studios in the Front building and two rooms with same dimensions, located at the third floor and accessible from the library. Type F was used for the toilets, with a very different veneering, for the door of the lift at

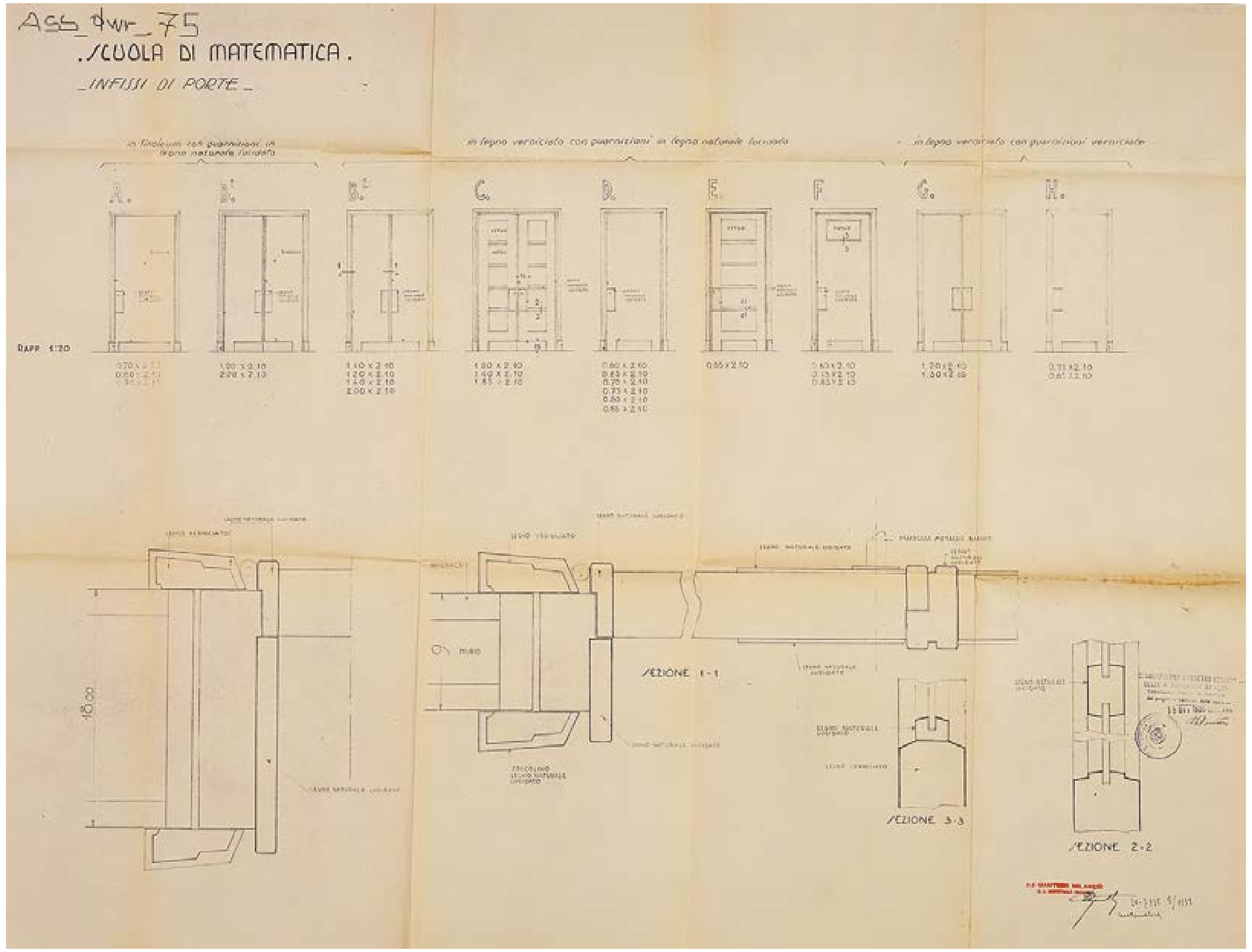


Figure 15 - The doors supplied by the firm Cantieri Milanesi; the drawing specifies models, materials and finishing processes (ASS_drw_75)

the ground floor of the Front building. Here, the door is veneered with a sheet of black rubber with thin vertical flutings; the door opposite the lift has the same finishing (Figure 16). Such an effect recalls Ponti's research around furniture, as in the case of the small closet for the Marmont House[3].

Almost all doors of the following phases use these as models. The contract describing the works necessary to adapt the first floor of the west wing to the purposes of IndAM, clearly specifies that all doors must be identical to those that were already in the building: the models chosen were B2, C, D and E. In this case, as the chronological gap is very small, the difference with the original ones of 1935-1938 is almost invisible. One cannot say the same for the two doors produced for the offices obtained from the professors' atrium in the front building in 1954. The model is still type C produced by Cantieri Milanesi, but proportions, materials and manufacture are of inferior quality. Finally, the doors produced in occurrence of further main transformation works copy the models B1, C, D and E, but replace Linoleum with laminated plastic and the handwork processes with the industrial ones. It must also be said that all the doors which open onto classrooms or public rooms have been equipped with safety handles, thereby introducing elements that compromise the original aesthetic idea.

Figure 16 - The door of the elevator at the ground level of the front building (© Bardati 2020)

V.
INTERACTION BETWEEN THE BUILDING AND USERS OVER A PERIOD OF TIME

FUNCTIONS, USES, AND STATISTICS, 1935-2021

TECHNICAL ISSUES, COMFORT, AND ENERGY EFFICIENCY

MAPPING MOVABLE HERITAGE: CHAIRS, ARMCHAIRS, DESKS, TABLES

BACK TO INDEX

©Nicolò Sardo

FUNCTIONS, USES, AND STATISTICS, 1935-2021

Simona Salvo, Marianna Cortesi

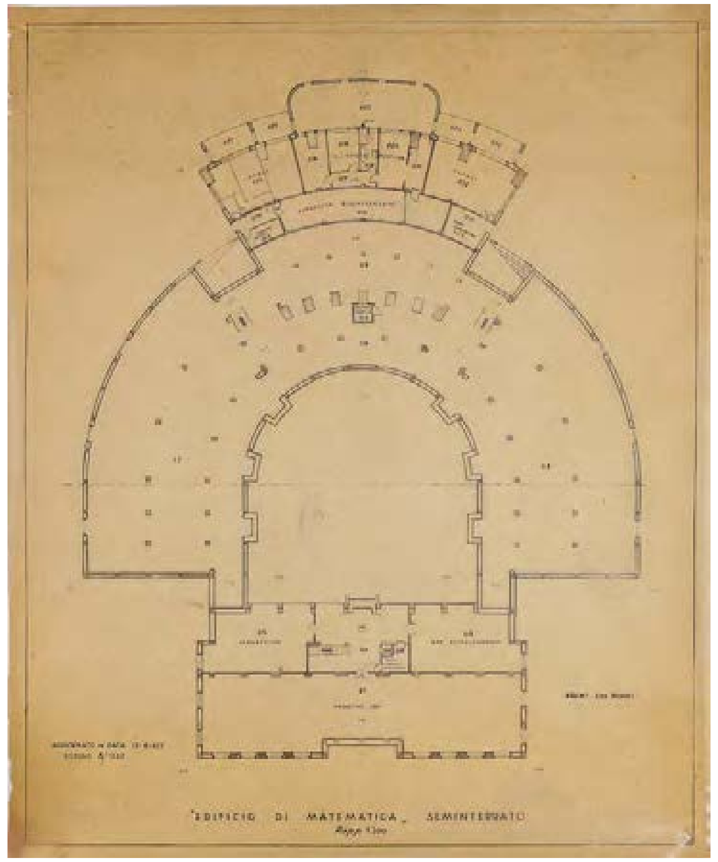


Figure 1 - Plan of the basement designed by Ponti in June 1935; details are provided regarding the house of the porter and his family, located at the foot of the classroom tower with its systems and garages (ASS_drw_69)

Gio Ponti's building has been home to Sapienza's Institute of Mathematics since 1935. This is not just a practical piece of information, but highlights the fact that the building, designed in 1935, was chosen to host one of the best scientific research institutes in Italy, both in the past and now. The names of the building and institute have changed over the years, while the many reforms that have been implemented in past decades have modified the Italian academic system, and also Sapienza University. So, although the building's function has remained unaltered throughout the decades, its use has instead radically changed.

As is well known, continued use is one of the best ways to preserve architecture: in the case of the School of Mathematics this has saved the building from major interventions, but it has also been the main source of 'stress' for its material conservation due to the continuous adjustments it has endured to accommodate the changes in academic activities and regulatory compliance. In other words, the use of a building is a watershed in architectural conservation.

Investigating the way in which the School of Mathematics has functioned and been used in its almost ninety years of life was therefore a key topic in this research, given that continuous and qualified occupation of the building- in line with the scope for which it was designed- is not only a value, but also partially guarantees its conservation. Its continuous use ensures that the site is maintained and cared for on a daily basis; it also establishes a crucial relationship between users and the building, and is the premise for its appreciation and, therefore, its assessment and conservation.

The daily presence of a caretaker, who also lives in the building, is a true asset for its continuous maintenance and care. The 'porter's house' was designed by Ponti as part of the original building in 1935 and has always been used by the porter and his family. This has ensured that the building has always been cared for throughout the years, somehow compensating for the lack of care by the governing body. This is why we have considered the presence of the porter in the building as a key element in the conservation plan.

Researching the functions and uses of the building over a period of time was implemented as follows:

- historical research in archives;
- analysis of research and teaching in the School of Mathematics from the Thirties to the present day;
- identifying the courses taught in the building;
- surveying statistical data regarding increases in the number of students, professors, and staff in the building from 1935 to the present day;
- analyzing the link between the different uses and recurring compliance with safety regulations; trying to find data regarding the use of the more notable spaces in the building, such as the library and courtyard.

We have also recovered and collected statements by those who attended courses in the building in the early Sixties and have continued working there as academics until their retirement; we also interviewed people who have lived in the building, considering it their private home, i.e., the former and current porters.

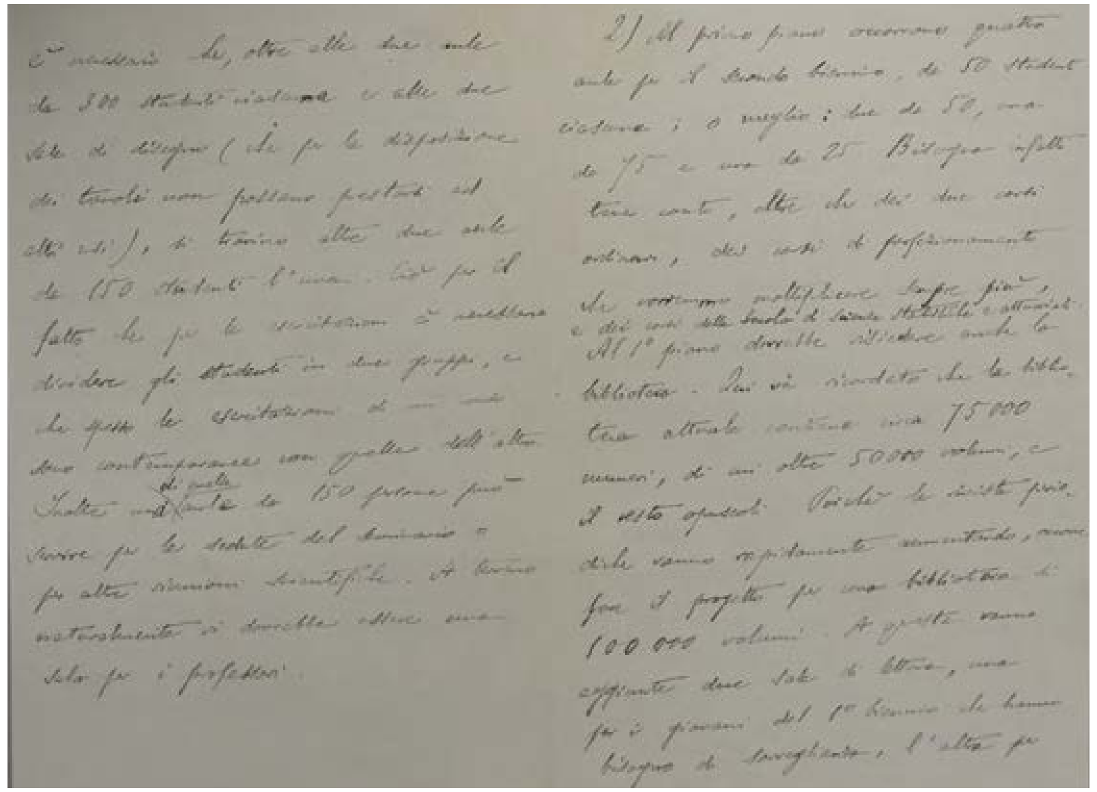
By merging this information with our analysis of the interiors and furniture we have been able to make our historical reconstruction more accurate, as well as detect weak and strong points.

A HISTORY OF HOW THE BUILDING HAS BEEN USED

The history of the building, and its archival documentation, shows that one idea was paramount for Marcello Piacentini when he designed the general plan of the University campus and assigned the projects for each building to select architects: it was to ensure that the buildings were functional. To achieve his goal he adopted a dual method: he encouraged each architect to communicate with the older and younger academics of the future Institute, in this case Gio Ponti and the well-known mathematicians Guido Castelnuovo and Enrico Bompiani[1]. Archival documents clearly illustrate the correspondence between the three- Ponti, Castelnuovo, and Bompiani- and the exchange of information regarding the space needed for teaching and research activities, as well specific rooms, such as the library.

It is interesting to note that as far back as 1928 there had been an attempt to commission a building for the Institute of Mathematics in the area around via Panisperna, as part of a group of buildings to be used by other scientific institutes. The functional program drafted at that time by the Civil Engineering Corps was not very different to the one developed by Ponti a few years later in 1932[2].

Apart from the list of courses to be held in the classrooms[3], other spaces were specifically requested by the two academics, i.e., the professors' rooms, big halls for crowded activities such as seminars and scientific meetings, and a library big enough to contain the numerous books collected by the Institute of Mathematics and housed in the library of the School of Engineering at San Pietro in Vincoli4. Ponti's very original library- on three floors and designed as a closed box with walls completely covered in bookshelves- was certainly a great architectural invention, inspired by Castelnuovo's request to house up to 100,000 volumes. A similar input probably came from Enrico Bompiani, but this time it had to do with the need for big, well-lit halls, where it would be possible



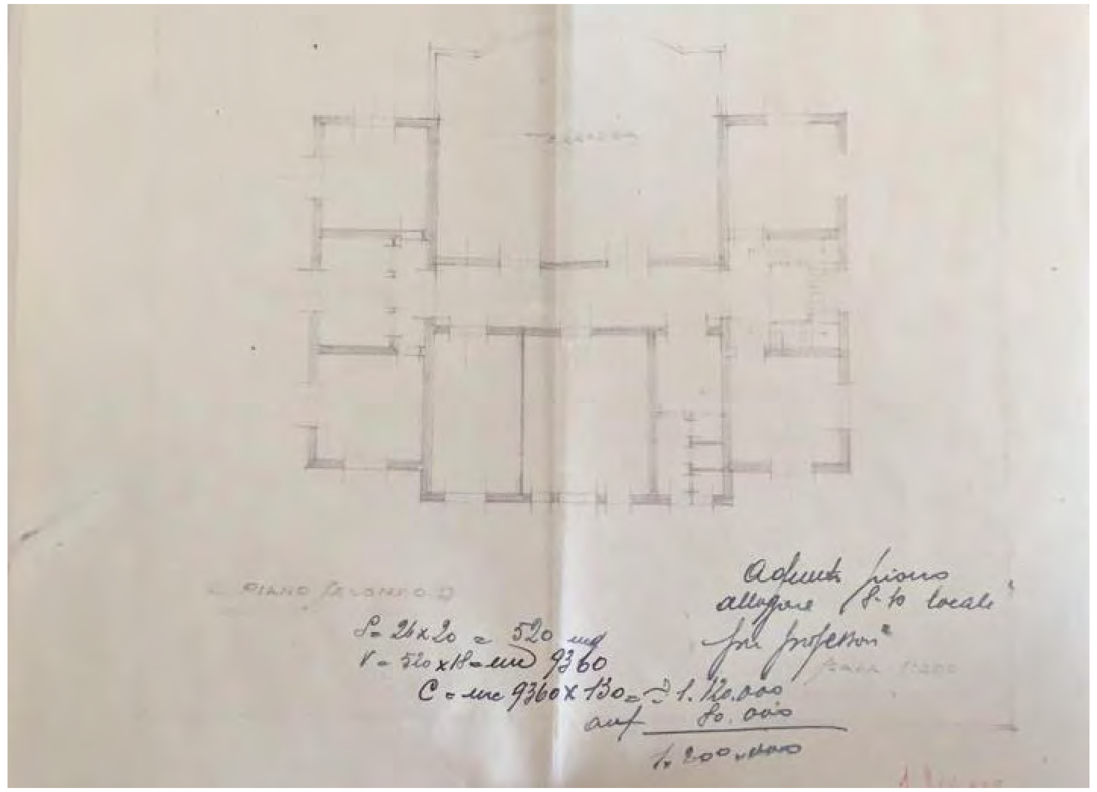


Figure 2 - Letter from Guido Castelnuovo to the Rector Francisci, March 30, 1932, explaining which spaces and rooms in the building were to used by the School of Mathematics in the new University campus, (ASS_dcm_02)

Figure 3 - Plan of the ground floor of a building to be used by the Higher School of Mathematics drafted in 1928 by engineer Tullio Nicoli on behalf of the Civil Engineering Corps Technical Office (ASR_drw_02)

to teach “Drawing and Descriptive Geometry”, and big tiered lecture halls, given the many students that would enroll in courses on “pure mathematics”.

At the time there were very few professors’ offices because there were just 23 full professors, of which only eight were ‘resident’ and therefore entitled to have private office space in the front building, to be used for research in ‘Higher Mathematics’. In fact, there are exactly eight rooms on the first floor, all with similar surface areas; they all give onto the central square of the campus5. Three less prestigious offices on the same floor overlooked the courtyard and were probably earmarked for younger, recently-hired professors who did indeed arrive over a period of time6. The ‘professors’ lounge’, at the junction between the landing of the staircase and the very silent corridor of the offices, was directly connected to the reading room in the library.

After the inauguration of the building and University campus on October 31, 1935, it took several more months to complete the curved wings and the classroom tower, as well as finalize the finishings and furnishing of the School. Although the first academic year on campus was inaugurated in 1935, it is likely that the School of Mathematics was only up to full speed the following year. A picture of Libyan leaders visiting the building in May 1936 is proof that construction was indeed complete[7].

A little less than three years later, a rather substantial part of the building- the second floor of the curved west wing- was assigned to the National Institute for Higher Mathematics (IndAM). This assignment was requested by Francesco Severi, one of the most famous mathematicians of his age, very close to Mussolini, and so influential he could allocate this distinguished venue within the School’s premises to the newly-established institute. In many ways this initial alteration to Ponti’s project undoubtedly subverted the functionality, harmony, and balance of the building. Despite this turn of events, this very first addition should be considered ‘historical’, and should therefore not be removed.

The history of the country also undoubtedly influenced the way in which the building was used; remember that the campus was bombed, occupied by Nazi military forces, then by the Allies, and finally returned to its academics in the Spring of 1945. It is interesting to note that Sapienza’s yearbooks[8], drafted annually from 1934 onwards, continue to be seamlessly published9 . Yearly issues were initially interrupted during World War II and then began again, albeit purged of any reference to fascist propaganda, which was instead very frequent in the years prior to the war. Archival documents reveal that the building was damaged during this period and, most of all, its furniture was mistreated and ended up in other campus buildings.

Notwithstanding the symbolic and ideological fascist content that influenced the founding of the University campus, after the war all the buildings remained in place, including the School of Mathematics. The most obvious fascist symbols were of course removed, in some cases only scraped away, and the campus restarted its activity as early as 1946. This must be emphasized in order to also underline the importance of the continuous functional use of these buildings over a period of time, especially during the darkest post-war years when the ‘uncomfortable memory’ aroused by this and other buildings was much less important than their strategic function. This also highlights the fact that use is the watershed that exists between the building’s importance, but also its worst deterioration.

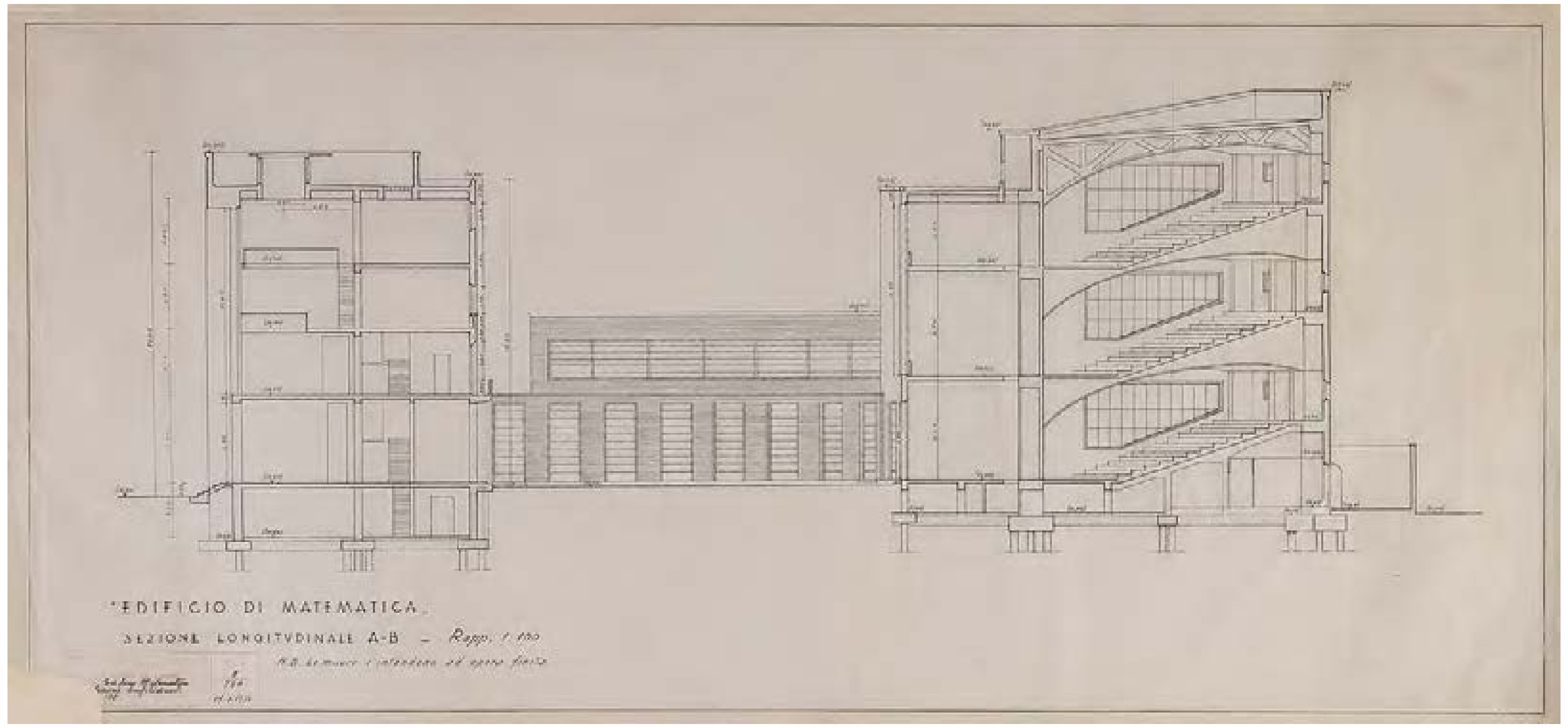


Figure 4 - Longitudinal section of the front building, drafted by Ponti in January 1934; it is easy to see that he envisaged a direct link between the corridor, the professors’ lounge and the library (ASS_drw_33)

The ten post-war years- from 1946 to 1955- were dedicated to repairing the damages caused by the war and reactivating research and teaching: it wasn't long before the number of students and teachers began to steadily increase. This was true for nearly all study courses at Sapienza and in other Italian universities, but the increase was even greater for courses in Natural and Life Sciences, and especially in Mathematics and in Physics in Rome and in other major academies (Salvo 2019). The graph showing the number of students enrolled in the faculty is unequivocal.

