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RATIONAL RECONSTRUCTIONS AND ARCHITECTURAL KNOWLEDGE

The “rational reconstruction” of the title stems from the thought of Imre Lakatos, from his logic of scientific discovery as constructed in the essay and book titled *The Methodology of Scientific Research Programmes*.1 Lakatos, a student of Karl Popper, retained his mentor’s *fallibilism*—there is no certainty in our intellectual pursuits—but rejected Popper’s *falsificationism*—the growth of knowledge through the assertion of bold hypotheses tested to failure (to state Popper’s position without the appropriate subtleties). Lakatos’ methodological unit of inquiry was not that of Popper, not Popper’s theory, or concatenation of theories, but rather *research programs* as set out in Lakatos’ methodology.

Long ago I made an attempt to place Lakatos’ epistemological position into the architectural discourse.2 In this paper I rely more directly on another of Lakatos’ essays, “History of science and its rational reconstructions.”3 However, the

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argument of Lakatos’ essay on history is entailed by his Research Programs, and thus I cannot avoid a brief consideration of Lakatos’ main essay.

**Lakatos’ research programs**

According to Lakatos’ methodology, the unit of appraisal in scientific discovery is not a theory or even a conjunction of theories, but rather a *research program* (fig. 1). He describes the program as composed of a “hard core” that is sustained for the life of the program, a band of “auxiliary hypotheses” that are revised in order to sustain the logic of the program as it confronts new conditions, and a “positive heuristic” that guides the course of the inquiry.

The hard core is not a matter of truth. Fundamental to Lakatos’ thought, and perhaps counter-intuitive, is this: What Lakatos terms the ‘hard core’ of a research program is accepted by convention and, during the pursuit of the program, the hard core is methodologically considered irrefutable. Now, quoting from Lakatos, the *hard core*, joined with a *positive heuristic*, “… defines problems, outlines the construction of a belt of auxiliary hypotheses, foresees anomalies and turns them victoriously into examples, all according to a preconceived plan. … It is primarily the positive heuristic of his programme, not the anomalies, which dictate the choice of his problems. Only when the driving force of the positive heuristic weakens, may more attention be given to anomalies. The methodology of research programmes can explain in this way the high degree of autonomy of theoretical science.”

**Lakatos’ autonomy and its limits**

What Lakatos’ explanation of the hard core may not adequately emphasize is this: it is the methodologically sustained hard core that provides a *high-degree of autonomy* to the enterprise. Thus autonomy is not given by some absolute foun-

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4 Ibid., pp. 110–111. The following paragraphs are indebted to the following pages of the same essay.
dation, but rather is asserted, held by convention, in order that an intellectual (or creative) enterprise can be conducted—and that enterprise is to be judged by its results rather than by some ultimate authority. Autonomy without authority.

So, with Lakatos, anything goes? Thanks to the methodologically-held hard core, programs can, and indeed should, be held tenaciously. Yet research programs can be assessed. One program, in its development, may predict a novel fact and thus show itself to be “theoretically progressive.” That prediction may be corroborated, and thus the program is also “empirically progressive.” “Program shifts” of another program may be degenerative. For example, a competing program may lag behind in prediction and incorporate new facts only by ad hoc, increasingly complex, auxiliary hypotheses introduced solely to sustain the program’s hard core.

Lakatos does not assume that the apparently degenerative program can be definitively eliminated—he is a fallibilist, we have no certainty. Nonetheless, to use a Popperian term, a demarcation, though one less rigid than with Popper, is drawn between science and pseudo-science thanks to the critical analysis and comparison of programs.

Lakatos’ historiography: External and internal history
There is of course much more to be said about Lakatos’ methodology, but for current purposes I wish to move on to its implications for history. Lakatos asserts that any methodology also constitutes a historiographic research program. With Lakatos, for example, the historian is led to look for research programs and progressive or degenerating problem shifts within the programs. This constitutes the internal history of the program. Note that Lakatos, concerned with science, speaks of rival research programs, and looks to those occasions where one program defeats another. Looking to architecture, for the word “rival” I would substitute “competing,” as it would be more common that

5 Ibid., p. 114.
multiple programs can thrive. In the arts, some programs may lose their force, but “defeat” may be rare.

