

**UCLA**

**UCLA Electronic Theses and Dissertations**

**Title**

The Architecture of Information at Plateau Beaubourg

**Permalink**

<https://escholarship.org/uc/item/0ww309s3>

**Author**

Branda, Ewan

**Publication Date**

2012

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

The Architecture of Information at Plateau Beaubourg

A dissertation submitted in partial satisfaction of the  
requirements for the degree Doctor of Philosophy  
in Architecture

by

Ewan Edward Branda

2012

© Copyright by  
Ewan Edward Branda  
2012

## ABSTRACT OF THE DISSERTATION

The Architecture of Information at Plateau Beaubourg

by

Ewan Edward Branda

Doctor of Philosophy in Architecture

University of California, Los Angeles, 2011

Professor Diane Favro, Chair

During the course of the 1960s, computers and information networks made their appearance in the public imagination. To architects on the cusp of architecture's postmodern turn, information technology offered new forms, metaphors, and techniques by which modern architecture's technological and utopian basis could be reasserted. Yet by the end of the 1970s, when computers and networks fully appeared in the workplace, schools, and even homes, architects had all but abandoned information technology as a source of architectural ideas, relegating computers to a supporting role in architectural practice where they performed only the most mundane of tasks, one from which they would emerge only two decades later.

This dissertation argues that architecture in the 1970s did not in fact retreat from information technology but rather that the changing nature of information technology



demanded new modes of architectural thinking that destabilized the traditional discursive function of the machine underpinning modern architecture. It examines various ways in which information technology influenced architectural thinking during this troubled period of transition through the historical treatment of a single case study, the Centre Georges Pompidou in Paris (or Beaubourg, as it was and is still known). It considers on the building's role in a more general program of social and cultural reorganization in the information society, from the original conception of the building as an enormous information processing machine to the reception of Piano and Rogers' building in the years following its completion. In chapters examining the informational ideas in the competition brief, the architectural responses to the competition, the sources for the winning scheme by Piano and Rogers and its relationship to technological utopianism in British architecture, the development of the final building and its challenge to the megastructure paradigm, and the privileging of the user in new techniques of architectural programming first deployed in a cultural building at Beaubourg, this dissertation tries to identify a broad spectrum of modes of engagement between architecture and information technology beyond the tool-based approaches prevalent today.

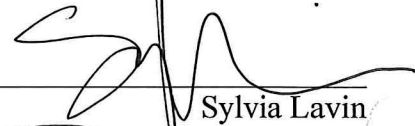
The dissertation of Ewan Edward Branda is approved.



Dana Cuff



Jonathan Furner



Sylvia Lavin



Diane Favro, Committee Chair

University of California, Los Angeles

2012

## CONTENTS

List of Figures	iv
Acknowledgements	vii
Vita	x
Publications and Presentations	xi
Abstract of the Dissertation	xii
Introduction	1
Chapter 1: Genesis of the Brief	31
Chapter 2: A Live Center of Information	82
Chapter 3: The Twilight of Megastructure	125
Chapter 4: From Functionalism to Functionality	174
Conclusion	206
Figures	223
Bibliography	269

## LIST OF FIGURES

1.1	Diagram of museum as information centre, from UNESCO conference.	223
1.2	Poster uncovered during Paris métro renovations, 2008.	223
1.3	Diagram showing the role of the CCI in the process of industrial design.	224
1.4	Program diagram from the competition brief.	225
1.5	Catalogs from CCI exhibitions at the Halles de Baltard (1970-71).	226
1.6	Site plan from competition brief showing connections to infrastructure and underground access.	226
2.1	Piano and Rogers competition entry.	227
2.2	Piano and Rogers competition entry – plan.	227
2.3	Piano and Rogers competition entry – West (plaza) elevation.	228
2.4	Piano and Rogers competition entry – section and site plan.	229
2.5	Piano and Rogers competition entry – model.	230
2.6	Piano and Rogers competition entry – model.	231
2.7	Piano and Rogers competition entry – model.	232
2.8	Piano and Rogers competition entry – model.	232
2.9	Piano and Rogers competition entry – structural details.	233
2.10	Piano and Rogers competition entry – network diagrams.	234
2.11	Jean-François Sérís et al. (project 88).	235
2.12	Kisho N. Korokawa (project 456).	236
2.13	Ken Maher, C. Stewart, C. Burton, R. Apperly (project 539).	237
2.14	Dennis Crompton, Nora Kohen, Will Alsop, Julius Tabacek (project 535).	238

2.15	Raimund Abraham, Friedrich Saint-Florian, et al. (project 585).	239
2.16	Michel Ducharme et al. (project 353).	239
2.17	Erickson and Massey (project 466).	240
3.1	Piano and Rogers, First Avant projet sommaire.	241
3.2	Piano and Rogers, First Avant projet sommaire.	241
3.3	Piano and Rogers, First Avant projet sommaire.	242
3.4	Piano and Rogers, Second Avant projet sommaire.	242
3.5	Piano and Rogers, Projet définitif.	243
3.6	Piano and Rogers, Development of West elevation.	244
3.7	Piano and Rogers, Projet définitif – section.	245
3.8	Piano and Rogers, Projet définitif – section (detail).	246
3.9	Experiments in Art and Technology (E.A.T.) – piazza installation.	247
3.10	Mies van der Rohe, Concert Hall Project (1942)	247
3.11	Ezra Ehrenkrantz, SCSD Prototype, Palo Alto.	248
3.12	Norman Foster, IBM Pilot Head Office, Cosham (1970).	248
3.13	Ezra Ehrenkrantz, SCSD Prototype, Palo Alto.	249
3.14	Ezra Ehrenkrantz, SCSD Prototype, Palo Alto.	249
3.15	Ezra Ehrenkrantz, The Modular Number Pattern.	250
3.16	Ezra Ehrenkrantz, SCSD schools.	250
3.17	IRNES, RAS project.	251
3.18	Programme spécifique, <i>kinakothèque</i> .	252
3.19	Centre Pompidou, <i>kinakothèque</i> .	252

3.20	Peter Rice, gerberette detail.	253
3.21	Norman Foster, IBM Pilot Head Office, Cosham (1970).	253
3.22	Title page from Martin Pawley, Architectural Design (November 1970).	254
3.23	Peter Cook, Ron Herron, Dennis Crompton, “Instant City” revisited.	254
3.24	Norman Foster, IBM Pilot Head Office, Cosham (1970)	255
4.1	Beaubourg programming team.	255
4.2	Lombard in conversation with Piano and Rogers.	256
4.3	Programme spécifique –Diagram of library functional ensemble.	256
4.4	Programme spécifique –Diagram of museum functional ensemble.	257
4.5	Programme spécifique –Diagram of reception functional ensemble.	257
4.6	Programme spécifique – Interfaces.	258
4.7	Programme spécifique – Interfaces.	258
4.8	Programme spécifique – Telephone systems in library.	259
4.9	Programme spécifique – Telephone systems in museums.	259
4.10	Programme spécifique – Flow of audio-visual material.	260
4.11	Programme spécifique – Flow of mail.	260
4.12	Programme spécifique – Flow of painting and sculpture.	261
4.13	Programme spécifique – Flow of garbage.	261
4.14	Harold Horowitz, Proximity diagram.	262
4.15	Jean Cousin, Topological representation of spatial relationships.	262
4.16	Jean Cousin, Topological representation of spatial relationships.	263
4.17	Topological compared to geometrical representation, from Cousin.	263

4.18	Programme spécifique – schematic section – flow of objects by activity.	264
4.19	Programme spécifique – schematic section – flow of objects by activity.	264
5.1	Study of visual perception of the building in the site.	265
5.2	Jean Widmer, signage for Centre Pompidou.	266
5.3	Jean Widmer, Logo for Center Pompidou (1976).	267
5.4	Study for exterior signage (1976).	267
5.5	Jean Widmer, Studies for the logo for Centre Pompidou (1976).	268
5.6	Paul Rand, Logo for IBM (1962)	268

## ACKNOWLEDGEMENTS

This work would not have been possible without the support of my committee at UCLA. My advisor, Diane Favro, consistently offered the sage advice, criticism, and inspiring conversation needed to shape this study and to navigate a complicated institution, along with consistent support in research projects that, although not directly part of this dissertation, provided both theoretical ideas and financial support. Sylvia Lavin, Dana Cuff, and Jonathan Furner provided valuable direction early in the process. I am particularly grateful for Professor Lavin's insights and generosity in the early stages of this work. Our Graduate Advisor at UCLA, Jim Kies, on more than one occasion cheerfully lent his considerable knowledge of the institution.

I am deeply grateful to those in Paris who made this work possible and enjoyable, in particular the archivists at the Centre Pompidou—Henry DeLangle, Monique Chardet, Jean Charlier, Jean-Philippe Bonilli—who were unflaggingly convivial and helpful. Patrick O'Byrne and H el ene Dano-Vanneyre shared their recollections of their experience in the  tudes et programmation group as well as their astonishing graphic material. I thank Patrick in particular for consistent hospitality in otherwise unfamiliar surroundings. Germain Viatte and Claude Mollard took time out of their busy schedules to share their experiences as members of Beaubourg's founding team, and Richard Rogers generously shared his thoughts on the project, while Jo Murtagh at his office made that possible. Dennis Crompton at the Archigram Archive in London was gracious and helpful. I also thank Chris Dawson for his willingness to discuss at length his



experience on the project and for providing valuable background information. Michel Bezman in Texas and Guy St-Pierre in Montréal shared their experiences with the Ford EFL research.

Simon Sadler offered insights early on in the process that proved central to the final dissertation, and Tim Anstey provided a forum at the Society of Architectural Historians Annual Meeting in which I could test some of these ideas in a friendly setting. Fellow PhD candidate Todd Gannon offered lively conversation and insights, and Paulette Singley, Mary Lou Lobsinger, John Welchman, and Michael Reibel offered advice throughout the process. My collaborators Joseph Tabbi, Anne Burdick, and Davin Heckman have over the years provided both inspiring conversation and a lively intellectual context outside architectural culture against which to measure my hypotheses.

I am grateful to the donors of several fellowships and awards that directly and indirectly supported this work: from UCLA, the Chancellor's Fellowship, the QGE grant program, the Edgardo Contini Award, the Leon Hoffman Award, the Graduate Research Mentorship and Summer Mentorship programs, and from the Society of Architectural Historians, the Scott Opler Award.

This dissertation was completed during my first two years as an Assistant Professor in the School of Architecture at Woodbury University. I owe Dean Norman Millar, Chairs Ingalill Wahlroos-Ritter and Jeanine Centuori, and VP David Rosen a special debt of thanks for their patience and encouragement.

Above all, Kati, Roland, Eve, and George deserve special thanks for their unwavering encouragement and tolerance. This work is dedicated to them.

## VITA

- 1985 Bachelor of Environmental Studies, Dean's List  
University of Waterloo  
Waterloo, Ontario, Canada
- 1988-89 Architectural Designer  
Peter Rose Architects  
Montréal, Québec
- 1989 Bachelor of Architecture  
University of Waterloo  
Waterloo, Ontario, Canada
- 1989-93 Architectural Designer  
Saucier + Perrotte architectes  
Montréal, Québec
- 1994 Architectural licensing exams, with distinction  
Ordre des architectes du Québec
- 1998 Master of Science in Architectural Studies  
Massachusetts Institute of Technology  
Cambridge, Massachusetts
- 2003-07 Research Fellow  
UCLA Experiential Technologies Center  
Los Angeles, California
- 2008-09 Teaching Fellow  
University of California Los Angeles  
Los Angeles, California
- 2008-11 Board Member  
LA Forum for Architecture and Urban Design  
Los Angeles, California
- 2009-present Assistant Professor  
School of Architecture, Woodbury University  
Burbank/Los Angeles, California

## PUBLICATIONS AND PRESENTATIONS

- Branda, Ewan. "Soft Culture Machines." In *Bracket [goes soft]*, edited by Neeraj Bhatia and Lola Sheppard. Vol. 2. Barcelona: Actar, 2012.
- . "Soft Culture Machines: Engineering Beaubourg's information spaces," conference paper, Society of Architectural Historians 61st Annual Meeting, Cincinnati, Ohio, 2008.
- . "Giant Robots and Lazy Rivers." In *Thought Matters II*. Los Angeles: UCLA Architecture and Urban Design, 2008.
- . "A Map of Relations: Three Interfaces in the Electronic Book Review." In *Proceedings of the First International HASTAC Conference*. Durham, North Carolina: 2007.
- . "Representing Epistophilia: Roman topography, spatial markup, and the Semantic Web," lecture, Institute for Advanced Technology in the Humanities (IATH) at the University of Virginia, April 2007.
- . "The mediated spaces of the Archaeological Park," conference paper, National Committee for the History of Art, Past Perfected: Antiquity and its Reinventions, Los Angeles, 2006.
- . "Semantic Topographies and Spatial Markup: The Digital Roman Forum Project," conference paper, Computer Applications in Archaeology, Fargo, North Dakota, 2006.
- . *Fieldworks: Geographic practices in contemporary art*, symposium co-organizer and moderator, Hammer Museum, Los Angeles, California, May 2005.
- . "Unseen Forces: The Ecology of Electronic Book Review 4.0," conference paper, Society for Social Studies of Science (4S), Pasadena, California, 2005.
- Branda, Ewan, and Kati Rubinyi. "Real Immaterial." *X-tra Contemporary Art Quarterly* 7, no. 3 (2004).

## Introduction

Over the course of the 1960s, computers and information networks made their appearance in the public imagination. To architects, the technologies of the information society offered new forms, metaphors, and techniques by which modern architecture's technological and utopian basis might be reasserted at a moment when such ambitions were becoming increasingly suspect. In Britain, Cedric Price proposed an instrumental architecture in which building components, computers, and cybernetic techniques were drawn together in a complex problem-solving approach, while the Archigram group turned to the hardware of computing as a source for both the image and operation of dynamic, pluggable, mobile utopias for a new postwar society.<sup>1</sup> Like Archigram, French architect Yona Friedman turned to the structures of computer hardware but did so less in search of an architectural image than for a model of a flexible, populist utopia that granted users of buildings full control over their physical environment, while Paul Maymont and Michel Ragon turned postwar urban planning on its head by assimilating cybernetics into a counter-utopian visionary architecture.<sup>2</sup> In Japan, Fumihiko Maki

---

<sup>1</sup> The literature on Price and Archigram grows daily. The major overviews are Stanley Mathews, *From Agit-Prop to Free Space: The Architecture of Cedric Price* (Black Dog, 2007); Simon Sadler, *Archigram: Architecture Without Architecture* (MIT Press, 2005). On the role of Cybernetics in Price see Mary Louise Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, ed. Sarah Williams Goldhagen and Réjean Legault (The MIT Press, 2001), 335. On the more theoretical work of Christopher Alexander and Lionel March at Cambridge, see Sean Keller, "Systems Aesthetics: Architectural Theory at the University of Cambridge, 1960-1975" (Doctoral thesis, Harvard University, 2005); Sean Keller, "Fenland Tech: Architectural Science in Postwar Cambridge," *Grey Room*, no. 23 (Spring 2006): 40-65.

<sup>2</sup> The definitive work on Friedman and French cyberneticians is Larry Busbea, *Topologies: The Urban Utopia in France, 1960-1970* (Cambridge, Mass.: MIT Press, 2007). Friedman's own manifesto is Yona Friedman, *Toward a Scientific Architecture*, trans. Cynthia Lang (MIT Press, 1975).

appropriated the connected node structure of networks to build a theory of collective form, and the Osaka exposition of 1970 brought together various explorations of environmental sensing and cybernetic feedback, such as the Pepsi Cola Pavilion by Experiments in Art and Technology and the Demonstration Robot by Arata Isozaki.<sup>3</sup> While all of these utopian experiments continued the modernist project of imposing a grand order on a complex world, they championed the libertarian ideals of freedom, play, and non-hierarchical organization perceived to be embodied in information technology as the principal tool for broadly challenging the assumptions of modern architecture, whether the Taylorist ideologies of the machine, the technocracy of postwar planning, or the populism of the welfare state.<sup>4</sup>

Apart from the experiments of Expo 67 and Osaka 70, however, such work had produced by the end of the decade only unbuilt schemes. All that would change with the announcement in 1970 of the design competition for the Centre Beaubourg.<sup>5</sup> The

---

<sup>3</sup> Maki set out these ideas in Fumihiko Maki, *Investigations in Collective Form* (School of Architecture, Washington University, 1964). The most complete coverage of the Pepsi Cola pavilion is Billy Klüver, Julie Martin, and Barbara Rose, eds., *Pavilion by Experiments in Art and Technology* (New York: E. P. Dutton & Co., Inc., 1972). Images of Isozaki's robots were published in popular venues such as Life magazine. Martin Pawley reported on Osaka in Martin Pawley, "Architecture Versus the Movies, or Forum Versus Content," *Architectural Design*, no. 6 (June 1970).

<sup>4</sup> For a discussion of connections between technology and social reform in modern architecture, see Mary McLeod, "'Architecture or Revolution?': Taylorism, Technocracy, and Social Change," *Art Journal* 43, no. 2 (Summer 1983): 132-147. The direct attack on modern architecture hit stride in the mid-1970s. See, for example, Peter Blake, *Form Follows Fiasco: Why Modern Architecture Hasn't Worked* (Boston: Little, Brown, 1977); Brent C Brolin, *The Failure of Modern Architecture* (New York: Van Nostrand Reinhold Co, 1976). For a discussion of the critique of the welfare state in British architecture see Royston Landau, *New Directions in British Architecture* (New York: George Braziller, 1968). For a discussion of Price's architecture as a critique of the welfare state see Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace."

<sup>5</sup> The project was called the Centre Beaubourg until President Pompidou's death in 1974. In this dissertation I refer to the project as Beaubourg when discussing its planning and construction phases, and as

competition brief announced from the start that “the entire Centre has been inspired by an original perspective, that of constantly renewing information.”<sup>6</sup> It went on to describe a complex institution whose metabolism was fueled by information exchange. The building was to be permeable to information flows both to and from its environment through various means such as visual transparency, electronic displays, exhibitions, television broadcasts, publications, and a remotely accessible electronic library catalog would extend the Center’s reach to the whole of France and outside. As Henri Lefebvre put it, Beaubourg was conceived as “a colossal information center, an immense ‘computer’ for receiving, breaking down, and redistributing all information concerning the industry of culture.”<sup>7</sup> With Beaubourg, the wait for a major building to emerge from the optimistic technological discourses of the 1960s would finally be over.

The competition entries, however, showed a technological impulse that was weak and exhausted. There were few entries from British architects representing the technological avant-garde beyond those Dennis Crompton of Archigram and Piano and Rogers (who were still unknowns), and the entries of dyed-in-the-wool techno-utopians like Safdie, Friedman and Maymont were little more than monumental petrified forms.<sup>8</sup>

---

the Centre Pompidou when discussing it as a living building today. This more-or-less follows the pattern used in Germain Viatte, *Le centre Pompidou: Les années Beaubourg* (Paris: Gallimard, 2007).

<sup>6</sup> *Concours international d’idées à un degré (competition brief)* (Paris: France, Ministère d’état chargé des affaires culturelles, 1970), 4.

<sup>7</sup> Quoted in Jean-Pierre Seguin, *Comment est née la BPI: Invention de la médiathèque* (Paris: Bibliothèque publique d’information, Centre Georges Pompidou, 1987), 126.

<sup>8</sup> Busbea points out the feebleness of the French techno-utopian entries (Busbea, *Topologies*, 189–91.) Although the term techno-utopia (or technoutopia) is in general usage, I borrow its use in architecture from Felicity D. Scott, *Architecture Or Techno-utopia: Politics After Modernism* (Cambridge, Mass.: MIT Press, 2007). On techno-utopia in general, see Howard P. Segal, *Technological utopianism in American culture*

Even the winning scheme of Piano and Rogers by the time of its opening in 1977 showed almost none of the assertive computational and media-savvy imagery that so captured the attention of the jury. When Crompton visited the newly opened “live center of information” shortly after its opening in 1977 he had expected to see “an intensity of information which [was] not only real and useful, but also gratuitous and entertaining.”<sup>9</sup> Instead, he responded, “well, where is it?” All that remained of the media screens and other information-age hardware was their bare supporting frame. Critics were beginning to suspect that Beaubourg was less a beginning than an endgame. Peter Buchanan later argued that, “as recognized during the 1973-74 oil crisis by some of those working on it, the building was already a dinosaur. It climaxes and brings to an end such architectural ideals of the 1960s as megastructures and flexibility achieved through mechanical gadgetry.”<sup>10</sup> And Reyner Banham declared in his 1977 review of the building, “It is very difficult nowadays to see it as anything other than a kind of terminal monument to that movement.”<sup>11</sup>

---

(Syracuse, NY: Syracuse University Press, 1985). As we shall see in chapter 1 of this dissertation, all utopias are in a sense technological in nature.

<sup>9</sup> D. Crompton, “Centre Pompidou: A Live Centre of Information,” *Architectural Design* 47, no. 2 (1977): 100.

<sup>10</sup> Peter Buchanan, *Renzo Piano Building Workshop: Complete Works* (London: Phaidon Press, 1993), 52. On architecture and the oil crisis at that time, see Giovanna Borasi and Mirko Zardini, eds., *Sorry, Out of Gas: Architecture’s Response to the 1973 Oil Crisis* (Montreal: Canadian Centre for Architecture; Montova, Italy, 2007). This shift in attitude of the time is best summed up by Donella H. Meadows et al., *Limits to Growth: A report for the Club of Rome’s project on the predicament of mankind* (New York: Universe Books, 1972).

<sup>11</sup> Reyner Banham, “Enigma of the rue du Renard,” *The Architectural Review* CLXI, no. 963 (1977): 277. This view persists today. Larry Busbea closes his history of French technological urban utopianism with the Centre Pompidou. (Busbea, *Topologies*.) This is also borne out in the marked decline of experimental projects bringing together architecture and information technology after Osaka 70, the last big celebration. After that point, computers are relegated to the marginal work of specialists such as March at Cambridge

Given the broader political and cultural climate of the time, it is not surprising that the occasionally naive idealism of the 1960s was now suspect. But more narrowly within architectural culture, postmodern thinking was increasingly critical of modern architecture's obsession with technology, and so during the decade that followed, computers would be quietly relegated to the innermost bureaucracies of architectural practice and the arcane fields of design methods.<sup>12</sup> Why had experimental architects forsaken the possibility of a fertile engagement with the ideas, metaphors, and techniques of the information society at the precise moment when information technology in the form we know it today was coming online, as it were, and tightening its grip on the collective imagination? Or had they? Crompton wasn't naive, and recognized that to ask, "where is it?" was in many respects a mark of success because, as he put it, "information is only perceptible when it is in the process of being transmitted. It really is not a load of hardware hanging from the ceiling, flashing out of capsules or sprouting off pylons; these are only symbols, which we use on drawings, of a transient activity."<sup>13</sup> Although, as Crompton hints at, Beaubourg was born into a moment of transition in the emergence of the information society, one in which machine-age computer hardware was in the process of ceding to the intangibility and invisibility of software and telematic networks. If the machine provided Modern Architecture with a clear, if problematic, system of

---

and the Design Methods movement largely at Berkeley and MIT, or even the practical aspects of office management (See Clarence Herbert Wheeler, *Emerging Techniques of Architectural Practice* (American Institute of Architects, 1966)). Experimental utopians like Friedman continued their work in the margins, while former techno-utopians like Superstudio addressed anthropological and historical concerns.

<sup>12</sup> For an overview of the state of computers in practice at that time see Ibid.

<sup>13</sup> Crompton, "Centre Pompidou: A Live Centre of Information," 101.



representation then it was certainly less clear how information technology in its more advanced forms could offer any such system, or indeed what architecture's modes of engagement with technology might be.

One goal of this dissertation, then, is to identify aspects of architecture's shifting relationship to information technology at the start of the 1970s—a period that we could variously call Postmodernism, or late-capitalism, or the post-industrial society. It posits that by the end of the 1960s, information technology was no longer seen as a wedge to be driven into architecture's disciplinary center, as it had been for experimental architects like Archigram and Friedman, but rather was in the process of being absorbed into architecture's own internal problems and practices. While this study of Beaubourg obviously takes its cue from Banham's assertion that architectural history should include a consideration of architecture's discursive overlaps with technology, it challenges his general opinion that an architecture of technology lay for the most part in the use of materials and systems or in the potential imagery it offered.<sup>14</sup> Instead, it considers information technology within areas of the architectural discipline not normally seen as technological.<sup>15</sup>

---

<sup>14</sup> When commentators on High Tech say that the movement concerns the application of advanced technologies from outside architecture they almost always mean hardware. (See, for example, Colin Davies, *High Tech Architecture* (New York: Rizzoli, 1988), 6.) Banham did acknowledge technology's more general effects beyond hardware on architecture's modes of thought: "Reinforced concrete, geodesic domes, irradiated plastics will not, of themselves, revolutionize architecture. Two things will, however. One is a general mental accommodation towards technology and its mental disciplines[...]. The other is what Le Corbusier calls *Recherche patiente* (without actually doing any himself), the incorporation of the products and usages of technology into architecture, making architecture out of them." (Reyner Banham, "On Trial 1: The Situation; What Architecture of Technology?," *The Architectural Review* 131, no. 780 (February 1962): 98.)

