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Crafting ‘Scientific’ Research in Architecture

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"E non conta che questa sua pregiudiziale sia rinnegata da coloro che più dovevo difenderla, o bandita da chi più, vaguamente, la tema: essa resterà, lo stesso, la fede segreta dell'epoca. Sostanza di cose sperate"

The reasons why we do scientific research can be many, from those induced by personal motives to those related with larger, imbricated social concerns, groups, or networks.

Scientific research has gained a special, all-pervasive status in academia in general, and that includes architecture. From digital modeling to tenure dossiers, from building performance to invocations of AI, from grant writing to politicians' electoral statements, scientific research holds a special value, that of *self-legitimation*. While of different kinds, origins, and know-hows, the scientific research is a product of intellectual labor, construction, and processing, rather than one of raw materials taken from nature, even if the (transformation of the) latter may be an object that scientific research. What is scientific research made of? And what are its results? Research is made of a combination of *egos* and *subjectivities* on the one hand and *objects* on the other. This combination is not simple but complex. That is, perhaps, why AI, which aims to replace many activities such as that of the driver, doctor, artisans, and so forth, has not yet replaced the activity scientific of research.

The very combination of the subject and object is at the very heart and origin of what constitutes scientific research. In *How to Write a Thesis* Umberto Eco gave quite a relaxed and operative definition of scientific research when he argued that for research to be scientific it must:

- deal “with a specific object, defined so that others can identify it.”
- say “things that have not yet been said about this object, or it revises things that have already been said from a different perspective.”
- be “useful to others.”
- and provide “the elements required to verify or disprove the hypotheses it presents, and therefore it provides the foundation for future research” (Eco, 27-30, 2015)

Such “loose” scientific requirements trigger a multiplicity of research agendas and objects. The 26th issue of Forum A+P dwell precisely on this multiplicity.

The main purpose of research is the growth of goods that are the fruit of human intellectual processing. But how is this production related to the field of architecture or planning? What is the objective of the research in these two fields whose primary object of inquiry is the human-inhabited space? It is regarding such question that Edoardo Persico considers the quality of the form and settlements where people live as “*the secret faith of the time*”. *Substance of things hoped for*.” So, we can affirm without hesitation that the scientific research in the discipline of architecture and/or planning is that of improving the condition of the settlements where we live. Regarding the methodology used in scientific research, one could claim that traditionally, science moved forward by following a Hegelian dialectical logic where thesis and antithesis are synthesized to a conclusion, while today attempts are made to move towards a dialogic orientation of science, where there is not a clash between two different theses but an equal confrontation of both theses in order to draw, following a logical win-win, conclusions that are not exclusive of one another but sum up in one the most fruitful aspects of both. The coupling of the ‘scientific’ with ‘research’ may be new in architecture. In Le Corbusier, for instance, we find multiple references to science on the one hand and research (*recherche patiente*) on the other, but rarely we find the two terms coupled into one, as in ‘scientific research’. The relationship of architecture with science, however, has a long history. In 1946, Le Corbusier met with Albert Einstein in Princeton, NJ, seeking ‘scientific’ validation for his *Modulor*. His pursuit represents Architecture’s eternal desire to be bound to Science, seen in both its employing science for assembling material realities, as well as in the rhetoric of a scientific design process. The history of architecture is not void of architecture-science relations: Anaximander’s cartographies, Descartes tri-axial spatial matrix, Newton’s static and relative spaces, the cosmic Baroque geometry of Galileo and Kepler, Giedion’s histories of architectural technology, and Hannes Meyer’s call for the ‘scientization of architec-

ture' are some cases in point. Even passionate Borromini had to redraw the plans of San Carlino according to a geometrical scheme thirty years after the church was constructed to convey a sense of scientific objectivity... Gaspard Monge formulation of descriptive geometry at the end of the 18th and beginning of the 19th century, is a direct example of how a mathematician's contribution to the presentation of objects affects the presentation of architecture and its formation. Perhaps the French mathematician was not aware that even today in the XXI century we would still present the projects following the logic of presentation according to descriptive geometry. Jean-Nicolas-Louis Durand's modularization of architecture, Semper's emphasis on technics, Auguste Choisy's axonometric drawings of historical monuments, Wittkower's drawings of Palladio's villas, Colin Rowe's repurposing of Perrault's scientization of beauty through the dispositif of the natural and the customary, Eisenman's generative analysis, Aldo Rossi's rationalization and, thus, operationalization of the concept of type, Christopher Alexander's coding of perception and objects (*a veritable precursor of today's smart city*), as well as the digital turn in architecture – they all seek a specific relationship with science, more precisely, the scientific thinking. Nor is the history of architecture void of monuments to scientists, for example, Boullée's Cenotaph for Newton and Erich Mendelsohn's Einstein Tower. In '*digital artists*' such as Nicolas Schoffer, Iannis Xenakis, Harold Bloom, Patricia Piccinini among others, both addressing and employing scientific perspectives from quantum physics, nanotechnologies, biotechnologies and so on, Modern Art and Architecture and their histories evince multiple liaisons with the History of Science. It should be emphasized that research does not always have a scientific form. It can be and in most cases it is empirical. We must say that genuine scientific research has a life of nearly four centuries. It used to be developed empirically. With the European Enlightenment, whose main figures were Descartes, Newton and Francis Bacon, the first traces of scientific research begin. The beginning of the research in architecture corresponds to the period of the birth of "*scientific*" thought in the period of enlightenment. In fact, authors such as Blondel, Laugier or even Semper, who comes almost a century later after the first two, begin to codify the origin of architecture to make it a "*scientific*" discipline such as mathematics, biology, chemistry or others. We can affirm that "*scientific*" research in architecture has the same "*age*" as research developed for other sciences, only that research in architecture has a different character from other sciences. The research hypotheses in architecture and the result cannot be verified and analyzed in the normal range (4-5 years) of research on a certain topic. At this point, the scientific value of a research in architecture is determined by the correct choice of the argument that will be treated as Eco would claim. Such a wealth of intersections of science and architecture suggest that it is impossible to separate and sometimes even distinguish between scientific research from its representation(s) as such. The latter consists of different languages, contexts, and artifacts.

A definitive answer on how and what should the scientific

research on architecture be in the present and near future? But, today, we can talk about the usefulness of scientific research. Why do we do scientific research? Who is the objective of research in architecture and planning? and who can be the search scenarios in the future? This issue presents contributions that deal precisely with the ideas and objects of scientific research in architecture, *broadly defined* as an inter-disciplinary approach to the built environment - from furniture, to building, to territory. This issue, then, is about the *combinations of subjectivities and objects through which the scientific research comes into being both in terms of its implementation and representation as such, as scientific research*. This issue proposes four kinds of architectural objects: historical, technical, textual, and territorial. These are not meant to be strict categories, but a "*loose*" structure that might help, however little, to distinguish among a multitude of nuances and hybridity in our vast milieu of informatics.