Any internal history must be supplemented with an external history. What research programs are established, which ones thrive or may disappear for lack of support, are largely issues external to the program itself. However, in Lakatos’ formulation, it is possible that what for others would be seen as external to scientific research may be held within the program and thus in the internal history.

**Research programs in the work of Le Corbusier**

Here I recall my effort to recognize research programs in the work of Le Corbusier, but now give more emphasis to the related issue of internal history. I assert, and it is a common claim, that Le Corbusier’s Five Points and his villas of the late ‘20s constitute a significant innovation in the discipline of architecture (fig. 2). I see them as parts of a research program and thus as the subject of an internal history. They emerge as contributions to knowledge, to the autonomy of architecture.

Le Corbusier’s achievement took place in the context of, and requires the presence of certain material conditions. In accord with Lakatos, these material, and seemingly external conditions, may be assigned to both the internal and external history of the program, as I will later demonstrate. Especially in a field like architecture, it is precisely because some material matters must be assigned to the program and its internal history that I prefer to speak of the *quasi-autonomy* rather than the autonomy of architecture.

Commentators often locate the underlying concept of the Five Points in Le Corbusier’s famous perspective drawing of the skeleton of the Maison Dom-ino, a work that precedes the Five Points by more than a decade (figs. 3, 4). This, despite the fact that Le Corbusier, in the first volume of his *Oeuvre complète*, in

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6 The reference is to my “Architectural Research Programmes in the Work of Le Corbusier.”
his presentation of the Maisons Dom-ino project, relates that 1914 work not to the Five Points and the villas of the late 1920s, but rather to the cognate housing project of the Maison Loucheur of 1929. Admittedly, the Maisons Loucheur do modestly draw on the Five Points, but the implication of Le Corbusier’s reference is to continue to see the Maisons Dom-ino as the beginning of an experiment in rationalized social housing rather than as the seed of an intrinsically architectural innovation. In so doing, Le Corbusier is consistent with what I will call the external history of the Maison Dom-ino project.

The Maison Dom-ino project was distinctly pragmatic in its origins; its premises are more fully revealed by attention not only to the famous “ossature” perspective, but especially to other Dom-ino project drawings: plans, detail drawings, and perspectives of possible houses/housing based on the project (figs. 3, 5). The project grew out of Le Corbusier’s interest to develop a system using the relatively new technology of reinforced concrete, calculated to meet the severe housing needs in Flanders, an area particularly devastated by the locally sustained battles of World War I. Le Corbusier sought to form an industrialized company for production of the rationalized frame system that could be deployed and then in-filled locally. Under then current exigencies the infill might include rubble from destroyed buildings, though Le Corbusier also envisioned industrialized in-fill systems.

The reflected ceiling plan of the Maison Dom-ino shows that it did not involve “slabs” in the usual sense of that word as monolithic concrete floors (fig. 3). Rather it is a framework of cast-in-place girders and beams formed by small repetitive cement or tile units, destined to have a plaster ceiling. For stability, infill walls would then have preferred locations on the structural lines. Referring to the Maison Dom-ino plans, there is no innovative exploitation of structure or space
(fig. 5). Whenever possible, columns are buried in walls. Where an interior wall is of lesser dimension than a column, the exposed part of the column is boxed-in or projected into the less significant space. Neither is the structure emphasized nor is the planning free from the structure. The cantilevered space beyond the columns on the long sides of the building merely sets the dimensions of insignificant spaces. Where a principal room is projected through that space, there is no distinct recognition of space within or beyond the column line. In brief, examination of the Maison Dom-ino project as a whole, and as it was propounded in 1914, reveals nothing of the Five Points, including the free plan.

Examination of all the drawings of the Maisons Dom-ino project, not just the famous perspective drawing of the skeleton, convinces me that Le Corbusier’s thought and work of the time is fully accounted for by the external historical and technical conditions then under consideration.