The next two decades- from 1956 to 1975- saw numbers increase exponentially not only thanks to the social and economic boom initially enjoyed by Italy, but also to easier access to university courses by all high school students pursuant to the reform of the education system after the students' movements in 1968. This trend remained stable for years, despite the suppression and merging of many courses, first and foremost when the first two-year courses in Engineering were transferred from the Mathematics building to the School of Engineering off campus. An initial deceleration and inversion of this trend began in the Eighties and has continued steadily until just recently.

According to the latest data- i.e., in 2020- there are 2,131 first-year students enrolled in courses on Mathematics, Physics, and Natural Sciences, plus another 4,418 students in the following years of those courses, for a total of 6,549. But these statistics do not reflect the number of students that actually use the School of Mathematics. As a matter of fact, the use of rooms on campus has become chaotic, depending on the greater or lesser flow of students in the many study courses proposed by the Faculty of Sciences, i.e. Mathematics, Physics and Natural Sciences. When courses are being organized for the academic year, the assignment of halls and classrooms depends on the space available: this means that students enrolled in other courses may easily be present in the School of Mathematics, even if they are not students of Mathematics.

In 2019, for example, the tiered lecture halls in the Tower- some of the very few that can accommodate up to 435 students (in compliance with fire escape regulations) in the Faculty of Sciences- have been assigned to first-year Biology courses which need the space due to an unexpected increase in the number of enrolled students. This complicates the reassignment of the classes and use of the building, forcing a yearly revision of where the courses can be held.

The library, instead, is a case apart. Variation in the numbers of students and professors has only indirectly influenced its functional organization because the number of employees has remained much the same: from two in the Thirties- the director and one assistant - to a maximum of five in the Nineties, and a current average of four.

Unlike the increase in the number of students, attendance in the library has not grown proportionally. The fact that 'paper' books are available is not linked to the study of Mathematics, since scientific progress is now published chiefly online or in scientific reviews rather than in traditional books. Attendance in the library is certainly steady, but this is mainly due to the fact that students are always searching for a place to study. The original reading halls in the library overlooking the courtyard have therefore been assigned to students, but have been separated from the main reading hall by plugging doors and corridors. In the past the library has also been used for more unusual events, such as theatrical performances, assemblies, and special ceremonies, including the kick-off of this research awarded by The Getty Foundation.

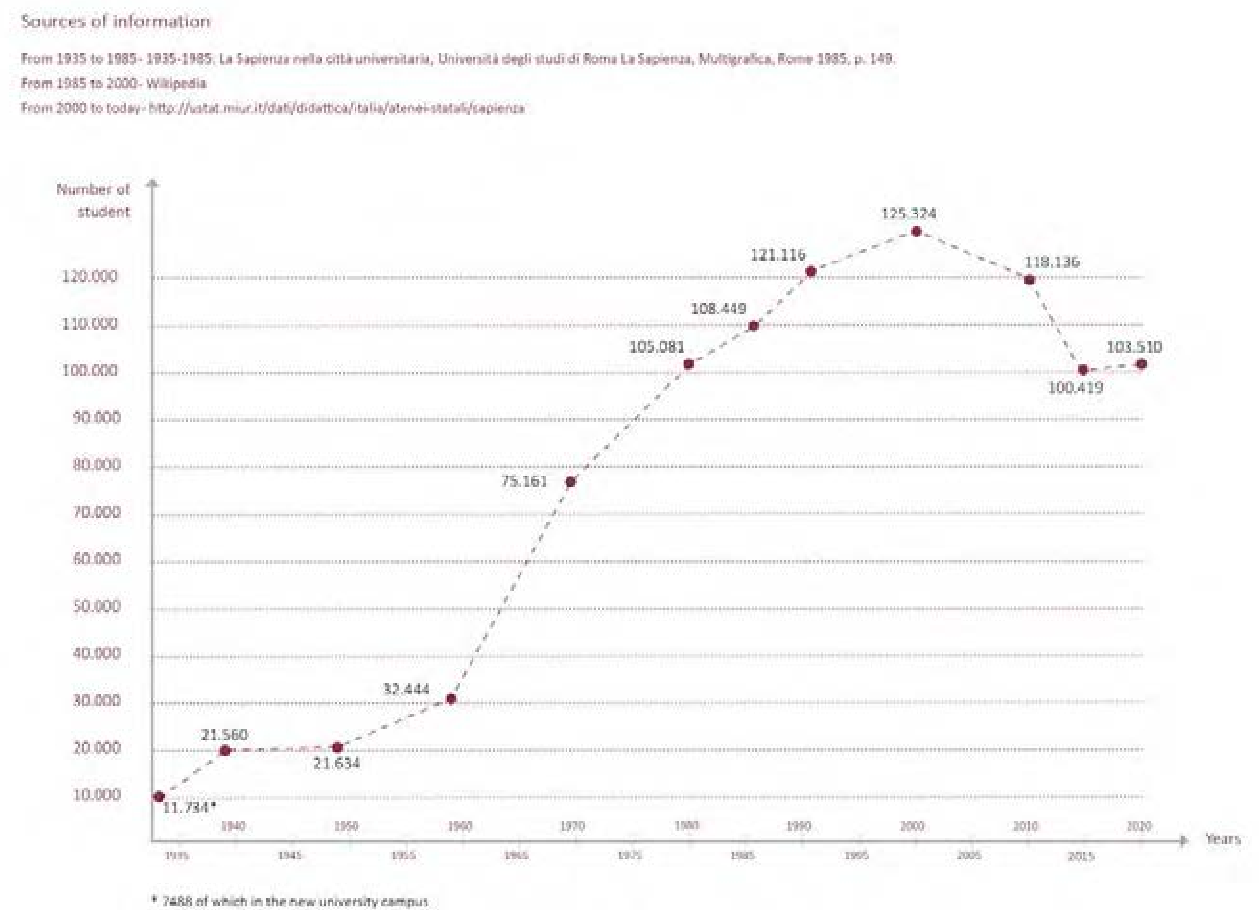


Figure 5 - Students enrolled at Sapienza University from 1935 to the present day (© Salvo 2020)

MATHEMATICAL RESEARCH, TEACHING METHODS AND PONTI'S FURNITURE

A Mathematician- either an academic, student, researcher, or professor- needs a blackboard, while a Geometry teacher needs a drawing table. This must have been very clear to Ponti as he began to design the building and its interiors, especially the furniture; and it is still true today, although technological instruments have changed the tools and their location. Ponti's specific focus on the design and details of the blackboards and drawing tables is part of his general approach to architecture considered as Gesamtkunstwerk, a rule that influences his architectural work and is embodied by the School of Mathematics- an early, true masterpiece.

Research on the building's furniture has shown that the design of the interiors and furnishings were a significant part of Ponti's commitment and a rather complicated aspect of the construction process both technically and economically. Most of Ponti's solutions regarding the furnishings are 'embedded' in the architectural design of the space, sometimes with strict reference to the systems (heating and lighting).

One good example is the study tables in the main reading room of the library incorporating the heating system and designed to be located right under the skylight since this is the only source of natural light in the room; another is the huge blackboards on the rear wall of the tiered lecture halls; the blackboard / teacher's desk / footboard / and an 'exclusive' entrance door for professors are rolled into one: a prototype of contemporary wall systems. They should all be considered 'inventions' with a special historical, artistic, and technical value, albeit mirroring an academic structure and a community of teachers and professors that has long disappeared.

The strong hierarchy between the academic staff, the separation of spaces between students and teachers, and the use of traditional slate blackboards and chalk are all aspects that have gradually been replaced by a much more integrated academic community, by informal relationships between students and professors, and by the use of technological hardware and software. This is of course true in any academic environment, but has strongly impacted the design of classrooms and halls in a very delicate and refined environment such as that of the School of Mathematics where everything was meticulously designed by Ponti, "from the spoon to the city".

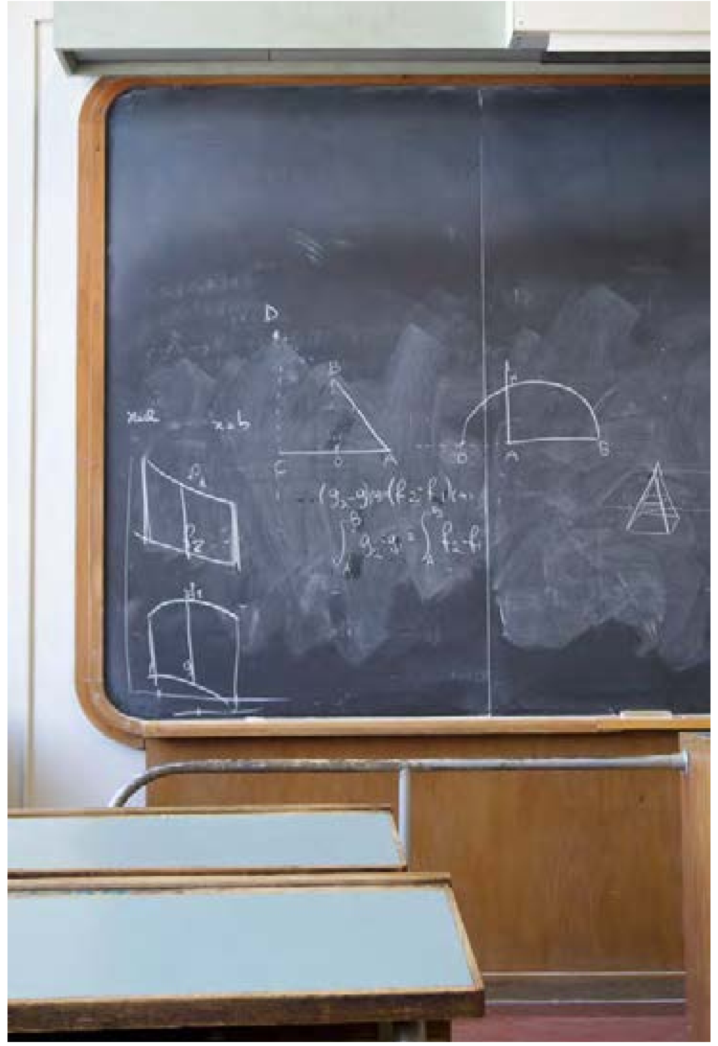


Figure 6 - One of the many blackboards designed ad hoc by Ponti for each classroom and lecture hall (© Salvo 2020)

Figure 7 - Integration of architectural features, cladding, furniture, and finishings in a corner of the main entrance hall (© Sardo 2021)

MATHEMATICS FOR MATHEMATICIANS, PHYSICISTS, ARCHITECTS, AND ENGINEERS

The School of Mathematics originally hosted not only students in mathematics in the Faculty of Sciences, which included Mathematics, Physics and Natural Sciences, but also students of the School of Architecture (Dall'Aglio, Emmer, Menghini, 2001)[14] and students enrolled in the first two years of the course in Engineering[15]. For decades it was also home to the Institute of Drawing, where drawing and descriptive geometry were taught in the drawing halls located in the curved wings, tailor-designed for drawing sessions.

In 1961 the course in Mathematics and Physics was gradually eliminated until it was no longer taught in 1969; however, this did not affect the general increase in the number of enrolled students. In 1961, the first two-year courses in Engineering also began to move from the School of Mathematics to the School of Engineering; the process was completed in 1976, but there is no precise indication as to when exactly the students of Engineering left the building.

In the Sixties the Institute of Drawing also started to downsize[16] as this discipline was slowly absorbed by the School of Architecture. Available data ends in 1963; we know that its directors were Vincenzo Fasolo (since 1934) followed by Giulio Pediconi in 1955 who continued until the Institute was closed. However, a Geometry and Drawing course for Mathematicians was still active up to 1960. Although these events did not determine a decrease in the number of students and professors, they were probably compensated by an increase in the number of students in Mathematics.

After the Institute of Drawing was no longer present in the building, and students in Mathematics grew in number, another setback occurred: the drawing halls in the curved east wing were divided up (in 1939 Francesco Severi had already turned the halls in the west wing into the Institute of Higher Mathematics). This is also reflected by a change in the names of the courses for mathematicians: “Analytical geometry and elements of projective and descriptive geometry, and drawing” was simplified to “Geometry I” and “Geometry II”, while “Rational Mechanics and Drawing” in 1960 simply became “Rational Mechanics”, reflecting the fact that the Institute was no longer present.

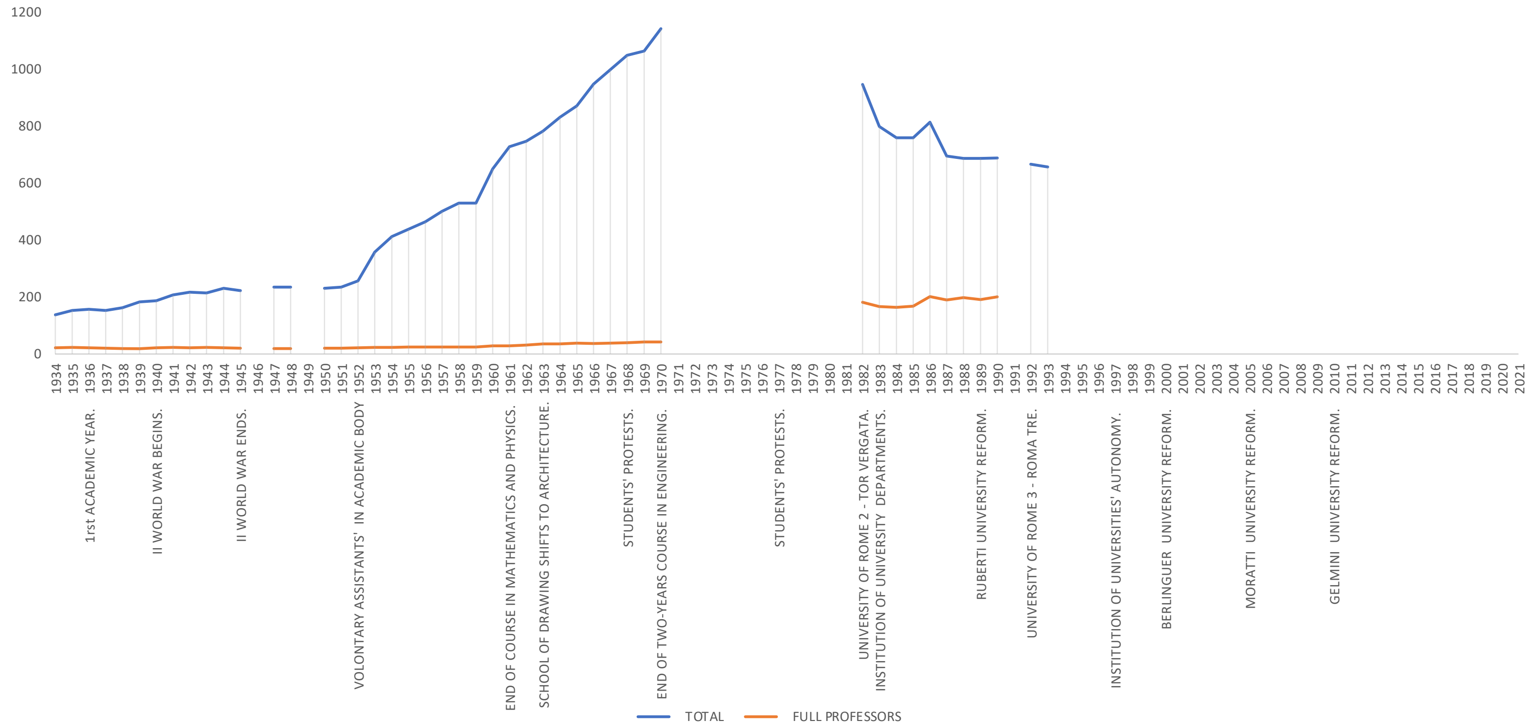
Figure 8 - Rows of curved desks in the tiered lecture hall on the second floor of the classroom Tower (© Salvo 2021)

STUDENTS, TEACHERS, STAFF, 1935-2021

The exponential increase in the numbers of students and professors has undoubtedly impacted the conservation of the building and the preservation of its original configuration. Although this is true for all the campus buildings in Rome's university, analyzing the relationship between the enrollment trends relative to the Faculty of Sciences, and the continuous search for space that characterized the period from 1965 to 1985, has been crucial in order to establish the changes made to the building, and accurately assess their authenticity and significance.

Graphs and charts provide evidence of the dramatic increase in numbers that marked the central decades of the XX century. Archival documentation and the frantic correspondence between the Directors of the Department of Mathematics, the Dean of the Faculty of Sciences, and the Rector, emphasize the lack of space for teaching and research. However, when reviewing these statistics, one should consider that the numbers refer to all the students enrolled in Natural Sciences courses- Physics, Mathematics and Natural Sciences- as well as several changes that are hard to detect and extrapolate; for example, the evolution of academic careers, changes in study courses, etc. This means that a more than accurate calculation of the number of students and professors at any given date is practically impossible, although the general trend is unequivocal.

The situation was such that two other premises were rented so courses could be held: the so called 'via Vicenza' and the Wuhrer building. This increase was implemented at a time when in 1983 the Departments were newly designed, at national level, as official and administrative academic institutions; it also mirrors the founding of Rome's second university "Tor Vergata" in 1982, and Rome's third university "Roma Tre" in 1992.



* Professors include assistant professors which appeared in the academic tenure track from 1952 onwards, and researchers, which appeared in the academic tenure track starting from 1980.

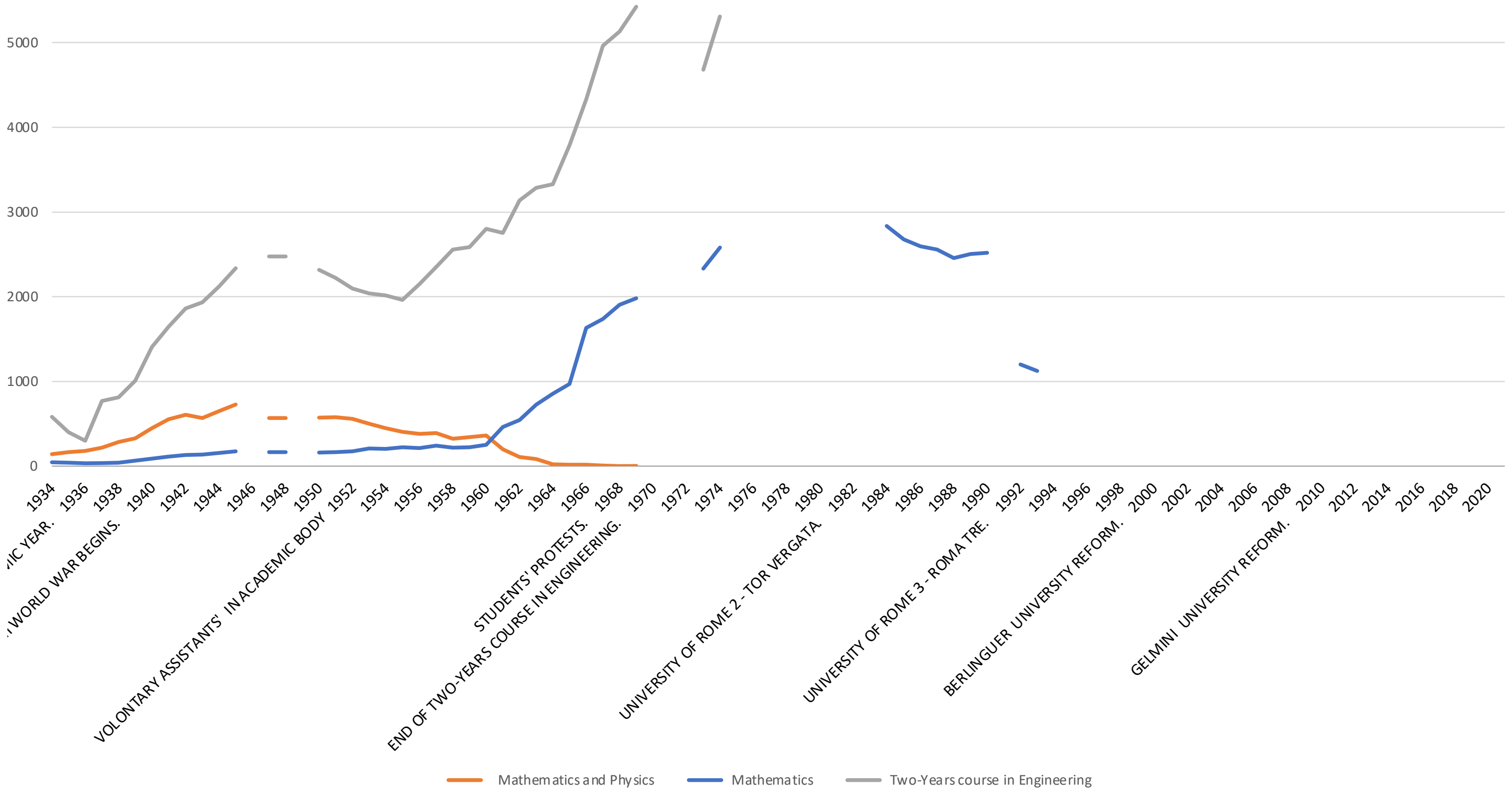


Figure 9 - Statistical study of the number of academics in the Sciences Course (© Castellan 2020)

Figure 10 - Statistical investigation on the number of students in the School of Mathematics (© Castellan 2020)

The overcrowding of the building and the changes in its functions, especially in the curved wings, inevitably affected the heating, electrical, fire safety, and communications systems. Without a general plan the upgrading, compliance, and updating of the wiring, ducts, cables, and machinery was performed piecemeal, rather than based on a strategic conservative approach. The result was an invasive presence of bundles of cables along corridors and in offices, as well as the unprepared installation of technical devices in classrooms and halls to allow the use of technological equipment especially during the pandemic (i.e. digital screens, video cameras, computers, etc.)

Yet one key consideration is that almost no demolition has occurred since 1939. This is true of most Italian buildings built during that period which are often unrecognizable due to the bundling of additions, and not due to demolition or destruction. This is to be deemed positive in terms of conservation of authenticity; it also makes it possible to reinstate the original condition by accurately and gradually removing the insignificant additions, at least ideally.

Figure 11 - Front building, first floor, bundling of cables, ducts, and wiring in the office corridor (© Sardo 2021)

MEMORIES: INTERVIEWS WITH PROFESSORS EMERITUS, ACADEMICS, SPECIALISTS, AND ORDINARY PEOPLE

One commonly shared opinion within Sapienza's academic body, especially by mathematicians and architects, is that the School of Mathematics is a true gem, and that its library is probably the most interesting interior not only on campus, but probably throughout all modern Italian university buildings. This opinion is certainly based on many individuals' sensitivity, on the presence of old photographs, and certainly on a cliché; as a result, many people appreciate the building, but without having personally experienced the architectural space.

For this reason, and to revive the personal memories of those who have used the building in the past, as well as provide scientific evidence of the trend of growing appreciation for the building, we conducted a series of interviews that have proved enlightening for several reasons. We have collected memories, experiences, opinions, knowledge, and information from different sources, starting with those who are more acquainted with Gio Ponti: Fulvio Irace; experts in the field of Architectural Modernism in Italy, such as Giorgio Ciucci and Alessandra Muntoni; experts in contemporary Italian arts, such as Antonella Greco; those who met him and shared his everyday life, such as his nephews Salvatore Licitra and Alberto Rosselli; those responsible for the Department of Mathematics, the former director Vincenzo Nesi and the current director Isabeau Birindelli; and those who live and deal with the building every day: the porter Paolo Mariani and the caretaker Beniamino Iezzi. Specific insight into the microcosm of the library was possible thanks to the memories and input by the former and current directors, Maria Rosaria Del Ciello and Lucilla Vespucci.