<sup>15</sup> Sean Keller, for example, has argued for a latent computational imperative behind the Neo-avant-garde's apparent rejection of techno-utopianism. See Keller, "Systems Aesthetics: Architectural Theory at the

This history of Beaubourg covers the period from the project's inception in 1969 to its opening in 1977, covering some historical material prior to that period where needed. Chapter 1 examines the competition brief itself and the ideas behind it. It looks at the roots of the informational imperative encoded in the brief, the discourses of the existing institutions that would make up Beaubourg, and the architectural schemes already in play when the competition was launched. Chapter 2 looks in detail at the competition process and the winning scheme. It considers the sources of the scheme in earlier British techno-utopianism, and how these roots on the one hand equipped the project to perfectly address the brief's information challenge, while on the other revealed contradictions and instabilities within the historical development of information technology and the architectural avant-garde. Chapter 3 tracks the development of the project over the seven-year period between the winning of the competition and the opening of the building. It argues that as the project developed and weathered political and budgetary changes, it lost many of the traits linking it to the 1960s technological utopianism of Archigram and Price. In particular, it argues that the decline of the dominant trope of Megastructure opened the door for alternative models. Chapter 4 examines the role of programming at Beaubourg. It looks in detail at the work of the Études et programmation, the group of architects and engineers who worked closely with the designers through much of project's development and construction. It considers their

---

University of Cambridge, 1960-1975." (Parts published as Keller, "Fenland Tech: Architectural Science in Postwar Cambridge.") Keller Easterling has used models from information technology as a way of revealing the hidden structures of landscapes. (Keller Easterling, *Organization space: landscapes, highways, and houses in America* (Cambridge, Mass.: MIT Press, 1999).)

working methods within the general framework of Systems Engineering and new American techniques of architectural programming, and how their work suggested ways that architecture might be understood as an information technology.

This study is part of recent scholarship on the architecture of the 1960s technological utopianism.<sup>16</sup> Following Scott's lead, it tracks the conditions of its putative downfall but differs in that it makes no attempt to recuperate specific practices but rather tries to shed light on practices that were never considered part of that movement to begin with. It nonetheless builds upon recent interest in utopian thinking (particularly technological utopianism) and its status today.<sup>17</sup> In considering architecture's relationship to positivist and technocratic cultures of corporate practices, I am indebted to Martin and Harwood.<sup>18</sup> Unlike them, however, I am less interested in identifying a coherent aesthetic unity than bringing together a set of often disconnected practices and conflicts. That said, the work of both of these authors, and Harwood in particular, has been helpful in opening the difficult connections between information technology and architecture an expanded field beyond imagery. Although Beaubourg is at the cusp of architecture's postmodern turn, its Postmodernism was motivated less by theories of language or signification (despite the

---

<sup>16</sup> Scott, *Architecture Or Techno-utopia*.

<sup>17</sup> See, for example, Scott and recent writings by Reinhold Martin. For a survey of the status of utopia, see Paul La Farge, "Utopia & Dystopia," *Bookforum* (August 2010).

<sup>18</sup> John Jeffrey Harwood, "The redesign of design: Multinational corporations, computers and design logic, 1945--1976" (Doctoral thesis, Columbia University, 2006); John Harwood, *The Interface: IBM and the Transformation of Corporate Design, 1945-1976* (Minneapolis: University of Minnesota Press, 2011); Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, Mass.: MIT Press, 2003).

building's overwhelming visual communicative impulse) than by specific material action in practice. The work I will look at is some of the most pragmatic imaginable: although at its heart ideologically driven and explicit about its utopian impulse, it is without "manifesto", which has been supplanted by the report, specification, and the diagram. This study takes as its departure point, then, the tension between the humanist intentions of its authors and sponsors and the techniques of the late-capitalist condition into which the project for Beaubourg was born. In so doing, it rejects the possibility of a zero-sum game between criticality and capitulation.<sup>19</sup>

Despite that fact that the Centre Pompidou is an almost universally recognizable architectural icon there has been no serious study of the building and its history. This is partly because the High Tech movement in general, within which Piano and Rogers' project plays a seminal role, has generally been seen at best as the sustained refinement of architecture's technical systems and at worst as superficial image-making with little theoretical impetus.<sup>20</sup> The literature on Beaubourg in French deals almost exclusively with the politics of culture and patronage and rarely deals directly with the built work

---

<sup>19</sup> The opposition between criticality and capitulation refers to debates on "postcriticality" active during in the early 2000's and launched by, among others, R. E. Somol and Sarah Whiting, "Notes around the Doppler Effect and Other Moods of Modernism," *Perspecta*, no. 33 (2002): 72-77. In rejecting this dichotomy I am indebted foremost to the historian Fred Turner's recent book on Silicon Valley counterculture. See Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2006).

<sup>20</sup> See, for example, Ignasi de Solà-Morales, "High-tech. Funzionalismo o retorica? (High-tech. Functionalism or rhetoric?)," *Lotus International*, no. 78 (October 1973): 66-79. No systematic history of High Tech has been written. For an overview, see Davies, *High Tech Architecture*. For a history of Reyner Banham's attitudes to High Tech, see Todd Gannon, "Theory and Design in the Last Machine Age: Reyner Banham and the Paradoxes of une Architecture Autre, 1955-1988" (Doctoral thesis, UCLA, 2011).

itself,<sup>21</sup> while literature in English, apart from early critical articles by Colquhoun and Banham, is restricted to oral histories and broad introductions in monographs on Piano and Rogers.<sup>22</sup> Little has been written about the competition itself.<sup>23</sup> Even less has been said about the programming process, perhaps the most innovative and theoretically interesting part of the project. DeRoo adequately covers Beaubourg's immediate political context in the events of 1968, although her analysis falls prey to a stock metanarrative of 1968 in which Beaubourg is a primary antagonist.<sup>24</sup> My concern in this dissertation,

---

<sup>21</sup> Most critical writings in French on the topic concerns cultural politics or are highly subjective reflections in the tradition of Baudrillard's famous tirade (Jean Baudrillard, *L'effet Beaubourg: Implosion et dissuasion* (Editions Galilee, 1977).) The major comprehensive memoirs are Claude Mollard, *L'enjeu du Centre Georges Pompidou* (Paris: Union générale d'éditions, 1976); Robert Bordaz, *Le Centre Pompidou: une nouvelle culture* (Paris: Ramsay, 1977). Works like Mollard or Bordaz —or even themed issues of the journals *Crée* (Issue 36, 1975) or *L'Architecture d'Aujourd'hui* (Issue 189, 1977) tend to be, in the words of Alan Colquhoun, "quasi-official apologia." (Alan Colquhoun, "Critique," *Architectural Design* 77, no. 2 (1977): unpaginated.) Of these, the most balanced and useful is Seguin, *Comment est née la BPI*. The most ambitious overall histories of the institution are Bernadette Dufrêne, *La création de Beaubourg* (Grenoble: Presses Universitaires de Grenoble, 2000); Bernadette Dufrêne, ed., *Centre Pompidou: trente ans d'histoire* (Paris: Centre Georges Pompidou, 2007). These are, however, marred by an unskeptical cronyism and an overwhelming avoidance of discussion of the building. Most useful of all the sources, perhaps, is the lengthy interview with the architects and commentary by Picon, in Renzo Piano, Richard Rogers, and Antoine Picon, *Du plateau Beaubourg au Centre Georges Pompidou* (Paris: Editions du Centre Pompidou, 1987).

<sup>22</sup> The most complete work in English is Nathan Silver, *The making of Beaubourg: a building biography of the Centre Pompidou, Paris* (Cambridge, Mass.: MIT Press, 1994). It is, however, an anecdotal oral history with no references or citations and so its reliability is difficult to assess. Moreover, it for the most part restricts its discussion to the drama of the construction process. More useful and carefully considered is Rogers' biography, Bryan Appleyard, *Richard Rogers: A Biography* (Faber and Faber, 1986). By far the richest source in English is the special issue of *Architectural Design* (47/2 1977) dedicated to the building. A useful overview is Jean-Louis Cohen, "Monuments for a Mass Cult," in *Rendezvous: Masterpieces from the Centre Georges Pompidou and the Guggenheim Museums* (Paris, New York: Centre Georges Pompidou, Guggenheim Museum, 1998). (I am grateful to Jean-Louis Cohen for bringing his article to my attention.)

<sup>23</sup> Silver dedicates only one short chapter to the competition, and handful of articles published in French journals at the time of the competition merely report on its results. The competition goals and process are, on the other hand, usefully summarized in a short 1977 interview on French television with three of the organizers. ("Qui va à Beaubourg" (A2, February 2, 1977).)

<sup>24</sup> See Rebecca J. DeRoo, *The Museum Establishment and Contemporary Art: The Politics of Artistic Display in France after 1968* (Cambridge University Press, 2006), 167–98.. This is a recurring

however, is not cultural politics per se but the particular sympathies between cultural politics and emerging fields of expertise in architecture and how they were both responses to a new informational condition.

The most glaring bias in this study of Beaubourg is the emphasis on the contribution of Richard Rogers over that of Renzo Piano. I made this decision primarily because Rogers was the ideologue, which makes his statements problematic but more accessible and explicit: it was Piano, after all, who moved to the relative openness and lively discourse of London to join the Rogers office out of dissatisfaction with the constricted context of Italy. In retrospect, however, Piano's almost exclusive interest in the problems of craft and materials, which seemed at first resistant to discourses of information, now seem to me to be worth further inquiry given recent interest in the convergence of digital culture with material research. The project is nonetheless treated here primarily as a product of Anglo-American architectural culture and the intersections of that culture with French theories and practices. The relative positions of Piano and Rogers, their authorship, and their views of architecture as embodied in later projects illuminate the paradoxes and complexities of high-tech. As Alan Stanton, a member of the architectural team, put it, Rogers was (and continues to be) the idealist with the big ideas who safeguards the "soul" of the project, while Piano is the pragmatist who tends to the detailed needs of its body.<sup>25</sup> Among other omissions in this study is the architecture of

---

oversimplification in most of the sources dealing with cultural politics, not to mention the architects themselves since many of the administrators were deeply involved in the events of 1968.

<sup>25</sup> Alan Stanton, quoted in Victoria Newhouse, "Paths from the Pompidou: Renzo Piano and Richard Rogers," *Harvard Design Magazine* (Spring/Summer 2007).

L'IRCAM (Institut de Recherche et Coordination Acoustique/Musique), excluded here because it was conceived as a separate building at a slightly later time.<sup>26</sup> Perhaps a larger omission is a detailed examination of the 680 other competition schemes.<sup>27</sup> Moreover, I do not deal in detail with the project's endgame and the various transformations and renovations that eloquently shed light on the strengths and weaknesses of the project's original intentions. This applies in particular to the renovation by Gae Aulenti in the 1980s. Future work would also consider in more detail the significant contribution of Jean Widmer and his design for signage and graphic identity.<sup>28</sup>

### **Context: Information Utopia and Environment**

The Beaubourg competition brief built on the idea of the information utopia already in place in France since the end of the 18<sup>th</sup> century. As with all utopias, this one was, in the words of the historian of technology Armand Mattelart, “at once technical and social,” and was built firmly on the French technocratic tradition.<sup>29</sup> Technocracy, a system in which a ruling body of technical experts and civil servants replace government or

---

<sup>26</sup> Dennis Crompton argued that IRCAM was a more successful realization of the “live center of information” that the main building, and Boulez himself was deeply involved in the role of information technology in cultural practices. The two best articles on the architecture of L'IRCAM are Michael Davies, “IRCAM,” *Architectural Design* 77, no. 2 (1977): 134-137; H. Demorlane, “L'IRCAM,” *L'Architecture d'Aujourd'hui*, no. 189 (1977): 77.

<sup>27</sup> Although the projects have been archived by the Service des archives at the Centre Pompidou, the collection is incomplete since more than 20 entries were damaged by flooding before they could be reproduced.

<sup>28</sup> On Widmer's contribution, see Gilles de Bure, “Signalétique pour le Centre Georges-Pompidou,” *Crée*, no. 36 (1975): 48-53; Catherine de Smet, “Histoire d'un rectangle rayé. Jean Widmer et le logo du Centre Pompidou,” *Cahiers du Musée national d'art moderne*, no. 89 (Automne 2004): 5-23.

<sup>29</sup> Armand Mattelart, *The Information Society: An Introduction* (Sage Publications, 2003), 41.

military rule in the control of society, was first proposed by Claude Henri de Saint-Simon. In his 1821 treatise, *Du Système industriel*, Saint-Simon described a model of a functional society based on the organizational structures of industry.<sup>30</sup> Society as a whole could be treated as if it were a vast complex of industrial firms whose operations were based on the cooperation of manufacturers and technicians: social management would no longer be a matter of the “government of men” but the “administration of things.” Saint-Simon’s theory was based on the belief that, in the words of historian of technology Armand Mattelart, “[o]nly a positive philosophy would be able to ensure the transition from the feudal, theological age to the industrial, scientific age.”<sup>31</sup> This technocracy was at the root of what the Neoliberal sociologist Daniel Bell would eventually call the Post-industrial society.<sup>32</sup> As the father of technocracy, Bell claimed, Saint-Simon put into play a set of themes that were the basis of the postwar information society: rationality, planning, forecasting, administration, and the privileging of a society organized according to industrial rather than military models.<sup>33</sup>

Saint-Simonism was built upon a decentralizing imperative, since it assumed a shift in power from a centralized state government to a decentralized network of administrative nodes that constituted the social-industrial organism. In place of monarchy

---

<sup>30</sup> These ideas are discussed in Frank E. Manuel, *The New World of Henri Saint-Simon* (Notre Dame: University of Notre Dame Press, 1963). See also Robert B. Carlisle, “The Birth of Technocracy: Science, Society, and Saint-Simonians,” *Journal of the History of Ideas* 35, no. 3 (September 1974): 445-464.

<sup>31</sup> Mattelart, *The Information Society*, 28.

<sup>32</sup> Bell’s use of the term is best known, but it was first coined by Alain Touraine in his book, *La Société post-industrielle* (1969). (Translated as Alain Touraine, *The Post-Industrial Society*, trans. Leonard F. X. Mayhew (New York: Random House, 1971).)

<sup>33</sup> Daniel Bell, *The Coming of Post-Industrial Society; a Venture in Social Forecasting* (New York: Basic Books, 1973), 342.



or democracy, Saint-Simon claimed that industry offered the model of an organism whose structural configuration was based on a network of functions. Here, networks of transportation, communications, and finance were much more than a scheme for spatial organization: they were the very “physiological” basis for the organization of a new “functional, reticular society.”<sup>34</sup> The merging of the technical and the social in the discourse of networks that was at the heart of Saint-Simonism was later picked up by Paul Otlet and Henri Lafontaine in the 1890s and developed into an informational utopia that they called “mondialism,” a world fully connected by “a universal network of information and documentation,” a global library linking all centers of production and consumption, connected by underwater cables, universal post offices, electric telescopes, and other techniques.<sup>35</sup> Otlet’s vision would eventually come to fruition in the early 1970s with such projects as the Minitel network in France, which started development in 1973 and was launched in 1982, and the Euronet network, a multi-national linkage across Europe—and today’s Internet.<sup>36</sup>

---

<sup>34</sup> Mattelart, *The Information Society*, 29.

<sup>35</sup> Otlet most fully set out these ideas in his 1937 book, *Traité de documentation*.

<sup>36</sup> Forty years after Otlet’s scheme, a news item in *Architectural Design* announced that 125 “Visiophones” would soon be installed in Paris post offices with the goal “to produce a system which will enable offices to consult documents regardless of how far apart they may be.” It added that a “copying system is being worked out so that photocopies of documents could be sent over the phone.” (*Architectural Design*, no. 41 (1971): 531.) On Minitel in context of Nora-Minc and cultural politics, see Hugh Dauncey, “A Cultural Battle: French Minitel, the Internet and the Superhighway,” *Convergence: The International Journal of Research into New Media Technologies* 3, no. 3 (1997): 72-89. On Minitel in detail, see *Ibid.*; *France’s experience with the Minitel: lessons for electronic commerce over the Internet*, OECD Working Papers (Paris: OECD, 1998); Andrew Feenberg, “From Information to Communication: the French Experience with Videotex,” in *The Social Contexts of Computer-mediated Communication*, ed. Martin Lea (Prentice Hall / Harvester Wheatsheaf, 1992). The Euronet project was presented in 1972. (D. L. A. Barber, “The European Computer Network Project,” in *Proceedings ICCO* (presented at the First International Conference on Computer Communication, Washington, D.C., 1972), 192-200.).

Communications networks have always been seen through the lens of a new humanism that revealed in them an emancipatory potential and the possibility for a new public sphere. Starting with late-18<sup>th</sup> century observations of American transportation networks, social thinkers in France and elsewhere had elevated the redemptive powers of the network to a cult status. As Mattelart has points out,

[e]ach step in the progress of communications networks was accompanied by a utopia of universal community and decentralized society.[...] Each new generation of technology revived the discourse of salvation, the promise of universal concord, decentralized democracy, social justice and general prosperity. [...] All of these methods – from the optical telegraph to underwater cable, the telephone, the radio, the television and the Internet – intended to transcend the spatial and temporal dimensions of the social fabric, brought back the myth of the recovery of the lost agora of Attic cities.<sup>37</sup>

And as Galloway and Thacker have recently put it,

the discourse surrounding networks tends to be posed both morally and architecturally against what its participants see as retrograde structures like hierarchy and verticality, which have their concomitant techniques for keeping things under control: bureaucracy, the chain of command, and so on.<sup>38</sup>

Networks have thus always had an ineluctable social aspect, not merely in their effects but in actual structure and operation. In this sense they are no different from any other large-scale technology. As Leo Marx has observed, technologies such as the railroad and the telegraph increasingly involved “nonartifactual” components in which the family firm was replaced with large corporations of technocrats that both required and produced changes in social behavior and in which, from the perspective of both operator and user,

---

<sup>37</sup> Mattelart, *The Information Society*, 23.

<sup>38</sup> Alexander Galloway and Eugene Thacker, “Protocol, Control, and Networks,” *Grey Room* - (October 2004): 7.

there was no inside nor outside.<sup>39</sup> Thus, for critics like Jacques Ellul and Lewis Mumford, the technological basis of late-modern society was therefore to be found less in its hardware tools than in its social formations, protocols, and bureaucracies.<sup>40</sup>

Not everyone was as optimistic as Otlet. By the early 1950s, the anxiety induced by technocracy, and by networked computers in particular, had become a topos in French literature and cinema.<sup>41</sup> Jacques Tati took on the subject in his films *Mon Oncle* (1958) and *Playtime* (1967), but perhaps the most memorable cinematic critique—in particular, in its ambivalent portrayal of the architecture and urbanism of information-age technocracy rooted in a love-hate relationship with American culture—was Jean-Luc Godard’s *Alphaville* (1965), a depiction of a system that, to borrow the words of the philosopher of technology Andrew Feenberg, when “viewed from above, embodies a

---

<sup>39</sup> Leo Marx has argued that our contemporary usage of the word “technology” to designate something between tangible object and intangible concept was designed to fill a “semantic void” created at the beginning of the 20th century by the development of technical ensembles that were both mechanical and social/informational. See Leo Marx, “Information Technology in Historical Perspective,” in *High technology and low-income communities: prospects for the positive use of advanced information technology*, ed. Donald A. Schön, Bish Sanyal, and William J. Mitchell (MIT Press, 1999), 138–43. Schivelbusch has described the railway networks of the late-19<sup>th</sup> century as just such a “machine ensemble” in that they merged the hardware of the locomotive, the rails, the telegraph network, and the bureaucracy of schedules and switching. See Wolfgang Schivelbusch, *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (Berkeley and Los Angeles: University of California Press, 1987).

<sup>40</sup> In 1954, Jacques Ellul drew the distinction between the “machine” and the more general concept of “technique,” while in 1967 Lewis Mumford theorized what he called the regime of “megatechnics,” a great machine made up of people rather than mechanical parts and operative since ancient Egypt but by which in the postwar world, “the dominant majority will create a uniform, all-enveloping, super-planetary structure, designed for automatic operation.” See Jacques Ellul, *The Technological Society*, trans. John Wilkinson (Knopf, 1964); Lewis Mumford, *The Myth of the Machine* (Harcourt, Brace & World, 1967).

<sup>41</sup> For a general discussion of technocracy and its role in literature see Bradford Lyau, “Technocratic Anxiety in France: The Fleuve Noir ‘Anticipation’ Novels, 1951-60 (Angoisse technocratique en France: les romans d’anticipation de la série Fleuve Noir de 1951 à 1960),” *Science Fiction Studies* 16, no. 3 (November 1989): 277-297.

higher level of social rationality, appears as a nightmare of confusing complexity and arbitrariness viewed from below.”<sup>42</sup>

In France, anxiety about this new megatechnics brought with it questions about the role of the state in culture, in particular in response to American cultural imperialism. By the mid-1960s, the so-called “IBM problem” suggested that information technology was to be the new arena of cultural politics.<sup>43</sup> This combination of euphoria and anxiety came to a head with the publication of the Nora-Minc report in 1978, which became a best seller in France and was translated into English by the Neoliberal theorist of the information society, Daniel Bell. During the 1960s, Nora and Minc argued, American corporations, and in particular IBM, were encroaching on a “traditional sphere of government power: communications.”<sup>44</sup> At the same time, information technology would “alter the entire nervous system of social organization” in France. More specifically, telematics—the merging of telecommunications with computers—would reorganize society through what Nora and Minc called the “power game” by tearing down the troubling “anarchy vs. centralization” dichotomy in which French cultural politics in the years around 1968 were mired.<sup>45</sup>

---

<sup>42</sup> Feenberg, “From Information to Communication: the French Experience with Videotex.”

<sup>43</sup> The IBM problem was uncannily foreshadowed in Godard’s 1965 film, *Alphaville*. On the IBM problem see John Walsh, “France: First the Bomb, Then the ‘Plan Calcul’,” *Science* 156, no. 3776, New Series (May 12, 1967): 767-770; P.E. Mounier-Kuhn, “History of Computing in France,” *IEEE Annals of the History of Computing* 11, no. 4 (1989): 237-240.

<sup>44</sup> Simon Nora and Alain Minc, *The Computerization of Society: A Report to the President of France*, trans. Daniel Bell (Cambridge, Mass: MIT Press, 1980), 6.

<sup>45</sup> *Ibid.*, 5.

This new space of technocracy and communications, along with all its contradictions, was given architectural form in the theories and practices of Environmental Design,<sup>46</sup> a nebulous discourse based on a critique of what one of its more technocratic spokespersons euphemistically called “the disparity between basic ideologies and the resulting man-made environments.”<sup>47</sup> In place of traditional design (with its reliance on prior forms and intuition) would be “a commitment to comprehensive environmental design as a resource for tackling a broad range of human problems.” At the heart of Environmental Design’s critique was the redefinition of design from the design of an object destined for use within a given environment to, as Christopher Alexander put it, “the ensemble comprising the form and its context.”<sup>48</sup> Environmental design claimed to address one of the principle oversimplifications inherent in modernist platitudes: the intractable complexity in human-environment interactions.<sup>49</sup> This complexity was

---

<sup>46</sup> The first Environmental Design Research Association (EDRA) conference was held in 1969 in Chapel Hill and was attended by 200 planners, architects, and scientists. See Environmental Design Research Association, Henry Sanoff, and Sidney Cohn, *EDRA 1: Proceedings of the 1st Annual Environmental Design Research Association Conference* (Stroudsburg, Pa.: Dowden, Hutchinson & Ross, 1970).

<sup>47</sup> Raymond G. Studer, “On Environmental Programming,” *Arena* (May 1966): 290.

<sup>48</sup> Christopher Alexander, *Notes on the Synthesis of Form* (Harvard University Press, 1964), 16.