**Internal history and Le Corbusier’s early work**

Nonetheless, later events have allowed commentators to make larger claims for the Maison Dom-ino project that can be accepted if we also conceive of “internal histories.” The Five Points were first adumbrated, still in incomplete form, in conjunction with Le Corbusier’s projects for the Weissenhof Siedlung in Stuttgart of 1927 (fig. 6).\(^9\) Published in several forms by Le Corbusier in the mid-1920s (fig. 7),

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9 Le Corbusier: “Calendrier d’architecture“ in his *Almanach d’architecture moderne* (Paris: G. Crès, 1926). Here, Le Corbusier makes an extended presentation within which, with hindsight, one can discern the Five Points. The Five Points are, however, stated succinctly, as points, in two publications associated with the Weissenhof exhibition: Le Corbusier and Pierre Jeanneret, “Fünf Punkte zu einer neuen Architektur.” In: Deutscher Werkbund, *Bau und Wohnung: Die Bauten der Weissenhofsiedlung* (Stuttgart: F. Wedekind, 1927), pp. 27–28; and in Alfred Roth: *Zwei Wohnhäuser von Le Corbusier und Pierre Jeanneret* (Stuttgart: F. Wedekind, 1928). In “Ou en est l’architecture?,” *l’Architecture vivante* (Autumn/Winter 1927), pp. 7–29, Le Corbusier lists six points, adding one on the “suppression of the cornice.” His discussion is heavily weighted to issues of snow on flat roofs and to his sixth point—not to what one would deem the more important architectural issues. Since this is a publication of late 1927, the concern to defend flat roofs in northern winter conditions is probably
the Five Points can, through a rational reconstruction, be seen as part of an internal history of the Maisons Dom-ino project. The Five Points, like the Maison Dom-ino, are premised on a reinforced concrete frame. In the Maison Dom-ino, the independence of the bottom floor plate from the ground may be taken as an anticipation of the *pilotis*. The stair does ascend to the roof and some of the drawings show people and plantings at the roof. Horizontally extended windows are hinted at. The key point, the free plan, is missing, though, with hindsight, its potential can be recognized.

With the Maisons Dom-ino, Le Corbusier made a relatively modest architectural proposition, but his own efforts more than a decade later constitute a rational reconstruction of the original proposition—a reconstruction that opened a genuine architectural innovation. That rational reconstruction is part of an internal history of a significant part of Le Corbusier’s first decades of production. Today we do not accord the Five Points the necessity that Le Corbusier then attributed to them. On the other hand, the Five Points are so intrinsic to architectural thought that it is a conscious decision to adopt them—or not. The Five Points are a contribution to the quasi-autonomy of the discipline of architecture.

**Peter Eisenman, the Maisons Dom-ino, and self-referentiality**

Peter Eisenman’s early architectural work, his “Cardboard Architecture” houses, made commitments remarkably similar to what the famed New York art historian Meyer Schapiro had, sixty years earlier, in 1936, ironically anticipated from some future architect besotted with dreams of autonomy: such an architect would seek “in the name of a similar purity, … an art which conceals or suppresses the tectonic, constructive elements as non-artistic, and which constructs independently of these factors its own effects of mass and space and light.” (fig. 8)\(^\text{10}\)

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A notable version of autonomy in art involves the search for how works exhibit internal reference to themselves and their media. Self-referentiality, aside from its appearance in innovative art, including cinematography, from the late nineteenth century onward, had also been theorized. The major art theorist of mid-twentieth century New York, Clement Greenberg, built his theory, criticism, and indeed his history on the concept.\footnote{See the hugely influential collection of writings, Clement Greenberg: \textit{Art and Culture: Critical Essays} (Boston: Beacon Press, 1961); and now the esteemed critical study of Greenberg and his thought: Caroline Jones: \textit{Eyesight Alone: Clement Greenberg’s Modernism and the Bureaucratization of the Senses} (Chicago: University of Chicago Press, 2005).}

Though his influence was soon to wane, Greenberg’s thought was compelling in the circles in which Eisenman moved in the years of his cardboard architecture.

Accepting that self-referentiality defined modernism in the arts, Eisenman noted that architecture had been slow to adopt this Modernist stance.

Eisenman’s cardboard architecture involved the ambition to bring modernist self-referentiality to the discipline of architecture, and thus to claim for himself a significant position in the cultural world of New York and beyond.

to the image of the Dom-ino skeleton—the perspective drawing of the “ossature” (fig. 3). In so doing, Eisenman set aside the reigning interpretation of that work, stemming largely from the writings of his mentor Colin Rowe. Eisenman asserts that Rowe’s claim for the innovative modernity of the Maison Dom-ino, revealed fully in Le Corbusier’s great villas of the late 1920s, marks only one more instance of historical change in an established mode of representation.