A very interesting view of the cultural context that inspired Ponti's project for the School of Mathematics is provided by Enrico Rogora's studies and Michele Emmer's research on the relationship between art and mathematics, both focusing on this building. Afterwards we interviewed people who were key figures in the past history of the building and who could tell us stories that have never been recorded, neither in archives, nor in old photographs. They include: famous alumni of the Department of Mathematics- Claudio Procesi, Lamberti, Silvana Abeasis, Lamberto Lamberti – and Bruno Bozzetti, a former employee of Sapienza's Technical Office.

The idea to broaden the scope of our study from the building to the University campus was supported by Carla Onesti, director of the Sapienza Historical Archive; it was also prompted by a desire to achieve specific insight into the geology of the site. This was crucially important in order to assess major structural and seismic risks for the building, data provided by geologist Lamberto Lambiase.

Given the culture of restoration that reigns in Italy and the role of conservation management planning, we had a very rewarding discussion with Pietro Petraroia about conservation issues, with a special focus on the restoration of Ponti's major works.

Figure 12 - Chairs in the library (© Salvo 2020)

MAPPING A MOVING HERITAGE: CHAIRS, ARMCHAIRS, DESKS, TABLES

Flaminia Bardati, Chiara Turco

The story of the building and the individual stories of many pieces show that furniture and doors of such an interesting and important building as the School of Mathematics should be considered historical heritage to be preserved.

One of the furniture's prominent characteristics is that is a "moving" heritage. Of course, doors move less easily than furnishings, but during the main transformations they are subject to replacement, alterations, delocalisation, or are simply turned to change the sense of the opening for functional reasons or for compliance to safety ruling. Instead, except for a few fixed elements of some of the classrooms, furnishings have been very easily moved. In fact, the Italian word for "furniture" is "*mobile*", which means something that "can be moved". Furniture of the School of Mathematics has been moved continuously, even nowadays in consequence to daily needs, such as a change in the professors' studios, a meeting in the reading room of the library etc.; but during the life of the building at least four critical happening are identified which have stimulated, encouraged or caused the relocation, and the loss of furnishing:

> 1943-1944: allied bombing of San Lorenzo (July 19 1943), which caused damage to various parts of the School of Mathematics, according to a report concerning the INDAM furniture, probably to be extended to other parts of the building, and following occupation of the building by the allied troops;
>
> 1968: student occupation of the university campus, during which desks, tables, chairs and blackboards from all the Institutes were used to erect barricades. It is most probable that much of the furnishings of the School of Mathematics shifted to other buildings on this occasion while pieces from the other buildings may have done vice versa.
>
> 1974: alteration of the curved wings, which caused the loss of almost all the furnishings of the drawing classrooms and the purchase of new furniture for the smaller classrooms obtained by their fragmentation.
>
> 1977: further student occupation of the university campus. The School of Mathematics is also occupied, and the furnishings may have been moved at least within the building, as shown in a picture of the atrium of the time with chairs and tables from other rooms, some original and other presumably of recent purchase. On this occasion, furnishings did not only leave the building, but was also moved in from other Institutes. In fact, we may not exclude that some elements currently present inside the School of Mathematics come from other Faculties, especially chairs and armchairs. But this aspect opens completely new research, extending the survey to every other building of the campus.

Such continuous moving of the furnishing pieces renders monitoring even more difficult, which means that preservation and conservation become a real hard task. The mapping offered in this document shows the current location of each piece of furniture compared to the original position, documented or hypothesized, when possible. This allows to critically consider whether the current situation respects the solution conceived by Ponti, or if the architect's idea has gone completely lost.

At the same time, mapping visualizes, and therefore helps to quantify, the loss of original pieces or, in other terms, how much historical fabric we are missing today. Last but not least, the mapping also highlights the presence of furniture pieces that remain unused - albeit in good conditions- as in the case of the items stocked in the basement or in some closets, waiting to be repaired, or removed.

As the issues concerning furnishings and doors are different, two different series of mappings have been produced.

Concerning the furniture, all the items listed in the catalogue are identified on the plans of the building, organized by levels and indicating:

> - the current location of the item, verified on site;
> - the original location of the item in 1935 (if possible).

The legend allows to identify any item, and links it to the furniture catalogue.
As for doors, all the items listed in the catalogue are identified on the plans of the building, organized by levels, indicating:

> - the current location, verified on site;
> - the original location in 1935 (if possible);
> - the doors removed between 1937 and today;
> - the doors transformed for compliance to safety standards.

The legend allows to identify any item and link it to the door catalogue.

Legend

- *Seats*
- *Table & Desks*
- *Lighting fixtures*
- *Leaning furnishings*
- *Suspended furnishings*
- *Footboards*
- *Exemple location*

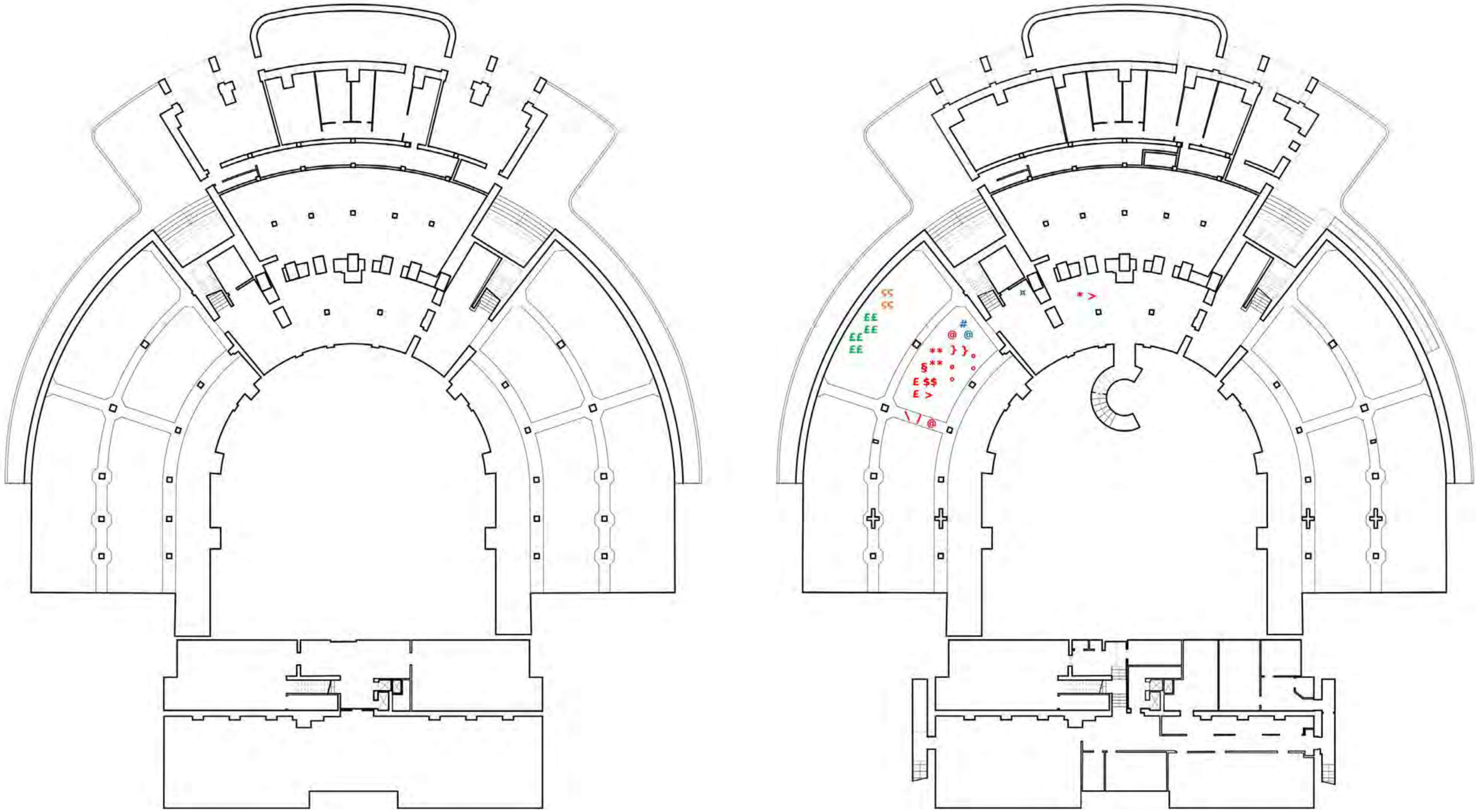


Figure 1 - Mapping of furniture in 1935 and 2021, at the basement level (© Bardati, Turco 2021)

Legend

Seats

Table & Desks

Lighting fixtures

Leaning furnishings

Suspended furnishings

Footboards

Exemple location

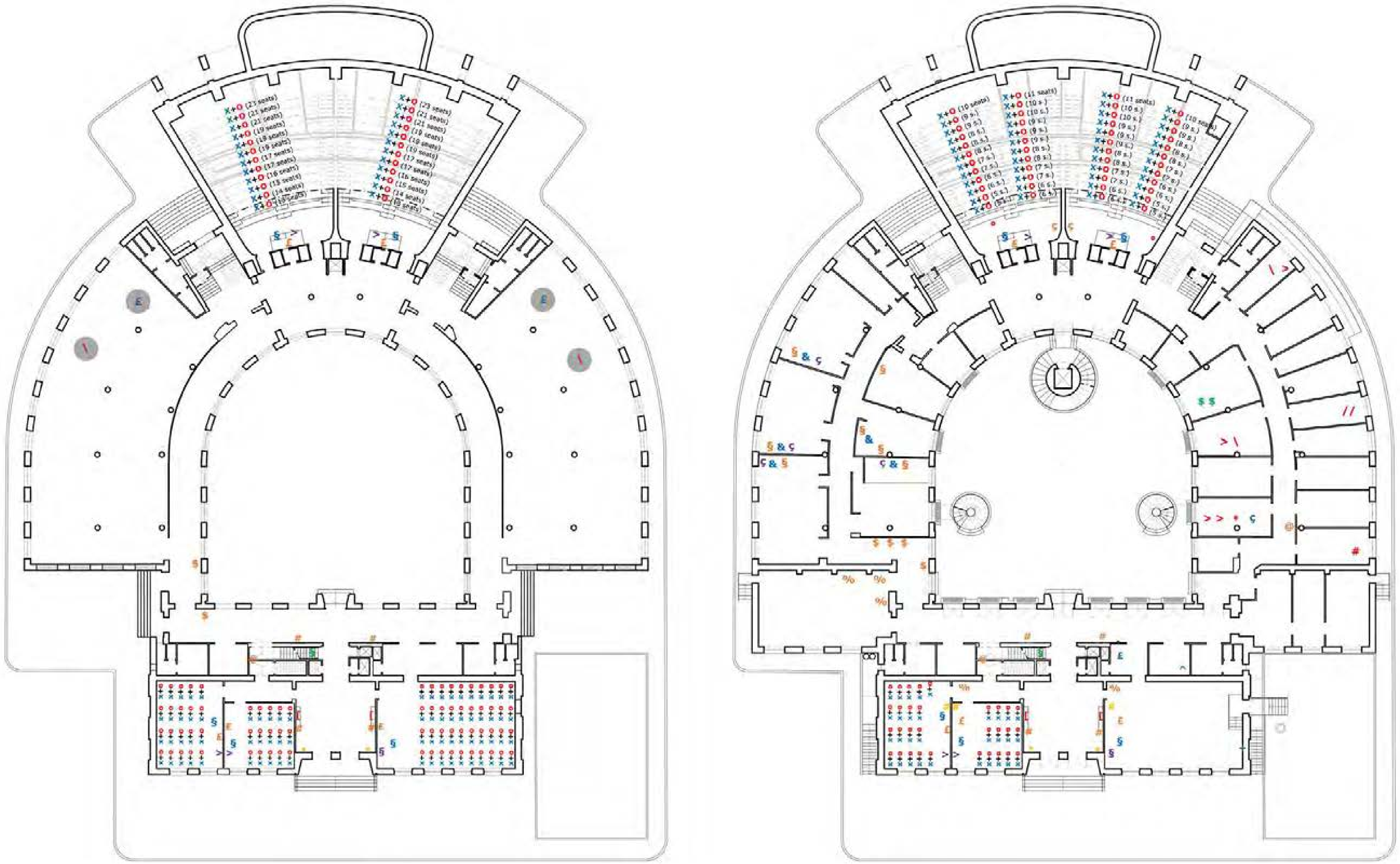


Figure 2 - Mapping of furniture in 1935 and 2021, at the ground level (© Bardati, Turco 2021)

Legend

Seats

Table & Desks

Lighting fixtures

Leaning furnishings

Suspended furnishings

Footboards

Exemple location

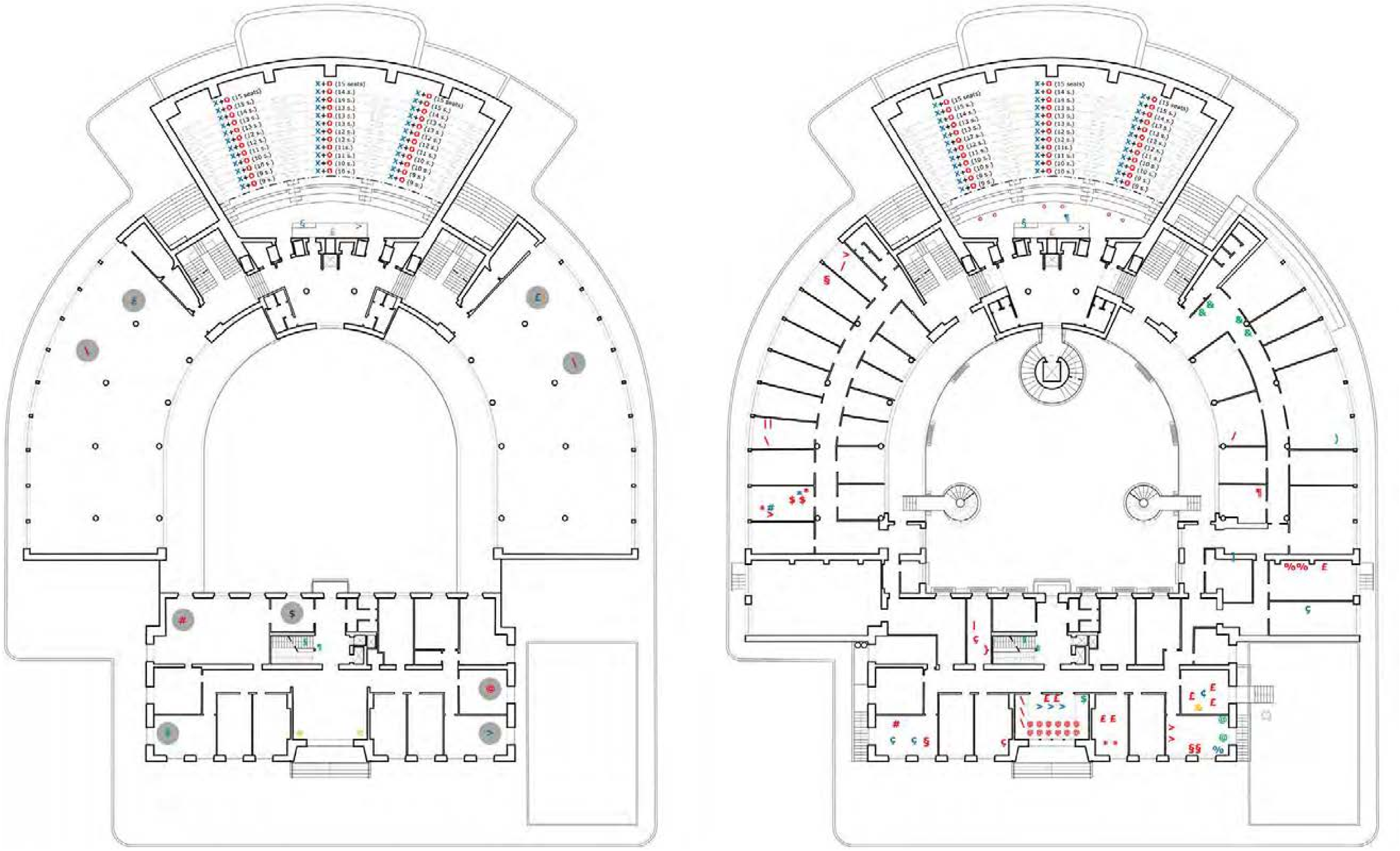


Figure 3 - Mapping of furniture in 1935 and 2021, at the first level (© Bardati, Turco 2021)

Legend

Seats

Table & Desks

Lighting fixtures

Leaning furnishings

Suspended furnishings

Footboards

Exemple location

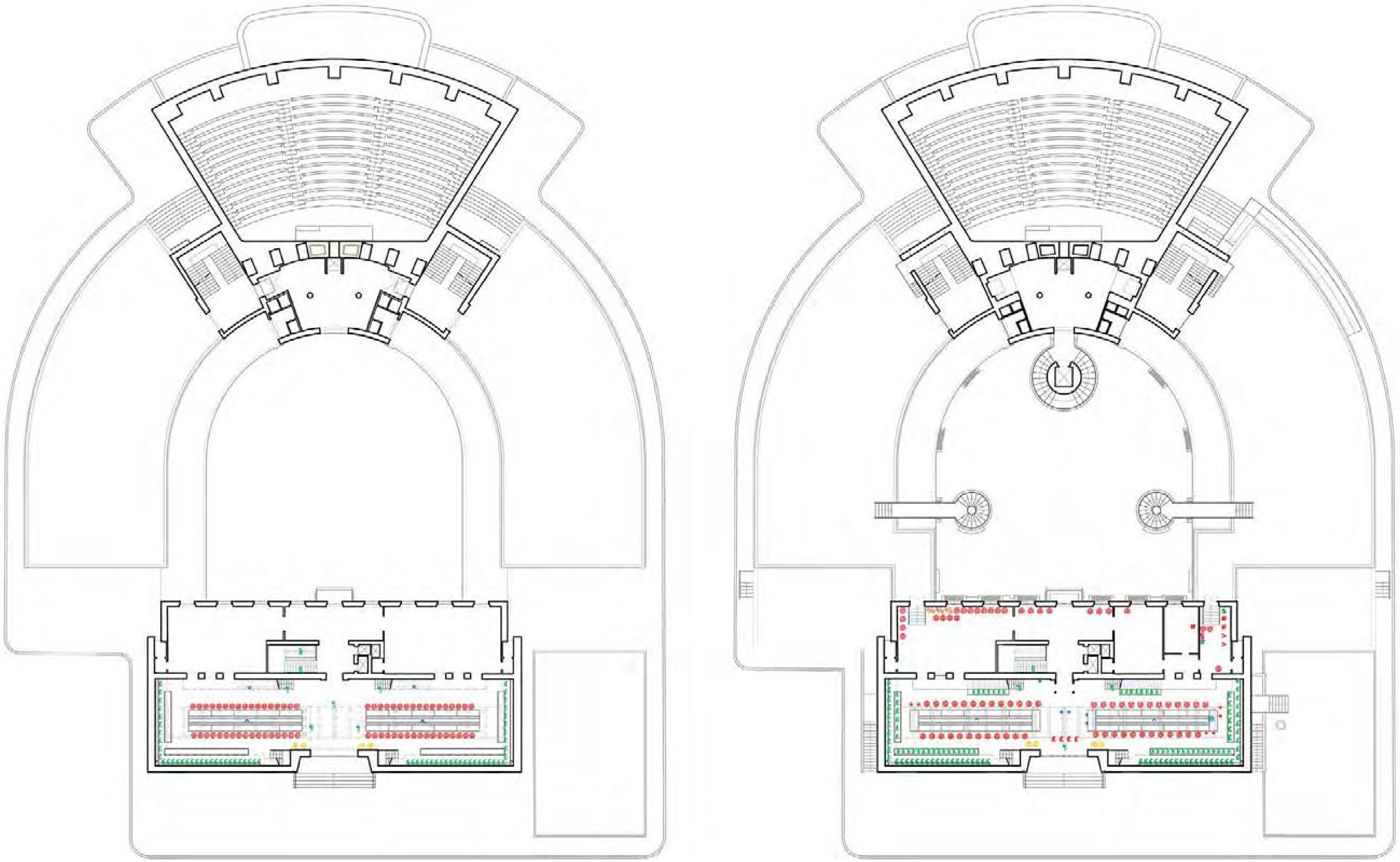


Figure 4 - Mapping of furniture in 1935 and 2021, at the second level (© Bardati, Turco 2021)

Legend

Seats

Table & Desks

Lighting fixtures

Leaning furnishings

Suspended furnishings

Footboards

Exemple location

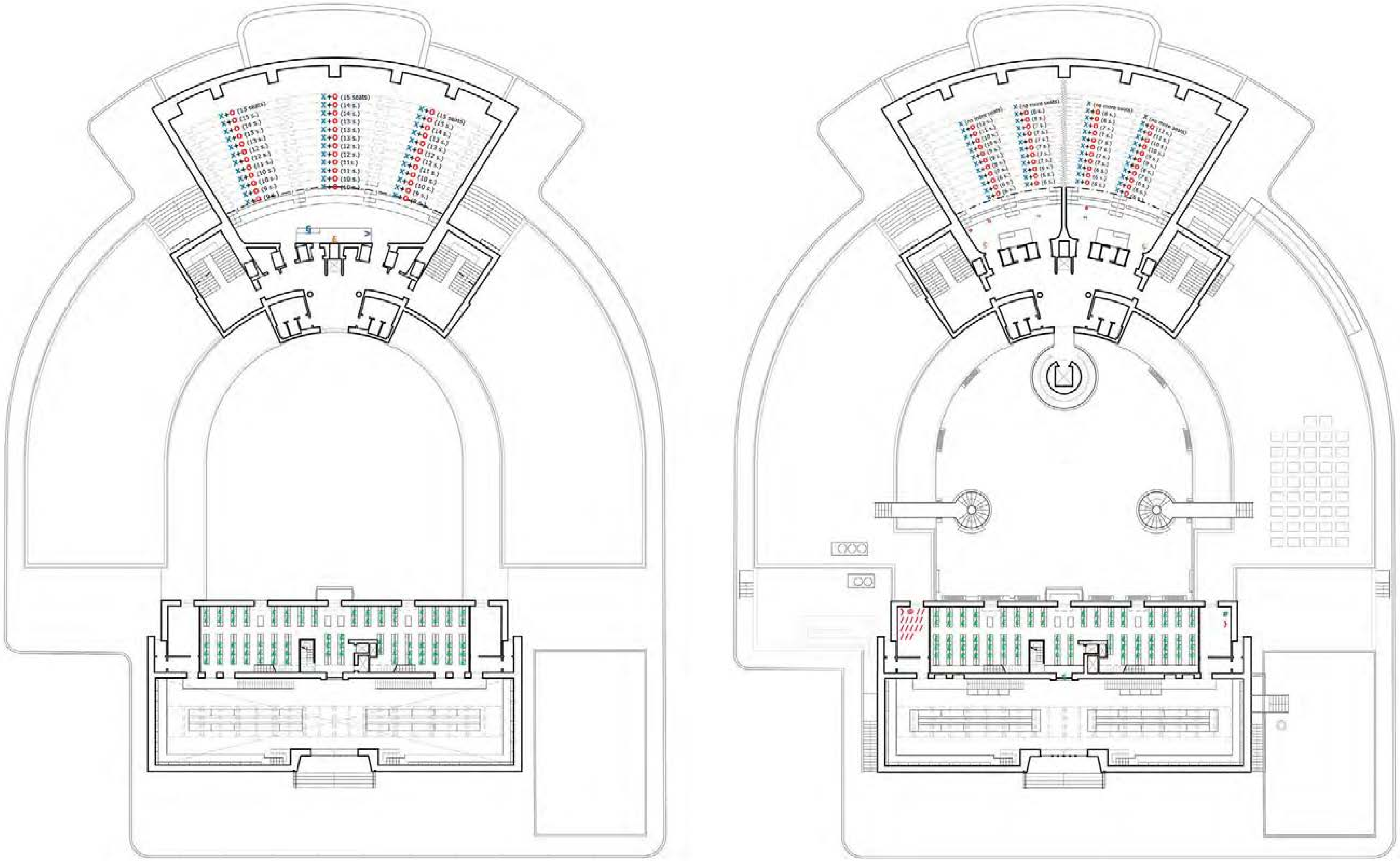


Figure 5 - Mapping of furniture in 1935 and 2021, at the third level (© Bardati, Turco 2021)