<sup>49</sup> In the early 1960s there was a growing realization in the design professions that problems of “man and environment” were becoming so complex as to invalidate their tools and knowledge of design (William J. Mitchell, *Environmental Design: Research and Practice: Proceedings* (Los Angeles: University of California, 1972), Introduction.) The design professions looked to the sciences for help. This interdisciplinary cluster of problems and techniques became known as Environmental Design (a semantic gap in need of filling if there ever was one). The first major meeting of designers and scientists consciously gathered to address this problem emerged from the network of contacts established by the Design Methods Group Newsletter at MIT and took place there in 1967. The result was Moore’s book *Emerging Methods in Design and Planning*. (Gary T. Moore, *Emerging Methods in Environmental Design and Planning; Based on the Proceedings of the Design Methods Group First International Conference, Cambridge, Mass., June 1968*, 1st ed. (Cambridge, Mass.: MIT Press, 1973, 1973).) Out of this first meeting was formed the Environmental Design Research Association (EDRA). As the concept of environment introduced a new scope of design problem, so the scope of design correspondingly widened. The first EDRA conference in 1969 established two cornerstone areas of this new field of research: 1) a deeper knowledge of the man-

primarily quantitative: “more people emitting more complex behaviors; more communications; more knowledge about what is required; and more means for finding solutions.”<sup>50</sup> “Environment” was conceived as a new object to be designed that was expansive enough to accommodate such complexity. An economist designed with one subset of environmental variables, the political scientist another set, and the architect with yet another set. The architect was one of many possible designers operating on only one of many possible subsets of environmental variables. So expansive was this conception that design itself was defined as “a technological commitment to the intentional evolution of environment”<sup>51</sup> and the creation not of a building but a “social ambience.”<sup>52</sup>

Environmental design was an outcome of negating the polar extremes of scale that separated design concerns: on the one hand, within urbanism the city was freed from the 19th c metalanguages of biology and mechanics and generalized into the vague notion of

---

environment milieu (which included cognitive, behavioral, and semiotic aspects); 2) the development of methods and techniques, of which computation would play a central role along with new ideas about simulation and game-playing. (Mitchell, *Environmental Design*.)

<sup>50</sup> Studer, “On Environmental Programming,” 290.

<sup>51</sup> Ibid.

<sup>52</sup> Mildred F. Schmertz, “Design for the 1970’s: A New Professional Conscience,” *Architectural Record* (October 1970): 119. In October 1970, *Architectural Record* dedicated a special issue to the future of architecture in the 1970s in which it argued for a wholesale re-assessment of the discipline, from practice to education, from building technology to client relations. Putatively motivated by the poor economy, political worry, and a new social and environmental awareness the thrust of the introductory essay, in contrast to the “less is more, smaller is better” specialization we are seeing in similar circumstances today, was in fact a sweeping claim to the expansiveness of the discipline. Couched in the neo-humanism of the day, it claimed that the progressive thinkers within the discipline had become increasingly aware “that architecture is really about everything and affects everything” and that “[t]he tasks, more deeply perceived, have become more complex.[...] To give appropriate physical form to society’s psychological, social, esthetic and practical objectives, the architect must first understand them, intuitively and philosophically.[...] The people who use his buildings must be at the center of his thoughts. He will create a social ambience which will not only enable them to do what it is that they do, but will give them options for doing other things as well.” (Ibid.) This statement, and countless others like it at the time, clearly articulates the problem set forth by the new discipline of environmental design: the primacy of the user and the problem of creating not merely a building but a programmatically open and indeterminate “social ambience.”

environment; on the other, the designed object was seen as existing in a broader ecology of people and things. These concerns had two aspects in common: the emergence of a new kind of subject—the user—and the centrality of information flow and interaction as the glue that held this environment together. For the environmental designer concerned with the urban scale, the city dweller was an empowered user who moved through an environment made coherent by information messages with a new humanist agency.<sup>53</sup> The designer of objects, on the other hand, was working in a radically expanded field.

According to French philosopher and engineer Abraham Moles, “It is becoming the function of design to examine this new field of ‘programmed sensualizations’ (what one used to call a ‘work of art’ and what one could call from now on a ‘scene of esthetic action’). What would become, for example, of an electronic tactile detector combined with a Minitel or Compuserve system?”<sup>54</sup> The designer of objects would need to engage engineering concepts like “transduction” (“to transform messages from one medium to another”) and “interfacing” (“to set up a partition of illusions for the projection of tele-images for example, a screen, a tactile sensor, a sonorous background, a simulated landscape, or a virtual actor.”)<sup>55</sup>

In France, environmental design was largely put forth as a bottom-up, tactical response to the strategic, heavy-handed modernist planning of the 1960s. During the

---

<sup>53</sup> See, for example, Kevin Lynch, *The Image of the City* (Cambridge, Mass.: MIT Press, 1960); Françoise Choay, *L’urbanisme, utopies et réalités* (Paris: Seuil, 1965).

<sup>54</sup> Abraham A Moles, “Design and Immateriality: What of It in a Post Industrial Society?,” *Design Issues* 4, no. 1/2 (1988): 30.

<sup>55</sup> *Ibid.*

years between the departure of the Les Halles markets and the infamous demolition of the Baltard's pavilions the environment of the Plateau Beaubourg became a locale of spontaneous public life, hosting ad hoc exhibitions—including two curated by the Centre de création Industrielle (CCI), one of the four cornerstone institutions making up Beaubourg—along with street theater, happenings, and magicians, an afterlife that was pivotal in establishing a discourse of everyday life and environmental design (as we shall see) and of which the Centre Pompidou became a sort of simulacrum. The CCI exhibition, *L'espace collectif, ses signes et son mobilier* was one of the cradles of the emerging French discourse on environmental design (Figure 1.5).<sup>56</sup> For François Mathey, director of the CCI and the exhibition's main organizer, it was a critical response to a modern urban condition that had prohibited the spontaneous forms of “true,” lived social exchange that flourished in the traditional city.<sup>57</sup> The street was the *idée fixe* of this emerging discourse of urban resistance. It offered a space of “immediate use” and relations of “everyday life.”<sup>58</sup> The accumulation of objects that constituted the space of the street, the exhibition proposed, compensated for the inadaptability of urbanistic decisions of 50 years earlier to the reality of needs of inhabitants. Thus, as François

---

<sup>56</sup> The catalog was published (on newsprint) as *L'espace collectif, ses signes et son mobilier* (Paris: Centre de création industrielle, 1970). The exhibition was held in the Halles de Baltard, Pavillon 10 and ran for two months starting on December 3, 1970. The Datar (“Délégation à l'aménagement du territoire et à l'action régionale”) had been working on a policy on environmental development in 1970 and asked the CCI to study the problem of urban furnishings, which resulted in the exhibition. (Ibid., 46.)

<sup>57</sup> Ibid., 3.

<sup>58</sup> This conception also recalled Joan Littlewood's description of the Fun Palace as a ‘university of the streets’ and so would have resonated with Rogers. (Joan Littlewood, “A Laboratory of Fun,” *The New Scientist* (May 14, 1964): 432–33.) For the flavor of responses typical of French discourses of environmental design at the time, see Antoine Grumbach, “Les équipements de la vie quotidienne,” *Techniques et Architecture* (May 1969); Denis Goldschmidt and Flavio Salamanca, “Le drugstore du trottoir: Essais sur une rationalisation de mobilier urbain,” *Crée*, no. 4 (April 1970).



Barré, Denis Goldschmidt, and Antoine Grumbach observed in their audio-visual installation, *Qu'est-ce que la rue?*, most signage in the modern city reprimands, prohibits, and regulates—the public face of a faceless administration organized according to principles of hierarchy and compartmentalization.<sup>59</sup> In contrast, they identified types of exchange—*flânerie*, encounter, meeting, expression, communication—which occurred in a “space of all possible relations, a space of definitive freedom and lived by everyone, not a space of a particular type of freedom regulated by someone else.”<sup>60</sup> Moreover, they argued that the replacement of traditional objects in urban space (fountains, clocks, sidewalks, etc.) with advertising was a sign that the street was slipping out of the hands of the citizen and into those of private interests.<sup>61</sup>

In 1970, Philippe Fayeton and Christian Ducrez published an article in *Crée*, the journal of the CCI, addressing this new domain of action. Invoking a range of sources from Kevin Lynch to *Townscape*, they claimed that the field of urban design, by which they meant much more than the simple sum of urbanism and industrial design (which for the most part concerned the distribution of urban furniture in urban space): it took as its mandate no less than the organization of the total environment as the overarching context

---

<sup>59</sup> *L'espace collectif, ses signes et son mobilier*, 10.

<sup>60</sup> *Ibid.*, 11.

<sup>61</sup> It was therefore not without irony that the exhibition was sponsored by Ministry of Cultural affairs, Ministry of industrial and scientific development, ministry of post and telecommunications, city of Paris planning dept (the same people that were at that time razing Les Halles), MNAM, CNAC, various public transit agencies from other countries, along with a host of multinationals (Kodak, Michelin, Siemens) and local industries. Some of the exhibits were installed like a trade show, and the catalog includes contact information for companies.

for “life” was only just being discovered.<sup>62</sup> This new field would be defined in part by a wide range of parameters: political, economic, historical, affective, climatic. “We perceive environment to be everything, global, all-encompassing; nothing can stand outside it. Therefore it is difficult to see the elements that constitute it and modulate it as determinants—everything is subsumed by it. The key is differentiating ‘space’ from ‘perceived space.’”<sup>63</sup> This environment was, according to Fayeton and Ducrez, a quasi-biological milieu in which intangible criteria such as “desirability” or “allure” combine with quantitative economic analysis in a kind of natural system with its own laws. As they astutely observed, the overdetermined field of environmental design was already well known to developers of commercial shopping centers, whose parameters included both the affective (light, sound, colors, and other stimuli) as well as the technocratic (frequency of visits, number of transactions). The design of environment or “social ambience” thus had its own precise techniques, and Fayeton and Drucez singled out Los Angeles in particular as a place that had refined this kind of calculus, encapsulated in the work of Victor Gruen.<sup>64</sup>

In this condition, as the historian Fred Turner has observed about Silicon Valley, the differences between counterculture critique and corporate techniques were becoming

---

<sup>62</sup> Philippe Fayeton and Christian Ducrez, “Design et urbanisme,” *Crée*, no. 4 (April 1970): 54.

<sup>63</sup> *Ibid.*, 55.

<sup>64</sup> Jameson would later pick up on this theme in Fredric Jameson, “Postmodernism, or The Cultural Logic of Late Capitalism,” *New Left Review*, no. 23 (August 1984). On this theme in the work of Gruen, see Alex Wall, *Victor Gruen: From Urban Shop to New City* (Barcelona: Actar, 2006).

difficult to discern.<sup>65</sup> Indeed, the discourses of resistance swirling around 1968 were increasingly hard to distinguish from the apparatus of late-capitalism: it was a but a small gap between the critical discourses of “everyday life” and the marketing research of postwar consumer culture, or the Ateliers populaires of 1968 talking of leaving the studio and infiltrating the streets with their posters and the horizontal spread of information emanating from think tanks. Beaubourg administrators would thus need to answer the question of what the role of the state should be in this new condition.<sup>66</sup> Somewhat surprisingly, new American models of consumption offered an alternative to the unhelpful dichotomies of 1968—top down versus bottom-up, populism versus elitism, high culture versus low, everyday life versus official culture, left versus right. In France, the supermarket, particularly those opened in the 1950s by Edouard Leclerc, followed soon after by the hypermarket—a combination of supermarket and department store that offered a simulacrum of the postwar world (largely suburban) within one vast shed—stood against the reactionary, protectionist, and frequently collaborationist shopkeeper class who kept prices in their traditional BOF (beurre-oeufs-fromage) shops high and mobilized a grass-roots conservative uprising in the mid-1950s.<sup>67</sup> Principles of democratic access, openness, and plenitude made institutions such as Leclerc socially

---

<sup>65</sup> See Turner, *From Counterculture to Cyberculture*. A specific example of this was the collaboration between the writers of the experimental Oulipo movement and IBM France research scientists. (*Rapport d'activité* (Centre national d'art et de culture Georges Pompidou, 1977).) See also Paul Fournel, “Computer and Writer: The Centre Pompidou Experiment,” in *Oulipo: A primer of potential literature* (Lincoln: University of Nebraska Press, 1986).

<sup>66</sup> Nora and Minc, *The Computerization of Society*, 7.

<sup>67</sup> On the battles waged by Leclerc against the conservative Poujadists see John Ardagh, *The New French Revolution* (Harper & Row, 1969).

progressive alternatives rather than merely agents of American cultural and economic imperialism.

Visitors to the temporary offices of the Centre Beaubourg administration at 35 Boulevard Sébastopol in the summer of 1970 would have passed, a few doors down at number 6, the flagship branch of the Fédération nationale d'achats des cadres, or FNAC. Launched in 1954 by two Trotskyist businessmen, André Essel and Max Théret, FNAC married the Socialist ideals of its founders to the entrepreneurial ambitions of the *Trentes glorieuses*, the period of thirty years of prosperity following the end of World War II. Conceived as a members-only buyer's club, FNAC sold what its founders called "cultural products"—books, records, photographic equipment, and consumer electronics—at greatly discounted prices to the new working class of the postindustrial society. A crucial aspect of FNAC's strategy was a rhetoric of openness, based largely on its notorious "blacklist," an information pamphlet in which the owners would loudly denounce some of the very products they sold, and on their open "Forums" that offered shoppers the opportunity to debate current events with guests ranging from the sociologist Pierre Bourdieu to Culture Minister Françoise Giroud. In this way, FNAC's aim was to improve the lives of workers by access free cultural events and to the latest technology and cultural products—a revolution if not of higher salaries then of lower prices and open information.

The managers of the future Centre Beaubourg working in the temporary offices on the Boulevard Sébstopol had all taken note of the steady flow of customers streaming

into FNAC,<sup>68</sup> and in their future cultural center, the museumgoer would be recast as consumer and the museum as a cultural hypermarché. Under the curator Pontus Hultén, the experience of art at Beaubourg, as DeRoo observes, was “rendered part of a broader complex of spectacular leisure activity and opportunities for consumption.”<sup>69</sup> Beaubourg thus was simultaneously attacked and defended for the same reasons as the hypermarket itself: its unashamed embracing of American consumer culture, its discourses of democratic openness and populism achieved through technocracy. Although Pompidou himself didn’t refer to his project in these terms, it would become a cornerstone of his neoliberal legacy and resonated with an emerging consciousness among those born during the 1940s who had seen hardship, a consciousness not only of “culture” but of their status as the new subject of “consumer.”<sup>70</sup>

Advertising messages were the engine behind these new spaces of consumption. To observers at the time—particularly those within the emerging science of semiology—the advertising industry was particularly adept at mastering the new and mysterious laws

---

<sup>68</sup> I am indebted to Claude Mollard for pointing this connection out to me. Claude Mollard, personal interview, April 2008.

<sup>69</sup> DeRoo, *The museum establishment and contemporary art*, 168.

<sup>70</sup> Indeed, the contradictions of this situation are encapsulated in the almost complete absence of unanimity of opinion on the Centre Pompidou among various factions. The Gaullists were mixed in their support for the project; the Communists liked it, while the Socialists hated it—at least until the early 1980s when François Mitterand, visiting the Centre, commented to his own Minister of Culture, Jack Lang, that “one day, we’ll build things like this.” (Mollard, interview.) Moreover, the key figures in the origins of Beaubourg, that monument later denounced from both left and right, came from complicated backgrounds. Claude Mollard, the Centre’s first chief administrator, was deeply involved in the protests of 1968, while Robert Bordaz, president of the commission established to oversee its construction, was a *gaullist de gauche*.

of communication, unseen but highly effective.<sup>71</sup> Under the influence of Shannon's seductive model of a communications pipeline connecting transmitter and receiver, theorists of culture proposed that culture was fundamentally a problem of communication.<sup>72</sup> On this matter the anthropologist Edward Hall, writing in 1959, could not have been more blunt: "Culture is communication and communication is culture."<sup>73</sup> During the 1960s, cultural discourses of communications and information technology fell along two lines of thinking: the analytical mode of semiotics and the projective mode of a new utopian thinking in which multinational corporations and public-private alliances take on many of the responsibilities of the state.<sup>74</sup>

---

<sup>71</sup> See, for example, Barthes' systematic dismantling of the modes of communication operative in an advertising image in Roland Barthes, "Rhetoric of the Image (1964)," in *Image, Music, Text*, ed. Stephen Heath (New York: Hill and Wang, 1977).

<sup>72</sup> Claude Shannon's 1948 article, *The Mathematical Theory of Communication*, was later re-published in a book that brought Shannon's model to a general audience. See Claude E. Shannon and W. Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949). Thanks to Warren Weaver's commentary, the book announced (despite its intimidating title) an easily graspable general model by which all culture could be understood. Its influence was immeasurable. In 1953, Charles and Ray Eames created the film, "A Communications Primer," for IBM illustrating Shannon's theory and showing the perception at the time of its universal applicability. Abraham Moles brought Shannon's ideas to France, and in particular to the cultural realm. (Abraham A Moles, *Théorie de l'information et perception esthétique* (Paris: Flammarion, 1958).) Shannon's work was also foundational to the new sciences of structuralism and semiotics. (Lévi-Strauss acknowledges the debt to Shannon and Weaver—and recounts that he lived in the same house in New York as Shannon between 1941 and 1945, albeit without ever meeting. See Bernadette Bucher, "An Interview with Claude Lévi-Strauss, 30 June 1982," *American Ethnologist* 12, no. 2 (May 1985): 360-68.)

<sup>73</sup> Edward Twitchell Hall, *The Silent Language* (Garden City, N.Y: Doubleday, 1959), 191. Few thinkers of this period were as committed to this idea as Hall and his ideas were influential in France, largely through Abraham Moles and Jacques Couëlle.

<sup>74</sup> A treatise by the American political scientist Harlan Cleveland captures its operative myths, all of which centered on erosion of hierarchical social structures. Because knowledge equated to power, the distribution of information promoted participation—a horizontality of organization rather than the flow of commands up and down. As Cleveland put it, "the number of committees per capita will be the new measure of observable changes brought about by the information society." This horizontal flow of information would promote openness in place of secrecy. Openness was the buzzword. It would also challenge traditional forms of ownership. Leak-prone, information cannot be owned, exchanged, monopolized in the way that industrial products can. It thus promotes practices of "fairness" and "access," which amount to a restoration

As I was working through this study, several of its ideas were suddenly given voice in the publication of Sanford Kwinter's short essay, *Beaubourg, or The Planes of Immanence*. And as I have worked through the material and have struggled with my own assessment of the building's successes and failures, I have come to agree with Kwinter's positive assessment of the building and in particular with his argument that its success comes not from a clarity of argument that trumps criticism but rather that it embodied so eloquently the contradictions inherent to a particularly complex historical moment. "Arguably the most significant building of its era," Kwinter declares, "Beaubourg is nothing if not a renunciation of canonical boundaries."<sup>75</sup> The building is at once a celebration of postwar technological culture and a questioning of that culture at a moment when it was in decline.

Yet Beaubourg's rampant, even celebrated 'contradictions,' contrary to the simplistic claims of its critics, were never its weakness, but rather its strength. It marked for the first time in a building, in so bald and declamatory a manner, the presence of processes that the fallout of World War II had impressed onto all other aspects of advanced capitalist culture, layers of moral, epistemological, and perceptual ambiguity that characterize only cultures on the brink of transformation.[...] The Renzo Piano and Richard Rogers tour de force was the intellectual harbinger of cultural and especially economic processes that were then remotely and

---

of the commons. Lastly, these tendencies have spatial implications. They result in a "passing of remoteness" in which power centers are no longer based on geographic proximity to resources. (Harlan Cleveland, "The Twilight of Hierarchy: Speculations on the Global Information Society," *Public Administration Review* 45, no. 1 (1985): 185—195.) Cleveland points out that Ivan Illich, on the other hand, saw in information technology "silence as the commons" and the computer as a new form of enclosure, "reserving to the few the privilege of breaking the silence otherwise available to the many." (Ibid., 194.) See Ivan Illich, "Silence is a Commons," *CoEvolution Quarterly*, no. Winter (1983): 5-9.

<sup>75</sup> Sanford Kwinter, "Beaubourg, or The Planes of Immanence," in *Requiem: For the City at the End of the Millennium* (Barcelona: Actar, 2010), 16. Kwinter's short essay doesn't develop this argument with any specific reference to the building; it is one of the goals of this dissertation to do so.

invisibly preparing themselves and that today have become so plain to see: the multiple, subtle ‘coups’ of economic liberalization, globalization, and systematic subsumption of social and cultural capital by financial rationality.<sup>76</sup>

Beaubourg was indeed an object around which French society shaped itself at a moment of cultural instability, and at the core of that process was the question of technology.

Beaubourg in turn was shaped by the French readiness to absorb seamlessly into society the “administrative and managerial gadgetry,” largely in the form of telematics (Minitel) and databases, and the continued embrace of such gadgetry during in the 1980s and 1990s represented the playing out of the very discourses surrounding Beaubourg.<sup>77</sup> And so, as Kwinter argues, while social and technological processes operate as a kind of “invisible hand” in the design act, design in turn changes the conditions in which those processes operate. “Design is a literal and continual modulation of, and communication with, social and historical process.”<sup>78</sup> Its relationship to these processes is one of reciprocity and mutual modulation, and Beaubourg needs to be understood as much as a shaper of technological discourses as their outcome. But where Kwinter argues that Beaubourg prepared society to accept the future shocks of technology, I feel that its imbrications with the technological discourses of late-capitalism run deeper than this. As Reinhold Martin has recently argued, “[a]t the very moment when so-called postmodern architecture jettisoned modernism’s ‘machine aesthetic,’ it revealed itself to be part of a

---

<sup>76</sup> Ibid., 16–17.

<sup>77</sup> Ibid., 18.

<sup>78</sup> Ibid., 20.



new machine as well as the representation of that machine.”<sup>79</sup> One of the goals of this study, then, is to sketch the outlines of that machine and the various ways in which it formed architecture’s condition at the start of the 1970s—a condition from which, in many ways, we have never departed.

---

<sup>79</sup> Reinhold Martin, *Utopia’s Ghost: Architecture and Postmodernism, Again* (Minneapolis: University of Minnesota Press, 2010), xi.

## Chapter 1: Genesis of the Brief

*The entire Centre has been inspired by an original perspective, that of constantly renewing information.<sup>1</sup>*

—Centre Beaubourg Competition Brief

*[W]e must firmly reject the dichotomy which sets the candle-lit garrets of genius in opposition to the complex institutions of technocracy.<sup>2</sup>*

—Pierre Boulez

Any architect who entered the international competition for the Centre Beaubourg in the winter of 1970 might have been struck by several things when first opening the package of competition materials. Most obvious would have been, as Richard Rogers later put it, the “highly formalized, super rationalized” brief.<sup>3</sup> This impression would have been particularly marked if the same architect had entered the competition for the Sydney Opera House fifteen years earlier. Where the Sydney brief consisted primarily of site photographs and competition regulations—with the building program and site analysis each given two short and unsystematic pages in the Appendix—the Beaubourg brief offered competitors a detailed program with meticulously tabulated requirements, diagrams of spatial relationships, and specifications for all technical aspects of the building’s performance.<sup>4</sup>

---

<sup>1</sup> *Concours international d’idées à un degré (competition brief)* (Paris: France, Ministère d’état chargé des affaires culturelles, 1970), 4.

<sup>2</sup> Pierre Boulez, “Maestro Computer: Exploring the new frontiers of sound,” *The Unesco Courier* 33 (April 1980): 28.

<sup>3</sup> “Piano & Rogers: Centre Beaubourg,” *Architectural Design* 42, no. 7 (1972): 408.

<sup>4</sup> *Concours international d’idées à un degré (competition brief)*. The Sydney brief was published as *An International Competition for a National Opera House at Bennelong Point, Sydney, New South Wales, Australia: Conditions and Programme*, 1955. The brief for the 1967 Amsterdam Town Hall competition was considerably more detailed, but like Sydney restricted its program to lists of required functions and areas, with rudimentary treatment of the interrelationships between spaces and other aspects of the building’s performance. See *Stadhuis-prijsvraag Amsterdam 1967 (competition brief)*, 1967.

These differences can partly be explained by the fact that architectural programming as a systematic area of technical expertise had not yet emerged by the time of the Sydney competition but by 1970 was fully part of the architect's professional toolkit for dealing with complex buildings.<sup>5</sup> Yet, here this new architectural technocracy, until then restricted to addressing new problems posed by building types emerging during the postwar period (large hospitals, mass housing, schools, the planning and programming of new suburbs) was being applied to an elite cultural building, and even flaunted in the context of a high-profile international design competition.

But perhaps more striking would have been that the myriad activities whose performance the program described in such technical detail—the museums, libraries, galleries, laboratories, theaters—were not in fact functional ends in themselves but rather constituted a meta-program for a meticulously engineered information machine in which visitors no longer went to a museum to merely view artworks nor visited a library simply to read books but rather were “users” of a more general apparatus of cultural exchange, education, self-improvement, and discovery.<sup>6</sup> Where opera-lovers visiting Sydney were given a high-performance opera house on which to further hone their musical sensibilities, museum-goers at Beaubourg who thought they were there to celebrate *l'art*

---

<sup>5</sup> The seminal paper on programming is William M. Peña and William W. Caudill, “Architectural analysis: Prelude to good design,” *Architectural Record*, no. May (1959).

<sup>6</sup> Where such agendas had been tacit operations of new systems of power in the development of 19<sup>th</sup> century institutions they were at Beaubourg made overt, and even celebrated. On the history of the museum in the 19<sup>th</sup> century as an apparatus of power see Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995).

*pour l'art* would encounter (whether they wanted it or not) the latest electronic music and world news.