Rather than establishing a historical continuity, as he found in Rowe, Eisenman discerns features of the Maisons Dom-ino that he poses as a radical break with tradition. Relying solely on the famed perspective drawing of the skeleton of the Maisons Dom-ino, Eisenman enters upon a close description entailing such observations as the different lengths, A and B, of the sides of the slabs, the alignment of the slabs and the equal spacing of their vertical stacking (fig. 9a). The possibility of many variations of these factors is noted, and also that such variations entail little more than geometrical distinctions. However, in Le Corbusier’s “ossature” drawing, Eisenman notes, these features are what they are; his respect for Le Corbusier and the renown of the Maisons Dom-ino diagram are such that he unquestioningly makes the assumption that there must be formal intentionality in the given configuration of the Maison Dom-ino skeleton.

What then is that intentionality? Eisenman finds it to be crucially revealed in the relation of the columns to the slabs (fig. 9b). The columns are set back from the long side of the slabs, but are close to the edge of the narrow ends of the slabs. Quoting Eisenman: “[As the difference, A versus B, of the column locations acts to reinforce the original geometric A B relationship which in itself is so clear as not to need reinforcement, one interprets this as an intention to underscore a condition of being, that is as a significant redundancy. … The redundancy

of the mark thereby signals that there is something present other than either the
geometry or the function of the column and slab.”

Eisenman concludes: “Thus, the fact itself—the slab—plus the spatial mark-
ing—the location of the columns—suggest an idea about sides A and B which is
an idea only about itself, a self-referential statement. This then may be a primitive
though truly Modernist phenomenon, one that speaks about its mere exis-
tence and its own condition of being.”

As I read Eisenman’s account, he seems to locate his self-referential reading
of the Maison Dom-ino in the intentions of Le Corbusier. Self-referentiality, he as-
serts, is found in the Maison Dom-ino.

In any case, aside from the always near-impossible task of discerning inten-
tions, I find that the entire set of Dom-ino drawings, as I argued above, under-
mines Eisenman’s account. The collection of drawings undermines Eisenman’s
account if these drawings are examined according to a conventional, external
historical account. But we need not read Eisenman’s account in that way. Indeed,
he surely was not offering an external history of the Dom-ino project. Let us
rather take Eisenman’s essay as a claim for yet another rational reconstruction
of the Maison Dom-ino. We may recall that within Lakatos’ formulation, the hard
core of a theoretical program may entail positions not realized by those who con-
structed it. Thus I have no issue with such an attempt by Eisenman, except to say
that the claim must still withstand criticism. It is not fruitful to accept that the
Maisons Dom-ino hard core can incorporate any interpretation. Of course, one is
inclined to respect Eisenman’s claim to find in Dom-ino an impetus for the kind
of work that he was engaged in. Eisenman’s essay can be seen as generosity in
acknowledging a source for his own thought. At the same time, one can raise the
question of whether Eisenman was reading his position back on Le Corbusier. It
is clear from Eisenman’s article that he sought to make Le Corbusier a pioneer in

14 See note 12, p. 194.
15 Ibid.
an effort in which Eisenman was involved sixty years later and in so-doing to give Le Corbusier a modernist position that Eisenman could use to bludgeon a more conventional historian and theorist like his mentor Colin Rowe. For myself, I am not so convinced that Eisenman’s position can be rationally reconstructed in the Maisons Dom-ino ossature.

Eisenman was involved in a different, honorable but different, research program. But Le Corbusier might give luster to Eisenman? The roles of such things as redundancy or overtly atectonic elements establishing self-referential markings in Eisenman’s cardboard architecture remain, for me, so distant from the nature of the Maisons Dom-ino, that I must question an internal history of the Maisons Dom-ino research program as incorporating Eisenman’s self-referentiality. But recall that I earlier suggested that something so fundamental to Le Corbusier’s achievement as the free plan is only to be visited upon the Maisons Dom-ino by seeing Le Corbusier’s research program as extended in time, incorporating the thought and work of the 1920s. That same extended research program, incorporating the ingenious complexities of Le Corbusier’s villas of the 1920s might provide an internal history that would connect with modernist self-referentiality—which was, after all, a contemporary phenomenon in other artistic ventures.