Legend

Seats

Table & Desks

Lighting fixtures

Leaning furnishings

Suspended furnishings

Footboards

Exemple location

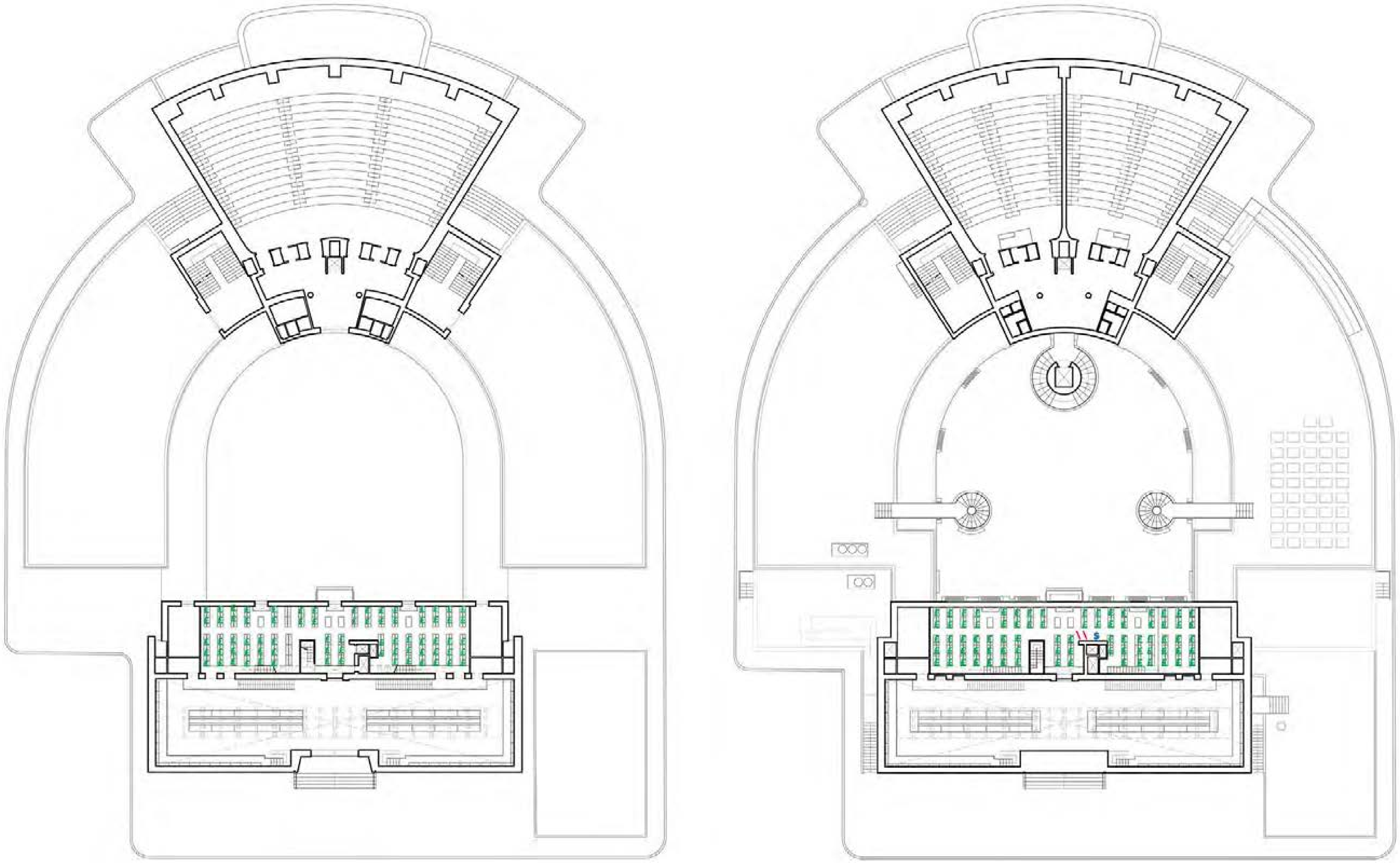


Figure 6 - Mapping of furniture in 1935 and 2021, at the fourth level (© Bardati, Turco 2021)

Legend

- *1935-1937*
- *1939-1940*
- *1954*
- *1969-1980*
- *after 1980*
- *hypothesis*
- *moved*
- *safety equipped*

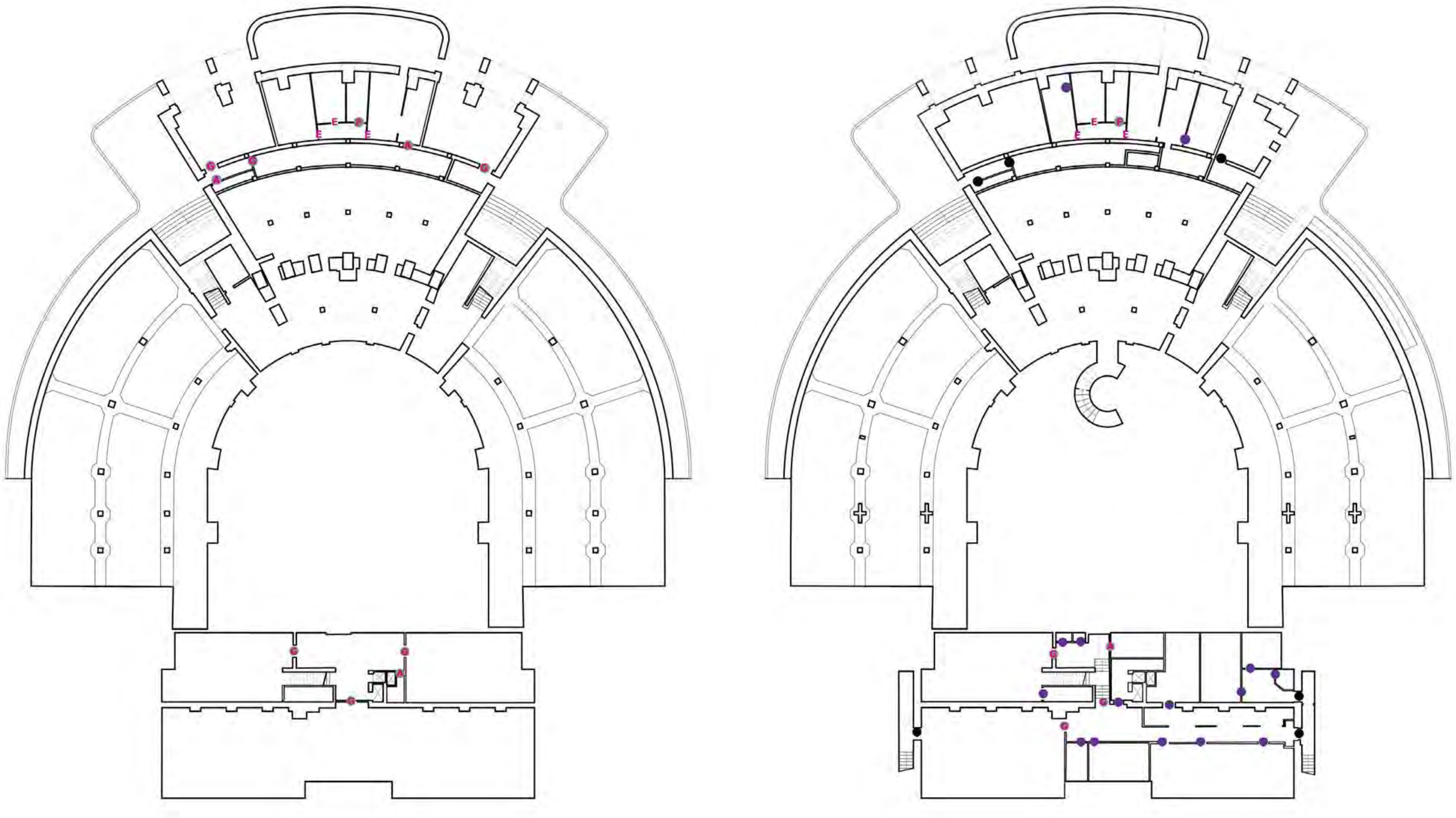


Figure 7 - Mapping of doors in 1935 and 2021, at the basement level (© Bardati, Turco 2021)

Legend

- 1935-1937
- 1939-1940
- 1954
- 1969-1980
- after 1980
- hypothesis
- moved
- safety equipped

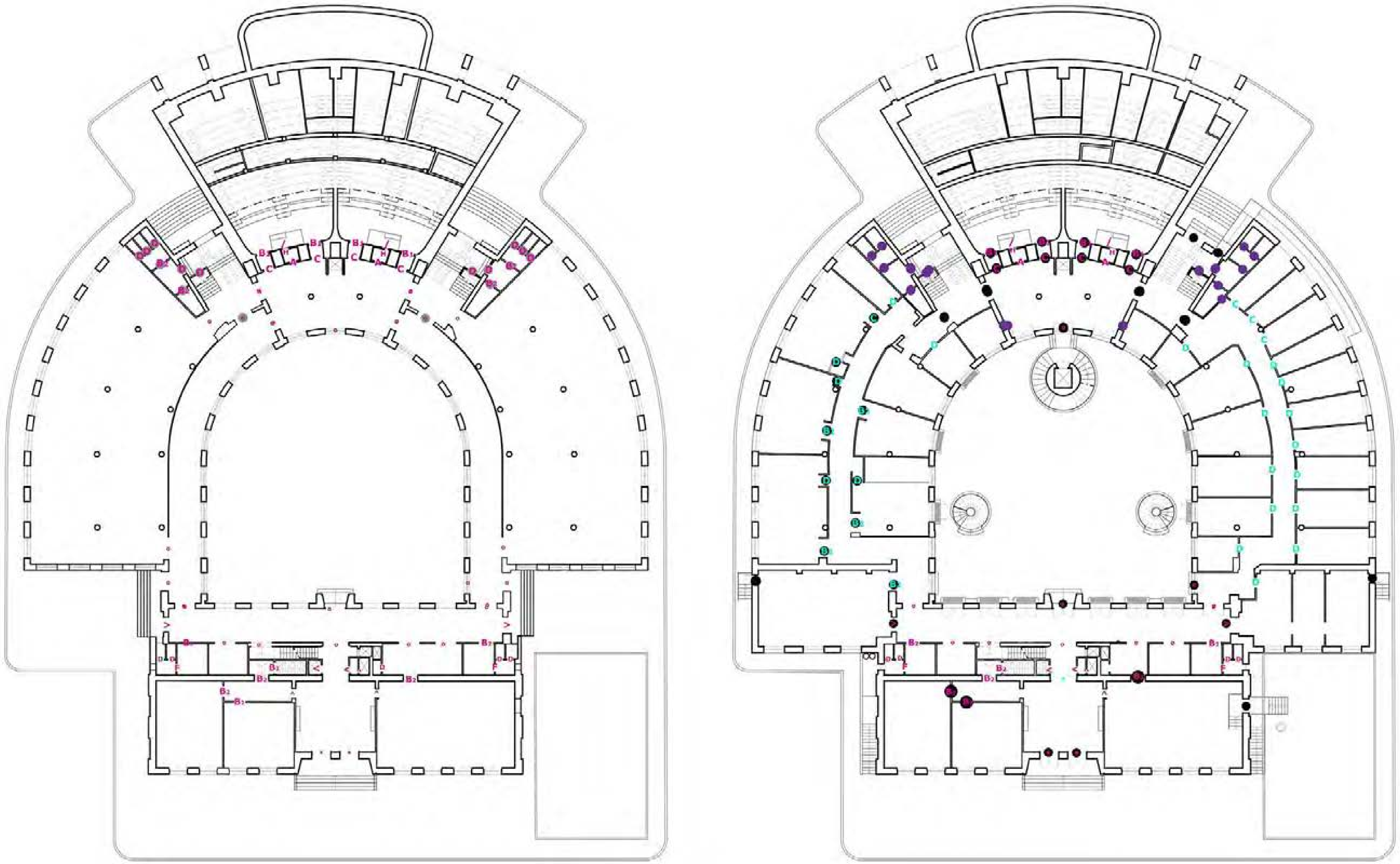


Figure 8 - Mapping of doors in 1935 and 2021, at the ground level (© Bardati, Turco 2021)

Legend

1935-1937

1939-1940

1954

1969-1980

after 1980

hypothesis

moved

safety equipped

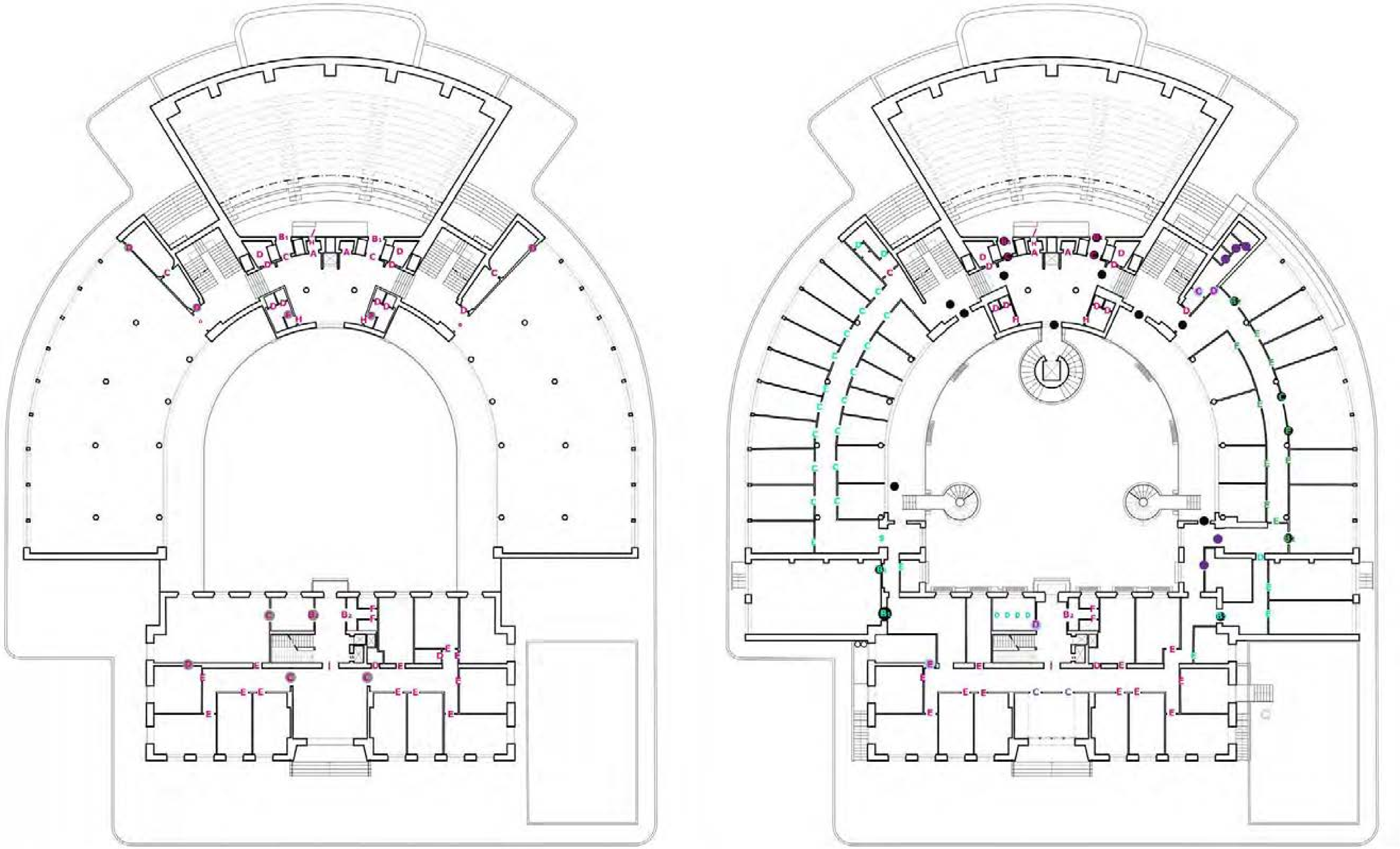


Figure 9 - Mapping of doors in 1935 and 2021, at the first level (© Bardati, Turco 2021)

Legend

- *1935-1937*
- *1939-1940*
- *1954*
- *1969-1980*
- *after 1980*
- *hypothesis*
- *moved*
- *safety equipped*

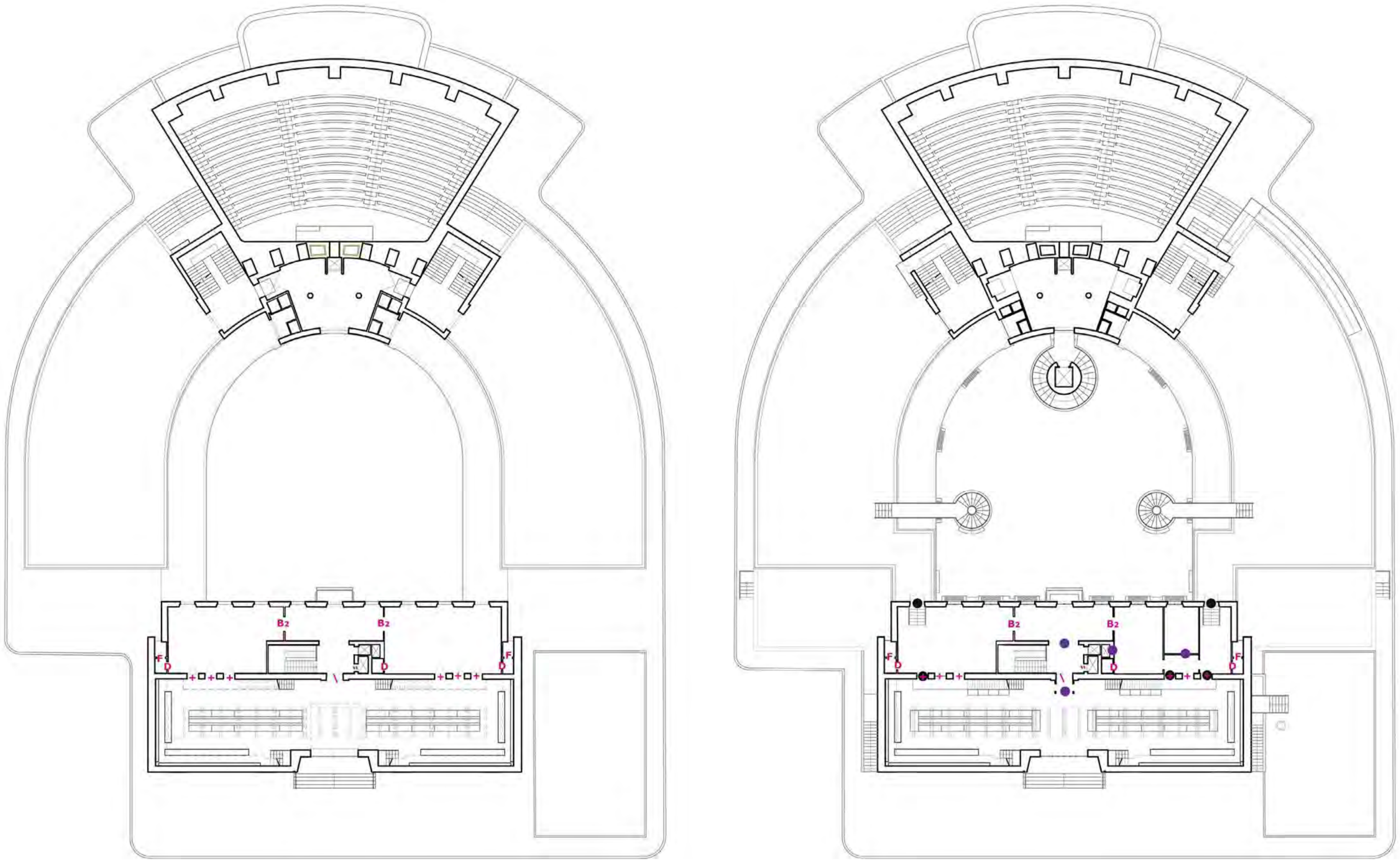


Figure 10 - Mapping of doors in 1935 and 2021, at the second level (© Bardati, Turco 2021)

Legend

1935-1937

1939-1940

1954

1969-1980

after 1980

hypothesis

moved

safety equipped

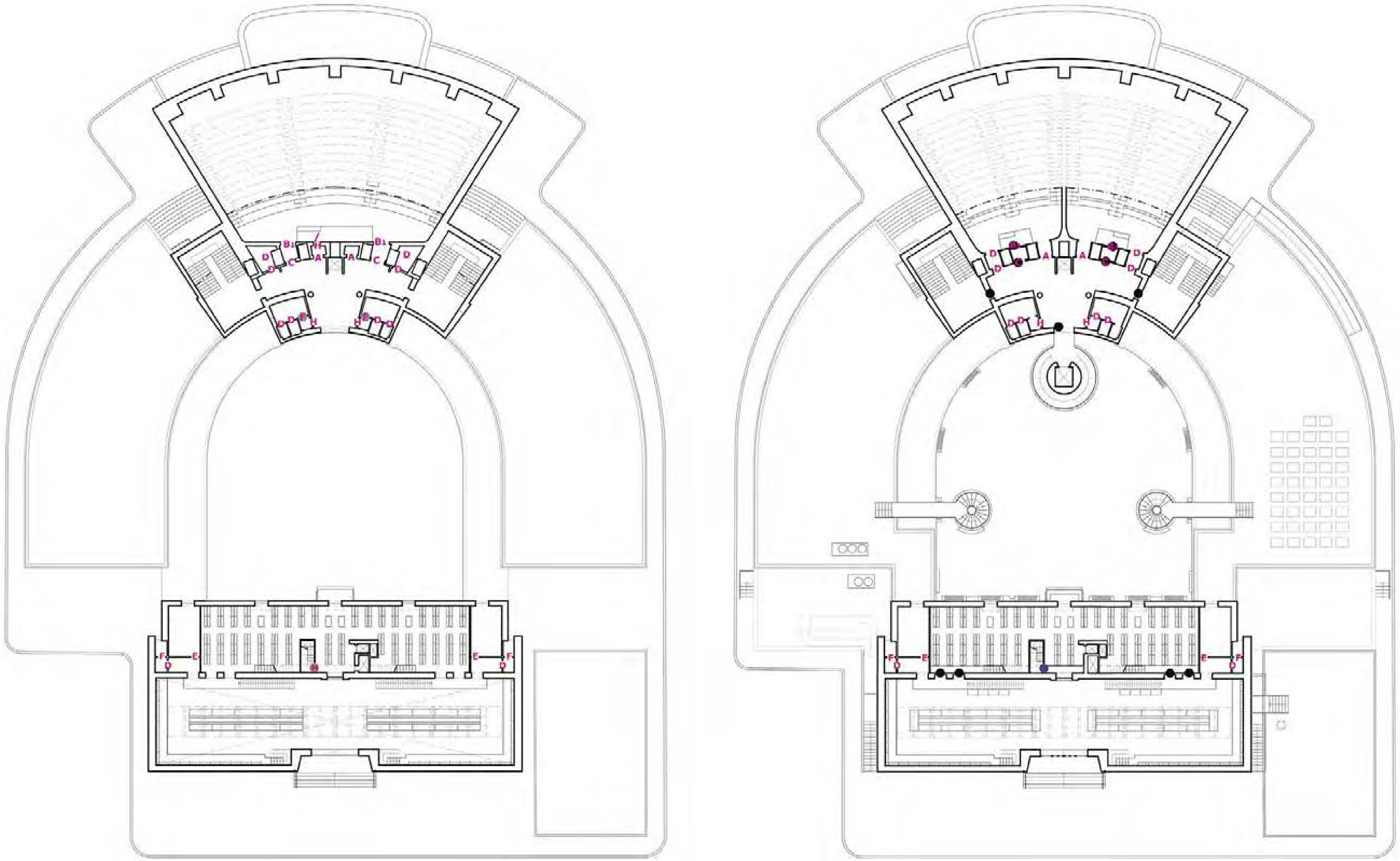


Figure 11 - Mapping of doors in 1935 and 2021, at the third level (© Bardati, Turco 2021)

VI.
FUTURE PERSPECTIVES

CONSERVATION, APPRECIATION, ENHANCEMENT, USE

TIMETABLE OF INTERVENTIONS AND MAINTENANCE

LOVE YOUR CHAIR AND IT WILL LAST FOREVER!