The ideas behind this meta-program were established between George Pompidou's election as president of France in June of 1969 through December of the same year.<sup>7</sup> A mere six months after his election, Pompidou described his intentions in a letter to Culture Minister, Edmond Michelet:

This architectural complex must not only include an expansive museum of painting and sculpture, but also specialized facilities for music, sound recording, and eventually film and theatrical experimentation. It would be desirable to also include a library, at minimum one that brings together works dedicated to the arts in their most contemporary forms.<sup>8</sup>

The brief opened with a statement on the makeup of the new institution: "On December 11, 1969, the French President decided to have a Center erected in the heart of Paris, not far from Les Halles, devoted to the contemporary arts, which would include a public library of all encompassing scope."<sup>9</sup> It also restated Pompidou's intention as a problem of information:

The entire Centre has been inspired by an original perspective, that of constantly renewing information: news of artistic creation in its many forms, news of industrial design, and especially the constant keeping up-to-date of those institutions, Library and Museum, which may be considered the memories of ideas and forms.<sup>10</sup>

---

<sup>7</sup> For a detailed view of Pompidou's cultural policies, see Serge Bernstein and Jean-Pierre Rioux, *The Pompidou years, 1969-1974* (Cambridge, UK; New York, NY: Cambridge University Press, 2000).

<sup>8</sup> Georges Pompidou, "Letter to Edmond Michelet", December 15, 1969, 2005100/3, Archives CGP.

<sup>9</sup> *Concours international d'idées à un degré (competition brief)*, 3.

<sup>10</sup> *Ibid.*, 4.

In so doing, the brief built on an emerging discourse of interdisciplinarity inflected in the 1960s by information theory.<sup>11</sup> As Claude Mollard, the Center's first General Secretary, later put it,

the intentions of those behind the Center were clear: tearing down of barriers between cultural disciplines, openness to all publics, and exchange with regions [of France] and with other countries.[...] Information and the formation of the public are our final goals.<sup>12</sup>

Information enabled transgression of boundaries between social groups, expert disciplines, and geographic spaces. As Mollard argued, "the possibility for breaking down disciplinary boundaries, as well as geographic, cultural, and social ones [...] made possible by increasing information had never been so great."<sup>13</sup> As the brief put it,

This Center should not therefore stay isolated; its activity will necessarily overflow the limits of the building, leaving its mark on the district and spreading throughout France and other countries by means of travelling exhibitions, television broadcasts, publications, etc. The possibility of consulting from a distance reference cards programmed into the Library's computer will create a service for the diffusion of knowledge which will be well appreciated.<sup>14</sup>

At Beaubourg the organized flow of information would help build new connections between experts and public, librarian and reader, industrial designer and industrialist, writer and musician, Parisian and Provincial.

---

<sup>11</sup> The emergence of the concept of interdisciplinarity as an offshoot of Shannon's information theory in the 1950s and 1960s is discussed in Julie Thompson Klein, *Interdisciplinarity: history, theory, and practice* (Detroit: Wayne State University Press, 1990), 29–36.

<sup>12</sup> Claude Mollard 1974 report. Archives CGP.

<sup>13</sup> Claude Mollard, *L'enjeu du Centre Georges Pompidou* (Paris: Union générale d'éditions, 1976), 22. Ibid.

<sup>14</sup> *Concours international d'idées à un degré (competition brief)*, 4.

From where did this view of a cultural center as an information center originate? In some respects, it was consistent with a tendency in cultural practices during the 1960s that were concerned with objective processes of accumulation and quantification.<sup>15</sup> But its history goes back further. In France, the notion of culture was inextricably linked to the late-Enlightenment project of encyclopedic accumulation and new discourses of preservation in post-Revolutionary years, a project that continued into the 20<sup>th</sup> century. In 1964, the art historian André Chastel launched his project for a national inventory of cultural monuments. He noted that “the general inventory must be understood as an enormous mass of information, of which print publications are merely one possible form.”<sup>16</sup> But the most seductive expression of this principle had been put forth twenty years earlier by André Malraux, France’s first Culture Minister, in his theoretical proposition for the *Musée imaginaire*.<sup>17</sup> Malraux’s “museum” was a utopian space in

---

<sup>15</sup> Among these, German Viatte, co-founder of the Centre national d’art contemporain (CNAC), cites as evidence the Restaurant Spoerri by Daniel Spoerri (1968), Le Boutique by Ben in Nice (1958-73), and early Boltanski. Germain Viatte, personal interview, April 2008.

<sup>16</sup> André Chastel, “L’invention de l’Inventaire,” *Revue de l’Art*, no. 87 (1990): 7–8. Malraux and Chastel’s work on the Inventaire générale was an attempt to comprehensively catalog the objects in the built environment based on the idea that culture was defined by the totality of its artifacts, and in particular that this totality could be represented by a comprehensive inventory or information database, democratic in its indifference to criteria of connoisseurship. Judgment for inclusion would not be based on a distinction between “high” and “low” but instead on perceived value the particular instance had in the articulation of cultural definition. For a detailed history of the Inventaire générale see Alexandra Kowalski, “From cathedrals to teaspoons: The Inventaire General and the cultural wealth of the French nation” (Doctoral thesis, New York University, 2007).

<sup>17</sup> Malraux’s essay was originally published in 1947 and re-published in 1951 and 1965. It was published in English as Andre Malraux, *Museum Without Walls* (New York: Doubleday, 1967). For a discussion see Douglas Crimp, “On the Museum’s Ruins,” in *The Anti-aesthetic: essays on postmodern culture*, ed. Hal Foster, 1st ed. (Port Townsend, Wash.: Bay Press, 1983); Jean François Lyotard, *Soundproof Room: Malraux’s Anti-Aesthetics* (Stanford: Stanford University Press, 2001); Rosalind E. Krauss, “Postmodernism’s Museum without Walls,” in *Thinking about Exhibitions*, ed. Reesa Greenberg, Bruce W. Ferguson, and Sandy Nairne (Routledge, 1996), 487. The key contemporary critique in French remains Georges Duthuit, *Le musée inimaginable* (Paris: J. Corti, 1956). On Malraux’s policies in general, see

which a constellation of photographic reproductions of artworks created a space of information in which new correspondences and contrasts could emerge through processes of shuffling and recombination, a conception in which, according to Rosalind Krauss, “every work whether tiny or colossal now to be magically equalized through the democratizing effects of camera and press.”<sup>18</sup> Unlike other modernist utopias, which tended to operate on a principle of radical subtraction, the information utopia of Malraux’s museum was radically cumulative: more was more.<sup>19</sup>

The desire to simultaneously unharness and constrain information’s tendency to proliferate was at the heart of all information utopias, from the Musée imaginaire extending back through his project for the Musée du XX<sup>e</sup> siècle to Le Corbusier’s first exploration of the problem in the Mundaneum and further to the museums of Patrick Geddes.<sup>20</sup> Le Corbusier’s 1928 unrealized project for the Mundaeum (or World Museum)

---

Herman Lebovics, *Mona Lisa’s Escort: André Malraux and the Reinvention of French Culture* (Cornell University Press, 1999).

<sup>18</sup> Krauss, “Postmodernism’s Museum without Walls,” 345. The overall conception was most eloquently expressed by the famous photograph of Malraux standing over a field of photographic reproductions. Malraux built on earlier information utopias, such as the World Brain of H.G. Wells that envisioned a vast, globally-distributed intelligence based on a constellation of documents. See H. G Wells, *World brain* (London: Methuen & Co., 1938). Wells’ idea is not unlike more recent conception of a Semantic Web, introduced in Tim Berners-Lee, James Hendler, and Ora Lassila, “The Semantic Web,” *Scientific American* (May 2001): 29-37.

<sup>19</sup> By 1979, IBM chief scientist Lewis Branscomb echoed this when he stated that the fundamental problem of information, considered as a resource, is not its scarcity but instead its state of chronic surplus. (Cited in Harlan Cleveland, “The Twilight of Hierarchy: Speculations on the Global Information Society,” *Public Administration Review* 45, no. 1 (1985): 187.) Historian John Carey has described the quintessential characteristic of modernist utopianism as being “radically subtractive,” whether in the form of eugenics or social-engineering. (“Modernist Utopias,” *In Our Time* (BBC Radio 4, March 10, 2005).)

<sup>20</sup> Seguin had effectively made such a claim when he unrelentingly argued that the library I.T. systems support documentary research over mere cataloging by providing a computerized desk at which researchers could work within an endless and immersive galaxy of documents, an argument that he finally lost. For a chronicle of those arguments see Jean-Pierre Seguin, *Comment est née la BPI: Invention de la médiathèque* (Paris: Bibliothèque publique d’information, Centre Georges Pompidou, 1987), 70–71, 90–94, 99–104. The

was the root of the architect's scheme for Malraux's Musée du XXe siècle.<sup>21</sup> A collaboration with the Belgian documentalist and pacifist lawyer Paul Otlet, it was committed to the socially transformative capacities of information documents.<sup>22</sup> Visitors to the World Museum were to take an elevator to the apex and slowly descend along a path made up of three parallel tracks representing objects, geographic places, and historical time. As they descended, visitors would make connections across the three tracks. Inspired by Otlet's encounter with Patrick Geddes at the 1900 Paris exposition and his so-called Index Museum, the Mundaneum merged the dual logic of the encyclopedia and world exposition. To a documentalist such as Otlet there was little distinction between object and paper document: artifacts, models, sculpture, archaeological objects, even animals in zoo could be documents.<sup>23</sup> In the Mundaneum, library and museum

---

view that information technology's fundamental role is to constitute and manage a space of documents was an important thread in the development of the information society. In 1945, Vannevar Bush speculated about such a collective memory machine, which he called the Memex, in Vannevar Bush, "As We May Think," *Atlantic Monthly* (July 1945). IT was also particularly resonant in the French context since Paul Otlet had speculated on a distributed system of electronic documents that many say prefigured the World Wide Web. (See, for example, W. Boyd Rayward, *International Organisation and Dissemination of Knowledge: Selected Essays of Paul Otlet* (Amsterdam: Elsevier, 1990). Also, Françoise Levie, *L'homme qui voulait classer le monde: Paul Otlet et le Mundaneum* (Paris-Bruxelles: Les Impressions Nouvelles, 2006).) Other information utopias in the early 20<sup>th</sup> century include Andersen and Hébrard's World Center for Communications (reported in A. Trystan Edwards, "A World Centre of Communication," *Town Planning Review* 5 (April 1914): 14-30.)

<sup>21</sup> Surprisingly little has been written on Le Corbusier's series of spiral museum projects. See Alberto Boralevi, "The Architectural Conception of the Museum in the Work of Le Corbusier," *Museum Management and Curatorship* 2, no. 2 (June 1983): 177-89.

<sup>22</sup> On Otlet and the Mundaneum, see Françoise Levie, *L'homme qui voulait classer le monde: Paul Otlet et le Mundaneum*; Isabelle Rieusset-Lemarié, "P. Otlet's Mundaneum and the International Perspective in the History of Documentation and Information Science," *Journal of the American Society of Information Science* 48, no. 4 (1997): 301-9; Georgina Araceli Torres-Vargas, "World Brain and Mundaneum: the ideas of Wells and Otlet concerning universal access," *Vine* 35, no. 3 (2005): 156-65.

<sup>23</sup> Suzanne Briet developed this approach into a theory in which documents were "any physical or symbolic sign, preserved or recorded, intended to represent, to reconstruct, or to demonstrate a physical or conceptual phenomenon." (Quoted in Michael Buckland, "What is a 'document'?", *Journal of the American Society of*



would lose the autonomy from one another that had been won during the 19th century: in merging the spaces of museum and library, all culture is represented as a vast network of documents.<sup>24</sup>

Geddes' earlier Index Museum likewise blurred the line between library and museum. In place of the apparent confusion and arbitrariness of 18<sup>th</sup> and 19<sup>th</sup> century collections and libraries, Geddes' Index Museum married the spectacle of fin-de-siècle consumption to the new principles of information management.<sup>25</sup> The Index Museum was, in Geddes' words, an "Encyclopaedia Graphica", by which he meant that visual knowledge (of images of objects or, better, of objects themselves) was given primacy over textually transmitted knowledge. It offered a space saturated with images, labels, objects, diagrams, and texts. As a kind of spatial encyclopaedia it was a "synoptic vision" whose sweep captured the total spectacle and organizational logic of the universal

---

*Information Science* 48, no. 9 (1997): 804-9.) Briet explained her theory in Suzanne Briet, *Qu'est-ce que la documentation?* (Paris: EDIT, 1951). For a discussion see Ronald E Day, *The modern invention of information: discourse, history, and power* (Carbondale: Southern Illinois University Press, 2001); Rafael Capurro and Birger Hjørland, "The Concept of Information," in *Annual Review of Information Science and Technology*, vol. 37, ed. B. Cronin, 2003, 343-411. The proposition that printed texts were not the only kind of signifying object found fertile ground of semiotics and Structuralism in the 1960s. Indeed, Briet's assertion that an animal in a zoo is a document while an animal in the wild is not suggests a way of understanding the role of the museum as a transformation of the objects of everyday life into documents so that they engage a broader network of documents of all kinds and suggested a convergence of library and museum.

<sup>24</sup> To many in the 1960s, the ethnographic museum held promise as a template for institutional reform based on the "objet témoin" idea from the 1920s and 30s. (Rebecca J. DeRoo, *The Museum Establishment and Contemporary Art: The Politics of Artistic Display in France after 1968* (Cambridge University Press, 2006), 37.) Objects were selected less for "rarity" or "value" but instead on a kind of eloquence about information they communicated about its conditions of production. The relationship between museum and library was the subject of later debate at the Centre Pompidou. See Bibliothèque publique d'information, ed., *Le musée et la bibliothèque, vrais parents ou faux amis?* (Paris: Centre Georges Pompidou, 1997).

<sup>25</sup> "[T]he true bunch of keys to the museums," Geddes put it, "nay the master-key itself, is the classification of the sciences and arts." Quoted in Alessandra Ponte, "Building the Spiral Stair of Evolution: The Index Museum of Sir Patrick Geddes," *Assemblage*, no. 10 (1990): 66. For a detailed discussion of the Index Museum see Volker M. Welter, *Biopolis: Patrick Geddes and the City of Life* (The MIT Press, 2003).

exhibition (which Geddes called the “primordial liquid” from which museums originated) in a single building.<sup>26</sup> Geddes described this in a passage that prefigured the complex unity proposed by the Beaubourg brief:

Museum and Gallery, Library and College are thus more and more clearly seen to be capable of essential expression and summary within a single culture-organisation, to be capable of generalised representation in culture within a single building. Why speak then as if it were a feature of an Exhibition? Why not permanently as a civic institution, linking the many larger but scattered resources of culture--museum and college, gallery and library--into one intelligible whole?<sup>27</sup>

Geddes’ aim was not limited to the display of material artifacts of culture and societies as end products in themselves but, through the spatial distribution of documents, images, diagrams, and objects, of the totality of interactions between social formations and their environments—echoing the words of Geddes’s contemporary and fellow biologist, Ernst Haeckel, who coined the term “ecology” to represent the “extremely varied and complex phenomena which show us the relations of organisms to the surrounding world, to the organic and inorganic conditions of existence: the so-called economy of nature[.]”<sup>28</sup>

In both the Index Museum and the Mundaeum, information resided less within an organization logic that mirrored the taxonomic logic of the archive than in a real-time synthesis, based on the visitor’s trajectory of affinities, correspondences, and contradictions among *objets temoins* caught in a web of annotations and contextualizations. As Krauss points out, the user was the key to Malraux’s imaginary

---

<sup>26</sup> Ponte, “Building the Spiral Stair of Evolution: The Index Museum of Sir Patrick Geddes,” 56.

<sup>27</sup> *Ibid.*, 69.

<sup>28</sup> Cited in *Ibid.*, 51.

museum (a fact suggested by its name in French and suppressed by the English title, “Museum Without Walls”) in that the “user” of the imaginary museum might write and re-write the fictions contained within its field.<sup>29</sup> Geddes’ Index Museum suggested just such a writing and re-writing: “in plan it is an abstract classification of the arts and sciences; in execution it is an outline of the evolution of civilisation” yet was only fully operational when inhabited and the precise messages contained in its classification system synthesized at the moment the visitor decides to move through the building in a particular path.<sup>30</sup>

Although Malraux’s imaginary museum was a powerful thought experiment in a broader process of rethinking cultural institutions and their role in an emerging information society, the museum as an information system was given much more concrete form during a series of Unesco workshops on “Problems of the museum of contemporary art in the West” held in October 1969 and April 1970. Among the nine of

---

<sup>29</sup> Krauss, “Postmodernism’s Museum without Walls,” 345.

<sup>30</sup> Geddes explained: “For instance, along the gallery of electricity one may see such expression as may be practically possible of the various stages of electrical invention and application exhibited immediately below. [...] From the staircase connecting these at one end, we look backwards from our present twentieth-century discoveries and inventions [...] Or starting a new from the opposite end—the earlier and simpler one—we show our visitor only a fragment of crude lodestone, a piece of amber, and point out for him the essential process of discovery which has followed the intelligent utilisation of these, from Flavio Gioja of Amalfi and Gilbert of Colchester, to Kelvin and Marconi.”(quoted in Ponte, “Building the Spiral Stair of Evolution: The Index Museum of Sir Patrick Geddes,” 68.) Likewise, the exhibition designs of Nicholas d’Harnoncourt at the Museum of Modern Art in the 1950s attempted to draw synchronic “affinities” between ethnographic objects that would materialize to the visitor through carefully constructed vistas encompassing groups of objects whose relationships were explained by the new science of Structuralism. On d’Harnoncourt’s “affinities” see Mary Anne Staniszewski, *The Power of Display: A History of Exhibition Installations at the Museum of Modern Art* (Cambridge, Mass.: MIT Press, 2001).

participants, three were members of the core Beaubourg team.<sup>31</sup> Under the heading “Information centre,” their report describes a conceptual cross-section diagram of an architectural information machine consisting of four concentric rings corresponding to four different types of information and processing (Figure 1.1). Its outermost ring was an interface to the outside world—a space for presenting and gathering raw facts about the contemporary world, live discussions, fashion reports, etc. Inside this would be a “workshop” layer for processing information offering any member of the public access to printing presses, studios, and television broadcasting equipment, followed by a “material processing” layer in which curators would synthesize exhibitions and performances from information received from outer layers and physical materials received from the central core, which was dedicated to the museum's traditional function of collecting and archiving: “the collection as a memory bank.”<sup>32</sup> “In this way,” the report argued, “the museum would become a transmitting centre instead of being as usual a repository of consecrated material.” It concluded:

All need information, and the question is what method should be used to obtain it? We advocate the creation of a model system in the form of a vast experimental laboratory, which could stimulate and test every kind of information situation; in other words, the museum seen as a centre of information, as a television broadcasting station.<sup>33</sup>

---

<sup>31</sup> These were Jean Leymarie of the MNAM, François Mathey of the CCI, and Pontus Hultén of the Moderna Museet. Their report was published as “Exchange of views of a group of experts,” *Museum* 24, no. 1 (1972): 5-32.

<sup>32</sup> *Ibid.*, 14, 43–44. They add that the memory bank and the objects stored in it do not necessarily need to be in the same building and that the core might be decentralized.

<sup>33</sup> *Ibid.*, 14.

This “museum seen as a centre of information” persisted in the imagination of the Beaubourg team, and Hultén later cited it several times.<sup>34</sup> Most importantly, the model discussed at the Unesco workshop suggested that information went beyond metaphor or a broad understanding of cultural trends: this new institution would need to actually perform as an information system.

In taking a performative and instrumental attitude to information rather than a metaphorical one, the Beaubourg brief rejected the mysticism and frequent poeticism of the earlier museum projects by Malraux and Le Corbusier. In so doing, it played upon the long-standing techocratic tradition in French utopian thinking.<sup>35</sup> In this context of technological aspirations and anxieties, the Beaubourg team embraced the new technocracy of the information age while celebrating its emancipatory, democratizing, utopian potential. The building would need to confidently assert the achievements of *la technique* and the retaking of administrative control in the face of the internationally publicized events of 1968.<sup>36</sup> A high-profile international competition and an international jury would ensure that this happened very publicly on the world stage. In this context, however, any architectural project proposing such a technological utopia would need to

---

<sup>34</sup> See, for example, Elizabeth C. Baker, “Beaubourg Preview: An Interview with Pontus Hultén,” *Art in America* 65, no. 1 (1977): 100-2.

<sup>35</sup> In 1974, a member of the National Assembly pointed out a disquieting phenomenon: “managers are replacing creators,” an observation supported by the fact that Beaubourg would be run by 800 managers. (“Centre national d’art et de culture Georges-Pompidou: Adoption d’un projet de loi,” in *Senat seance du 12 dec 1974*, 1974, 2820.) This is in keeping with Moles’ observation that in the post-industrial society, a culture of performance has been replaced by a culture of maintenance. (Abraham A Moles, “Design and Immateriality: What of It in a Post Industrial Society?,” *Design Issues* 4, no. 1/2 (1988): 25-32.)

<sup>36</sup> The celebration of postwar technocracy had been underway since the 1950s. Posters displayed around Paris invited people to Orly airport to see the one of the achievements of “la technique française.” (Figure 1.2)

confront the rising tide of suspicion of technology and in particular technology that was seen as an agent of American cultural colonization.

### **Development of the brief**

Along with these broad discourses of information and culture, a specific set of specific projects and participants helped shape a finely tuned information machine from Pompidou's vague ideas. It was Pompidou's wish from the start that the project be launched by an international competition. Michelet delegated the risky assignment to a meticulous and tenacious civil servant, Sébastien Lose.<sup>37</sup> In late-1969 Lose brought on François Lombard, and 30-year-old Berkeley-educated civil engineer who had been developing programming techniques for de Gaulle's new towns.<sup>38</sup> Between December 1969 and July 1970 Lose and Lombard assembled a team of experts from existing libraries and museums to study the problem of developing a competition program: Jean Leymarie, director of the Musée national d'art moderne, Blaise Gautier from the Centre national d'art contemporaine, François Mathey from the Centre de création industrielle, and Jean-Pierre Seguin from the nascent Bibliothèque des Halles.<sup>39</sup> The team was completed in August 1970 when the senior civil servant Robert Bordaz, who had just

---

<sup>37</sup> Germain Viatte, *Le centre Pompidou: Les années Beaubourg* (Paris: Gallimard, 2007), 18.

<sup>38</sup> As Reyner Banham later observed, the project's success as a realized utopian vision was due not only to Piano, Rogers, and Arup but also to Lombard's "less public but far longer sustained managerial determination." (Reyner Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper and Row, 1976), 211.)

<sup>39</sup> Seguin, *Comment est née la BPI*, 56. Lose and Gautier were the generators of ideas and were responsible for introducing the informational aspect to the project and therefore for interpreting Pompidou's vague intentions as a center for constantly renewing information. (Hélène Dano-Vanneyre, personal interview, April 2008.)

finished what was seen as a successful delegation to Expo 67 in Montréal, was brought in to lead the realization of the new Centre Beaubourg.

The brief presented the building as two large institutions (a public library and museum, each making up one fifth of the building's total surface) supported by a dense matrix of smaller ones (a gallery and documentation center for industrial design, an experimental gallery for contemporary art, a current events library, specialized documentation and research centers, theaters and meeting rooms, facilities for children, and restaurants).<sup>40</sup> Although the brief cited the National Library and the British Museum as cases where library and museum were combined, there was no clear model for such a scheme.<sup>41</sup> As a result, Loste and his team assembled one from fragments of ideas and projects that were floating around at the time.<sup>42</sup> Among these, perhaps most influential on the project's overall conception were the Maisons de la culture, an ongoing project of André Malraux, France's first Minister of Cultural Affairs from 1958 to 1969 that introduced a new institutional type. Built in provincial centers across France (there was never one for Paris), each Maison de la culture was an integrated, multi-disciplinary

---

<sup>40</sup> Critics used this merging of institutions in arguments against large buildings. In early 1970, *Le Figaro* complained that Pompidou's project, with its inevitable bulk and height, was inappropriate at a time when we were questioning the skyscraper. Cited in Seguin, *Comment est née la BPI*, 57.

<sup>41</sup> "The combination of an all-encompassing library and a museum has famous precedents: the Royal, now National Library, with its medals, antiques and engravings departments, the British Museum in London. But such a combination has not been attempted in the twentieth century; the aim for permanent education which has inspired it and the will to create a large center for documentation on all subjects give the undertaking an experimental aspect." *Concours international d'idées à un degré (competition brief)*, 3.