**Quasi-autonomy**

Returning to an earlier point: we may consider the widespread destruction in Flanders as an external history posing, as do so many other historical circumstances, the need and opportunity to address a housing crisis. But under what program? Viewing the extended history of the Maisons Dom-ino, one recognizes that Le Corbusier sought a distinctive architectural solution. However, one must also recognize external factors that were made internal to his research program: for example, the then still innovative reinforced concrete frame, the felt need for a rationalization of building practice, the presence of quantities of materials from ruined buildings that encouraged a distinction between structure and infill. External factors are integral to the internal history. There is an autonomous aspect to his extended Maisons Dom-ino program, but it has to be seen as “only” quasi-autonomous. This is an important claim for the integrity and, yes, autonomy of the architectural discipline, but also that this discipline must always be understood to operate with and in external conditions. “With” and “in” because a research program is typically facilitated by external history but also only becomes effective by selectively bringing some of that externality into the program.

To summarize my argument: Le Corbusier’s 1915 Maison Dom-ino project receives an adequate account with an external history.
Le Corbusier’s achievements in the late 1920’s, the Five Points and the exceptional villas, require an internal history that incorporates the Maison Dom-ino project and certain external conditions.

Incidentally, I believe this internal history can be continued in Le Corbusier’s career, for example in the Carpenter Center at Harvard University.

While Eisenman’s early architectural projects deserve an internal history of their own, I reject that one can find its source in the Maison Dom-ino project of 1914. At best it would be related to the continuity of Le Corbusier’s program, perhaps down to the Carpenter Center—not as the model for Eisenman’s Cardboard Architecture, but perhaps as an instance of self-referentiality in architecture.

With these examples and others, I would argue that architecture does possess quasi-autonomous knowledge, incorporating internal and external conditions, that gives uniqueness to this discipline—allowing architecture to make its unique contributions to society and the environment.

Now I risk a bridge to a question put in the call for papers for this Bauhaus Colloquium: Can theory “assume a more constructive, projective role of influencing future [global] practice”? Pursuing neither abstruse theorization alone, nor simplistic rationalistic problem-solving, I suggest that the intellectual construct of research programs, and the quasi-autonomy of its selective incorporation of externalities, can bring intellect and design and art to bear on societal conditions.

Finally, our conference program asked about “a more constructive, projective role of influencing future global practice.” Has my presentation addressed this question? How so? What are some possibilities?

- The logic of Research programs opposes meta-histories that would make of such phenomena as globalization a historical necessity or an unassailable force.
- The logic of Research programs reveals and values multiple lines of inquiry.
- The logic of Research programs is resistant to periodization and apparent necessities imposed by claims for a Zeitgeist.
- Modernity is not a period, but, as Foucault has said, an attitude.\(^\text{16}\)
- Modernity itself might be seen as a broad and extended research program.

How do rationalism and the pursuit of liberty and justice, survive, adapt, and thrive under changing external conditions?

- Globalization should not be re-ified, periodized. It is not new in our time. It is not monolithic. It presents opportunities.

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• Earlier positions may be rationally reconstructed to serve well in new circumstances.

• The internal history of architecture, and architectures, is more crucial than the conventional or external history.

• The logic of Research Programs offers internal histories that recognize what architecture can uniquely bring to the table, but nonetheless also recognizes the quasi-autonomy of architecture – that it must engage its social and technical dimensions.

I am ready to join in severe criticism of what the Colloquium has termed “Empire,” but we may nonetheless recognize some promising conditions within globalism. Do our patterns of global activity provide also a positive breeding ground: for example, does it provide conditions and opportunities that facilitate interchange, learning and understanding, that, whether observed at the level of individuals or societies, nurture a robust form of cosmopolitanism, encouraging and making provision for world-citizens?

If so, then, in the realm of architecture, one might share the fruit of our rational reconstructions: quasi-autonomous architectural knowledge that is not local in concept but capable of acting locally and responsibly.