BACK TO INDEX

LOVE YOUR CHAIR AND IT WILL LAST FOREVER!

Flaminia Bardati

The furnishings and doors of the School of Mathematics represent a heritage of great historical and artistic interest, which deserves to be preserved and enhanced. The abacus and the inventory mapped on each plan of the building constitute a first tool to monitor the consistency of this heritage and gain the attention of the public, with the aim of urging Sapienza to provide each item with an inventory number and plan the restoration of some of the pieces.

As in the case of the building, some furnishings- at least those dating back to the 1930s- should be officially protected, so to monitor and orient any intervention planned on these objects, perhaps also with the supervision of a special committee including experts in the field of furniture conservation and the Governance of the School of Mathematics. This would oversee the planning interventions and initiatives, providing precise instructions about materials, colours and work processes to be delivered to upholsterers and carpenters in charge of repairs and restoration works. In addition, technological upgrading of the classrooms - which has been and will be necessary in future – will be correctly approached, especially in view of applying microphones, digital devices and wiring to fixed furnishings, in order to reduce the visual impact and the material damage produced by cables and technical boxes, notwithstanding the major costs that this implies.

Still, this heritage risks every day to be further modified and damaged due to lack of consciousness of its value. Therefore, one of the main objectives consists in reviving the daily users' awareness of the historical

Figure 1 - A chair 'Model 14' by Parma and a stool by Beltrami, abandoned in the basement albeit in perfect conditions (© Bardati 2021)

and artistic importance of these ‘old’, ‘uncomfortable’, ‘odd’ furnishings.

Almost all professors, scholars, students and staff that work (or ‘live’) in the School of Mathematics know that a famous architect named Gio Ponti designed the building, but few of them know that he also designed the furniture and the doors, and even fewer are able to discern original items from copies or others; probably none are aware of the fact that they are personally responsible for the conservation of such a heritage.
To raise the daily users’ awareness of the importance and uniqueness of the “chair left in the darkest corner of their offices”, usually covered by piles of paper and books, it is essential to trigger off a virtuous process of appreciation, conservation, enhancement, and correct use.

A brochure with short descriptions of each item, describing their history and indication their correct use, would definitely help to render the academic community a “heritage community” (As in the Faro Convention of 2005), and encourage their personal involvement in maintaining the furniture properly.
Such scope could be also reached by enhancing some specific sets of original furnishings, which appear most interesting: panels with short descriptions of the room and its furniture in the original display and condition, completed with historical pictures, could be placed in the atrium and in the classrooms of the front building, in the main hall of the library and in the classrooms of the rear Tower, in order to offer a general historical overview of the rooms and the basic information concerning seats and desks of current use.

When possible, and with slight effort, the objects that pertain to a specific room could be put back in their original location, as in the case of the Parma chairs that could be gathered in the main hall of the library, while other chairs today in the room could be moved elsewhere. The reading room of the library- which today is stacked with non-original furniture of all kinds - could take great advantage from a similar ‘clean up’.

Figure 2 - A teacher’s desk supplied by the firm Santi and a students’ desks ‘Model Milano’ supplied by Beltrami (© Bardati).

Furniture of the Tower of classrooms also deserves much attention and care, as it participates to the general concept that structures one of Ponti's most interesting parts of the project. The rows of curved desks for the students, with integrated seats, represent a characteristic ensemble of the original design of the fan-shaped tiered lecture halls. They are similar to other desks supplied by the firm Liporesi for other buildings of the campus, but their curved shape renders them unique, such that the drawing of every row with its own dimensions and number of seats had to be provided for production. These have been heavily damaged in two occasions: in 1960 due to the subdivision of the tiered lecture hall at the third floor, and more recently due to regulatory compliance of the smaller classrooms at the ground floor where the fire escape paths have been adjusted in dimension. Furthermore, several seats of the tiered lecture halls have disappeared after breakage of small parts. The original supply provided by Liporesi consisted of 96 rows of variable lengths, for 1296 seats, but at present there are only 132 rows (72 'half-rows' and 60 normal rows) for 1086 seats: this must be preserved from further loss.

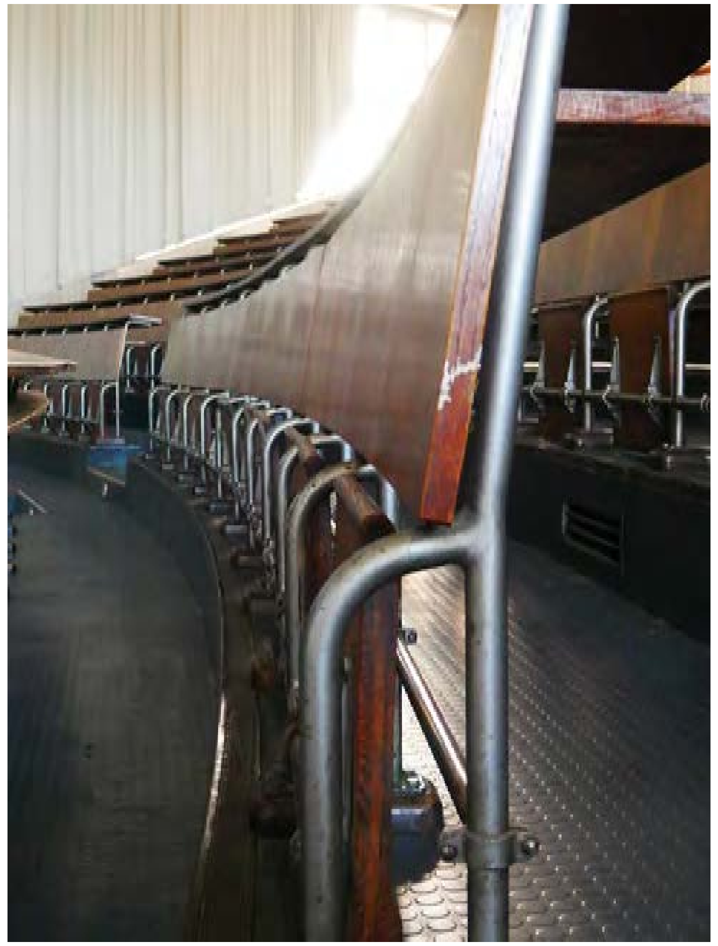


Figure 3a - A row of curved desks and seats by the firm Liporesi in the Tower of the classrooms (© Bardati 2021)

Figure 3b - One of the seats of the tiered lecture halls, dismissed for breakage of a metal part and stacked in the basement for disposal (© Salvo 2021)

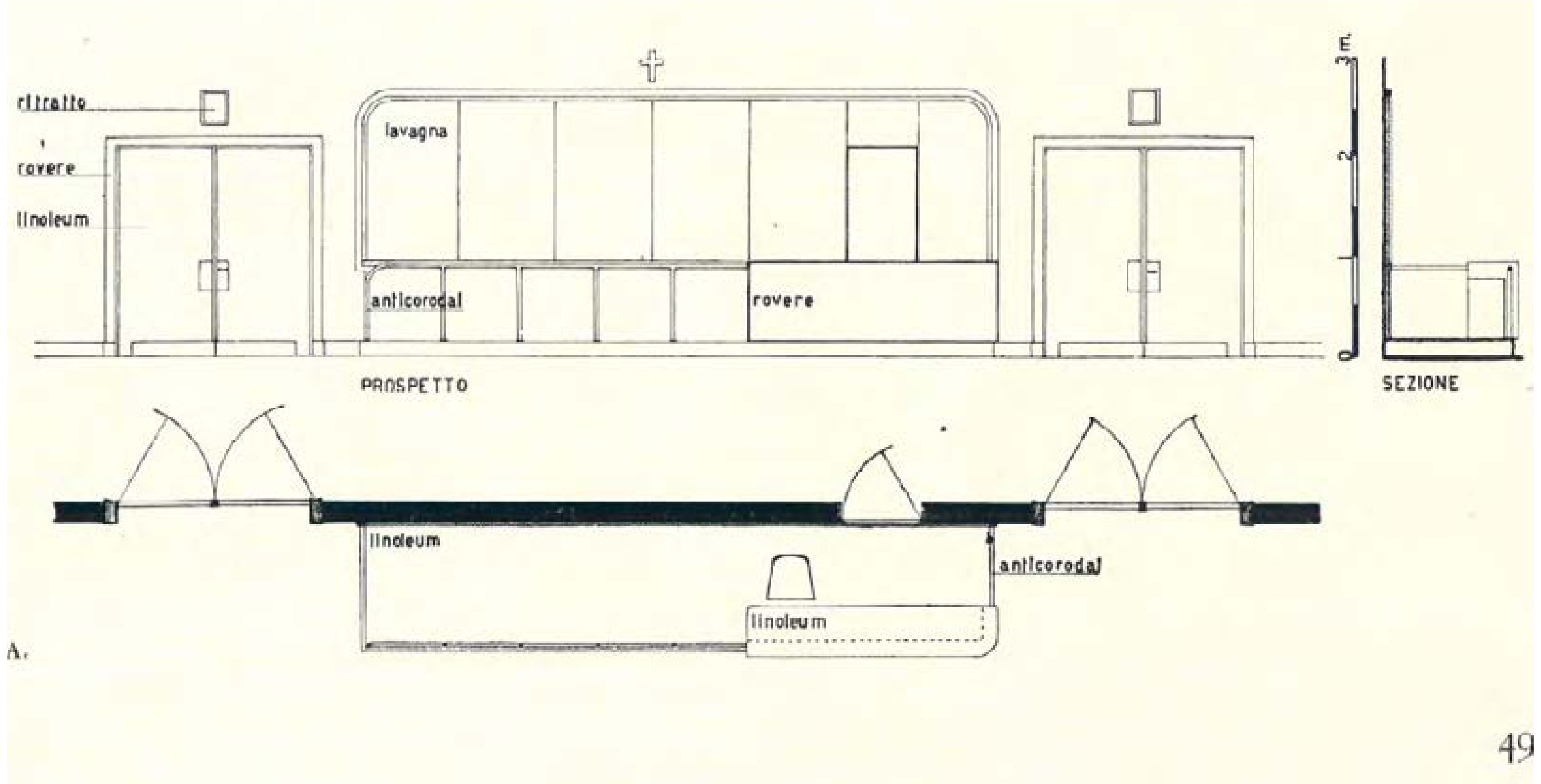


Figure 4 - The ‘wall system’ including footboard / blackboard / desk / railing and wooden wall veneering, with the door opening leading to the changing room; plan, elevation, section (BBL_drw_10)

Figure 5 - The blackboard on one of the tiered lecture halls with the door opening onto the changing room in the current condition (© Bardati 2021)

In the same classrooms the integrated ensemble composed of footboard / blackboard / desk / railing and wood veneering is also very characteristic of Ponti’s design, especially thanks to the door opening in the blackboard, that makes this “wall system” a tridimensional element that also includes the professors’ changing room, today obsolete. In 1935 this separate access to the classrooms was the expression of a precise and strong hierarchy between professors and students in their daily life at the campus, but nowadays, considering the experience imposed by the pandemic that has shown the importance of separating pathways, this distinction could turn useful. Therefore, the use of blackboard door and changing room could be easily retrieve, without the need for special safety equipment as they would be used by one person at a time. In any case, the containment of technological equipment for teaching purposes should also be observed.

Finally, the furnishings in chromed steel tube (tables, racks, armchairs), that has survived all odds but is currently dispersed in many rooms of the building, represent a lot with specific stylistic features, although they originally belonged to different rooms. Part of them has been placed in the “Aula Ponti” at the first level of the front building, while other pieces could be placed in the reading room of the library. This room still retains the original fixtures (apart from the addition of emergency exit,) and could be the right space where to recompose an interior the 1930s: such set-up would certainly arouse appreciation, respect, and care for what remains of the original furniture conceived by Gio Ponti for the School of Mathematics.

APPENDIX

BACK TO INDEX

ABBREVIATIONS

Abbreviations have been used to indicate the provenience of archival documents, which have been a cross reference to all tasks of investigation. The code related to each document therefore indicates archive, typology of document (drw = drawing / dcm = document / pht = photograph / vdo = video) and progressive number with which the document has been filed in the research repository. The list of archives investigated during the research may be found in the Appendix at the end of this report.

Ex. ASS_dcm_05 = Sapienza Historical Archive_ document_ number 05

Archive Abbreviations

ASS = Archivio Storico Sapienza Università, Sapienza University Historical Archive

ADM = Archivio del Dipartimento di Matematica "Guido Castelnuovo", Sapienza Università di Roma, Archive of the Department of Mathematics, Sapienza University

BFAR = Biblioteca della Facoltà di Architettura, Sapienza Università di Roma, Library of the School of Architecture, Sapienza University

> Carlo Severati Archival Fund: BFAR_pht_11 (p. 49); BFAR_pht_04 (p. 94); BFAR_pht_05 (pp. 94, 128)

BFAF = Biblioteca della Facoltà di Architettura, Università degli studi di Firenze, Library of the School of Architecture, University of Florence

BUB = Biblioteca Universitaria, Università degli studi di Bologna, University Library, University of Bologna

ACS = Archivio Centrale dello Stato, State Central Archive Gaetano Minnucci Archival Fund, 141, 254: ACS_pht_10 (pp. 114, 168, 276); ACS_pht_14 (pp. 167, 276); ACS_pht_18 (p. 277)

> Gaetano Minnucci Archival Fund, 142, 256: ACS_pht_08 (pp. 61, 116); ACS_pht_22 (p. 79); ACS_pht_15 (pp. 166, 276); ACS_pht_30 (p. 273)
> Gaetano Minnucci Archival Fund, 207, 205: ACS_drw_09 (p. 69)
> Ministero Pubblica Istruzione Archival Fund, 33, 27: ACS_drw_03 (pp. 85, 117)
> Allied Commission Control Archival Fund, 17, 1181C, 10404_144_16: ACS_drw_08 (p. 122)

ASR = Archivio di Stato di Roma, Rome State Archive

> Genio Civile Archival Fund, 1028, Edifici universitari: ASR_drw_01 (pp. 64, 101); ASR_drw_02 (p. 250); ASR_drw_03 (pp. 64, 101)

ASC = Archivio Storico Capitolino, Historical Capitoline Archive

CSAC = Centro Studi e Archivio della Comunicazione, Università degli Studi di Parma, Study Centre and Communication Archive, Parma University

GNAM = Galleria Nazionale d'Arte Moderna, National Gallery of Modern Art, Rome

MAXXI = Museo Nazionale delle Arti del XXI Secolo, Centro Archivi di Architettura, Architecture Archive Center, MAXXI National Museum of the XXI Century Arts

AST = Archivio Storico, Triennale di Milano, Historical Archive of the Milan Triennale

ICCD = Istituto Centrale per il Catalogo e la Documentazione, Central Institute for Catalogue and Documentation

> Aerofototeca Nazionale, Sara Archival Fund: ICCD_pht_08 (p. 63)
> Aerofototeca Nazionale, Fotocielo Archival Fund: ICCD_pht_01 (p. 85)
> Gabinetto Fotografico Nazionale: ICCD_pht_03 (p. 91); ICCD_pht_02 (pp. 92, 123)

ASL = Archivio Istituto Luce, Istituto Luce Archive, Cinecittà S.p.A., Rome

> Frame da Giornale Luce n. B0453 del 1934, "Roma. Come proseguono i lavori della "Città universitaria": ASL_pht_07 (p. 108)
> Frame da documentario del luglio-agosto 1943, "La Città universitaria bombardata": ASL_pht_21 (p. 121)

BHR = Biblioteca Hertziana, Fototeca, Istituto Max Plank per la Storia dell'Arte, Phototeque of the Bibliotheque Hertziana, Rome

> Walter Kruft Archival Fund, NEG. U.Fi D611d17: BHR_pht_02 (p. 126)
> Eberhard Schroter Archival Fund, NEG. U.Fi D611c13: BHR_pht_05 (p. 127)
> Eberhard Schroter Archival Fund, NEG. U.Fi D611b09: BHR_pht_08 (p. 127)

ANS = Accademia Nazionale delle Scienze, National Academy of Sciences

ANL = Accademia Nazionale dei Lincei, National Academy of the Lincei, Rome

ASCCR = Camera di Commercio di Rome, Archivio Storico, Historical Archive of the Chamber of Commerce, Rome

ASCCM = Camera di Commercio di Milano, Monza-Brianza e Lodi, Archivio Storico, Historical Archive of the Chamber of Commerce oh Milan, Monza Brianza and Lodi

CRDAV = Centro Ricerca e Documentazione Arti Visive, Centre for Research and Documentation of Visual Arts, Rome

GPA = Gio Ponti Archive, Gio Ponti Archive, Milan

AFG = Archivio Francesco Guidi, Francesco Guidi Private Archive
AFS = Archivio Francesco Succi, Francesco Succi Private Archive

ACP = Archivio Claudio Procesi, Claudio Procesi Private Archive

ARS = Archivio Regni Sennato, Bruno Regni and Marina Sennato Private Archive

ACG = Archivio Carla Giovannone, Carla Giovannone Private Archive

APL = Archivio Ditta Palazzo della Luce, Palazzo della Luce company Private Archive

ASMS = Archivio Simona Maria Salvo, Simona Maria Salvo Private Archive

AFB = Archivio Flaminia Bardati, Flaminia Bardati Private Archive

BBL = Immagini e disegni da fonti bibliografiche e digitali, Images and drawings from bibliographical references and digital sources

Published in Ceccherini R. V. (1933), "Dallo Studium Urbis alla Città degli Studi", in Capitolium, 598: BBL_pht_06 (pp. 35, 72, 108)
Published in Pagano G. (1933), "Registro (dell'università di Roma)", in Casabella, 39: BBL_pht_02 (pp. 68, 105)
Published in Pacini R. (1933), "Il grandioso progetto della Città Universitaria di Roma", in Emporium, 178: BBL_pht_04 (p. 70)
Published in Pacini R. (1933), "Il grandioso progetto della Città Universitaria di Roma", in Emporium, 179: BBL_pht_05 (pp. 70, 106)
Published in Pacini R. (1933), "La città universitaria di Roma", in Architettura, 491: BBL_drw_01 (pp. 71, 106)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue, 102: BBL_pht_08 (pp. 74, 163)
Published in Ponti G. (1944), "Invenzione d'una architettura composta. Dai "cuboni" alla composizione d'una architettura", in Stile, 1: BBL_drw_14 (p. 83)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue, 5: BBL_pht_14 (p. 84)
Published in Guidoni E., Regni Sennato M. (1985), 1935/1985 La "Sapienza" nella Città Universitaria, Catalogue of the exhibition (Rome, June 28- November 15, 1985), Rome, Multigrafica editrice, 115: BBL_pht_10 (pp. 110, 162)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue, 45: BBL_pht_26 (pp. 56, 114)
Published in Minnucci G. (1935-1936), "Studium Urbis", in Edilizia Moderna, 30: BBL_pht_30 (pp. 55, 114, 274)
Published in Pica A. (1936), Nuova architettura italiana, Milan. Hoepli, 125: BBL_pht_13 (p. 114)
Published in "Domus" (1936), 98, cover: BBL_pht_32 (pp. 40, 115)
Published in Roghi G. (2005), "Materiale per una Storia dell'Istituto Nazionale di Alta Matematica dal 1939 al 2003", in Bollettino U.M.I. La matematica nella Società e nella Cultura, 9: BBL_pht_38 (p. 120)
Published in https://www.corriere.it/gallery/cronache/06-2010/dichiarazione-guerra/1/10-giugno-1940-italia-guerra_7e19585e-6fc0-11df-b547-00144f02aabe.shtml: BBL_pht_39 (p. 120)
Published in Gentiloni Silveri U., Carli M. (2007), "Bombardare Roma. Gli alleati e la "città aperta" (1940-1944), Rome, Il Mulino: BBL_pht_42 (p. 121)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue: BBL_pht_23 (p. 166)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue, 83: BBL_drw_12 (p. 169)
Published in Architettura (1935), "La Città Universitaria di Roma" in Architettura, special Issue, 83: BBL_drw_11 (p. 169)
Published in Galli P., Molin D. (2012), "Beyond the damage threshold: the historic earthquakes of Rome", in Bulletin of Earthquake Engineering, 12, 3: BBL_drw_15 (p. 177)
Published in Funiciello R., Giordano G. (2008), "La Carta Geologica di Roma alla scala 1:10:000", in R. Funiciello R., Praturlon A., (eds.), La geologia di Roma: dal centro storico alla periferia. Memorie descrittive della Carta geologica d'Italia, Florence: S.E.L.C.A., 39-86: BBL_drw_16 (p. 178)
Published in http://zonesismiche.mi.ingv.it/class1984.html: BBL_drw_17 (p. 204)
Published in http://zonesismiche.mi.ingv.it/images/class2003_mid.gif: BBL_drw_18 (p. 204)
Published in http://zonesismiche.mi.ingv.it/mappa_ps_apr04/italia.html: BBL_drw_19 (p. 204)
Published in Colombo G. (1933): Manuale dell'Ingegnere, Edition 65th, Milan: Hoepli: BBL_pht_ 44 (p. 206)
Published in Colombo G. (1933): Manuale dell'Ingegnere, Edition 65th, Milan: Hoepli: BBL_pht_ 45 (p. 206)
Published in (1935): "La Città Universitaria di Roma". In: Architettura, special issue, 49: BBL_drw_10 (p. 352)

List of Research Documents - KIM2018_R-ORG-201838588

This is the list of the documents produced during the research funded by the Getty Foundation with the 2018 “Keeping It Modern” award and supported with a grant of 180.000,00 $. The research, developed between 2018 and 2021, would not have been possible without financial and cultural support form the Getty Foundation, to which we are deeply thankful.