<sup>42</sup> Viatte, *Le centre Pompidou*, 14. As Blaise Gautier of the CNAC later observed, the problem of the modern museum in Paris alone had given rise to a succession of reflections and projects: the "horizontal and alveolar structure of Le Corbusier's endless museums, which absorbed and reconciled the recent past and present; [...] the "Musée du XXe siècle of Malraux and Maurice Besset, a museum of civilization bringing together art and technology; [...] the contemporary art gallery (CNAC) of François Mathey." Blaise Gautier, "Sur Beaubourg," *Revue de l'Art*, no. 34 (1976): 9.

cultural center presenting a range of major art forms to the public and providing facilities for artistic production and performance, usually within the compass of a single building.<sup>43</sup> A decentralized network of sites for cultural creation, diffusion, and animation, the Maisons de la culture played an important discursive and instrumental role within the larger cultural state apparatus. Under Malraux, a comité de décentralisation had been established to respond to criticism accusing Paris of taking the lion's share of government spending on culture.<sup>44</sup> As a result, resources were re-allocated to the provinces as the Ministry of Cultural Affairs turned its attention to redistributing the cultural wealth of the capital.<sup>45</sup> By the mid-1970s a network of complementary Centres d'animation culturelle were added. These "parish churches of culture" (as they were called at the time) formed smaller scale, less costly to run, network within the larger network of "cathedrals."<sup>46</sup>

Both the successes and failures of the Maisons influenced Beaubourg's direction.<sup>47</sup> On one hand, a critical assessment of Malraux's elitism resulted in a shift in emphasis from the display of exemplary works to the construction of an information

---

<sup>43</sup> By 1975 there were twelve Maisons de la culture flung across France as far as Corsica. Among the best-known was the one built in Le Havre by Oscar Niemeyer, who would sit on the Beaubourg competition jury. There has been little written on Malraux's important initiative or its architecture. For a brief overview in English see George Walker, "Temples for a new humanism: the Maisons de la Culture," *Country life* 158 (July 10, 1975).

<sup>44</sup> On the cultural impact of decentralization in France see James Rowdybush, "The hexagon and the Napoleonic state: a study of decentralization and regional reform in France" (Doctoral thesis, University of California Berkeley, 1983).

<sup>45</sup> The reality of decentralization was that it was primarily discursive and applied to the cultural realm. By 1970, one fifth of the population of France lived in Paris, a projection that was expected to continue.

<sup>46</sup> Walker, "Temples for a new humanism," 40.

<sup>47</sup> By 1975, attendance at the Maisons was only 60% of capacity and despite Malraux's intentions, most visitors came from sectors of society already educated in the arts. Malraux had refused to allow the Maisons to be used to host night-classes for what he called "Sunday painters". (Ibid., 39.)



environment that subsumed all cultural practices. For this reason Bernadette Dufrene has argued that to call Beaubourg a “Maison de la culture par excellence” is mistaken and points out that, as a project of the 1970s, it needs to be seen less within Malraux’s humanist cultural policies and more within the problematics of information sciences that had emerged during the years between the genesis of the idea for the Maisons and that of Beaubourg university discipline of “information and communication sciences.”<sup>48</sup> Moreover, where Malraux’s idea had been to export a traditional idea of fine art from Paris to the provinces, Beaubourg responded to a contemporary discourse on the popular and the everyday, and so would engage the local conditions immediately outside the center—the street, the local neighborhoods.<sup>49</sup>

On the other hand, the Beaubourg team embraced Malraux’s seductive conception of the decentralized network of cultural centers broadcasting from the center to the provinces. By creating a space for the negotiation between positive technocracy and neo-humanist discourses of freedom, the network was a powerful rhetorical tool in cultural decentralization. The decentralization movement had taken as given that the center was a

---

<sup>48</sup> Bernadette Dufrene, *La création de Beaubourg* (Grenoble: Presses Universitaires de Grenoble, 2000), 14–15. On the emergence of these new disciplines in France see Daniel Bounoux, *Sciences de l’information et de la communication* (Paris: Larousse, 1993). This trajectory would continue under Mitterand, for whom cable television played the role that the Maisons did for de Gaulle. Along with state-funded work in microelectronics, computers, robotics, and office communications, cable television was central to Mitterand’s “information revolution.” (Raymond Kuhn, *The media in France*, 1995, 207.)

<sup>49</sup> DeRoo, *The museum establishment and contemporary art*, 169. The deployment at Beaubourg of this emerging discourse of the everyday will be addressed in a later chapter. For a detailed discussion of the specific problems of “popular culture” in France see Brian Rigby, *Popular Culture in Modern France: A Study of Cultural Discourse* (London: Routledge, 1991).

problem, and the redistribution of power away from a single center was a key aspect to network discourses.<sup>50</sup>

The decentralizing logic of networks raised fundamental problems, not least of which concerned building a “center” at a time of decentralization.<sup>51</sup> In 1974, the directors of Beaubourg and representatives of the national museums throughout France held a meeting to discuss relations between the new center and the existing periphery.<sup>52</sup> One option was to consider Beaubourg as a kind of broadcast center, where equipment, expertise, personnel, artworks, etc. would be made available to the provinces on request. But this broadcast model merely reinforced perceptions of hegemony of Paris over the broader territory. In response, Hultén argued that the travelling exhibition should be abandoned in favor of strategies that promote spontaneous initiatives both in Paris and in the provinces. The challenge was, as Blaise Gautier unhelpfully pointed out, “to propose without imposing.” Better than the travelling exhibition model was to “instigate spontaneity.” “Paris,” Gautier and Hultén argued, “has a role of a center of spontaneity. It should be concerned with promoting exchanges that inspire local initiatives.” This

---

<sup>50</sup> Rowdybush, “The hexagon and the Napoleonic state: a study of decentralization and regional reform in France.”

<sup>51</sup> Indeed, Hultén saw centralization, along with the gentrification of the Les Halles district, as a good thing. “Europe needs a focalizing point,” he said. (Baker, “Beaubourg Preview: An Interview with Pontus Hultén,” 101.) But as one member of the National Assembly expressed it, “at a moment when even the maisons de la culture are in question and some have been closed, at the moment when even the very idea of these centers is in question, at the moment when the Ministry [of Culture] proposes shutting down small, dispersed, and scattered centers, the government audaciously asks us to build the most important cultural center in France or maybe the world.” (“Centre national d’art et de culture Georges-Pompidou: Adoption d’un projet de loi,” 2819.)

<sup>52</sup> Sébastien Lose, “Procès-verbal de la réunion du 24 septembre 1974”, October 14, 1974, Lose box 1, Archives CGP.

entailed treating the center and periphery as one undifferentiated system built upon various “organic connections.”<sup>53</sup>

The vision of a decentralized network of cultural centers distributed across France like an optical telegraph, nuclear power stations, or broadcast transmitters was a potent one, of which Beaubourg’s critics and supporters would later take note.<sup>54</sup> Paradoxically, it was decentralization itself that cleared the way for a *grand projet* at the center of political power. The result of redirecting funds from the capital was that by 1970 Paris had few major cultural building beyond those built prior to the 20th century. Beaubourg was part of an effort to redress the balance by confronting what was generally agreed were immediate and long-standing inadequacies in the city’s cultural equipment, from theaters to libraries and museums.<sup>55</sup> The Beaubourg team invoked decentralization as a way of

---

<sup>53</sup> Ibid. Ultimately, Mollard was clear that the new “center” operated at a national level and that its relationship to the provinces was as a resource. “It is not about cultural imperialism imposed upon local initiatives but about offering them technical and financial assistance.” (Mollard 1976 report) This approach was consistent with Pompidou’s Keynesian views, and it showed how much times had changed since Malraux’s original conception of the Maisons de la culture; indeed, Pompidou himself put it succinctly: “the state provides the means, and then it allows the ingenuity of its time and its people to act.” (1972 interview in *Le Monde*, reprinted in Georges Pompidou, *Entretiens et discours, 1968-1974* (Paris: Flammarion, 1984).) Indeed, Pompidou supported the funding of small experimental telecommunications projects to explore alternatives to top-down structures such as the DTG (Kuhn, *The media in France*, 206.)

<sup>54</sup> In the years after 1968 the relationship between network of cultural centers and information networks would be reversed when the decentralization movement provided the discursive rationale for a nation-wide push for cable television. The analogy to television broadcasting was also latent within the program for the Maisons. State-run television (ORTF) in the 1960s was a wing of the Ministry of Cultural Affairs and, like the Maisons de la culture, was part of a broader program of cultural democratization. As Raymond Kuhn has pointed out, the media in France were part of a system of political communication. The ORTF therefore did not reflect the desires of a “mass” market; instead, it considered its mission to expose citizens to programming that the free market would not otherwise spontaneously offer. Ibid., 130. This agenda is perhaps most clearly embodied in the series of programs interviewing French philosophers. See Tamara Chaplin, *Turning on the Mind: French Philosophers on Television* (University of Chicago Press, 2007). On the optical telegraph as information utopia, see Armand Mattelart, “Mapping Modernity: Utopia and Communications Networks,” in *Mappings*, ed. Denis E Cosgrove (London: Reaktion Books, 1999).

<sup>55</sup> These shortcomings were the subject of a 1966 special issue of *L’Architecture d’Aujourd’hui*. In particular, see André Veinstein, “Les théâtres expérimentaux: organisation, architecture,” *L’Architecture*

defusing criticism that the project reasserted top-down control at a time when the dominant discourses in cultural politics asserted the tactical and the quotidian.<sup>56</sup> The Centre, they repeatedly explained, was but one node in a greater cultural network. (That this network was now global and included the US offered little comfort to its critics.) In a much-repeated sound bite, Michel Guy, Michelet's successor as Culture Minister, declared that Beaubourg was the "centrale de décentralisation," a quip that was a *triple-sens* since by the early 1970s, "centrale" had come to mean not only "power plant" but a host computer in a network.<sup>57</sup>

While the Maisons de la culture provided a general model for the synthetic cultural center, a set of more specific projects already underway provided a ready-made program of core institutions that further reinforced its information direction. Of these, the public library component was the largest and by far the most ambitious, and provided from the start an "informational" language for expressing the project's goals. Germain Viatte, personal interview, April 2008.<sup>58</sup> A life-long project of Jean-Pierre Seguin, a librarian at the Bibliothèque nationale, it tackled a straightforward problem: "Nowhere in Paris," Seguin observed, "is there a large public reading library that satisfies contemporary

---

*d'Aujourd'hui*, no. 129 (January 1966): 62-63; Willem Sandberg, "De la conception architecturale d'un musée contemporain," *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 64-67; "Le problème des bibliothèques en France," *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 24-26; Emile Biasini, "Les Maisons de la culture en France," *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 64-67.

<sup>56</sup> I refer here, of course, to the work of Henri Lefebvre and Michel de Certeau, among others.

<sup>57</sup> Guy made this statement in several reports, but also used it on television. ("Michel Guy sur le centre Beaubourg" (ORTF, October 16, 1974).)

<sup>58</sup> Viatte, interview.

demands in the area of information needs.”<sup>59</sup> In 1956, Seguin was sent on a research trip abroad to explore solutions to this problem. Visiting the Amerika-Gedenkbibliothek in Berlin, which the US had donated as a gift to Berlin after the war, this curator of 90,000 linear meters of old books at the musty and restrictive BN was astonished by what he saw: here was “a functional and ‘flexible’ building, with up-to-date collections, a free-access library for an undifferentiated public.”<sup>60</sup> Nine years later, Seguin was asked to draft a proposal for a new public library, “Nationale B,” of a kind unknown in France. Inspired by what he saw in Berlin, Seguin sketched the outlines of an encyclopedic, multidisciplinary, “non-specialized cultural center” with a vast reading room, a telephone reference service, and exhibition and meeting rooms. The essential vocation of this library was to be “openness to a vast public, to general information, and communication, both within its walls and without, and to the notion of ‘encounter’.”<sup>61</sup> By June of 1966 the

---

<sup>59</sup> Jean-Pierre Seguin, *Undated report*, n.d., 1992037/001, Archives CGP. The only large library with open access to a reading room was the Bibliothèque Sainte-Geneviève, which received daily 4000 visitors, mainly students, for a mere 735 places. Note that if one visits today there are still lines of students waiting for spaces to become available outside both the Bibliothèque Sainte-Geneviève and the BPI at Beaubourg.

<sup>60</sup> Seguin, *Comment est née la BPI*, 16. The architects of the library were Fritz Bornemann and Willy Kreuer. An evocative description of this library is at Eva Flug, “American Memorial takes Form of Public Library,” *Berlin Sketches*, March 3, 2006, <http://berlinsketch.blogspot.com/2010/03/american-memorial-takes-form-of-public.html>. In turning to an American model, Seguin was participating in cultural politics between France and the US that were playing out in other arenas such as the Plan Calcul. An official brochure published by the center in 1976 expressed the double-edged nature of US influence when it declared that the center “crystallizes the needs of the modern sensitivity—eliminate [sic] partitions separating cultural media, break with the notion of the conservatory-museum. It also expresses the desire to reaffirm the cultural role of Paris in the face of American and Nordic influences.” (Quoted in Cultural Affairs Committee of the Parti Socialiste Unifié, “Beaubourg: The Containing of Culture in France,” *Studio International* 194, no. 1 (1978): 27-36.) The language and sentiments of Seguin’s epiphany were characteristic of European views of American innovation in place since the end of the 19<sup>th</sup> century. See Jean-Louis Cohen, *Scenes of The World To Come*, English ed. (Flammarion, 1995).

<sup>61</sup> Jean-Pierre Seguin, “L’histoire et les grandes lignes du programme d’architecture de la bibliothèque des Halles: juin 1965-décembre 1969,” in *Construction et aménagement des bibliothèques*, ed. Jean Bleton (Paris: Editions du cercle de la Librairie, 1986), 235. There was added impetus from a general “crisis of the

focus had shifted emphatically away from archives and storage to public reception spaces, galleries for permanent and temporary exhibitions, and auditoria. As Seguin later put it, “the library conceived in this way assumed the functions and scope of a polyvalent cultural center and prefigured Beaubourg.”<sup>62</sup>

By April 1967 the French Ministry of Education had incorporated this scheme in a proposal to the Paris city prefecture. The proposed building uncannily resembled the final Beaubourg scheme: in the basement, conference rooms and parking; on the ground floor, reception, bookstore, newspapers, current events media, and exhibitions; on the second through fourth floors, a matrix of the main reading and processing functions expressed as a system of multimedia “reading ensembles”; on the fifth floor, meeting rooms, restaurant, and roof terraces. All that remained to complete the proposal was a site. In January 1959 the Conseil de Paris famously decided to move the central markets from Les Halles to Rungis and by March of 1969 the move would be complete. During that time, the Conseil studied the problem of what to do with the leftover space, including Baltard’s pavilions should they be saved. By 1967 Seguin’s proposal for a public reading library was written into the budget for the Ministry of Education and, consequently, into master plans for the urbanism of the Les Halles district, with the Plateau Beaubourg as a suggested site, and so was renamed the Bibliothèque des Halles.<sup>63</sup>

---

reading public” in France. In 14 March 1966, *Le Figaro* complained that the BN couldn’t accommodate readers and demanded a petition for a plan of reform. (Seguin, *Comment est née la BPI*, 21.)

<sup>62</sup> Seguin, “L’histoire et les grandes lignes du programme d’architecture de la bibliothèque des Halles: juin 1965-décembre 1969,” 236.

<sup>63</sup> Seguin provides a detailed history of this process. Seguin, *Comment est née la BPI*, 26–52.

But in December of 1969, when the future of the library on the Plateau Beaubourg seemed secure, Seguin and his team were surprised to read Pompidou's public announcement of a cultural center to be built in central Paris on the very site that had been singled out for the library and, more worrying, of his desire to move quickly. Pompidou's proposal focused on art and theater, but he was sympathetic to the possibility of a library, although he initially envisioned one focused on art.<sup>64</sup> Through intensive persuasion and political maneuvering, Seguin ensured that his library would be a central component of the new cultural center.<sup>65</sup> This arrangement gave Pompidou's project a running start, bringing with it a clear identity and problem formulation along with a language with which to address it, an architectural program, an embryonic project team, and, not least, secured funding.

The Centre Beaubourg competition brief inherited the program for the Bibliothèque des Halles intact.<sup>66</sup> The library provided, in addition to a detailed tabulation of floor areas, a language seductive in both its ideological sweep and its pragmatism, for expressing ideas of openness and democratization centered on access to information.<sup>67</sup> In

---

<sup>64</sup> Pompidou, "Letter to Edmond Michelet." Earlier, Pompidou had been interested in the "crisis of reading" in France and in 1966, had assembled a committee, which included Malraux, to study it. The committee's reports mentioned the nascent Bibliothèque des Halles as part of its attack on the problem.

<sup>65</sup> Seguin chronicles this complicated history. Seguin, *Comment est née la BPI*, 47–9. See also Seguin, "L'histoire et les grandes lignes du programme d'architecture de la bibliothèque des Halles: juin 1965-décembre 1969." As of July 1969, the Conseil de Paris had decreed that the the Bibliothèque des Halles would be the only building built on the Plateau Beaubourg. ("La Bibliothèque publique des Halles", n.d., 1992037/001, Archives CGP.)

<sup>66</sup> A detailed program study from 1970 for the "Bibliothèque des Halles" to be housed at Beaubourg shows how little the library changed between its first instantiations in the mid-1960s. (Archives CGP, 1992037/001.)

<sup>67</sup> Seguin was not alone, of course, in his interrogation of what kinds of libraries were appropriate to postwar France. A 1966 article in *L'Architecture d'Aujourd'hui* surveyed the situation and drew many of

a note of 1965, Seguin referred to his library as a “national library of communication” and in 1967, almost directly foreshadowing the language of Piano and Rogers’ competition entry, described it as “a live center of culture and information for all classes of society.”<sup>68</sup> In place of restrictive policies, capricious opening hours, and layers of bureaucracy between citizen and information, the Centre Beaubourg was to be encyclopedic, open, freely-accessible, and would offer access in a self-service mode and generous hours with an emphasis on news and current events that squarely positioned with a view to the present rather than the past.<sup>69</sup> Seguin’s observations about what he saw during a study trip to the United States in 1973 reinforced this:

Thanks to the public library, the American reader of all origins and means has at his disposal a high-performance instrument for work or personal improvement. Moreover, this reader is altogether ‘at home’ in the library; he comes as much to work as to browse a magazine, prepare for a trip abroad, or watch a television broadcast. It is for him, depending on his particular needs, a place for relaxing or a place of work.<sup>70</sup>

This aspect of the library helped shield the overall project from criticism since the social and cultural value of a public library, in contrast to that of the museum, was unimpeachable in the eyes of those would normally have been hostile to such a large government maneuver in the aftermath of 1968.<sup>71</sup>

---

the same conclusions: what was needed above all else was flexibility, but also surveillance systems and standardization, from record formats to heights of ceilings. See “Le problème des bibliothèques en France.”

<sup>68</sup> Seguin, *Comment est née la BPI*, 20. In their competition entry, Piano and Rogers described their scheme as a “live center of information.”

<sup>69</sup> *Rapport d’activité* (Etablissement public du Centre Beaubourg, 1973), 9.

<sup>70</sup> Voyage d’étude 1973. Archives CGP.

<sup>71</sup> The student newspaper *Etudiant* declared that, “as for the library, it made our heads go ‘tilt’. Here we have a fantastic tool offering direct and free access to culture, books, images, and records.” (“La plus chouette bibliothèque de France,” *Etudiant*, no. 2 (November 1977): 35-46.)



Like all technocratic utopias, the public library built its social program on a technical foundation. By 1969, Seguin had allocated the better part of his small budget to automation, and the program for the Bibliothèque des Halles specified a computerized, integrated, universal control system for the entire institution, as much concerned with building management as with bibliography.<sup>72</sup> The competition brief explicitly specified library automation and closed circuit security systems, both recent inventions and both relying on an invisible computational infrastructure.<sup>73</sup> But the brief also underscored the wider implications of these networks, stating that one of the library's primary responsibilities was to connect the Center to its broader environment through the diffusion of information on current events and interoperating with specialized documentation centers in Paris, throughout France, and globally.

Like the library, the modern art museum proposed for Beaubourg had its roots in an unfinished project that addressed an inadequacy in the cultural equipment of the state. It had become painfully apparent that Paris had no museum that could rival the upstart Museum of Modern Art or Guggenheim in New York. In response, the Ministry of

---

<sup>72</sup> Computerized library automation was in its early stages of development. (For a history, see W. B. Rayward, "A history of computer applications in libraries: prolegomena," *Annals of the History of Computing, IEEE* 24, no. 2 (2002): 4-15.) In particular, the idea of a global network of catalogs forming one universal database was embryonic and would only take concrete form in the early 1970s, although Paul Otlet and H.G. Wells had put forth utopian schemes for global information networks in the early 20<sup>th</sup> century. See Torres-Vargas, "World Brain and Mundaneum: the ideas of Wells and Otlet concerning universal access." Also, Rayward, "A history of computer applications in libraries." The library would eventually choose the BIKAS-2 format for data interchange, a format already used in Austria, Italy, and the Netherlands, and easily convertible to the newly invented MARC format in the US, allowing Beaubourg to be part of an emerging global library network.

<sup>73</sup> The Service Informatique, the department supplying all other departments with IT services, was built around C.I.I.-Honeywell Bull 77-40 computer (Constans, 1977), part of an economic and cultural war with IBM.

Cultural Affairs turned to the Musée nationale d'art moderne, which since 1937 had been housed in the Palais Wilson, a left-over from the 1937 International Exposition, which, according to Blaise Gautier, director of the Centre national d'art contemporain, were "hurried, pretentious, poorly equipped, and poorly located quarters."<sup>74</sup> During the 1960s Malraux suggested that the collections be moved to a new building, which he called the Musée du XX<sup>e</sup> siècle, and in 1965 commissioned Le Corbusier to propose a design.<sup>75</sup> As its name suggested, the Musée du XX<sup>e</sup> siècle, like Le Corbusier's earlier projects for the Musée de Tokyo and the Centre International d'Art at Erlenbach, encompassed much more than an art museum: it would bring together fine arts, moving pictures, radio, television, design, and music in a grand synthesis of the arts of the kind that had preoccupied the architect since the 1920s. For Le Corbusier, here was an opportunity finally to realize his scheme for the endless museum in all its utopian, encyclopedic ambition. Le Corbusier and Malraux argued over the location of the new museum. Malraux wanted a site at La Défense, but the Le Corbusier felt that it should be more centrally located. This signaled a change of heart for the architect. In his schemes of the 1930s, Le Corbusier had argued for a suburban site where the endless museum could grow unfettered by the crowded urban center, its organic system unfolding without artificial and arbitrary constraints.<sup>76</sup> By 1965, however, the architect's sentiments had

---

<sup>74</sup> Gautier, "Sur Beaubourg," 8.

<sup>75</sup> On this project see Le Corbusier and W. Boesiger, *Oeuvre complète: Volume 8 Les dernières oeuvres* (Zurich: Les éditions d'architecture, 1970), 162–67; Eugène Claudius-Petit, "LC., dernier projet pour Paris," *L'Architecture d'Aujourd'hui*, no. 249 (February 1987): liv-lv.

<sup>76</sup> Le Corbusier felt that whether the site was rural or urban mattered little since the universal and abstract nature of the endless museum was equally compatible, as he put it, with "fields of potatoes and beets" and

changed and he had grown to feel that the push westward toward La Défense had been at the expense of the historical center.<sup>77</sup>

The architect's death in 1966 interrupted the project and only a schematic study was made. Without Le Corbusier, the future of Malraux's project was unclear.<sup>78</sup> Although he was a skilled rhetorician, Malraux was known to be poor at follow-through and so the Musée du XX<sup>e</sup> siècle remained an obscure and unrealized project.<sup>79</sup> The final blow came with the resignation of de Gaulle, and with him Malraux, whose reputation had suffered during the protests of 1968 and who left office as a gesture of loyalty. The MNAM remained in the Palais Wilson, whose rigid layout, it was now apparent, were unsuitable to the particular demands of showing contemporary art. The following year, however, Pompidou and Michelet agreed that the collection would be moved to the Plateau Beaubourg, escorted by the ghost of Le Corbusier (doubtless smiling about the choice of site). With this decision, the project for the Musée du XX<sup>e</sup> siècle was brought to an end at the same moment that, with Seguin's Bibliothèque des Halles, it created the nucleus of Pompidou's project.

---

"factory chimneys". See Le Corbusier and W. Boesiger, *Oeuvre complète: Volume 2: 1929-34* (Zurich: Les éditions d'architecture, 1964), 73.

<sup>77</sup> *Rapport d'activité*, 9; Jean-Louis Cohen, "Monuments for a Mass Cult," in *Rendezvous: Masterpieces from the Centre Georges Pompidou and the Guggenheim Museums* (Paris, New York: Centre Georges Pompidou, Guggenheim Museum, 1998), 23.

<sup>78</sup> André Wogenscky, the designer of one of the best-known Maisons de la culture (in Grenoble) and disciple of Le Corbusier, took over the design but the project remained in the schematic design stages. On the Wogenscky project see Le Corbusier and Boesiger, *Oeuvre complète: Volume 8 Les dernières oeuvres*, 166.

<sup>79</sup> Claude Mollard, personal interview, April 2008.