1 I NARRATIVE REPORT

1.1 Research Narrative Report
1.2 Dissemination Initiatives
1.3 General Building Description
1.4 Photographic Documentation
1.5 Nomenclature and coding

2 I TASKS REPORT MATERIALS

2.T1 | TASK 1 | Historical Analysis. Archival and Bibliographical Research
2.T1.1 Urban Context
2.T1.2 The Conception of the School of Mathematics
2.T1.3 Gio Ponti Biography
2.T1.4 Bibliographical References
2.T1.5 Archival Documentation and Drawings
2.T1.6 Historical Photographs and Videos
2.T1.7 List of Archives
2.T1.8 Interviews

2.T1F | TASK 1F | Interiors and Furnishing
2.T1F.1 Furniture and Doors

2.T2 | TASK 2 | Survey 2D and 3D Representation
2.T2.1 Survey Report
2.T2.2 2D Representation Drawings
2.T2.3 3D Representation Drawings

2.T3 | TASK 3 | Materials, Construction Techniques and State of Conservation
2.T3.1 Materials, Construction Techniques and State of Conservation Report
2.T3.2 Analysis Sheets
2.T3.3 Boards

2.T4 | TASK 4 | Structural Analysis and Geotechnical Investigation
2.T4.1 Structural Analysis Report
2.T4.2 Structural element codes and Rebar Locating Tests
2.T4.3 Rebar Locating Tests Datasheets
2.T4.4 Geotechnic Report
2.T4.5 Geognostic Report

2.T5 | TASK 5 | Energy efficiency and Installations
2.T5.1 Energy Efficiency and Installations Report
2.T5.2 Abacus of Window Fixtures
2.T5.3 Energy Efficiency Evaluation

2.T6 | TASK 6 Functions and Value Assessment
2.T6.1 Construction and Transformation Phases (1934-2021)
2.T6.2 Construction and Transformation Phases Drawings (1934-2021)
2.T6.3 Building Chronology
2.T6.4 Building Chronology Drawings (1932-2021)
2.T6.5 Functions, Uses and Statistics
2.T6.6 Functions, Uses and Statistics Drawings

3 I FINANCIAL REPORT

3.1 Final Financial Narrative Report
3.2 Final Financial Itemized Report
3.3 Final Report Grantee Form

4 I CONSERVATION MANAGEMENT PLAN

4.1 Conservation Management Plan Narrative
4.2 Conservation Management Plan Chrono program of Interventions
4.3 Conservation Management Plan Chrono program of Maintenance Works

LIST OF ARCHIVES

Archivio Storico Sapienza Università, *Sapienza University Historical Archive*
 Archivio Generale
 Archivio Storico Generale
 Fondo del Consorzio per l'Assetto Edilizio della Regia Università di Roma
 Patrimonio Architettonico

Archivio del Dipartimento di Matematica "Guido Castelnuovo", Sapienza Università di Roma, *Archive of the Department of Mathematics, Sapienza University*

Biblioteca della Facoltà di Architettura, Sapienza Università di Roma, *Library of the School of Architecture, Sapienza University*
 Archivio Carlo Severati

Biblioteca della Facoltà di Architettura, Università degli studi di Firenze, *Library of the School of Architecture, University of Florence*
 Fondo Marcello Piacentini
 Fondo Roberto Papini

Biblioteca Universitaria, Università degli studi di Bologna, *University Library, University of Bologna*
 Archivio Rodrigo Pais

Archivio Centrale dello Stato, *State Central Archive*
 Allied Commission Control
 Attività del Duce
 Fondo del Consiglio Nazionale delle Ricerche
 Fondo Gaetano Minnuccl
 Ministero dell'Industria, Commercio e Artigianato
 Fondo Ministero della Pubblica Istruzione (già Ministero dell'Educazione Nazionale, 1929-194)
 Presidenza del Consiglio dei Ministri
 Segreteria Particolare del Duce

Archivio di Stato di Roma, *Rome State Archive*
 Fondo del Genio Civile di Roma

Archivio Storico Capitolino, *Historical Capitoline Archive*
 Delibere Governatorato

Centro Studi e Archivio della Comunicazione, Università degli Studi di Parma, *Study Centre and Communication Archive, Parma University*
 Fondo Gio Ponti
 Archivio Cesare Vasari

Galleria Nazionale d'Arte Moderna, *National Gallery of Modern Art, Rome*
 Fondo Ugo Ojetti

Museo Nazionale delle Arti del XXI Secolo, Centro Archivi di Architettura, *Architecture Archive Center, MAXXI National Museum of the XXI Century Arts*
 Fondo Eugenio Montuori

Archivio Storico, Triennale di Milano, Historical Archive of the Milan Triennale
 Archivio Fotografico
 Fondazione Bernocchi

Istituto Centrale per il Catalogo e la Documentazione, *Central Institute for Catalogue and Documentation*
 Fondo SARA
 Fondo Fotocielo
 Gabinetto Fotografico Nazionale
 Fondo Oscar Savio
 Fondo Ministero della Pubblica Istruzione

Archivio Istituto Luce, *Istituto Luce Archive, Rome*
 Giornale Luce

Biblioteca Hertziana, *Fototeca, Istituto Max Plank per la Storia dell'Arte, Phototeque of the Bibliotheque Hertziana, Rome*
 Fondo Walter Kruft
 Fondo Eberhard Schroter
 Fondo Reale Aeronautica

Accademia Nazionale delle Scienze, *National Academy of Sciences*
 Fondo Enrico Bompiani
 Fondo Francesco Severi

Accademia Nazionale dei Lincei, *National Academy of the Lincei, Rome*
 Fondo Guido Castelnuovo
 Fondo Reale Accademia d'Italia

Camera di Commercio di Rome, Archivio Storico, *Historical Archive of the Chamber of Commerce, Rome*

Camera di Commercio di Milano, Monza-Brianza e Lodi, Archivio Storico, *Historical Archive of the Chamber of Commerce oh Milan, Monza Brianza and Lodi*

Centro Ricerca e Documentazione Arti Visive, *Centre for Research and Documentation of Visual Arts, Rome*
 Fondo Oscar Savio

Gio Ponti Archive, *Gio Ponti Archive Milan*
 Photographic and Epistolary Archive

Archivio Francesco Guidi, *Francesco Guidi Private Archive*

Archivio Francesco Succi, *Francesco Succi Private Archive*

Archivio Claudio Procesi, *Claudio Procesi Private Archive*

Archivio Regni Sennato, *Bruno Regni and Marina Sennato Private Archive*

Archivio Carla Giovannone, *Carla Giovannone Private Archive*

Archivio Ditta Palazzo della Luce, *Palazzo della Luce company Private Archive*

Archivio Simona Maria Salvo, *Simona Maria Salvo Private Archive*

Archivio Flaminia Bardati, *Flaminia Bardati Private Archive*

BIBLIOGRAPHICAL REFERENCES

On the School of Mathematics

Architectural Review 1936
(1936): "School of Mathematics. University of Rome". In: Architectural Review, 80, 204-206.

Melis 1936
Melis A. (1936): "La scuola di Matematica alla R. Università di Roma". In: L'Architettura Italiana, 8, 171-182.

Rassegna di Architettura 1936
(1936): "Scuola di Matematica nella città universitaria. Architetto Gio Ponti". In: Rassegna di Architettura, 7, 228-229.

Campanini 1937
Campanini R. (1937): "Biblioteche". In: Rassegna di architettura, 10, 363-398.

Carbonara 1941
Carbonara P. (1941): "Compiti e caratteri della biblioteca moderna". In: Architettura, 6, 235-246.

Ponti 1944
Ponti G. (1944): "Invenzione d'una architettura composta. Dai "cuboni" alla composizione d'una architettura". In: Stile, 39, 1-16.

Sinestrari 1980
Sinestrari E. (1980): "La biblioteca dell'Istituto Matematico "G. Castelnuovo". In: Bollettino della Facoltà di Scienze Matematiche Fisiche Naturali, 3, 55-58.

Mornati 1992
Mornati S. (1992): "La Città universitaria di Roma. Note sulla Scuola di Matematica di Gio Ponti". In: Casciato, Mornati, Scavizzi 1992, 345-359.

Giovannone 1994
Giovannone C. (1994): Relazione tecnica dell'intervento di restauro eseguito sui rivestimenti marmorei siti nell'atrio del dipartimento di matematica Istituto Guido Castelnuovo dell'università "La Sapienza" di Roma, Roma.

Israel 1995
Israel G. (1995): La storia dell'istituto di matematica G. Castelnuovo, Roma.
[www.mat.uniroma1.it/dipartimento/chi-siamo/storia]

Nastasi 1998
Nastasi P. (1998): "La matematica italiana dal manifesto degli intellettuali fascisti alle leggi razziali". In: Bollettino U.M.I. La matematica nella Società e nella Cultura, 8, 1-A, 3, 317-345.

De Cesaris 2001
De Cesaris F. (2001): Progetto di adeguamento delle ringhiere dei ballatoi della biblioteca dell'Istituto Matematico "Guido Castelnuovo" (Gio Ponti, 1932-35)". In: M. M. Segarra Lagunes (eds.), Manutenzione e recupero nella città storica, Rome: Gangemi, 303-310.

Dell'Aglio, Emmer, Meneghini 2001
Dell'Aglio L., Emmer M., Meneghini M. (2001), "Le relazioni tra matematici e architetti nei primi decenni della Facoltà di Architettura: aspetti didattici, scientifici e istituzionali". In: V. Franchetti Pardo (eds.), La Facoltà di Architettura dell'Università di Roma "La Sapienza" dalle origini al Duemila. Discipline, docenti, studenti, Rome: Gangemi, 55-72.

Mornati 2001
Mornati S. (2001): "La Scuola di Matematica di Gio Ponti a Roma (1932-35)". In: P.G. Bardelli (eds.), La costruzione moderna in Italia. Indagine sui caratteri originari e sul degrado di alcuni edifici, Rome: Edilstampa, 278-293.

Remiddi, Greco, Bonavita, Ferri 2001
Remiddi G., Greco A., Bonavita A., Ferri P. (2001): Il moderno attraverso Roma. Guida a 200 architetture e alle loro opere d'arte, Rome: Palombi, 108D.

Dal Falco 2002
Dal Falco F. (2002): "La scuola di Matematica di Gio Ponti. Roma, 1933-1935". In: F. Dal Falco (eds.), Stili del razionalismo. Anatomia di quattordici opere di architettura, Rome: Gangemi, 101-122.

Barucci 2002
Barucci C. (2002): "Tra razionalità e classicismo". In: F. Dal Falco (eds.), Stili del razionalismo. Anatomia di quattordici opere di architettura, Rome: Gangemi, 123-124.

Mornati 2002
Mornati S. (2002): "L'edificio della Scuola di Matematica di Gio Ponti alla Città Universitaria di Roma". In: Bollettino U.M.I. La Matematica nella Società e nella Cultura, 8, 5-A, 1, 43-71.

Bardati 2003
Bardati F. (2003): "La scuola di Matematica di Gio Ponti. I materiali e la qualità dello spazio interno". In: V. F. Pardo (eds.), L'architettura nelle città italiane del XX secolo, Rome: Jaka Book, 175-181.

Cerutti Fusco 2003
Cerutti Fusco A. (2003): "La scuola di Matematica nella Città Universitaria di Roma. Opera dei primi anni Trenta di Giovanni (Gio) Ponti (1891-1979). Alcune riflessioni". In: V. Franchetti Pardo (eds.), L'architettura nelle città italiane del XX secolo, Rome: Jaka Book, 103-120.

De Cesaris, De Sanctis, Ferri, Marucci 2004
De Cesaris F., De Sanctis R., Ferri P., Marucci G. (2004): "Osservatorio sul moderno romano: l'Istituto di matematica alla Città Universitaria di Gio Ponti". In: G. Remiddi, Studi sul moderno romano, Rome: Palombi, 40-55.

Presta 2005
Presta C. (2005): "Architecture for Mathematics: The School of Mathematics at Città Universitaria in Rome". In: Nexus Network Journal, 7, 2, 98-104.

Roghi 2005
Roghi G. (2005): "Materiale per una Storia dell'Istituto Nazionale di Alta Matematica dal 1939 al 2003". In: Bollettino U.M.I. La matematica nella Società e nella Cultura, 8, 8-A, 3-2, 3-301.

Daniele 2013
Daniele G. (2013): "Gio Ponti (Milano, 1891-1979). Scuola di Matematica". In: Nigro Covre, Carrera 2013, 126-129.

Salvo 2015
Salvo S. (2015): “Conservation and modern architecture. Fortune and misfortune of the school of Mathematics at «Sapienza» University (G. Ponti, 1932-1935)”. In: Frontiers of architectural research, 4, 186-201.

Degli Esposti, Lanciano 2016
Degli Esposti C., Lanciano N. (2016): Emma Castelnuovo, Rome: L’asino d’oro.

Catucci, Garroni, Salvo 2017
Catucci S., Garroni G., Salvo S. (2017): La vetrata artistica della Scuola di matematica: disegno di Gio Ponti per Luigi Fontana, Macerata: Quodlibet.

Salvo 2017
Salvo S. (2017): “Più di una vetrata, un concetto architettonico. Processualità storico-critica della rievocazione di un oggetto storico artistico come atto di restauro”. In: Catucci, Garroni, Salvo 2017, 1-7.

Baratelli 2020
Baratelli G. (2020): “L’invenzione dello spazio nella Scuola di Matematica di Gio Ponti”. In: Engramma, 175. [www.engramma.it/eOS/index.php?id_articolo=3970]

On Rome’s University Campus

Minnucci 1932
Minnucci G. (1932): Degli Istituti per l’Istruzione superiore. Relazione dell’Ing. Gaetano Minnucci dell’Ufficio Tecnico per la Costruzione della Città Universitaria di Roma, typescript.

Architettura 1933c
(1933): “Mostra dell’Italia che si rinnova”. In: Architettura, special issue,, 145-159.

Ceccherini 1933
Ceccherini R. V. (1933): “Dallo Studium Urbis alla Città degli Studi”. In: Capitolium, 12, 581-610.

Giovannetti 1933
Giovannetti E. (1933): “La più bella università del mondo”. In: La rivista illustrata del Popolo d’Italia, 4, 45-50.

Nezi 1933
Nezi A. (1933): “Battesimo dell’architettura moderna in Italia. L’opera e gli artefici”. In: Emporium, 465, 138-160.

Pagano 1933
Pagano G. (1933): “Registro (dell’università di Roma)”. In: Casabella, 61, 39-41.

Pacini 1933a
Pacini R. (1933): “Il grandioso progetto della Città Universitaria di Roma”. In: Emporium, 459, 177-182.

Pacini 1933b
Pacini R. (1933): “La città universitaria di Roma”. In: Architettura, 8, 475-495.

Spano 1933
Spano N. (1933): “La città universitaria di Roma”. In: La Scuola Superiore, 1, 41-62.

Minnucci 1934
Minnucci G. (1934): La Città Universitaria di Roma. In: L’Ingegnere, 9, 418-422.

Architettura 1935a
(1935): “La Città Universitaria di Roma”. In: Architettura, specimen, monographic issue.

Architettura 1935b
(1935): “La Città Universitaria di Roma”. In: Architettura, special issue.

Biancale 1935
Biancale M. (1935): “La Città Universitaria”. In: Il Popolo di Roma, October 30.

Minnucci 1935-1936
Minnucci G. (1935-1936): “Studium Urbis”. In: Edilizia Moderna, 19-20, 9-33.

Del Vecchio 1935
Del Vecchio G. (1935): “A proposito della Città Universitaria”. In: Capitolium, 3, 148-150.

Oppo 1935a
Oppo C. E. (1935): “Sguardo alla Città Universitaria”. In: La Tribuna, October 29.

Oppo 1935b
Oppo C. E. (1935): “Architetture alla Città Universitaria”. In: La Tribuna, November 9.

Pacini 1935
Pacini R. (1935): “La Città Universitaria”. In: Terzo Congresso Nazionale di Studi Romani. Conference Proceedings (Rome, April 22-28, 1933), Rome: Tumminelli.

Sarfatti 1935
Sarfatti M. (1935): “La città universitaria di Roma”. In: Nuova Antologia, 1528, 187-192.

Scarpa 1935
Scarpa P. (1935): “Panorama artistico, urbanistico, funzionale della nuova Città universitaria”. In: Il Messaggero, October 30.

Spano 1935
Spano N. (1935): “L’università di Roma”. Rome: Casa Editrice Mediterranea.

Lenzi 1936
Lenzi L. (1936): “Die neue Universitätsstadt in Rom”. In: Monatshefte für Baukunst und Städtebau, 6, 225.

Nezi 1936
Nezi A. (1936): “La città universitaria di Roma grandiosa affermazione dell’architettura moderna”. In: Emporium, 493, 18-24.

Pensabene 1936
Pensabene G. (1936): “La Città Universitaria”. In: L’ingegnere, 1, 19-38.

Persitz 1936
Persitz A. (1936): “La Cité Universitaire de Rome”. In: L’Architecture d’aujourd’hui, 6, 12-20.

Pica 1936
Pica A. (1936); Nuova architettura italiana, Milan: Hoepli, 20-27, 125-154.

Rassegna di Architettura 1936a
(1936): “La Città Universitaria di Roma”. In: Rassegna di Architettura, 6, 181-194.

Rassegna di Architettura 1936b
(1936): “Città universitaria di Roma”. In: Rassegna di Architettura, 7, 225-234.

Minnucci 1937
Minnucci G. (1937): La città universitaria di Roma, typescript.

Guidi 1958
Guidi F. (1958): “L’Università di Roma nel nuovo piano regolatore”. In: Capitolium, 4, 3-13.

Caniggia 1959
Caniggia G. (1959): “Il clima architettonico romano e la città universitaria”. In: La Casa. Quaderni di architettura e critica, 6, 272-299.

De Martino 1967
De Martino U. (eds.) (1967): “Il problema dell’edilizia universitaria a Roma”. In Rassegna dell’Istituto di Architettura e Urbanistica, 8-9, 211-270.

Patetta 1972
Patetta L. (1972): L'architettura in italia 1919-1943. le polemiche, Milan: Clup, 315-333.

Semino 1982
Semino G. P. (1982): "Roma 1932-35. Città Universitaria, una cittadella per i futuri quadri del regime". In: N. Bortolotti (eds.), AnniTrenta. Arte e cultura in Italia, Exhibition Catologue (Milan, December, 1981 – April, 1982), Milan: Nuove Edizioni Mazzotta, 574-575.

Guidoni, Regni Sennato 1985
Guidoni E., Regni Sennato M. (eds.) (1985): 1935/1985 La "Sapienza" nella Città Universitaria, Catalogue of the exhibition (Rome, June 28- November 15, 1985), Rome: Multigrafica editrice.

Regni, Regni Sennato 1986
Regni B., Regni Sennato M. (1986): La città universitaria di Roma. Seminario internazionale di progettazione, Rom: Clear.

Lux, Coen 1985
Lux S., Coen E. (eds.) (1985): "1935, Gli artisti all'Università e la questione della pittura murale, Catalogue of the exhibition (Rome, June, 28- November 15, 1985), Rome: Multigrafica editrice.

Palumbo, Tiberi, Ferrante 1993
Palumbo R., Tiberi M., Ferrante T. (eds.), Progetto Gulliver per una città universitaria a misura d'uomo, Rome: Tipografia del Genio Civile.

Mornati 1994-1995
Mornati S. (1994-1995): "La sperimentazione nella costruzione della Città Universitaria di Roma (1932-35)". In: Rassegna di architettura e urbanistica, 84/85, 109-117.

Strappa, Mercurio 1996
Strappa G., Mercurio G. (1996): Architettura moderna a Roma e nel Lazio: 1920-1945. Atlante, 2, Rome: Edilstampa, 192-195.

Coiro Cecchini 2001
Coiro Cecchini F. (2001): L'architettura del ventennio a roma, Rome: Edilazio, 47-56.

Insolera 2001
Insolera I. (2001): Roma fascista nelle fotografie dell'Istituto Luce, Rome: Editori riuniti, 56-59.

Nicoloso 2006
Nicoloso P. (2006): "Piacentini e Mussolini nella città universitaria di Roma 1932-1935". In: G. Mazzi (eds.), L'università e la città. Il ruolo di Padova e degli altri atenei italiani nello sviluppo urbano, Conference Proceedings (Padua, December 4-6, 2003), Bologna: Clueb, 231-245.

De Santoli, Caruso 2007
De Santoli L., Caruso G. (2007): "Impianto di tririgenerazione nella città universitaria de "La Sapienza" di Roma". In: Gestione Energia, 1, 47-50.

Mitrano 2008
Mitrano I. (2008): La Sapienza 1932-1935. Arte architettura storia, Rome: La Sapienza.

Ciucci 2010
Ciucci G. (2010): "La Roma di Piacentini. 1916-1929". In: Rassegna di architettura e urbanistica, 130/131, 21-50.

Muntoni 2010
Muntoni A. (2010): "La città universitaria di Roma (1933-1935)". In: A. Muntoni, Roma tra le due guerre 1919-1944. Architettura, modelli urbani, linguaggi della modernità, Rome: Edizioni Kappa, 87-126.

De Santoli 2011
De Santoli L. (2011), Le comunità dell'energia, Macerata: Quodlibet, 85-99.

Azzaro 2012
Azzaro B. (2012): La Città universitaria della Sapienza di Roma e le sedi esterne 1907-1932, Rome: Gangemi.

Ciucci 2012
Ciucci G. (2012): "Marcello Piacentini, Roma e la Città Universitaria". In: Ciucci, Lux, Purini 2012, 217-240.

Di Marco 2012
Di Marco F. (2012): "La Città Universitaria di Roma. Dal progetto Botto-Giovannoni alle ultime proposte prima di Piacentini". In L. Marcucci (eds.), L'altra modernità nella cultura architettonica del XX secolo. Progetto e città nell'architettura italiana, Rome: Gangemi, 79-100.

Purini 2012
Purini F. (2012): "Geometrie della Sapienza". In Ciucci, Lux, Purini 2012, 241-255.

Nigro Covre, Carrera 2013
Nigro Covre J., Carrera M. (eds.) (2013): Sapienza Razionalista. L'architettura degli anni '30 nella Città Universitaria, Conference Proceedings (Rome, November 19-23, 2012), Rome: Edizioni Nuova Cultura.

Marcello, Gwynne 2015
Marcello F., Gwynne P. (2015): "Speaking from the walls. Militarism, education and romanità in Rome's Città Universitaria 1932-35)". In Journal of the Society of Architectural Historians, 3, 323-342.

Beese 2016a
Beese C. (2016): "La Sapienza". Die römische Universitätsstadt der 1930er Jahre und ihre Rolle innerhalb der italienischen Architektur Geschichtsschreibung". In: Architectura, 2, 190-213.

Di Marco 2016
Di Marco F. (2016): "La città universitaria di Roma. Dal piano aperto di Gustavo Giovannoni alla "piccola città raccolta" di Marcello Piacentini". In: J. Rivera Blanco (eds.), Arquitectura universitaria. Ciudades patrimonio mundial (Madrid, 1- 3 December 2015), Madrid: Univesidad de Alcalà. Servicio de Publicaciones, 291-316.

Portoghesi 2016a
Portoghesi P. (2016): "La città universitaria di Roma. Esempio di un'altra modernità". In: Il Veltro, 1/3, 3-24.

Portoghesi 2016b
Portoghesi P. (2016): "La città università di Roma, le due modernità si conciliano. Tre anni d'oro dell'architettura italiana del Novecento". In: Disegnare. Idee. Immagini, 52, 12-23.

Azzaro 2018
Azzaro B. (2018): "Progetti e nuove opere per la Città Universitaria di Roma 1930-1960". In: Quaderni dell'Istituto di Storia dell'Architettura, special issue, 101-123.

Greco 2018
Greco A. (2018): "Ora non ho più da fare". Riflessioni su Marcello Piacentini. Roma, la Città Universitaria, la rinascita dell'EUR". In Quaderni dell'Istituto di Storia dell'Architettura, special issue, 81-100.

Baratelli 2019
Baratelli G. (2019): La città universitaria. Costruzione di un testo architettonico, Cinisello Balsamo: Silvana editoriale.

Azzaro 2020a
Azzaro B. (eds.) (2020): Le città universitarie del XX secolo e la Sapienza di Roma, Conference Proceedings (Rome, November 23-25, 2017), 1. In: Palladio, 59-60.

Azzaro 2020b
Azzaro B. (eds.) (2020): Le città universitarie del XX secolo e la Sapienza di Roma, Conference Proceedings (Rome, November 23-25, 2017), 2. In: Palladio, 61-62.

Azzaro 2020c
Azzaro B. (eds.) (2020): Le città universitarie del XX secolo e la Sapienza di Roma, Conference Proceedings (Rome, November 23-25, 2017), 3. In: Palladio, 63-64.

About Gio Ponti
* Selection of references dealing with the architect's artistic production (especially the projects in Rome of the 1930s), his editorial activity, and his projects for the University of Padua, and are therefore directly related to the School of Mathematics.