As with the Maisons de la culture, the reasons for the failure of the Musée du XX<sup>e</sup> siècle included Malraux's insistence on masterworks from the past and on eternal values at a moment unsympathetic to those ideals. That the MNAM now seemed anachronistic and disconnected from the present stemmed from a growing movement of critically questioning the museum as a legitimate institution and, more specifically, of questioning the traditional architecture of the museum in the context of contemporary art production.<sup>80</sup> To balance the conservative MNAM, Loste brought in Blaise Gautier and Germain Viatte of the Centre national d'art contemporain (CNAC).<sup>81</sup> Created in 1967 with support from the Ministry of Cultural Affairs, the CNAC was a low-budget counterpoint to the MNAM that proposed a role for the art institution that went far beyond exhibiting and collecting. The CNAC was less a museum than an information center, broadly conceived, providing artists, collectors, and the public with production facilities and documentation for research.<sup>82</sup>

---

<sup>80</sup> For more on the role of the museum in the years around 1968, see DeRoo, *The museum establishment and contemporary art*.

<sup>81</sup> Part of the solution at Beaubourg was to expand the disciplinary boundaries of the art museum by displacing modern painting and sculpture, along with the MNAM itself, from its privileged place and so when Pontus Hultén finally came aboard as director of the museum in 1973 distinctions between the various museums at Beaubourg were suppressed under the rubric of the "Direction des Arts Plastiques," which included industrial design and even urbanism. ("Decisions du président de la république," Loste box 1, Archives CGP.) As Gautier later put it, solving the practical shortcomings of the MNAM was relatively easy: more difficult was confronting the growing suspicion that the museum of the kind Pompidou had in mind was already obsolete. (Gautier, "Sur Beaubourg," 7.)

<sup>82</sup> Viatte, *Le centre Pompidou*, 14, 22. Pierre Restany, critic and promoter of contemporary art, later wrote that the CNAC proposed a viable new model for the fossilized art museum. At the root of this redemption of the museum was the new mandate of the institution to "make information and animation on contemporary art a permanent public service."

The experiments of Willem Sandberg at the Stedelijk Museum in Amsterdam were important in shaping attitudes to the museum.<sup>83</sup> Sandberg's influence on Beaubourg was considerable. He would sit on the competition jury, while his greatest admirer Pontus Hultén, who, as the influential Director of the Moderna Museet in Stockholm, had borrowed many of Sandberg's ideas, later assumed the position of head of the Beaubourg's Département des arts plastiques (under which the MNAM, the CNAC, and the CCI all fell).<sup>84</sup> At the Stedelijk, Sandberg developed a new kind of open museum based on the principles of a small number of permanent works, a high turnover of temporary exhibitions, the opening to new audiences such as schoolchildren, and the hosting of events that "animated" what was increasingly seen as a tomb-like institution. Beaubourg's critics sneered at Sandberg's "flexible, ramified, organic" spaces, which were dedicated "to temporary and spectacular activities, [...] empty spaces, with no collections, in which an inspired and athletic 'animator' kept contemporary events going all year round."<sup>85</sup> Within these principles was a preoccupation with the integration of contemporary art into the vague concept of "everyday life" and the generally held belief

---

<sup>83</sup> Gautier, "Sur Beaubourg," 9.

<sup>84</sup> Although many on the team saw Hultén as bullying it quickly became apparent that under him the museum would take on an importance that it didn't have at the outset of the project and thereby achieve the prestigious museum that Pompidou wanted while addressing the critiques of obsolescence. Seguin, *Comment est née la BPI*, 90.

<sup>85</sup> Cultural Affairs Committee of the Parti Socialiste Unifié, "Beaubourg: The Containing of Culture in France," 31.

that the museum should shift its focus toward pedagogy and what today would be called outreach.<sup>86</sup>

Several years before the 1969 Unesco workshops, Sandberg introduced a conception of the contemporary museum as a space of information. Originally a graphic designer, Sandberg worked on the development of the Isotype pictogram system with Otto Neurath in Vienna.<sup>87</sup> Later, his Stedelijk programs treated exhibition design and publishing as a unified project, as he did with the architectural and typographic aspects of exhibition design, and he installed a publicly accessible library at the core of the museum. In the mid-1950s Sandberg oversaw the creation of a new wing of the Stedelijk that countered Weismann's neo-Renaissance 1895 building (the interiors of which Sandberg had already painted white) with a gray and white glass and metal pavilion, and replaced the original building's wood doors with a glass entry.<sup>88</sup> Like the Amerika-Gedenkbibliothek in Berlin, the so-called Sandberg wing of the Stedelijk deployed a spare, functionalist architectural language and invoked tropes of transparency in constructing a discourse of cultural democratization and access to information.

---

<sup>86</sup> Mollard cites the Unesco conference on the museum in 1969 as pivotal (Mollard, *L'enjeu du Centre Georges Pompidou*, 21n1.) In 1966, Sandberg addressed the growing crisis of the museum in an article for Unesco reprinted the following year in *L'Architecture d'Aujourd'hui*. Willem Sandberg, "The Israel Museum in Jerusalem," *Museum* 19, no. 1 (1966): 15-30; Sandberg, "De la conception architecturale d'un musée contemporain." The literature on the problem of the museum in the 1960s is vast. On the immediate context of Beaubourg see DeRoo, *The museum establishment and contemporary art*; Rigby, *Popular Culture in Modern France*; Annette Michelson, "Beaubourg: The Museum in the Era of Late Capitalism," *Artforum* 13, no. 8 (April 1975): 62-67.

<sup>87</sup> On Neurath and the Isotype system, see Nader Vossoughian, *Otto Neurath: the language of the global polis* (Rotterdam: NAI Publishers, 2008).

<sup>88</sup> On Sandberg's tenure at the Stedelijk see Ad Petersen, *Sandberg, Typographer and Museum Pioneer: Graphic Design in the Netherlands 2* (010 Uitgeverij, 2003). There is surprisingly little written on Sandberg.

Following the lead of Sandberg and Hultén, the CNAC, largely through the efforts of Germain Viatte, treated the contemporary museum as an information space. In the competition brief, the CNAC's experimental gallery was to be directly accessible from the street, a "dynamic information source" that broadcast information about recent work at the Center, artistic activities in Paris and elsewhere, on other media (film, television, music), and on recent developments in material techniques in art. Pierre Restany, the critic and philosopher of contemporary art, later argued that the CNAC proposed a viable new model for the fossilized art museum: the mandate of such an institution was less to exhibit an archive of works than to "make information and animation on contemporary art a permanent public service."<sup>89</sup>

If the CNAC provided artists and collectors with a general information resource, the Centre de création industrielle (CCI) offered the same to designers and manufacturers. The second of the institutions that Loste brought to Beaubourg whose influence was disproportionate to its size, the CCI was founded by François Mathey and François Barré in 1969 but had been active in various forms earlier.<sup>90</sup> Drawing inspiration from the opening of the Design Centre in London twelve years earlier, along with comparable institutions in Japan, Germany, and the Netherlands, the CCI was created by the Union Centrale des Arts Décoratifs to address the perceived gap between the state of

---

<sup>89</sup> Viatte, *Le centre Pompidou*, 14, 22.

<sup>90</sup> Mathey had been one of the participants in the Unesco museum workshop. Barré was a member of the confrontational French contingent (that also included Jean Baudrillard) to the Aspen 1970 design conference. Their presentation dismissed ecological concerns as a new "opium of the people" that concealed the real social and political questions. See Reyner Banham, ed., *The Aspen Papers; Twenty Years of Design Theory from the International Design Conference in Aspen* (New York: Praeger, 1974), 207–10.

design discourse in France and elsewhere.<sup>91</sup> Unlike the Design Centre, however, the CCI was based, according to Barré, on

a global conception of design not limited to industrially produced products but embracing all disciplines involved in the creation of our environment in the anglo-saxon sense of the word design: urbanism, architecture, products, [...] visual communication. [It concerned] everything that constituted the framework for living: it is not concerned with privileged objects but rather that which is materially constitutive of, properly speaking, everyday life.

More specifically, in demonstrating the links that held this environment together it attempted show that they were not, as Barré put it, a matter of “the simple adjacency of various disciplines (urbanism + architecture + graphic design) but a global system of relations (space, volume, signs...).”<sup>92</sup> As with the CNAC, the traditional museum functions of exhibition and collecting at the CCI were displaced by an emphasis on documentation and the bringing together of the various stakeholders: manufacturers, collectors, designers, and the public (Figure 1.3). The CCI’s self-defined role was to make visitors aware “of the relations between individuals, spaces, objects, and signs,”<sup>93</sup> or, as a report on the Information Technology systems for the CCI put it,

[t]he CCI’s main objective is to be a relay between creators on the one hand and manufacturers and public agencies on the other. It must inform

---

<sup>91</sup> Sébastien Loste, “Note sur le Centre Beaubourg”, 1974, Box 3, Archives CGP - Administrative offices.

<sup>92</sup> François Barré, *Exposé de M. Barré sur le CCI (réunion d’information générale du 27/9/73)*, September 1973, 2005100/42, Archives CGP.

<sup>93</sup> “Réponse aux questions posées par la commission des affaires culturelles du sénat”, n.d., 2005100/42, Archives CGP. The policies of the CCI were not without controversy. See François Barré, C. Braunstein, and J.-P. Grunfeld, “Le débat à propos de la politique du Centre de création industrielle,” *Crée*, no. 37 (November 1975): 43-4; Jocelyn de Noblet, “A propos de la valeur d’usage du Centre de création industrielle,” *Crée*, no. 36 (September 1975): 36,82.



and make aware the public of certain problems pertaining to the environment.<sup>94</sup>

Like the CNAC, the CCI shifted the emphasis of the museum from collections to documentation, built around a wide range of media (reports, journals, bibliographies, photographs, audio tapes, samples of materials, books, films, videotapes) addressing equally wide-ranging fields (industrial design, architecture, urbanism, graphic design). The collection and organization of this information was based less on the cataloging of collections than on a principle of connection and exchange between a triangle of designer, manufacturer, and user (or consumer).<sup>95</sup> Along with documentation, a program of temporary exhibitions, a publications department, and a professional consulting service formed the system for connecting public, designer, and manufacturer.<sup>96</sup> And like the library, the CCI argued that their computerized database be part of a broader decentralization program. The “Système d’information sur les produits” (SIP), was to be distributed to satellite centers throughout France such as permanent installations in the new towns and in the provinces, mobile installations in trade shows, banks, train stations, and travel agencies.<sup>97</sup> The brief applied these ideas to all of the other departments. Of

---

<sup>94</sup> *Système d’information du C.C.I.: Cahier d’objectifs*, n.d., 2005100/50, Archives CGP.

<sup>95</sup> This was borne out, for example, in the controlled vocabularies used for organizing this information, whose various facets were designed to allow mapping between the domains of design, production, and use. Ibid.

<sup>96</sup> See diagram in Ibid. This arrangement reflects the definition of industrial design given by Tomás Maldonado in 1969 and cited by François Barré in a report on the CCI: “Industrial design is a creative practice in which the goal is to determine the formal qualities of industrially produced objects. These formal qualities do not consist only of outward appearance but instead principally the relationships between structure and function that transform a system into a coherent unity, as much from the perspective of the producer as of the consumer.” (Barré, *Exposé de M. Barré sur le CCI (réunion d’information générale du 27/9/73)*.)

<sup>97</sup> “Internal memo”, n.d., Archives CGP.

CNAC's Experimental Gallery of Contemporary Art, for example, it stated that "[i]t is especially designed to be used by all those working in cooperation with artists: architects, engineers, businessmen, critics, galleries, associations, and foundations."<sup>98</sup> The CCI thus contributed much more to Beaubourg than its collections: it shaped many of the ideas behind the project and a view of the cultural institution as a locus of communication and information exchange.<sup>99</sup>

Between December of 1969 and July of 1970, Loste, Lombard, and their team of experts gathered together these various programmatic threads, fragmentary ideas, and abortive projects into one coherent proposal. The project team worked directly for Pompidou, who understood that the only way that his vision could be faithfully realized, was to bypass the Ministry of Culture, under whose domain this kind of project would normally fall.<sup>100</sup> As a result, everything was done "off the record and on the cheap," including the many hand-drawn diagrams and tables produced by the programmers.<sup>101</sup> Both Loste and Lombard were perfectionists and so, despite the somewhat impoverished working conditions and limited resources, the competition program was detailed beyond anyone's

---

<sup>98</sup> *Concours international d'idées à un degré (competition brief)*, 12–13.

<sup>99</sup> The details of the CCI's approach to information exchange and design are the topic of a later chapter.

<sup>100</sup> The Ministry of Culture maintained a *Direction des musées* which normally would be responsible for managing such projects. The Ministry hated Beaubourg because it was required to supply the funds while Pompidou gave the orders directly to the project team. (Mollard, interview.)

<sup>101</sup> Patrick O'Byrne, personal interview, November 2, 2007. In 1971, all operations were relocated for one year to temporary quarters in the vacated Pavilion 1 of Les Halles, alongside unit 8 architecture students from the Ecole des beaux-arts.

expectations.<sup>102</sup> By June of 1970 the funds for the competition were released and in July the brief (the so-called *Livre Rouge*) was officially adopted by presidential decree and the competition announced that November.<sup>103</sup>

The program broke down the building's activities into four non-hierarchical categories (whose labels correspond to the diagrams and persisted through the construction of the building)—Reception and Orientation (A), Main Activities (B), Management (C), and Parking (D). It imposed no prejudice as to the importance of each category in the building's operations, including the library and museum, which despite being the most imposing of the programmatic elements and their status as the alleged *raison d'être* of the complex received no special emphasis. Where the Maisons de la culture, the Lincoln Center, and Le Corbusier's projects for the Musée de Tokyo and Ehrlenbach treat the arrangement of these primary building blocks as the core organizational and symbolic units, the Centre Beaubourg program diagram that accompanied the brief shows them pushed to the margins, monolithic, and leaden, like department stores in shopping centers (Figure 1.4). Instead, at the heart of the building it shows a matrix of interconnected minor activities including temporary exhibitions, documentation and research, reception, and a range of new experimental galleries and resources. These secondary activities—emphasized by their centrality and symmetry of the diagram—operate as interfaces between public and the flow of objects/documents and between public and the circulation of experts, interpreters, and reference workers. The

---

<sup>102</sup> Seguin, *Comment est née la BPI*, 56.

<sup>103</sup> Georges Pompidou, "Letter to Jacques Chaban-Delamas, Prime Minister", June 23, 1970, 2005100/3, Archives CGP.

program's surprising de-emphasizing of the building's major programmatic elements was reinforced in the preamble to the brief, which although it mentions a "public library of all-encompassing scope", makes no mention of a "museum" but instead evasively proposes a "center [...] dedicated to the contemporary arts."<sup>104</sup> Any architect reading the detailed description of the program would find the relatively tiny documentation and research center given as much attention as the library or museum.

In some respects, the brief's flattening of programmatic hierarchy straightforwardly reflected changing patterns of cultural production and consumption. The provision, for example, of an "Experimental Gallery for Contemporary Art" acknowledged emerging modes of artistic production and consumption such as happenings and electronic multimedia art. This relatively small gallery (800 m<sup>2</sup> to the museum's 15,000) for the production and display of contemporary art was also to be used by a broad range of constituents that was at that time seen as increasingly crucial to the production of art: "architects, engineers, businessmen, critics, galleries, associations, and foundations."<sup>105</sup> This tiny, dynamic, semi-autonomous institution located at the edge of the complex at the interface with the city would hold its own—if not in size then in public presence—with the larger and more conservative Musée national d'art moderne.

The Beaubourg program was also indicative of a broader shift in emphasis in museums from collections and archives to secondary spaces such as reception areas and restaurants. A few years earlier, Emile Biasini, director of the theater at the Ministry of

---

<sup>104</sup> *Concours international d'idées à un degré (competition brief)*, 3.

<sup>105</sup> *Ibid.*, 13.

Cultural Affairs, speculated on such spaces in the architecture of the Maisons de la culture in *L'Architecture d'aujourd'hui* in such a way that anticipated this emphasis on these secondary functions: in addition to the obvious major activities such as libraries, theaters, etc., the program should include the crucial “elements of the lymphatic system: reception spaces, bar, restaurant, *salles-à-rien-faire*, corners and alcoves, kindergartens, and “that which Le Corbusier called ‘the Forum’.”<sup>106</sup> The public spaces in the Beaubourg program were conceived as just such a lymphatic system. The lower, public levels of the building were to consist primarily of *avant-postes* for the larger departments that would house their most “animated and creative” activities.<sup>107</sup> For the library, these were the Salle d’actualité and the children’s library; their position within the building—at the interface between street and interior—was analogous to their function as spaces of “animation” and exchange between expert and public and between various disciplines.<sup>108</sup> Among the more novel of these *avant-postes*, the Salle d’actualité received the most media attention after the building’s opening. Seguin had based its design on the Kulturhuset in Stockholm, a large, polyvalent cultural center that opened at the time of the Beaubourg competition.<sup>109</sup> All of these *avant-postes* were located on the lower levels because of the

---

<sup>106</sup> Biasini, “Les Maisons de la culture en France,” 65.

<sup>107</sup> Loste, “Note sur le Centre Beaubourg.”

<sup>108</sup> “De la Bibliothèque des Halles (1967) à la Bibliothèque publique d’information (1972)”, n.d., Fonds Loste, Box 3, Archives CGP. By the time of the building’s opening, these “lymphatic systems” would require their own department to plan and manage. (“Coordination des manifestations (Note),” Archives CGP, 2005100/56.)

<sup>109</sup> Visiting the Kulturhuset, he was struck in particular by the ground floor, which was run by the municipal library and where in a large and undifferentiated space that was open from 9am-10pm every day users of all ages—but particularly young people—read books, listened to sound recordings, watched television broadcasts and films, and read magazines. The Beaubourg program would formalize hours of

crucial interface with the street. In this way, they directly corresponded to the outermost layer of the concentric information museum sketched in the Unesco report (discussed above), the spectacle of the storefront drawing the public inside. Thus, if the lymphatic systems were inspired by a humanist privileging of the “user” of the Kulturhuset and the Maisons de la culture, they also pointed to the possibility that the humanism of Malraux and the mechanisms of mass consumption were not incompatible.

Within this environment, links were more important than the components they connected. The museum, discussed here as admittedly monolithic and reductive, was of less interest than the myriad connections between programmatic nodes. The brief specified that it was in these semi-programmed public spaces that formed their connective tissue that

the visitor will find necessary information with respect to all the Center’s activities, and to all artistic events taking place in Paris, elsewhere in France, and in other countries. Television receivers should also be planned. [...] This zone will function as a connecting element between the accesses [sic] to different parts of the Center: library, museums, temporary exhibitions, experimental gallery for contemporary art, lecture and theater facilities, documentation and research services, administrative services, cafeteria and restaurant.<sup>110</sup>

Visitors were to pass through the public reception spaces not simply on their way in and out of the building but *as often as possible* as they moved from activity to activity within

---

operation as an integral part of the “architectural” performance of the building. At Toyo Ito’s Sendai Mediatheque, “time” likewise was considered part of the architectural concerns: in exchanging building in the setback with longer opening hours, the architects “traded time for space.” (Richard Copans, *Multimedia Library of Sendai by Toyo Ito* (ARTE France/Les Films d’ici, 2004).) The high volume of visitors also led Seguin to be predisposed to spare and functional materials: glass for the exterior walls, concrete for the interior walls, and acoustic tiles for the ceilings. Jean-Pierre Seguin, *Rapport de voyage, 1971, 1971, 1992037/001*, Archives CGP.

<sup>110</sup> *Concours international d’idées à un degré (competition brief)*, 11.

the building, and in so doing would continually encounter the “constantly renewing” information they offered. In this way, the brief exploded the concentric rings of the Unesco model into a constellation of interfaces and interactions.

These activities will only be meaningful if they convey a shared experience, permitting a mixture of ideas and men. None can be self-sufficient: all are needed. Unity must be created by the public.<sup>111</sup>

This public was the glue that held the whole together. Key to this was the practice of “animation” in which guides, docents, and curators acted as interpreters of works for visitors.<sup>112</sup> The *animateurs* were crucial to creating the “unity” described in the brief. Mobile and playful, they were the human agents that induced the synapse to fire within a network of potential exchanges.<sup>113</sup>

The brief made it clear that principles of connection and exchange also applied to the building’s relationship its immediate environment and also the site’s relationship to the city and its wider region. An island in one of the densest neighborhoods of Paris, “the plateau,” the brief stated, “is unusual in that it is at once central and isolated.”<sup>114</sup> In the context of the national decentralization movement this site was indeed at the center, but

---

<sup>111</sup> Ibid., 3.

<sup>112</sup> The Cellule d’animation of the library, for example, was formed as an official sub-department in 1975 and operated out of the Salle d’actualité to organize workshops, exhibitions, and engage other departments in the Centre. Seguin, *Comment est née la BPI*, 121.

<sup>113</sup> The negative aspect to this approach was potential disorientation, and the brief expressed concern that visitors could easily become lost in this complex space. Le Corbusier had already addressed this problem in his various projects for spiral museums that were the prototypes for the Musée du XXe siècle.

<sup>114</sup> *Concours international d’idées à un degré (competition brief)*, 6.

in its reassertion of the center it claimed a site that had fallen into the condition of an edge as the city moved West.<sup>115</sup>

The selection of a site occurred at a moment when the urban space of Paris was at its most contested. Since Beaubourg was part of a larger urban renewal project for the area and an important catalyst for the gentrification of the surrounding neighborhoods, it became quickly caught up in the major building controversies of the day—the Master Plan of 1965, the project for the Front de la Seine, and La Défense and, foremost, the closing of Les Halles and the subsequent demolition of Baltard’s market pavilions.<sup>116</sup> With the announcement in the national press on July 10, 1971 of mass demonstrations to be held two days later in Les Halles “history was made,” Antoine Grumbach declared, “as urban space made its debut in French politics as a major issue.”<sup>117</sup> The destruction of Les Halles in the summer of 1971 after long debates on their future roughly coincided with the groundbreaking at the Plateau Beaubourg, a fact that incorrectly linked the two

---

<sup>115</sup> The new towns also played a complicated role in decentralization. From the perspective of Paris as a historical center, opening branches of the university or building cultural centers in the new towns was part of decentralization. From the perspective of nation as a whole (the hexagon with Paris at its center), the new towns fell within the symbolic center. For an overview of the plans and projects for Paris at that time, see the special issue of *Architecture d’aujourd’hui* (138, June-July 1968). Most of the projects of 50s-60s are “decentralizing” in their broad ambition.

<sup>116</sup> For a history of these projects see Simon Texier, *Paris contemporain: de Haussmann à nos jours* (Paris: Parigramme, 2005). For an account of the complex history of Les Halles see Bertrand Lemoine, *Les Halles de Paris* (Paris: L’Equerre, 1980), Ch. 15. For an overview of the controversy see Norma Evenson, “The Assassination of Les Halles,” *The Journal of the Society of Architectural Historians* 32, no. 4 (1973): 308-315.

<sup>117</sup> Antoine Grumbach, “La Bataille des Halles,” *Architectural Design* (July 1971). The degree to which the architecture and urbanism of Paris had become by this point a battleground is testified to by the publication of two major issues of *L’Architecture d’aujourd’hui* dedicated to an exhaustive treatment of the city’s contested spaces: No 138 (Paris) June-July 1968 and No 153 (La Ville) December 1970-January 1971.



events forever in the public imagination.<sup>118</sup> But despite the rhetoric of exceptionalism surrounding the project, the brief clearly shows Beaubourg to be part of a larger strategic plan (Figure 1.6). It boldly stated the city's ambitions for the area, of which the Center would be only one part, albeit a pivotal one, and it clearly identified a ring of renewal zones with the Plateau Beaubourg and Les Halles at their symbolic and geographic center.

The primary task given to architects was to reconnect the Centre to the surrounding city: "there should be as total permeability as possible between the Center and its surroundings," the brief declared.<sup>119</sup> The brief's proposed strategies of urban reconnection operated at various scales. On the one hand, it showed a preoccupation with the local: the primary users were to be residents of the district "for whom the Center should be a familiar element of their daily lives, and perfectly integrated into the urban environment. [...] It must particularly welcome schoolchildren and students interested in present day creative forms."<sup>120</sup> Through architectural permeability and outdoor displays the Centre would transmit information to its immediate district. The public reception areas were to be an interface to the site's circulation systems. Through these connections the center would engage the totality of systems constituting the site's environment:

---

<sup>118</sup> Viatte, *Le centre Pompidou*, 15. Blaise Gautier, like others, strove to disassociate the project from Les Halles: "One must remind oneself that the Centre Georges Pompidou has nothing directly to do with the construction site of the old block of Les Halles[.]" (Gautier, "Sur Beaubourg," 10.)

<sup>119</sup> *Concours international d'idées à un degré (competition brief)*, 9.

<sup>120</sup> *Ibid.*, 4. In the end, tourists, not locals, would be the main visitors. Detailed analysis of visitors is in *Rapport d'activité* (Centre national d'art et de culture Georges Pompidou, 1978). These are summarized in John Coolidge, *Patrons and Architects: Designing Art Museums in the Twentieth Century* (Amon Carter Museum, 1989).