Piacentini 1930
Piacentini M. (1930): Architettura d'oggi, Rome: Paolo Cremonese editore.

Muzio 1931
Muzio G. (1931): "Alcuni architetti d'oggi in Lombardia". In: Dedalo, 4, 1082-1119.

Ponti 1931a
Ponti G. (1931): "Per l'Italia e per la modernità". In: Domus, 44, 13.

Ponti 1931b
Ponti G. (1931): "Stile e civiltà". In: Domus, 45, 23.

Chiesa 1932
Chiesa P. (1932): "Vetri incisi a Venezia". In: Domus, 56, 477-479, 513.

Del Bufalo 1932
Del Bufalo E. (1932): La mostra dell'edilizia e dei materiali da costruzione. In: L'Industria Italiana del Cemento, 11, 363-366.

Domus 1932a
(1932): "Aspetti di Architetture d'oggi in Italia". In: Domus, 50, 72.

Ponti 1932a
Ponti G. (1932): "Giudicare lo stile moderno". In: Domus, 53, 247.

Ponti 1932b
Ponti G. (1932): "Una mostra di architettura moderna a Roma". In: Domus, 57, 520- 523.

Ponti 1932c
Ponti G. (1932): "Verso gli artisti". In: Domus, 59, 645.

Architettura 1933a
(1933): "Concorso per la sistemazione edilizia della R. Università di Padova". In: Architettura, 10, 674-677.

Architettura 1933b
(1933): "Concorsi. Concorso nazionale per il progetto del Palazzo del Littorio e della mostra della rivoluzione da erigersi in via dell'Impero". In: Architettura, 12, 811-813.

Corriere della Sera 1933a
(1933): "Sistemazioni edilizie di Università". In: Corriere della Sera, July 23, 2.

Corriere della Sera 1933b
(1933): "L'assetto dell'Università di Padova". In: Corriere della Sera, July 25, 1.

Corriere della Sera 1933c
(1933): "Il concorso dello Stato per la sistemazione delle Università". In: Corriere della Sera, August 18, 5.

Elenco prezzi 1933
(1933): Elenco dei prezzi di opere e materiali da costruire, Rome.

Ferrobeton 1933
(1933): Ferrobeton. Impresa generale di costruzioni, Roma. 1908-1933, Milan: Archetipografica.

Ojetti 1933
Ojetti U. (1933): "Lettera a Giovanni Ponti sul lusso necessario". In: Pegaso, 1, 97-99.

Persico 1933
Persico E. (1933): "Il gusto italiano". In: L'Italia Letteraria, June 4, 1-2.

Pica 1933
Pica A. (eds.): V Triennale di Milano. Catalogo Ufficiale, Milan: Casa Editrice Ceselina.

Ponti 1933a
Ponti G. (1933): "Architettura. Pittura. Scultura". In: Domus, 66, 285.

Ponti 1933b
Ponti G. (1933): "Moderno o non moderno". In: Domus, 71, 574.

Ponti 1933c
Ponti G. (1933): "Primo ospite: la bellezza". In: Corriere della Sera, December 14, 5.

Architettura 1934
(1934): "Il "Premio Mussolini" a Giovanni Ponti". In: Architettura, 4, 255-256.

L'Architettura Italiana 1934a
(1934): "Concorso per il Palazzo della Facoltà di Lettere in Piazza Capitaniato in Padova. In: L'Architettura Italiana, 9, 302-312.

L'Architettura Italiana 1934b
(1934): "Il concorso per il Palazzo del Littorio in via dell'Impero a Roma". In: L'Architettura Italiana, 11, 364-396.

Domus 1934
(1934): "I moderni d'oggi sono come "i nostri antichi". In: Domus, 74, 1.

Fariello 1934
Fariello F. (1934): "Concorso per la sistemazione edilizia della R. Università di Padova". In: Architettura, 9, 541-562.

G.R. 1934
G.R. (1934): "Il Concorso per Palazzo del Littorio". In: Rassegna di Architettura, 12, 475-504.

Griffini 1934
Griffini E. A. (1934): Dizionario dei nuovi materiali per l'edilizia, Milan.

Pacini 1934
Pacini R. (1934): "Cronache romane. La mostra dei progetti per il Palazzo del Littorio a Roma". In: Emporium, 478, 233-237.

Pagano 1934
Pagano G. (1934): "Il concorso per il Palazzo del Littorio". In: Casabella, 82, 4-9.

Persico 1934a
Persico E. (1934): "L'architetto Gio Ponti". In: L'Italia Letteraria, April 29, 2.

Persico 1934b
Persico E. (1934): "Bilancio a Roma". In: L'Italia Letteraria, September 29, 3.

Persico 1934c
Persico E. (1934): "Punto ed a capo per l'architettura". In: Domus, 83, 2-3.

Ponti 1934a
Ponti G. (1934): "Ponti (Concorso per il Palazzo del Littorio) relazione di progetto". In: Casabella, 82, 36-39.

Ponti 1934b
Ponti G. (1934): "Le idee che ho seguito in alcune costruzioni". In: Domus, 84, 3-14.

Reale Accademia d'Italia 1933-1934
(1933-1934): Annuario della Reale Accademia d'Italia, 6, 289-290.

Repertorio 1934
(1934): Repertorio 1934 dei materiali per l'edilizia e l'arredamento, Milan: Editrice Domus.

Valeri 1934
Valeri D. (1934): "Padova antica e nuova. Rinnovamento del Bo". In: Le Tre Venezie, 4, 170- 175.

Domus 1935
(1935): "Il salone del Ministero delle Corporazioni". In: Domus, 85, 17.

Enciclopedia Italiana 1935
(1935): “Ponti Giovanni, in Enciclopedia Italiana, XXVII, Milan: Istituto della Enciclopedia Italiana, 896.

Pagano 1935
Pagano G. (1935): “Architettura italiana dell’anno XIV”. In: Casabella, 95, 2-7.

Ponti 1935
Ponti G. (1935): “Architettura per noi”. In: Corriere della Sera, February 10, 5.

Benedetti 1936
Benedetti (1936): “La mostra della stampa cattolica”. In: La Rivista illustrata del Popolo d’Italia, 8, 23-27.

Domus 1936
(1936): Domus, 98, Cover.

Labò 1936
Labò M. (1936): “Mostra universale della stampa cattolica al Vaticano”. In: Casabella, 105, 18-23.

Marmi, pietre e graniti 1936
(1936): Marmi e pietre nella nuova città degli studi di roma. In: Marmi, pietre e graniti, 1, 4.

Minnucci 1936
Minnucci G. (1936): Scuole, Milan: Hoepli.

Moretti 1936
Moretti B. (1936): “L’Esposizione della stampa cattolica. Architetto Gio Ponti”. In: Edilizia Moderna, 23, 36-45.

Piacentini 1936
Piacentini M. (1936): “Esposizione Mondiale della Stampa Cattolica nella Città del Vaticano”. In: Architettura, 7, 297-306.

Ponti 1936a
Ponti G. (1936): “Opinioni sul convegno Volta”. In: Domus, 107, 39-40.

Ponti 1936b
Ponti G. (1936): “La Mostra della stampa cattolica”. In: Emporium, 502, 199-205.

Pagano 1937
Pagano G. (1937): “Tre anni di architettura in Italia”. In: Casabella, 110, 2-5.

Ponti 1937
Ponti G. (1937): “Risposta al dibattito della Terza Seduta “Ritorno delle arti figurative ai compiti monumentali”. In: Convegno di arti. Rapporti dell’architettura con le arti figurative, Conference Proceedings (Rome, October 25-31, 1936), Rome: Reale Accademia d’Italia, 78-79.

Gorgerino 1938
Gorgerino G. (1938): “Ponti”. In: L’Ambrosiano, March 4, 5.

Nervi 1938
Nervi P. L. (1938): “Per l’autarchia. I problemi economici delle costruzioni e la politica dell’architettura”. In: Il Giornale d’Italia, July 23, 3.

Architettura 1940
(1940): “Il concorso per il Ministero degli Affari Esteri a Roma”. In: Architettura, 11, 529-566.

Campigli 1940
Campigli M. (1940): “Il mio lavoro di Padova”. In Aria d’Italia, 2, 60-65.

Pallucchini 1940
Pallucchini R. (1940); “Affreschi padovani di Massimo Campigli”. In: Le Arti, 5-6, 346- 350.

Ponti 1940a
Ponti G. (1940): “Affreschi nell’Università di Padova: studi e particolari”. In: Aria d’Italia, 4, 47- 53.

Ponti 1940b
Ponti G. (1940): “Tendenze del gusto”. In: Domus, 156, 33-34.

Ra. 1940
Ra. (1940): “Una grande pittura murale di Campigli”. In: Domus, 147, 60-63.

Rassegna di Architettura 1940
(1940): “Il “Livianum” della R. Università di Padova. Architetto Giovanni Ponti”. In: Rassegna di Architettura, 12, 342-347.

Ghiotto 1941
Ghiotto R. (1941): “Che cosa significano i nuovi affreschi del Bo”. In: Il Veneto, November 5.

Pagano 1941
Pagano G. (1941): “Potremo salvarci dalle false tradizioni e dalle ossessioni monumentali?”. In: Costruzioni-Casabella, 1941, 157, 2-7.

Piacentini 1941
Piacentini M. (1941): “Onore dell’architettura italiana”. In: Architettura, 7, 263-273.

Pica 1941
Pica A. (1941): Architettura moderna in Italia, Milan: Hoepli.

Ponti 1941a
Ponti G. (1941): “L’antico e noi”. In: Stile, 3, 57-58.

Ponti 1941b
Ponti G. (1941): “Una palazzina a Roma in Piazzale delle Muse”. In: Architettura, 7, 274-279.

Ponti 1941c
Ponti G. (1941): “Padovando”. In: Stile, 10, 1.

Stile 1941
(1941): “Stile di Fontana”. In: Stile, 1, 60-61.

Anti 1942
Anti C. (1942): Descrizione delle sale accademiche al Bo e del Liviano, Padua: Tipografia Antoniana.

Pagano 1942
Pagano G. (1942): “Sogno di una notte di mezza estate”. In: Costruzioni-Casabella, 180, 2.

Ponti 1942a
Ponti G. (1942): “Opere durature agli artisti, non solo premi ed esposizioni. Anticipazioni di Padova”. In: Stile, 13, 7-29.

Ponti 1942b
Ponti G. (1942): “Dove noi architetti abbiamo mancato”. In: Stile, 19-20, 22-23.

Ponti 1942c
Ponti G. (1942): “Lo stile del secolo. Buona architettura e cattiva edilizia”. In: Corriere della Sera, July 2, 3.

Costruzioni-Casabella 1943
(1943): “Padova. Il riordino edilizio dell’Università”. In: Costruzioni-Casabella, 182, 37.

Pagano 1943a
Pagano G. (1943): “Modernità maledetta”. In: Costruzioni-Casabella, 181, 29-30.

Pagano 1943b
Pagano G. (1943): “Presupposti per un programma di politica edilizia”. In: Costruzioni-Casabella, 186, 2-7.

Ponti 1943a
Ponti G. (1943): “Architetture italiane di domani”. In: Corriere della Sera, June 15, 3.

Ponti 1943b
Ponti G. (1943): “Proposizioni per la futura edilizia”. In: Stile, 35, 28-29.

Bini, Ponti 1944
Bini V., Ponti G. (1944): Cifre parlanti, Milan: Edizioni Vesta.

Libera, Ponti, Vaccaro 1945
Libera A., Ponti G., Vaccaro G. (1945): Verso la casa esatta, Milan: EDIT.

Minnucci 1945
Minnucci G. (1945): Gli elementi costruttivi nell'edilizia, Rome: Libreria dell'università editrice Tumminelli.

Ponti 1945
Ponti G. (1945): L'Architettura è un cristallo, Milan: EDIT.

Ponti 1946
Archias (Ponti G.) (1946): Ringrazio Iddio che le cose non vanno a modo mio, Milan: Antoniazzi editore.

Ridolfi et al. 1946
Ridolfi M. et al. (1946): Manuale dell'architetto, Rome: Consiglio Nazionale delle Ricerche, U.S.I.S.

Franco 1947
Franco A. (eds.) (1947): Giuseppe Pagano Pogatschnig, Architetture e scritti, Milan: Editoriale Domus.

Ponti 1949
Ponti G. (1949): "L'opera di Pietro Chiesa". In: Domus, 234, 32-49.

Zevi 1950
Zevi B. (1950): Storia dell'architettura moderna, Turin: Einaudi.

Ponti 1952
Ponti G. (1952): "Dieci anni fa come oggi e la questione delle opere d'arte nell'architettura". In: Domus, 270, 18-19.

Veronesi 1953
Veronesi G. (1953): Difficoltà politiche dell'architettura in Italia 1920-1940, Milan: Tamburini.

Aria d'Italia 1954
(1954): "Espressione di Gio Ponti". In: Aria d'Italia, 8.

Valverde 1954
Valverde J. M. (1954): "Un ejemplo tipico de arquitecto italiano: Gio Ponti". In: Goya, 2, 114-116.

Ponti 1955
Ponti G. (1955): "Ingegneria e architettura". In: Domus, 313, 1-3.

Ponti 1956
Ponti G. (1956): Paradiso perduto?, Milan: Guarnati.

Jouffroy 1957
Jouffroy A. (1957): "Le pionner du style italien actuel". In: Connaissance des arts, 62, 45-45.

Ponti 1957a
Ponti G. (1957): Amate l'architettura, Genoa: Vitali & Ghirlanda.

Ponti 1957b
Ponti G. (1957): "Massimo Campigli". In: Domus, 334, 49.

Benevolo 1960
Benevolo L (1960): Storia dell'architettura moderna, Bari: Laterza.

Ponti 1960
Ponti G. (1960): In praise of Architecture, New York: Dodge Corporation.

Insolera 1962
Insolera I. (1962): Roma moderna. Un secolo di storia urbanistica 1870-1970, Turin: Einaudi.

Canella, Gregotti 1963
Canella G., Gregotti (eds.) (1963): "Il Novecento e l'architettura". In: Edilizia Moderna, 81.

Veronesi 1963
Veronesi G. (1963): "Gio Ponti". In: Knaurs Lexikon des modernen Architektur, München-Zürich: Gerd Hatje, 259-261.

Veronesi 1964
Veronesi G. (eds.): "Edoardo Persico. Tutte le opere (1923-1935)", Milan: Edizioni di Comunità.

Brunetta 1966
Brunetta G. (1966): Gli interventi dell'Università di Padova nel riutilizzo di edifici antichi, Padua: La Garangola.

Ponti 1967
Ponti G. (1967): Nuvole sono immagini, Milan: All'insegna del pesce d'oro.

Shapira 1967
Shapira N.H. (eds.) (1967): "The Expression of Gio Ponti". In: Design Quarterly, 69-70.

De Seta 1972a
De Seta C. (1972): La cultura architettonica in Italia tra le due guerre, Bari: Laterza.

De Seta 1972b
De Seta C. (eds.) (1972): Giolli. L'architettura razionale, Bari: Laterza.

Patetta 1972
Patetta L. (1972): L'architettura in Italia 1913-1943. Le polemiche, Milan: Clup.

Danesi, Patetta 1976
Danesi S. Patetta L. (eds.), Il Razionalismo e l'architettura in Italia durante il Fascismo, Milan: Electa.

De Seta 1976
De Seta C. (eds.) (1976): Giuseppe Pagano, Architettura e città durante il fascismo, Bari: Laterza.

Mariani 1977
Mariani R. (eds.): Edoardo Persico, Oltre l'architettura. Scritti scelti e lettere, Milan: Feltrinelli.

Casabella 1978
(1978): "Gli anni '33-36/'36-43. Sviluppi e identità del razionalismo italiano: i grandi concorsi e le opere". In: Casabella, 440-441, 25-30.

Pansera 1978
Pansera A. (1978): Storia e cronaca della Triennale, Milan: Longanesi.

Beretta 1979
Beretta E. (1979): "Gio Ponti architetto". In: Arte Cristiana, 658, 127-134.

Mendini 1979
Mendini A. (1979): "Gio Ponti". In: Modo, 25, 19.

Milano 1979
(1979): 28/78 Architettura, Catalogue of the exhibition (Milan, March 28- May 13, 1979), Milan: Editoriale Domus.

Semenzato 1979
Semenzaio C. (1979): L'Università di Padova. Il Palazzo del Bo: Arte e Storia, Trieste: Edizioni Lint.

Zevi 1979
Zevi B. (1979): "L'inventore del Pirellone". In: L'Espresso, 40, 105.

Bossaglia 1980
Bossaglia R. (1980): Decomania: omaggio a Gio Ponti, Catalogue of the exhibition (Milan, April 24- May 2, 1980), Milan: Cop.T.E.

Frampton 1980
Frampton K. (1980): Modern architecture. A critical history, London: Oxford University Press.

Savi 1980
Savi V. (1980): "Gio Ponti". In: Casabella, 454, 8.

De Seta 1981
De Seta C. (1981): L'Architettura del Novecento, Turin: Utet.

Space Design 1981
(1981): "Gio Ponti". In: Space Design, 200, monographic issue.

De Seta 1982
De Seta C. (1982): Architetti italiani del Novecento, Bari: Laterza.

Bossaglia 1984
Bossaglia R. (1984): L'Art Déco, Rome-Bari: Laterza.

Pietrogrande 1984
Pietragrande E. (1984): "I progetti "alla veneta" tra le opere padovane di Gio Ponti". In: Atti e memorie dell'Accademia Patavina di Scienze, Lettere ed Arti", 289-297.

Rossi 1984
Rossi P. O. (1984): Roma. Guida all'architettura moderna 1909-1984, Rome-Bari: Laterza.

Greco 1985
Greco A. (1985): "Gio Ponti. Un moderno temperato", in Lux, Coen 1985, 76-78.

Zucconi 1985
Zucconi G. (1985): "L'imperativo del capitolato". In: Rassegna, 24, 55-66.

Avon 1986
Avon A. (1986): "Uno "Stile" per l'abitare. Attività e architettura di Gio Ponti fra gli anni Venti e gli anni Trenta". In: Casabella, 523, 44-53.

Cresti 1986
Cresti C. (1986): Architettura e fascismo, Florence: Vallecchi.

Farina 1986
Farina P. (1986): "Gio Ponti. Anni Trenta e dintorni". In: Ottagono, 82, 60-65.

Isozaki 1986
Isozaki A. (eds.) (1986): "Gio Ponti 1891-1979. From the Human-Scale to the Post-Modernism, Catalogue of the exhibition (Tokyo, September 19- October 7, 1986), Tokyo: Kajima Institute Publishing.

Mejetta, Sato 1986
Mejetta M., Sato K.)1986): "L'architettura è un cristallo. L'opera di Gio Ponti nel percorso della sua vita". In: Interni, 361, 2-13.

Tafuri 1986
Tafuri M. (1986): Storia dell'architettura italiana 1944-1985, Turin: Einaudi.

Calvesi, Guidoni, Lux 1987
Calvesi M., Guidoni E., Lux S. (eds.) (1987): E42 Utopia e scenario del regime, Catalogue of the exhibition (Rome, April 10- May 10, 1987), Venice: Marsilio.

D'Amato 1987
D'Amato G. (1987): L'architettura del protorazionalismo, Bari: Laterza.

Licitra Ponti 1987
Licitra Ponti L. (1987): "Arata Isozaki/Gio Ponti: mostra al Seibu Museum di Tokyo". In: Domus, 679, 10-12.

Mariani 1987
Mariani R. (1987): E42, un progetto per l'"Ordine Nuovo", Milan: Edizioni di Comunità.

Avon 1988
Avon A. (1988): "Un libro su Gio Ponti. La ricerca non è finita". In: Casabella, 551, 31-32.

Ernesti 1988
Ernesti G. (eds.) (1988): La Costruzione dell'Utopia. Architetti e urbanisti nell'Italia fascista, Rome: Ed. Lavoro.

Irace 1988
Irace F. (1988): Gio Ponti. La casa all'italiana, Milan: Electa.

La Pietra 1988
La Pietra U. (eds.) (1988): Gio Ponti. L'arte si innamora dell'industria, Milan: Coliseum.

Tamagno 1988
Tamagno E. (1988): "Architettura, un luogo comune. Il gusto all'italiana di Gio Ponti". In: Il giornale dell'arte, 61, 82.

Ciucci 1989
Ciucci G. (1989): Gli architetti e il fascismo. Architettura e città 1922-1944, Turin: Einaudi.

Universo 1989
Universo M. (1989); Gio Ponti designer. Padova 1936-1941, Rome: Laterza.

Licitra Ponti 1990a
Licitra Ponti L. (1990): Gio Ponti. L'opera, Milan: Leonardo.

Licitra Ponti 1990b
Licitra Ponti L. (1990): Gio Ponti. The complete works 1923-1978, London: Thames and Hudson.

Zacheo 1990
Zacheo M. I. (1990): L'architettura del ventennio a Roma, Rome: Palombi.

Avon 1991
Avon A. (1991): "Ponti su Ponti". In: Casabella, 578, 31.

Daprà Conti, Felisio 1991
Daprà Conti M. G., Felisio P. (eds.) (1991): Una casa lunga cinquant'anni: riscritture per Gio Ponti, Turin: Celid.

Etlin 1991
Etlin R. A. (1991): Modernism in Italian architecture 1890-1940, Cambridge-London: The MIT Press.

Lupano 1991
Lupano M. (1991): Marcello Piacentini, Rome: Laterza.

Masetti 1991
Masetti A. (1991): "Gio Ponti". In: Frames, 34, 36-41.

Polano 1991
Polano S. (1991): Guida all'architettura italiana del Novecento, Milan: Electa.

Casciato, Mornati, Scavizzi 1992
Casciato M., Mornati S., Scavizzi C. P. (eds.): Il Modo di Costruire. 150 anni di costruzione edile in Italia. Conference Proceedings (Rome, November 13-15, 1991), Rome: Edilstampa.

Poretti 1993
Poretti S. (1993): "Storie di marmi. Il problema dei rivestimenti lapidei nell'architettura degli anni trenta". In: M- G. Gimma (eds.), Il restauro dell'architettura moderna, Viterbo: BetaGamma, 274-288.

Dal Piaz 1992
V. Dal Piaz V. (1992): "«Il cantiere università» durante il rettorato di Carlo Anti". In: Carlo Anti. Giornate di Studio nel Centenario della nascita, Conference Proceedings (Verona-Padua-Venice, March 6-8, 1990), Trieste: Edizioni Lint, 241-286.

Brunetti 1993
Brunetti F. (1993): Architetti e fascismo, Florence: Alinea.

Ciucci, Dal Co 1993
Ciucci G., Dal Co F. (1993): Architettura italiana del '900. Atlante, Milan: Electa.

Cupelloni 1993
Cupelloni L. (1993): "Restaurare il Moderno. Il caso della Città Universitaria". In: Disegno industriale e produzione edilizia, special issue, 10-27.

Arditi, Serrato 1994
Arditi G., Serratto C. (1994): Gio Ponti. Venti cristalli di architettura, Venice: Il Cardo.

Irace 1994
Irace F. (1994): Giovanni Muzio 1893-1982. Opere, Milan: Electa.

Puppi 1994
Puppi L. (1994): “Campigli al Liviano”. In: B. Mantura (eds.), Massimo Campigli, Catalogue of the exhibition (Padua, May 1- July 24, 1994), Milan: Electa, 44-52.

Poretti 1994
Poretti S. (1994): “Tecniche di costruzione fra modernismo e autarchia”. In: Roma moderna e contemporanea, 2, 775-796.

Poretti 1994-1995
Poretti S. (1994-1995): “La facciata del palazzo delle Poste di Napoli e la questione dei rivestimenti lapidei nell’architettura italiana degli anni trenta”. In: Rassegna di Architettura, 84-85, 28-37.

La Pietra 1995
La Pietra U. (eds.) (1995): Gio Ponti, Milan: Rizzoli.