The Center will be a direct extension of the urban fabric permeated through the life of the renewed and re-structured district. The public will enter on all sides, from the level of pedestrian circulation on the surface, from the parking lots on the basement levels, from the shopping gallery planned underneath the Boulevard Sébastopol, and from any other pedestrian passage under, on, or above ground level that could be proposed by the competitor.<sup>121</sup>

Like the reception areas, exterior space in the brief is treated as an interface between user and urban environment. Reading the brief, one imagines a building shot through with outdoor spaces, and the program diagram clearly suggests this.<sup>122</sup> These spaces are shown as independent of any particular function and operate as buffers or interfaces between other more specifically defined activities.<sup>123</sup>

The Center also would be required to engage with large-scale systems. “This Center should not therefore stay isolated,” the brief declared. “[I]ts activity will necessarily overflow the limits of the building, leaving its mark on the district and spreading throughout France and other countries by means of travelling exhibitions, television broadcasts, publications, etc.”<sup>124</sup> The Center also would be required to make connections to transportation networks such as the existing Metro system and the new underground RER rail line, which had a major hub planned for the Halles area. The RER station was only one cog in a vast underground system planned for the site of Les Halles

---

<sup>121</sup> *Concours international d'idées à un degré (competition brief)*, 11.

<sup>122</sup> The restaurant was already prefigured in the brief as a rooftop terrace, as Seguin had suggested for the Bibliothèque des Halles.

<sup>123</sup> At the same time the brief makes clear the specific performance requirements of these exterior spaces. The brief, for example, specifies that an outdoor space of 1800 m<sup>2</sup>, with a part sheltered from the rain, be provided for the museum's temporary exhibitions.

<sup>124</sup> *Concours international d'idées à un degré (competition brief)*, 4.

(Figure 1.6). By tapping into this network, the Center would extend its reach to new a clientele and to an old one recently moved to new suburbs. Through a system of underground linkages for people and cars, the underground levels of the Center would connect the new building to a vast new “underground ‘Forum’ containing boutiques, facilities for sports and educational and cultural activities, and restaurants.” (Figure 1.6)<sup>125</sup> Indeed, the brief makes it clear that solutions should assume a large number of visitors arriving from underground.<sup>126</sup>

If the genteel and gentrified spaces proposed for urban environment of the Plateau Beaubourg constituted a new humanist utopia at ground-level, the underground proposed a subterranean one. In Paris, the preoccupation with a world beneath the city dated back to the 19th century, of course, but it took hold of the public imagination with renewed force in the postwar years.<sup>127</sup> To apologists and critics of postwar technocracy the underground offered a potent image of a city that rendered indistinct the boundaries

---

<sup>125</sup> *Ibid.*, 6.

<sup>126</sup> Reading the brief’s description of the linkages between the new Center and Les Halles, one imagines a visitor venturing into the tunnels under Rue de Venise and discovering this vast underground “Forum” like an archaeologist stumbling across an buried city. The ground plan of this Forum even recalls the apses of Imperial Fora in Rome.

<sup>127</sup> There have been underground technocratic utopias for Paris since at least the 1930s, when the Société d’études et d’aménagement urbains anticipated Piano and Rogers’ recommendation that the rue Saint-Martin would be better buried beneath the vast public space of the Plateau and proposed networks of underground parking garages several stories below the city. The postwar utopian dreams of a world underground are clearly expressed in the journal *Le monde souterrain*. See, for example, “Autoroutes souterraines de Paris,” *Le monde souterrain*, no. 57 (February 1950). Postwar interest in the underground can be seen in work from Paul Maymont’s *Paris sous la Seine* (1962-1964, and published in *Paris Match*) to Reyner Banham’s discussion of Montréal’s so-called “underground city” (Banham, *Megastructure*.) These preoccupations were undoubtedly fueled by the incorporation of the fallout shelter into the cultural imaginary. On the urban underground in the European cultural imaginary in general, see Rosalind H Williams, *Notes on the Underground: An Essay on Technology, Society, and the Imagination* (Cambridge, Mass: MIT Press, 1990); David L. Pike, *Subterranean Cities: The World Beneath Paris and London, 1800-1945* (Cornell University Press, 2005).

between windowless, fluorescent-lit interiors and underground networks of telephone lines, parking garages, and shopping centers that re-enacted for the computer age the skylit capitalist delirium of Benjamin's arcades.<sup>128</sup> In many respects, the artificially lit underground space was the architectural space of the new computer-controlled environment; indeed, the brief makes it clear that the computer and surveillance facilities require no physical contact with other activities and therefore may be placed underground with the parking. So, while Beaubourg's architects explored the spatial and programmatic potential of artificially lit and ventilated interior worlds, its detractors seized upon images of the "void" and of counter-utopias buried deep beneath its sunlit plazas.<sup>129</sup>

Despite the brief's rhetoric of the local and the everyday, the modernizing and technocratic imperative behind its strategies of urban reconnection are clear: of the nine aerial photographs provided to competitors in the brief none show the Marais to the East nor the neighborhood to the North of Rue Rambuteau (whose future is deliberately left vague). Instead, all look West and South and, with the maps, suggest the formation of two symbolic axes with the Plateau at their intersection. The first, running South to the Hôtel de Ville and La Cité, established the Center's relationship to the past, while the second ran West to the already doomed pavilions of Les Halles, through the stock exchange and hotel district beyond, and by extension, past the Louvre to La Defense, a

---

<sup>128</sup> Whether the world beneath the city was utopian or dystopian was an open question. The windowless, disorienting space completely cut off from the world outside became the alter ego of the clear skies through which the telegraph sent its signals. For Jean-Luc Godard, such spaces were dystopian, and Alphaville contains immurable scenes of fluorescent-lit disorientation.

<sup>129</sup> Jean Baudrillard, *L'effet Beaubourg: Implosion et dissuasion* (Editions Galilee, 1977); Gustave Affeulpin, *La soi-disant utopie du Centre Beaubourg* (Paris: Éditions Entente, 1976).

new Decumanus for a technologized, positive future.<sup>130</sup> In contrast, the Marais and the immediate surroundings of the Plateau to the North and East remain a loosely sketched, picturesque backdrop whose medieval streets were the realm of “glass painters and money-changers.”<sup>131</sup>

The brief thus deferred, albeit tentatively, to the demands of preservation, and shows a sensitivity to Les Halles controversy and to the earlier clearance of the Plateau, and it put forth a typically pragmatic and glib compromise: “[O]ne does not preserve by merely embalming, but by renewing. One should not fear to use modern architectural forms for the Center, which should nevertheless fit in with their environment without distorting or crushing it.” Deference to the old city notwithstanding, the brief was committed to the advance of a positive and technocratic urbanism of the kind that had been designed or carried out between the 1959 master plan and 1974, when Giscard d’Estaing brought that type of planning to an end. This commitment to pragmatism in both preservation and progress did not diminish the utopianism of the proposal. Indeed, in many respects the official projects such as the underground scheme for Les Halles proposed by the Atelier Parisien d’Urbanisme (created in 1967 by the city council) were no less visionary or absurd than those of the spatial urbanists. The boundary between

---

<sup>130</sup> The path of the *Cardo* of ancient Lutetia runs along the West edge of the Plateau Beaubourg, following the rue Saint-Martin, while the *Decumanus* was in the Latin Quarter roughly following the rue Soufflot.

<sup>131</sup> *Concours international d’idées à un degré (competition brief)*, 5.

avant-garde utopianism and technocracy of the most positivist and pragmatic kind was proving dangerously thin.<sup>132</sup>

Despite the brief's fragmenting of the program into a constellation of micro-activities, *antennes*, and sub-departments, it paradoxically suggested a single, unified whole. By contrast, the Lincoln Center, the Maisons de la culture, and the cultural centers of Le Corbusier had all proposed federated ensembles of independent buildings housing different activities, each with a physiognomy appropriate to the activity it contained.<sup>133</sup> Read carefully, the Beaubourg brief rejected this approach to architectural synthesis, a fact that was later underscored by jury. Among the 30 submissions given honorable mention, none follow the "ensemble" approach of Musée du XX<sup>e</sup> siècle; instead, all are to some extent monolithic structures, unified environments that suppress rather than articulate distinctions between programmatic elements. The brief was clear that "the geographical reconciliation of the different activities can only have meaning if it leads beyond mere juxtaposition to integration."<sup>134</sup> Bisani had anticipated such a conception in his 1966 essay on the architecture of the Maisons de la culture: a cultural center should be

---

<sup>132</sup> Texier, *Paris contemporain: de Haussmann à nos jours*, 144. The utopian projects of Paul Maymont, for example, were published in Paris Match as well as in esoteric journals of fellow utopians. In a 1971 article on the events of 1968, Bernard Tschumi and Martin Pawley used the official APUR cutaway drawing of the RER station next to the Plateau Beaubourg as an emblem of oppressive technocracy. (Bernard Tschumi and Martin Pawley, "The Beaux-Arts since '68," *Architectural Design* 41 (September 1971): 542.)

<sup>133</sup> In the scheme for Musée du XX<sup>e</sup> siècle, as in the earlier Tokyo Museum project of 1957, Le Corbusier expressed the synthesis of the arts through a carefully articulated ensemble of discrete forms. The museum, for example, was assigned the form of an endless spiral form while the experimental theater was a "boîte à miracles." (Le Corbusier and Boesiger, *Oeuvre complète: Volume 8 Les dernières oeuvres*, 162–67.)

<sup>134</sup> *Concours international d'idées à un degré (competition brief)*, 9.

“a totality of techniques brought together in a privileged place” but done so in a synthetic manner, so that activities

respond to, complement, and provoke each other, so that sculpture offers itself up to the eye of the theater-goer, music is heard by participants of a scientific conference, etc. [...] A cultural center must not be a simple aggregation of means and techniques, it must be a whole. It is not a theater, an exhibition hall, cinema, cafe, auditorium. It is a whole and at the same time something else.<sup>135</sup>

It was in this “whole that is at the same time something else” that lay the question of architectural form. Like all good practitioners of the new science of architectural programming, Loste’s team created a brief that specified desired performance while keeping the architectural solutions open. “This program has been conceived in order to be as unrestrictive as possible for the architects,” it declared.<sup>136</sup> “It should be noted,” the brief further cautioned, “that in this program the terms ‘gallery,’ ‘rooms,’ etc. should not be interpreted in a strict sense; they describe spaces reserved for specific functions.”<sup>137</sup> Yet, despite its insistence on avoiding any hint of a solution, the brief contained a latent scheme. The museum’s adoption of the flexible, open, and “ramified” spaces of the Kunsthalle pointed to it, but it was in the studies already completed for the library that it was most apparent. Between 1965 and 1969, Seguin and the principle architect of the Bibliothèque nationale, André Chatelin, had developed a program for the Bibliothèque des Halles in which they concluded that a low, ideally single-storey, building with a maximum footprint on the ground and in which books and readers comingled offered not

---

<sup>135</sup> Biasini, “Les Maisons de la culture en France,” 64.

<sup>136</sup> *Concours international d’idées à un degré (competition brief)*, 9.

<sup>137</sup> *Ibid.*, 10.

only the best functional solution but one that, “with neither ‘towers’ nor ‘silos’ of books broke away from forms expressing any conception of ‘monumentality’.”<sup>138</sup> Their 1967 scheme sandwiched a floor of stacks and catalogs between two vast, identical, undifferentiated reading floors. Within these reading floors were five to eight “ensembles de consultation”, grouped by general subject area. The number of these “ensembles” would change with demand. “Only the four walls delimiting the building would be fixed. [...] It should be a living library [whose form], for the most part, was determined by its users.”<sup>139</sup> It was clear that, in the absence of floor-to-ceiling spatial separations, furniture and equipment would be central not only to the library’s operations but, as they would be at Beaubourg, to the building’s larger spatial and functional organization. In March 1969, Seguin hired Jean Faugeron, architect of the French pavilion at Expo 67 in Montréal and a disciple of Le Corbusier, to study the problem of designing the Bibliothèque des Halles. In November 1969, he and Seguin went on a study trip to the United States and Canada and extracted some basic principles of the libraries they had visited. The buildings they saw were on the whole undifferentiated spatial plenums, often on a single storey, in which shelving, partitions, and even freight elevators could be relocated at will, and whose organizational logic was achieved through equipment, signage, and other “non-architectural” devices. It was a pragmatic solution that also offered a potent architectural image.

---

<sup>138</sup> Seguin, “L’histoire et les grandes lignes du programme d’architecture de la bibliothèque des Halles: juin 1965-décembre 1969,” 235.

<sup>139</sup> Ibid., 236–7.



Le Corbusier and Otlet had proposed one unified, all-encompassing architectural form for this complex organism, but in so doing, in the opinion of critics, had fallen into the trap of monumental, historical forms.<sup>140</sup> It was a trap that the Beaubourg brief tried to avoid. Like all cultural buildings, Beaubourg was burdened with the task of representing the particular culture in which it was sponsored, a fact away from which the brief did not shy. This would need to take place within a changing conception of culture in which the traditionally firm connection between nation state and cultural identity had been loosened, particularly since the building would need to operate as a node within a national and international cultural network, as well as within a new historicism that argued that cultural production was inextricably bound to the conditions of its production and was synthetic and relational in nature.<sup>141</sup> As the brief put it in its opening statements,

[t]he purpose is not merely to summarize the twentieth century, however prestigious this many seem, nor to speculate about the future, but to assert that by means of its fertility, and even its contradictions, creativity in all its palpable forms has become the most complete and direct means of expression of our time. The reunion, in one place, of books, the fine arts, architecture, music, cinema, and industrial design—which has not yet been recognized as an art form in our culture—is an idea of great originality. This confrontation should enable a far greater public to realize that although creativity affects an appearance of liberty, artistic expression is not inherently autonomous, its hierarchy is merely fictitious, and that there is a fundamental link between today's art forms and the productive relations within society.<sup>142</sup>

---

<sup>140</sup> The most famous critique of the Mundaneum along these lines was by Karel Teige (translated with commentary in Karel Teige, “Mundaneum (1929),” in *Oppositions Reader*, ed. K. Michael Hays (New York: Princeton Architectural Press, 1998), 589-597.)

<sup>141</sup> I use the term historicism here in its broadest sense. See Paul Hamilton, *Historicism* (Psychology Press, 2003).

<sup>142</sup> *Concours international d'idées à un degré (competition brief)*, 3.

The questioning of absolutism explicit in the brief's surprisingly polemical opening was also part of a wider view of culture that saw it in terms of change rather than permanence. The brief expressed this through the recurring themes of flexibility and change, in terms both pragmatic and utopian:

[T]he Center's internal flexibility should be as large [sic] as possible. In a living and complex organism such as the Center, the evolution of needs is to be especially taken into account; all sectors and each part of a sector should be treated in a such as way as to allow manipulation of spaces which will allow the necessary possibilities of adaptation.<sup>143</sup>

The themes of flexibility and polyvalence were thus established early on, and were tropes that signaled a broader ideological position. As Mollard put it, "[m]obility at Beaubourg is a sort of state of mind. It promotes innovation and good design. And it's to be expected that this translates into a new conception of architecture."<sup>144</sup> He added:

Flexibility would allow for reorganizing the interior in concert with the evolution of the activities, the nature of their interrelation, and the desires of the public... Would it be reasonable to cast in concrete the fleeting nature of our contemporary society's state of mind?<sup>145</sup>

In this way, flexibility was deployed in the brief as part of a broader discourse of exchange and cultural evolution: where Malraux had spoken of transcendent, permanent values, by the late-1960s his view was challenged by the possibility that change itself was one of those values.<sup>146</sup> The brief absorbed these ideas and proposed a museum defined

---

<sup>143</sup> Ibid., 10.

<sup>144</sup> Mollard, *L'enjeu du Centre Georges Pompidou*, 25.

<sup>145</sup> Ibid., 81.

<sup>146</sup> Change as an autonomous concept was a recurring theme in writing on the information society. See, for example, Alvin Toffler, *Future Shock* (New York: Random House, 1970); Warren G. Bennis and Philip Slater, *The Temporary Society* (Harper & Row, 1968).

more by its temporary events than by its permanent collection. Likewise, the CCI focused not on the history French industrial design but on objects of all origins “at the moment they hit the French market.”<sup>147</sup> It was a quasi-real-time system reflecting the state of the French market for consumer goods and the web of relations between consumers, designers and manufacturers at any given time. As with the museum, Barré wanted no collections and that everything be current.<sup>148</sup> The program was clear: in place of a permanent collection with secondary functions for conservation and restoration would be spaces for temporary exhibitions supported by spaces dedicated to creation and the production and dissemination of “constantly renewing information.”<sup>149</sup> The brief had opened its discussion of the museums with a seemingly banal requirement:

The architect’s attention is drawn to one original and essential characteristic of the Center: whether it be the Library, the Museum of Modern Art, the National Center of Contemporary Art, or the Center of Industrial Design, etc. the areas given have been estimated sufficient for the full exercise of all activities presently foreseen. No extension of the building is to be planned, as the collections will be periodically renewed.<sup>150</sup>

In place of permanent collections was to be a series of rotating exhibitions—permanent change unfolding within a finite building.<sup>151</sup> In other words, the sacred role of the museum an enduring repository of objects was terminated.

---

<sup>147</sup> Barré, *Exposé de M. Barré sur le CCI (réunion d’information générale du 27/9/73)*.

<sup>148</sup> Viatte, interview.

<sup>149</sup> *Concours international d’idées à un degré (competition brief)*, 4.

<sup>150</sup> *Ibid.*, 10.

<sup>151</sup> The museum, however, didn’t adapt well to this new model. In particular, the lack of emphasis on collections made the museum unstable in a bad way. To Viatte, one of the failures of Beaubourg was the lack of provision for collections. “What was needed was a cycling relationship of exchange between collections and documentation.” (Viatte, interview.)

The brief's commitment to constant change and flexibility, to the redemptive agency of information technology, and to the idea of fragmentation and multiplicity contained within a single unified logic (hinting at what Banham would later call Megastructure but also at something beyond it) set up the conditions into which Piano and Rogers' competition entry would seem to fit hand in glove, as we shall see. Yet its commitment to both technocratic positivism and critical social action through utopian *dirigisme* rather than libertarian individualism was in many respects incompatible with the earlier ideals on which the competition entry was based.

Moreover, the brief capitalized on the fact that information technologies and networks, like all technologies, operated within society as both tool and symbol, like the first steam engines, whose transformative capacities lay as much in the way they dramatically exuded power to an observer as in their abilities to actually transport loads.<sup>152</sup> The projects of 1960s techno-utopians like Archigram therefore built upon this dual aspect, and their radicalism resulted in equal parts from image and actual performance. But was it architecture's role to represent an underlying, governing principle through a practice of motivated form making, as Le Corbusier and Otlet had done earlier at the Mundaneum? And if it was, did the state of information technology at the turn of the 1970s—when it was becoming impossible to distinguish between hard and soft, mechanical and virtual—deny any possibility of such an architectural correlate?

---

<sup>152</sup> On the use of machines as models in the 18<sup>th</sup> and 19<sup>th</sup> century social and political imagination, see Otto Mayr, *Authority, Liberty, and Automatic Machinery in Early Modern Europe* (The Johns Hopkins University Press, 1989). Bernard Tschumi, writing on the network of barricades in the Latin Quarter during May 1968, points out that “the importance of a barricade does not lie in its being a traffic hindrance, but in its power to reveal the violence of the regime through being also a symbol and a catalyst.” (Tschumi and Pawley, “The Beaux-Arts since ’68,” 565.)

## Chapter 2: A Live Center of Information

*Certain critics, disoriented by the multiplicity of its activities and the resulting perception of disorder, have complained about its resemblance to a 'supermarket; ' this comparison has never bothered me: a supermarket is always more lively than a museum.<sup>1</sup>*

—Richard Rogers

*Beaubourg was a big joke executed by serious professionals, like certain bits of the Beatles.<sup>2</sup>*

—Renzo Piano

In the late summer of 1970, Richard Rogers received a telephone call from Ted Happold, head of the Structures 3 group in the London office of Ove Arup and Partners. Arups had recently completed the engineering for the Sydney Opera House and was interested in entering the Beaubourg competition. Happold, who had been introduced to Rogers by Frei Otto, felt that the ambitions of Rogers' fledgling office, which Renzo Piano had recently joined, of bringing together the technical and social aspects of architecture would be the ideal partner for a joint entry to this unusual competition.<sup>3</sup> Both Happold and Peter Rice—who, with Lennart Grut, later formed the core Beaubourg team—had been astute enough to recognize from the brief that an overly cautious proposal would guarantee not winning, “since the principal factor will be not to offend,” and that what

---

<sup>1</sup> Renzo Piano, Richard Rogers, and Antoine Picon, *Du plateau Beaubourg au Centre Georges Pompidou* (Paris: Editions du Centre Pompidou, 1987), 41. This interview with Antoine Picon conducted ten years after the building's opening is the most complete published account of the intentions and ideas behind the project. It has not been published in English.

<sup>2</sup> *Ibid.*, 15.

<sup>3</sup> These events are recounted in Peter Rice, *An Engineer Imagines* (London: Artemis, 1994), 25–46. Piano had come to London dissatisfied with the opportunities afforded in Italy and had approached Rogers with an offer of collaboration.

was needed was a provocation.<sup>4</sup> Despite Happold's argument, Rogers hated the idea. As Bryan Appleyard, Rogers' biographer, described the situation, "To participate would seem to represent a volte-face in the direction his work had been taking towards an increasingly available, serviceable and reticent architecture. Everything about this project reeked of the grand gesture, the wasteful flamboyance, the bad faith which opposed the Fullerian virtues of efficiency and flexibility."<sup>5</sup> The recent and highly publicized plans to demolish the pavilions of Les Halles did not help to persuade. Since the markets had moved to Rungis in the suburbs, Baltard's pavilions had become the locus of spontaneous cultural activity, from theatrical performance to art exhibitions.<sup>6</sup> Beyond the general question of preservation, the threat to Les Halles represented the hegemony of the official over the spontaneous, the top-down over the everyday. As Rogers put it, "Les Halles, having outgrown their original function, were living a magical moment as one of the most live and spontaneous cultural centres ever." In contrast to the popular counter-utopia that had emerged seemingly spontaneously in Baltard's pavilions, "the highly formalised, super rationalised Beaubourg competition brief invited immediate, invidious comparison."<sup>7</sup>

---

<sup>4</sup> Ibid., 25.

<sup>5</sup> Bryan Appleyard, *Richard Rogers: A Biography* (Faber and Faber, 1986), 159–60.

<sup>6</sup> Norma Evenson, "The Assassination of Les Halles," *The Journal of the Society of Architectural Historians* 32, no. 4 (1973): 308-315. The degree to which this activity was truly spontaneous and unofficial remains an open question. The CCI, for example, had hosted an exhibition on design and the city, and the Ecole des Beaux-Arts rented studio space in the pavilions. (The catalog of the CCI exhibition was published as *L'espace collectif, ses signes et son mobilier* (Paris: Centre de création industrielle, 1970).)

<sup>7</sup> Peter Rawstorne, "Piano & Rogers: Centre Beaubourg," *Architectural Design* 42, no. 7 (1972): 408. This 1972 interview with Rogers describes the spirit of the original scheme while reflecting on the shortcomings that had emerged during the one year since the competition.

These conflicts would need to be addressed head-on if Piano and Rogers were to enter a competition founded on such an apparently regressive premise. The first of these concerned the building's relationship to its urban context: if the Centre proposed a complex set of cultural activities that would normally exist in the wild—and in so doing drained that environment of those very activities—then what would this implosion offer in return? The second concerned the scale of the gesture: if it attracted 10,000 locals per day (the numbers would in fact be much higher) then how could a building create conditions and forms that responded to the inherent diversity of this population rather than subsuming it into one singular monument, “the ultimate palatial expression of the alienation of ‘culture’ from ordinary life?”<sup>8</sup> After a week of deliberations Piano and Rogers decided that they would enter as long as they took a provocative and polemical approach to these questions and to the “formal and monumental brief.”<sup>9</sup> Their approach was grounded in the decentralizing, democratizing, humanist discourses surrounding communications technologies and computing. “We take the example of Les Halles,” Rogers observed. “Not just places to sell meat and vegetable but also places to meet, to communicate.”<sup>10</sup> Their response was

a kind of machine, an information tool. Instead of providing a container for art, we would offer a building for information, entertainment, and also for culture, a sort of frame supporting activity, a machine for everything

---

<sup>8</sup> Ibid.

<sup>9</sup> Renzo Piano and Richard Rogers, “L’histoire du projet,” *L’Architecture d’Aujourd’hui*, no. 189 (1977): 54.

<sup>10</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

rather than a specialized building housing a library, museum, music; a magnet; an exchanger; more audio-visual instrument than architecture.<sup>11</sup>

The text accompanying the Piano and Rogers competition entry summed up this approach:

We recommend that the Plateau Beaubourg is developed as a ‘Live Centre of Information’ covering Paris and beyond. Locally it is a meeting place for the people.