Muratore 1995
Muratore G. (eds) (1995): Cantieri romani del Novecento: maestranze, materiali, imprese, architetti nei primi anni del cemento, Rome: Archivio Guido Izzi.

La Pietra 1996
La Pietra U. (eds.) (1996): Gio Ponti, New York: Rizzoli.

Cohen 1997
Cohen J. L. (eds.) (1997): Les Années 30. L’architecture et les arts de l’espace entre industrie et nostalgie, Catalogue of the exhibition (Paris, 23 January 23- April 15, 1997), Paris: Éd. du Patrimoine.

Falconi 1998
Falconi L. (1998): Fontana Arte. Una storia trasparente, Milan: Skira.

Casciato, Mornati, Poretti 1999
Casciato M., Mornati S., Poretti (eds.): Architettura moderna in Italia. Documentazione e Conservazione, Do.co.mo.mo Italia Conference Proceedings (Rome, January 21-23, 1998), Rome: Edilstampa.

Fontana 1999
Fontana V. (1999): Profilo di architettura italiana del Novecento, Venice: Marsilio.

Greco 1999
Greco C. (1999): “Intervento di restauro e riuso di un appartamento nella palazzina Salvatelli di Gio Ponti a Roma”. In: Casciato, Mornati, Poretti 1999, 533- 540.

Nicoloso 1999
Nicoloso P. (1999): Gli architetti di Mussolini. Scuole e sindacato, architetti e massoni, professori e politici negli anni del regime, Milan: Franco Angeli.

Scarrocchia 1999
Scarrocchia S. (1999): Albert Speer e Marcello Piacentini. L’architettura del totalitarismo negli anni Trenta, Milan: Skira, 139-161.

Martignoni 2000
Martignoni M. (2000): “Adalberto Libera e Gio Ponti. Carteggio negli anni di guerra”. In: Studi trentini di scienze storiche, 1/2, 133-153.

Kish 2001
Kish B. (eds.): Gio Ponti. A Metaphysical World, Catalogue of the exhibition (New York, February 15- May 20, 2001), New York: Queens Museum of Art.

Massarente 2001
Massarente A. (2001): “Parlando “per interposte immagini”. Questioni di forma e contenuto da “Amate l’architettura” di Gio Ponti (1957)”. In: P. Bonifazio, R. Palma (eds.), Architettura e spazio scritto. Forme e tecniche delle teorie dell’architettura in Italia dal 1945 ad oggi, Turin: Utet.

Miodini 2001
Miodini L. (2001): Gio Ponti. Gli anni Trenta, Milan: Electa.

Olmo 2001
Olmo C. (eds.) (2001): Dizionario dell’architettura del XX secolo, 5, Turin: Umberto Allemandi, 127-129.

Casciato, Poretti 2002
Cascato M., Poretti S. (eds.): Il palazzo della Civiltà Italiana. Architettura e costruzione del Colosseo Quadrato, Milan: Federico Motta editore.

Cimoli 2002
Cimoli A. C. (2002): “L’archivio di Gio Ponti”. In: L’architettura. Cronache e storia, 558, 305-306.

Martignoni 2002
Martignoni M. (2002): Gio Ponti. Gli anni di Stile 1941-1947, Milan: Abitare Segesta.

Romanelli 2002a
Romanelli M. (eds.) (2002): Gio Ponti. A World, Catalogue of the exhibition (London, May 3- October 6, 2002), Milan: Abitare Segesta.

Romanelli 2002b
Romanelli M. (eds.) (2002): Gio Ponti. A World, Catalogue of the exhibition (Milan, October 19- January 15, 2003), Milan: Abitare Segesta.

Amate l’architettura 2004
(2004): G. Ponti, Amate l’architettura. L’architettura è un cristallo, Milan: Società Editrice Cooperativa CUSL, anastatic edition.

Ciucci, Muratore 2004
Ciucci G., Muratore G. (eds.): Storia dell’architettura italiana. Il primo Novecento, Milan: Electa.

Sermisoni 2004
Sermisoni S. (2004): Gio Ponti. Cento lettere, Milan: Archinto.

Dal Piaz 2005
Dal Piaz V. (2005): “La scala del sapere del Bo a Padova. Gio Ponti architetto-pittore”. In: G. Biscontin, G. Driussi (eds.), Sulle pitture murali (Brixen, July 12-15, 2005), Venice: Edizioni Arcadia, 437-446.

Falconi 2005
Falconi L. (2005): Gio Ponti. Interni, oggetti, disegni 1920-1976, Milan: Electa.

Pontiggia 2005
Pontiggia E. (2005): In viaggio con Fontana, Gio Ponti, Boetti... il mondo di Lisa Ponti, Cinisello Balsamo: Silvana editoriale.

Colpo, Valgimigli 2006
Colpo I., Valgimigli P. (eds.): Pittori di muraglie. Tra committenti e artisti all’Università di Padova 1937-1943, Catalogue of the exhibition (Padua, March 25- May 28, 2006), Treviso: Canova.

Crippa 2006
Crippa M. A. (2006): “Il restauro del moderno, problemi e casi di studi d’architettura”. In: Arte lombarda, 146/148, 285-895.

Barranco di Valdivieso 2007
Barranco di Valdivieso A. (2007): “Le forme della luce. Alcuni disegni inediti di Gio Ponti”. In: Il disegno di architettura, 33, 47-52.

Colpo 2007
Colpo I. (2007): “Il committente e l’artista. L’opera di Carlo Anti tra Bo e Liviano”. In: Eidola, 3, 109-151.

Nelson 2007
Nelson G. (2007): Building a new Europe. Portraits of moderni architects, 1935-1936, New York: Yale University Press.

Bignami 2008
Bignami S. (eds.), "Aria d'Italia" di Daria Guarnati. L'arte della rivista intorno al 1940, Milan: Skira.

Dal Piaz 2008
Dal Piaz V. (2008): "La Mostra della Vittoria a Padova del 1938 progettata da Gio Ponti". In: A. M. Spiazzi (eds.), La memoria della Prima guerra mondiale. Il patrimonio storico-artistico tra tutela e valorizzazione, Vicenza: Terra Ferma, 309-323.

Domus 2008
(2008): "Gio Ponti". In: Domus, 911, monographic issue.

Nezzo 2008
Nezzo M. (eds.): Il miraggio della concordia. Documenti sull'architettura e la decorazione del Bo e del Liviano: Padova 1933-1943, Vicenza: Canova edizioni.

Nicoloso 2008
Nicoloso P. (2008): Mussolini architetto. Propaganda e paesaggio urbano nell'Italia fascista, Turin: Einaudi.

Poretti 2008
Poretti S. (2008): Modernismi italiani. Architettura e costruzione nel Novecento, Rome: Gangemi.

Blanchaert 2009
Blanchaert J. (2009): "L'architettore Gio Ponti". In: Art e dossier, 256, 36-42.

Fossi 2009
Fossi G. (2009): "La tecnica e il dettaglio". In: Art e dossier, 256, 43-45.

Irace 2009
Irace F. (2009): Gio Ponti, Milan: Federico Motta editore.

Roccella 2009a
Roccella G. (2009): Gio Ponti 1891-1979. Maestro della leggerezza, Köln: Taschen.

Roccella 2009b
Roccella G. (2009): Gio Ponti 1891-1979. Meister der Leichtigkeit, Köln: Taschen.

Celant 2011
Celant G. (eds. (2011): Espressioni di Gio Ponti, Catalogue of the exhibition (Milan, May 6- July 24, 2011), Milan: Electa.

Chelz 2011
Chelz C. (2011): "Pietro Chiesa and the Language of Modern Glass in Interwar Italy". In: Journal of Glass Studies, 53, 215-231.

Aria d'Italia 2011
(2011): "Espressione di Gio Ponti". In: Aria d'Italia, n. 8, Milan: Electa, anastatic edition.

Dulio 2011
Dulio R. (2011): Pontesca. In: Casabella, 806, 104-106.

Irace 2011
Irace F. (2011): Gio Ponti, Milan: 24 Ore Cultura.

Molinari, Rostagni 2011
Molinari L., Rostagni C. (eds.): Gio Ponti e il Corriere della Sera, 1930-1963, Milan: Rizzoli.

Ciucci, Lux, Purini 2012
Ciucci G., Lux S., Purini F. (eds.) (2012): Marcello Piacentini architetto 1881-1960 (Rome, 16- 17 December 2010), Rome: Gangemi.

Crippa 2012
Crippa M. A. (2012): "L'umana avventura dell'architetto Gio Ponti". In: Arte cristiana, 870/872, 373-384.

Deboni 2012
Deboni F. (2012): Fontana arte. Gio Ponti, Pietro Chiesa, Max Ingrand, Turin: Umberto Allemandi.

Rossi 2012
Rossi P. O. (2012): Roma. Guida all'architettura moderna 1909-2011, Rome: Laterza.

Toscani 2013
Toscani C. (2013): Tutto al mondo deve essere coloratissimo. In: G. Jean (eds.), La conservazione delle policromie nell'architettura del XX secolo, Conference Proceedings (Lugano-Canobbio, February 8-9, 2012), Florence: Nardini, 97-105.

Bosoni 2014
Bosoni G. (2014): Franco Albini e la Gommapiuma Pirelli. Per una storia della schiuma di lattice di caucciù in Italia (1933-1951). In: A/I/S/Design. Storie e Ricerche, 4.
[www.aisdesign.org/aisd/franco- albini-e-la-gommapiuma-pirelli-per-una-storia-della-schiuma-di- lattice-di-caucciu-in-italia-1933-1951]

Pisani 2014
Pisani S. (2014): Die Villa als unzeitgemäße Reflexionsfigur des Selbst im faschistischen Italien. In: S. Pisani, E. Oy-Marra (eds.), Unter Mitarb. von Katharina Siebenmorgen, Conference Proceedings (Mainz, October 27-29, 2011), Bielefeld: Tanscript.

Ciucci 2015
Ciucci G. (2015): "Le riviste di architettura fra il 1945 e il 1965". In: Rassegna di Architettura e Urbanistica, 146, 31-45.

Falconi 2015
Falconi L. (2015): "Gio Ponti. du retour au classicisme à la naissance du design". In: G. Cogeval, B. Avanzi (eds.), Dolce vita? Du Liberty au design italien (1900-1940), Catalogue of the exhibition (Paris, April 14- September 13, 2015), Paris: Skira, 143-149.

Licitra, Rosselli 2015
Licitra S., Rosselli P. (eds.) (2015): G. Ponti, Amate l'architettura. Una storia editoriale, schizzi, disegni, lettere e telegrammi, Milan: Rizzoli.

Mannini 2015
Mannini L. (2015): "Un «uomo di gusto finissimo goloso ed accorto»: Pietro Chiesa maestro vetraio ed eclettico collezionista". In: Rassegna di studi e notizie", 37, 227-251.

Beese 2016b
Beese C. (2016): Marcello Piacentini. Moderner Städtebau in Italien, Berlin: Reimer Verlag, 254-270.

Blanchaert 2016
Blanchaert J. (2016): "Solo architetto? Ci sarebbe bastato. Gio Ponti e l'Art Déco". In: Art e dossier, 335, 48-53.

Irace 2016
Irace F. (2016): "Facciate leggere". In: C. Togliani (eds.), Un palazzo in forma di parole. Scritti in onore di Paolo Carpeggiani, Milan: Franco Angeli, 448-460.

Pratesi 2016
Pratesi M. (2016): Gio Ponti, vita e percorso artistico di un protagonista del XX secolo, Pisa: Pisa University Press.

Rostagni 2016
Rostagni C. (eds. by): Gio Ponti, stile di, Milan: Electa.

Salvo 2016a
Salvo S. (2016): Restaurare il Novecento. Storia, esperienze e prospettive in architettura, Macerata: Quodlibet.

Salvo 2016b
Salvo S. (2016): "Il patrimonio architettonico del Novecento nell'orizzonte del restauro". In: Materiali e strutture, 10, 121-138.

Scagliola 2016
Scagliola I. (2016): Comprendere Gio Ponti e la bellezza matematica delle cose, Asti: Editori Nova Ars.

Bellucci 2017
Bellucci G. (2017): "L'oscuro contributo degli "inclassificabili" storici-ingegneri civili italiani allo studio della storia dell'ingegneria e dell'architettura contemporanea". In: Studi e ricerche di storia dell'architettura, 1, 48-65.

Bertolazzi 2017
Bertolazzi A. (2017): Gli isolanti termici (1920-1940). Tecniche e materiali nella costruzione italiana, Milan: Franco Angeli.

Spinelli 2017
Spinelli L. (2017): "La fotografia e le riviste italiane di architettura. La "Domus" di Gio Ponti". In: M. A. Crippa, F. Zanzottera (eds.), Fotografia per l'architettura del XX secolo in Italia. Costruzione della storia, progetto, cantiere, Conference Proceedings (Milan, November 24-25, 2016), Cinisello Balsamo: Silvana editoriale, 146-159.

Tramonti 2017
Tramonti U. (2017): "Architettura e Art déco in Italia, immagini di modernità". In: V. Terraroli (eds.), Art Déco. Gli anni ruggenti in Italia 1919-1930, Catalogue of the exhibition (Forlì, February 11-January 18, 2017), Cinisello Balsamo: Silvana editoriale, 41-53.

Beese, Dobler 2018
Beese C., Dobler R. M. (eds.): L'urbanistica a Roma durante il ventennio fascista, Rome: Campisano editore.

Bouilhet-Dumas, Forest, Licitra 2018
Bouilhet-Dumas S., Forest D., Licitra S. (eds.): Gio Ponti archi-designer, Catalogue of the exhibition (Paris, October 19, 2018- February 10, 2019), Paris: MAD.

Colonetti 2018
Colonetti A. (2018): "Antropologie contemporanee. I paradigmi progettuali di Gio Ponti". In: Art e dossier, 352, 28-33.

Giuliano 2018
Giuliano A. A. (2018): I materiali dell'architettura italiana tra le due guerre. Conoscenza e catalogazione per il restauro architettonico, Milan: StreetLib.

Nicoloso 2018a
Nicoloso P. (2018): Marcello Piacentini. Architettura e potere. Una biografia, Udine: Gaspari.

Nicoloso 2018b
Nicoloso P. (2018): "Un "faro della civiltà italiana". La Città Universitaria di Rio de Janeiro di Piacentini e Morpurgo. 1935-1946". In: Quaderni dell'Istituto di Storia dell'Architettura, special issue, 65-80.

Patetta 2018
Patetta L. (2018): Gio Ponti e l'Architettura Organica?. In: Il disegno di architettura, 43, 49-56.

Rucellai 2018
Rucellai O. (2018): Il Centro da tavola per il Ministero degli Esteri su disegno di Gio Ponti. Varianti e precisazioni. In: Amici di Doccia. Quaderni, 11, 71-93.

Abbate, Vigevano 2019
Abbate C., Vigevano C. (eds.) (2019): Gio Ponti inedito Rediscovered. Notre Dame de Sion, Roma, Florence: Forma Edizioni.

Bonaccorso 2019
Bonaccorso G. (2019): "Giovannoni, Muñoz, e il "pericolo Borromini" per i giovani architetti italiani". In: F. Bonaccorso, F. Moschini (eds.), Gustavo Giovannoni e l'architetto integrale, Conference Proceedings (Rome, November 23-25, 2015), Rome: Accademia Nazionale di San Luca, 313-320.

Buratti 2019
Buratti A. C. (2019): "La lezione di Palladio nella cultura progettuale di "Novecento" a Milano. Mino Fiocchi e Gio Ponti, due interpretazioni a confronto". In: Disegnare. Idee. Immagini, 58, 12-23.

Casciato, Irace 2019
Casciato M., Irace F. (eds.): Gio Ponti. Amare l'architettura, Catalogue of the exhibition (Rome, November 27, 2019- April 13, 2020), Florence: Forma edizioni.

Dal Falco 2019
Dal Falco F. (2019): Italian Rationalist Design. Modernity between Tradition and Innovation. In: MPDI- Arts, 27, 1-40.

Licitra 2020
Licitra S. (eds.) (2020); Gio Ponti, Köln: Taschen.

SCIENTIFIC PROFILES OF AUTHORS

Martina Attenni
Architect and PhD, is adjunct professor since 2019 at the Department of History, Representation and Restoration of Architecture at Sapienza University of Rome. She is interested in integrated methods of non-contact surveying for architectural and archaeological heritage, and studies 3D surveying technologies and data modeling, and BIM/HBIM processes for the knowledge, management, and communication.

Flaminia Bardati
Architect and Phd, is Associate Professor of History of Architecture at Sapienza University. Her research interests mainly focus on cross-cultural interactions between Italy and France from the 15th to the early 20th century, especially on the role of cardinals' patronage of arts in the diffusion of Renaissance (research supported by a Getty Postdoctoral Fellowship in 2006). She has published extensively on these topics, with books essays and articles on national and international scientific reviews and, more specifically, on Sapienza's seat of the School of Architecture in piazza Borghese and on the interiors of Gio Ponti's School of Mathematics.

Maria Carla Ciacchella
Conservation Scientist, PhD in Materials Engineering, is a conservation scientist mainly interested in material characterization, provenance studies and technologies applied to cultural heritage. Her professional activity deals with the analyses of the materials the construction techniques and the state of conservation.

Simone Castellan
Mathematician, currently PhD candidate, studied at "La Sapienza" in Rome, where he completed his Bachelor (2018) and Master (2020) in Mathematics. He is currently PhD candidate at the University of Glasgow. His research focusses on algebra and representation theory, with applications to integrable systems. He is particularly interested in problems of quantization, both of Poisson and Poisson vertex algebras.

Marianna Cortesi
Architect, Specialist and PhD student in Architectural Conservation at Sapienza University, has recently obtained funding for research on recycled materials dedicated to architectural conservation. Her scientific interests focus on the conservation of modern architecture and on advanced sustainable policies for the conservation and maintenance of construction materials.

Alberto Coppo
Architect and PhD in History of Architecture at Sapienza University of Rome, is currently freelance professional in historical and archival investigation and has long collaborated with the Accademia di San Luca of Rome in the reorganization of 20th century architects' archives and with the Italian Ministry of Culture within the project "Censimento delle Architetture del Secondo Novecento". His scientific interests focus on the history of Italian modern architecture and on contemporary urban planning.

Elisabetta Giorgi
Architect, qualified in Restoration of Monuments, has taken part in research activities at ICCROM-International Centre for the Study of the Preservation and Restoration of Cultural Property, in restoration sites for the consolidation of frescoes, experimenting hydraulic mortars. She has cooperated with IsCR-National Institute for Conservation and Restoration in educational sites and takes part to research and teaching activities of the Architecture courses at Sapienza University, where she is currently the technical manager of AStRe LabMat Laboratory for Historical Architecture and Restoration.

Alfonso Ippolito
Architect, is Associate Professor in Architectural Survey and Descriptive Geometry at Sapienza University of Rome. He has worked on the survey of the Dome of St Peter at the Vatican, of the wooden model of Antonio da Sangallo the Younger of the same Basilica, of the Arch of Giano in Rome, of the Roman theatres in Merida (Spain), of the El Khaseneh theatre and royal tombs at Petra an of the theatre in Jarash (Jordania), of the dome of San Carlo ai Catinari in Rome. He is member and referee of Computer Applications and Quantitative Methods in Archaeology since 2012, of the editorial board of "Disegnare. Idee Immagini" since 2005.

Giuseppe Lanzo
Engineer and PhD, is currently Associate Professor at Sapienza University of Rome. He obtained his M.S. degree in Hydraulic Engineering in 1988 and his Ph.D. in Geotechnical Engineering in 1995, from Sapienza University of Rome. Primary research interests are in geotechnical engineering, with focus on soil dynamics. He has participated to national and international research projects and has been speaker and session leader in national and international conferences. He is the author or coauthor of more than 150 scientific publications.

Laura Liberatore
Engineer and PhD, is Assistant Professor in Structural Engineering at Sapienza University of Rome. She has been Assistant Professor in Structural Mechanics (2008-2021) and holder of research grants (2002-2008). She obtained her PhD in Structural Engineering in 2002 and her master's degree in civil Structural Engineering in 1996, with honors. Her research activity is mainly focused on the response of structures subjected to earthquakes. She participated to research projects as investigator or principal investigator and authored more than 70 scientific papers.

Francesco Mancini
Mechanical engineer and PhD, is Assistant professor in Technical Plants at Sapienza University of Rome since 2002. He has been carrying out research activities since 1999, focussing on procedures and methodologies for the control and improvement of energy-environmental quality in buildings, with specific reference to the passive behaviour of the building envelope; on plant systems with low primary energy consumption that rely on renewable energy sources or high-efficiency plant systems; and on the definition of maintenance strategies to increase energy efficiency of the building heritage.

Ilaria Martella
Architect, graduated with honors in 2019 at Sapienza University of Rome, has obtained research grants from Sapienza University of Rome. Her professional interests focus on structural issues and architectural design. She is currently freelance architect and associate for an architectural design and construction consulting firm.

Luisa Pandolfi
Architect, graduated with honors in 2018 at Sapienza University of Rome is specialized in the analysis and restoration of historic and monumental buildings. Her professional activity mainly deals with the conservation of architectural materials and on the identification of structural criticalities.

Giada Romano
Architect, graduated with honors in 2019 at Sapienza University of Rome, is currently PhD. Her specific scientific interests focus on technological-plant engineering aimed at improving energy-environmental quality and at redeveloping the existing building heritage. Her current research activity concerns the deep energy-zero emission renovation of buildings through the improvement of the processes of circularity of resources in urban districts.

Maria Rosso
Architect and PhD, she has been postdoctoral fellow at the Research Center for Sciences Applied to the Protection of the Environment and Cultural Heritage at Sapienza University of Rome has obtained a Master's in Museum Didactics Centre of the Roma Tre University and has worked for CNR-National Research Center. She is currently cooperating within CITERA Department of Sapienza University focussing on adaptive reuse of historic buildings and perceptive comfort.

Simona Salvo
Architect, PhD and Specialist, is Associate Professor in Architectural Conservation at Sapienza University of Rome. Her scientific interests are focused on restoration theory and technology, especially concerning contemporary architecture, and the dynamics of spread of the conservation culture throughout the world, and therefore carries out research and teaching activities in collaboration with international universities and cultural institutions. She has lectured extensively and has coordinated national and international research projects, among which the restoration of the Pirelli skyscraper in Milan (2002-2004). She has authored a number of scientific publications concerning architectural conservation.

Maria Laura Santarelli
Chemist and PhD, is Associate Professor at the Department of Chemical Engineering Materials and Environmental of Sapienza University of Rome. She has been Director of the CISTeC-Research Centre in Science and Technology for the Conservation of the Historical-Architectural Heritage of the same university (2013-2019) and is currently responsible for the Heritage-Lab of Sapienza University of Rome and member of the DTC Lazio-Technological District for the Cultural Heritage of the Lazio Region. She has authored over hundred scientific publications.

Nicolò Sardo
Architect, PhD in Drawing and Survey of Heritage Building, is Associate Professor at the School of Architecture and Design, University of Camerino. His research activity is focused on communication and representation of architecture, with a particular reference to photography and depiction through models. He also deals with visual communication and teaches Graphic Design. On these topics he has published numerous scientific contributions.

Luigi Sorrentino

Architect and PhD, is Associate Professor of Structural Engineering at Sapienza University of Rome. His main research interests are the investigation of the static and dynamic behavior of masonry and monumental structures, resorting to experimental, analytical, numerical and statistical tools, as well as their strengthening. He is member of the Working Group 1, Masonry Constructions, for the revision of Structural Eurocode 8, Earthquake-Resistant Constructions.

Chiara Turco
Bachelor's Degree in Architectural Sciences with honors at Sapienza University in March 2020 with a dissertation on Gio Ponti's School of Mathematics, she is currently enrolled in the Master's Program in Architecture (Conservation) at Sapienza University and has obtained an internship at the International Research Center on Contemporary Arts of the Venice Biennale.

Sapienza
Università Editrice
2022

www.editricesapienza.it

ISBN 978-88-9377-233-4