This centre of constantly changing information is a cross between an information-orientated, computerised Times Square and the British Museum, with the stress on two-way participation between people and activities/exhibits.

The Plateau Beaubourg information centre will be linked up with information dispersal and collection centres, throughout France and beyond; for example, university centres, town halls, etc.<sup>12</sup>

Echoing the brief, the entry allied information with strategies of urban connectivity. As Rogers later put it, “Instead of proposing a self-referential object [implied in the brief], we imagined a machine that was open on the city and in direct contact with the activities taking place there.”<sup>13</sup> Peter Rice later summarized these early intentions:

Piano & Rogers had a clear idea of the building or image they wanted to explore—an idea stemming from Archigram, Cedric Price and Joan Littlewood, and the optimism of the 1960s. It was a large loose-fit frame where anything could happen. An information machine. At its core was the belief, which had been identified in the brief, that culture should not be elitist, that culture should be like any other form of information: open to all in a friendly, classless environment.<sup>14</sup>

---

<sup>11</sup> Piano and Rogers, “L’histoire du projet,” 54.

<sup>12</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text)”, June 1971, Archives CGP.

<sup>13</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 12.

<sup>14</sup> Rice, *An Engineer Imagines*, 25.



Rice's account touches on the twofold aspect of the idea of an "information machine." First, the building would perform as such a machine, replete with satellite dishes and information displays. Second, the building would, through its use and its organization, achieve the same socially beneficial results that, according to the discourses of the day, were the potential of all information machines: openness and access, dismantling of social hierarchy, democratization, self-enlightenment. Whether the building achieved these results through the absorption of information technology into architecture or through modes of performance particular to architecture itself was an open question that later critics would revisit.

The scheme divided the activities described in the brief into three main areas: the urban environment and piazza, the underground parking and connections to infrastructure, and the superstructure. Within these areas the proposal identified the zones where visitors would encounter information in various ways. The first of these was the building's interior and its vast floor plates (Figure 2.1). The competition entry proposed six floors, all free of columns, partitions, and all other fixed vertical elements since all circulation and services had been displaced to the exterior: "Totally uninterrupted floor space is achieved by limiting all vertical structure, servicing and movement to the exterior. 3-dimensional walls, floors and partitions may be unclipped and/or extended at will, offices may be positioned anywhere, more highly serviced areas will tend to be located near the exterior for easier connections with vertical runs." (Figure 2.2)<sup>15</sup> On

---

<sup>15</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, "Plateau Beaubourg Centre Paris (competition entry text)."

these vast plains, visitors would encounter the full range of information systems intrinsic to the operation of the museum and library, whether computer terminals and audio-visual equipment or exhibition display systems.<sup>16</sup>

The second of the zones where visitors would encounter information was on the main east and west facades. On the one hand, the facades were a kind of billboard structure, a framework to support the display of information screens — the ones facing the piazza offered pedestrians “constantly changing information, news, what’s on in Paris, art works, television, robots, temporary structures, electronic two-way games and information, etc.” (Figure 2.3), while the ones on the Rue du Renard offering images relating to the scale of moving cars.<sup>17</sup> From the start, the two principle facades were spaces in which all systems were integrated, from information to air handling and were treated as semi-programmed spaces of activity.<sup>18</sup> Where the floor plates were empty zones for as-yet unformed activities, the facades were saturated and dense, and resembled, as Rogers later put it, “a sort of sophisticated Chicago tenement block fire escape.” Housed within the overall framework defined by the white steel structure was an almost Borgesian set of categories of activity: “walk-ways containing shops, reception, kiosks, plants, specialist capsules and all horizontal and vertical circulation, [...] the

---

<sup>16</sup> The entry text also noted that the main block of the building would be fully wired with invisible security systems.

<sup>17</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

<sup>18</sup> T. Happold, “Beaubourg: Architecture or Engineering,” *Architectural Design* 47, no. 2 (1977): Unpaginated. This is in contrast to, say, Franco Albini’s Rinascente department store in Rome in which only the mechanical services were pushed into the building envelope.

people overlooking the piazza and the services on the street side.”<sup>19</sup> As Piano and Rogers later put it, “the facade itself becomes an activity container, a three-dimensional structural framework with people walking on it and looking down from it, a wide variety of items clipped to it, tents, seating, and audio-visual screens etc.”<sup>20</sup>

The last of the zones of information was the piazza and its adjunct exterior spaces (Figures 2.4-2.6). The building was pushed to the West edge of the site, leaving a large piazza to the East, the only scheme to do so. The piazza was conceived, as the entry text put it, as “the horizontal continuity of the facade” and took the form of a vast plaza sunken 3.2 m below street level on which spontaneous, unprogrammed events such as “mobile exhibitions, live theatre and music, games, stalls, meetings, parades, competitions, etc.” could play out.<sup>21</sup> By sinking the exterior space around the building, the designers exposed the raw infrastructure of the underground, the new pedestrian and vehicular underpasses, and the cellars of the buildings bordering the Plateau. The subterranean perimeter of the Plateau, suddenly exposed, would be lined with “shops, cafes, children’s reception area, current events rooms, information rooms, Design Centre, etc.,” all acting as “filters and links with the surrounding pedestrian environment.”<sup>22</sup>

Although the act of sinking the plaza was, according to the text, to segregate pedestrians and vehicles it also provided a transitional zone—neither street nor building—in which

---

<sup>19</sup> Rawstone, “Piano & Rogers: Centre Beaubourg,” 408.

<sup>20</sup> Renzo Piano and Richard Rogers, “A Statement,” *Architectural Design* 77, no. 2 (1977): unpaginated.

<sup>21</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

<sup>22</sup> *Ibid.*

all of the building's "lymphatic systems" could operate.<sup>23</sup> "Pedestrian [sic] pass under the neighbouring roads on the way permeating many of the 'information and commercial activities' before entering the sunken square, such as under the Rue du Renard, where there are the current events room [Salle d'actualité], industrial design permanent galleries and documentation rooms."<sup>24</sup> These were located for the most part outside of the main floor areas (which were reserved for the major functions), on the roofs or in the square.<sup>25</sup>

This environmental impetus was integral to the project's performance as an information machine. The three zones in which users would encounter information—the interior, the facades, and the roofs and piazza—were conceived as one interrelated system rather than discrete experiences. The information displays in the principle facades, for example, modulated the building's relationship with its urban environment. As the entry text put it, "the facade facing Rue de Renard [sic] will have visual displays related to moving traffic, whilst the facade facing the sunken square will relate to pedestrians."<sup>26</sup> Likewise, the pedestrian views of the facades were based on visual interaction with the interplay between information displays and building mass. "The building is lifted on piloti, well above ground level, so that it is possible from the Rue du Renard to see under

---

<sup>23</sup> Biasini used this expression in discussing the Maisons de la culture. (Emile Biasini, "Les Maisons de la culture en France," *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 64-67.) For more, see Chapter 1 of this dissertation.

<sup>24</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, "Plateau Beaubourg Centre Paris (competition entry text)."

<sup>25</sup> "Areas needing view, uninterrupted daylight, and/or open space, such as the roof top restaurant, with its view over Paris, experimental and temporary exhibitions, outdoor museum, children's reception area, are located either on the roof on the south end of the building [...] or in the square below, all areas free of the vertical grill. The roof itself is completely clear for display and community use, the restaurant being suspended over it." (Ibid.)

<sup>26</sup> Piano and Rogers, "A Statement."

the building the whole of the facades of the houses on Rue Saint-Martin, whilst on entering the square from Les Halles direction [sic], one is faced by the information grill.”<sup>27</sup> By pushing the building tight against the Rue du Renard, the pedestrian entering the building would not see the Rue du Renard facade (reserved for cars) but the activity of the plaza. From the east, the pilotis lifted the building into the realm of the visitor’s peripheral vision and exposed the urban landscape beyond; from the west, the vast facade dissolved the mass into a field of information. At the time, the architects thought that Baltard’s pavilions would not be demolished and that the spontaneous cultural life that had sprung up within them would be drawn through the underground network into the 3D matrix of the facade.<sup>28</sup> Visitors flowed into a central glass reception area (the only enclosed space on the ground level) from either the plaza or the underground parking, and from there up the face of the building via tubular escalators, elevators, and galleries, which were conceived, according to the architectural team, “as open-air, up-in-the-air, roads with places for sitting, street-vending, cafes and so on,” and were located outside the controlled activities of library and museum, in the public realm but five storeys above the piazza.<sup>29</sup> This effect was underscored by the facades’ semi-autonomous reading, since they extended above and beyond the volumes behind. As the entry text explained, “The building on the square has two scales. The 3-dimensional steel grill on the two long sides is light, semi-transparent and higher than the neighbouring existing buildings. The much

---

<sup>27</sup> Ibid.

<sup>28</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 12.

<sup>29</sup> L. Abbot, M. Davies, and A. Stanton, “An Inside View,” *Architectural Design* 47, no. 2 (1977): 140-151.

lower enclosed volume inside is broken up by the grill and the applied information coming down in scale at the south end, with stepped terraces to relate to the neighbouring buildings.”<sup>30</sup> The building and its urban context thus merged into one information space (Figure 2.7). As Rogers put it, “We conceived of the interior of the neighborhood as the core of a system of communication networks.”<sup>31</sup>

Piano and Rogers’ scheme extended the logic of the information center into the underground and, reciprocally, the logic of the underground into the body of the building. The impossibly deep floor plates relied for the most part on artificial systems/lighting, and a highly contrived interface to the world outside.<sup>32</sup> Piano and Rogers saw no problem with the APUR proposals for the world beneath Les Halles (apart from the demolition of the markets) and encouraged its further development. In particular, they suggested that the underground connection from the new Les Halles development be extended into the sunken plaza, and encouraged “the forming of the maximum number of pedestrian routes under the neighbouring roads.” For the designers, these urban interconnections were part of a broader class of informational connectivity. “The basic idea,” they conclude in their discussion of their urban approach, “is of an information centre which presents information on the outside, as well as on the inside, of the building, relays it and is linked

---

<sup>30</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

<sup>31</sup> Piano and Rogers, “L’histoire du projet,” 54.

<sup>32</sup> The deep floor plates of the Team 4 work also cut the interior off from the exterior (in contrast to, say, the courtyard types of IBM) so they were in a sense subterranean.

up to other centres throughout the world.”<sup>33</sup> For the architects, the activities lining the piazza were crucial zones of linkage to the city. In 1972, Rogers argued that the “shops, cafes, restaurants, children’s areas, current events and information rooms, etc. will link the centre with the rest of the city. This linkage is the key to the success of the scheme and will need careful study and control.”<sup>34</sup>

The building’s major public circulation systems instantiated a mental map within the subjects who inhabited this seemingly unfettered realm of possibilities. The brief had singled out the problem of orientation and the possibility that visitors might be lost or overwhelmed in such an immersive and indeterminate environment. In response, the façades in the winning scheme included all many of the public functions such as entrances to major departments. The brief had pointed out that visitors could easily become lost in such a complex organism. “For easy orientation and flexibility,” the winning entry responded, “all vertical movement takes place on the face of the building, so that it can clearly be seen by anyone viewing the building from the square in front.” The network of circulation linkages and entrances was thus displayed on the facade of the building in a didactic manner (Figure 2.8). “Each of the major department entrances,” the text stated, “are indicated on the facade by a clearly coded system.” Whether the nature of this coded system was the circulation hardware itself or applied graphics was left open. The graph-like diagram that accompanied this text made it amply clear. Also, the smooth, reflective information facade acted as a backdrop.

---

<sup>33</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

<sup>34</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 408.

Rogers was clear that the billboards and media screens drew their inspiration from imageable urban landscapes of consumption—Tokyo, Times Square, Piccadilly Circus—rather than from textual or theoretical sources on information and media like McLuhan.<sup>35</sup> He later pointed out that the role of the media screens and other apparatus on the original scheme was to symbolize the building’s vocation as a live center of information.<sup>36</sup> “In general,” the brief announced, “the Centre, aimed towards a vast public, will present a total view of contemporary civilization by means of its varied approaches.”<sup>37</sup> Outdoor advertising provided a mode of translating this lofty goal into something concretely imageable.<sup>38</sup> Like Oscar Nitzchké’s unrealized *Maison de la Publicité* of 1934, the relationship between advertising displays facing the street and the building’s activities behind was arbitrary; indeed, it was the very unrelatedness of billboard to building that gave it its surreal potency.<sup>39</sup> The façades of the Piano and Rogers’ competition entry were

---

<sup>35</sup> Richard Rogers, telephone interview, June 2009.

<sup>36</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 12.

<sup>37</sup> *Concours international d'idées à un degré (competition brief)* (Paris: France, Ministère d'état chargé des affaires culturelles, 1970), 4.

<sup>38</sup> As the Smithsons put it, “To understand the advertisements which appear in the *New Yorker* or *Gentry* one must have taken a course in Dublin literature, read a *Time* popularising article on Cybernetics and to have majored in Higher Chinese Philosophy and Cosmetics.” (Alison Smithson and Peter Smithson, “But Today We Collect Ads,” *Ark* (November 1956): 50. Quoted in Nigel Whiteley, *Reyner Banham: Historian of the Immediate Future* (MIT Press, 2002), 134.) Eduardo Paolozzi had approximated this effect in a presentation at the ICA in 1952 in which he projected a flood of photographs and advertisements in which “no single image was important: what mattered was the rapid turnover and random juxtaposition of images of science fact and fiction, car advertisements, robots, food—consumer goods which created the impression of a time-based collage.” (Ibid., 85.)

<sup>39</sup> Rogers would certainly met Nitzchké while a graduate student at Yale. The entire façade could be rented out in 2-3 week blocks (Joseph Abram, “Oscar Nitzchke: *Maison de la Publicité*,” *AMC Architecture mouvement continuité*, no. March (1984).) Abram cites a special issue of *L'Architecture d'Aujourd'hui* of 1933 on “the aesthetics of the street” in which such a project is envisioned, with buildings dissolving into burning neon. The Surrealists were increasingly interested in advertising and its role on experience of the



subservient to neither interior nor streetscape. Instead, it is a buffer zone, a new, autonomous space of meaning and intervention. It has thickness, is inhabitable. At Beaubourg, the information displays installed within the frameworks were a reflection of the activity happening on the inside the information machine, within the core with its vast floor plates. “We want the outside to reflect the activities inside (big projections, moving walls, technological gadgetry that aids change).”<sup>40</sup> As communicators of the building’s activities, the electronic information displays were neither directly indexical nor arbitrary signs; instead, they were part of a continuous visual field that included human actors and the silhouetted volumes of circulation and activities seen through translucent, veil-like quality of the façade.<sup>41</sup> In comparison to Nitzchké’s billboards, the image conveyed by the competition scheme’s two great facades was enigmatic. There were no ducts or shafts clipped onto the façades, and the model shows them as smooth, reflective surfaces with minimal articulation. In the end, the goal was less to express the building’s technical systems than the epiphenomena of those systems: the flows of people, goods, and information. Compared to the projects of Archigram, the machinery and technical apparatus was suppressed: the gantries are tiny, and there is no direct communication of physical demountability. The expression of the built project, with a greater degree of structural and mechanical articulation that invited comparisons to oil refineries and

---

city. See Roger Cardinal, “Soluble City: The Surrealist Perception of Paris,” *Architectural Design*, no. 2-3 (1978).

<sup>40</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

<sup>41</sup> Some critics disagreed, and argued that the information screens were a renunciation of architecture’s communicative functions. “Withhold the startling admission that architecture in itself will not carry meaning and that it will be reduced to borrowing.” (Pierre Joly, “Beaubourg: 700 projets pour rien,” *L’Oeil*, no. 203 (1971): 36.)

factories, was regressive by comparison. In the winning competition scheme, building systems were an enabling technology, contained within a more complex matrix.

Flexibility was an obsession of both the brief and the winning scheme. The idea of a building based on flexibility drew upon the recent past of British architecture that allied change and flexibility with a broader concept of individual choice, freedom, everyday life, and play. “Things change all the time anyway.[...] We want to make a loose infrastructure in which people can move, criss-cross on the way somewhere, live, eat, enjoy themselves, do things, and make decisions which can, if necessary, change the building.”<sup>42</sup> Flexibility was not only an explicit demand of the brief, but was also an information problem. “If culture,” the architects later argued, “means to educate, to inform, to send messages, to receive answers, to trigger within an anonymous public a consciousness of its actual conditions and to provide the means by which it might modify them, then the proposed instrument can only be conceived as flexible, transformable, evolutionary, unfinished.”<sup>43</sup> In this relationship between information and flexibility lay a notion of freedom and choice consistent with Price’s doctrines. Rogers later summarized the broader relationship between flexibility and information exchange:

We are after a rich, flexible matrix. In all this we want to mix as many modern gadgets as possible. Electronic gadgetry is not just a fad, even if things alter constantly. There are other things, sensory techniques that can help bring people together, help them to communicate.[...] We see communication, information, as vital. The being in contact and communication between the individual and individuals. The more you can spread this out, the more frequent the changes. The more change that what

---

<sup>42</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

<sup>43</sup> Piano and Rogers, “L’histoire du projet,” 54.

we are making won't just become another statistic [sic] monument in time.<sup>44</sup>

Flexibility took various forms in the competition scheme. First, the building itself would be physically reconfigurable. Here, megastructure provided the model: “In this case, the framework provides a rhythm to the improvisations of the users; it represents a necessary permanence, while the volumes and spaces vary.”<sup>45</sup> The floors themselves could be repositioned as the building’s activities evolved, achieved by a structural system was simple and was to be assembled on site from a kit of parts: a series of water-filled, diagonally-braced columns laid out on the 12.8 m north-south module formed the permanent immovable structure, over which repositionable trusses equipped with friction collars were slipped and wedges installed where the each truss was to be located (Figure 2.9). As Rogers put it, “We think of having a constantly moving structure like a jack under a car. We think more and more of the mobile, the demountable.”<sup>46</sup> Likewise, the facades were conceived as a reconfigurable information framework. “All lifts and escalators are clipped on to the facade and can be changed if the intensity of use increases or the positions of the departments or their entrances are changed. [...] The external structural grill is designed to carry a constantly changing clip-on system of information. Cranes on the roof lift and maintain the different clip-on parts of the building, from wall panels to electronic components.”<sup>47</sup> It was not only the façade that changed. The facade

---

<sup>44</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

<sup>45</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 14.

<sup>46</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

<sup>47</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

and floors would change as the program shifted, but the rectangular volume of the building mass remained stable. Instead, the exoskeletal structure could be optimized with the addition of cross bracing between exterior columns where loads were large (as in the library).

Flexibility suggested programmatic evolution, and even replacement, within a fixed architectural form. “Houses, factories, today become museums tomorrow. Maybe one day our museum might become a foodstore, a supermarket.”<sup>48</sup> This degree of flexibility could not be supported only by the reconfiguration and repositioning of existing arrangements and so the second mode of flexibility was the provision of vast uninterrupted floor plates defining a generic, functionally indeterminate container. As Happold straightforwardly put it, “zones rather than specific areas provided for the users.”<sup>49</sup> Such was their confidence in this approach to flexibility that for the important section of the entry text dealing with “Unity of the Centre” Piano and Rogers simply state “See paragraphs 1, 2 and 5,” referring, respectively, to the sections of their text dealing with information as the guiding principle of the Centre, with urban integration established through the sunken square with its filters, and with access and circulation through those spaces. Likewise, the section discussing “Correlation between the programme and the project” merely states, “See paragraph 4,” referring, of course, to the discussion of flexibility.<sup>50</sup>

---

<sup>48</sup> Rawstorne, “Piano & Rogers: Centre Beaubourg,” 407.

<sup>49</sup> Happold, “Beaubourg: Architecture or Engineering.”

<sup>50</sup> Indeed, the precise location of the museum within the complex was only decided upon a few months before the building opened.

Piano and Rogers' approach skillfully translated the brief's often-abstract notions of information into a concrete architectural approach. Although the text that accompanied the entry was primarily a restatement and refinement of the wording of the brief, it was the only one that picked up on the "center of information" as the true desire of the organizers. The proposal presented the cultural center as an information machine—an intelligent maneuver since the brief had already done so quite explicitly, something that very few competitors recognized or were able to exploit. Among the more explicit ways included a text that echoed the wording of the brief in its slogan "a live center of information," which gave both the architects and the client a tidy aphorism that they would deploy repeatedly, and which provided correspondingly aphoristic diagrams of information networks—nodes and links with Beaubourg at their hub (Figure 2.10). Where Rogers might have intended the diagrams to show information messages linking institution to institution and individual to individual, in the imagination of its French client the redemptive power of networks lay also in their synchronic, structural aspects in which lay a deep structural reorganization of the institution's territory of influence.<sup>51</sup> The diagram was thus its immediate and potent translation.

---

<sup>51</sup> On the telegraph in the 18th century, Mattelart says "[a] star- or pyramid-shaped model would be used for the architecture of the network, which branched out from the top in Paris." Armand Mattelart, "Mapping Modernity: Utopia and Communications Networks," in *Mappings*, ed. Denis E Cosgrove (London: Reaktion Books, 1999), 23.

## The jury

The task of organizing the competition fell to Sebastien Loste, who identified three possible structures for the competition: an open international call for project proposals, an open international call for ideas, and an invited call for proposals.<sup>52</sup> Although the first would gather the widest range of solutions and the third would deliver the result most quickly, Loste pragmatically argued that the second offered a compromise between openness and efficiency of process. He also argued that, more importantly, the schematic nature of the designs submitted to an ideas competition left the proposals open enough to allow intervention by the users representing the various departments.<sup>53</sup> They wanted bold imagery and ideas, not detailed solutions.

Loste had been equally pragmatic in his recommendations for the jury selection. It was to be as small as possible while representing a wide range of disciplines; architects and users would be given equal representation, as would a range of architectural tendencies and ideologies and various nationalities.<sup>54</sup> For Piano and Rogers, the makeup of the jury was promising and would be sympathetic to a technological response to the brief. Jean Prouvé, the jury president, was well known to both Piano and Rogers, while

---

<sup>52</sup> Sébastien Loste, *Note: Formules de concours envisageables*, n.d., Archives CGP.

<sup>53</sup> The APUR proposals in 1967 for the area between the Bourse and the Plateau Beaubourg failed to deliver a scheme that could be supported either by politicians or the public. (Hilde de Haan and Ids Haagsma, *Architects in Competition* (Thames and Hudson, 1988), 171–72.)

<sup>54</sup> Sébastien Loste, “Propositions pour un jury (Plateau Beaubourg)”, July 1, 1970, Archives CGP. The jury consisted of Jean Prouvé, Émile Aillaud, Willem Sandberg, Gaétan Picon (former Director General of Arts and Letters under Malraux), Sir Frank Francis (of the British Museum), Philip Johnson, Michel Laclotte (curator at the Louvre), Oscar Niemeyer, and Herman Liebaers (of the Royal Library of Belgium). (ref jury report) Utzon was originally to be a member, but his health prevented it. As a replacement, Prouvé suggested Liebaers and Maillard. (Jean Prouvé, “Letter to Robert Bordaz”, May 25, 1971, 1992037/009, Archives CGP.)

Émile Aillaud's housing schemes had been touted by Banham as exemplary of an indeterminate approach to building form.<sup>55</sup> Moreover, the presence of Willem Sandberg suggested that the jury might be sympathetic to a critical view of cultural institutions. The jury also included those sympathetic to Seguin's agenda. Seguin brought to the jury Sir Frank Francis and Herman Libelers. More importantly, perhaps, also brought on board Philip Johnson, who had just finished the addition to the Boston Public Library and whom Seguin met during a study trip to New York in November of 1969. Johnson and Seguin had discussed the Bibliothèque des Halles and Johnson contributed several sketches and studies, as well as insisting that all functions of the library be dedicated in some way to the reception of the public.<sup>56</sup>

In addition to the invited jurors, a technical committee held substantial sway over the judgment. François Lombard, the engineer who directed the writing of the brief, was head of this committee, and he had been entrusted by Loste to steer the process and to ensure that the winner conformed to the technical requirements of the brief. The programming group within the technical committee was charged with representing the client's interests, including evaluating the degree to which each entry met the client's requirements. It therefore had great influence over how the political interests read the projects. Although the jury claimed to approach its work in the spirit of the program (there would be no prevailing stylistic bias, no preconceived formal or organizational solution) it recognized that a desire for neutrality in combination with the vast range of

---

<sup>55</sup> See Reyner Banham, "A Clip-On Architecture," *Design Quarterly*, no. 63 (1965): 7.

<sup>56</sup> Jean-Pierre Seguin, *Comment est née la BPI: Invention de la médiathèque* (Paris: Bibliothèque publique d'information, Centre Georges Pompidou, 1987), 60.

proposed solutions meant that the degree to which a proposal met the technical demands of the program would play a large role in the decision.<sup>57</sup>

Over a period of ten days starting on July 5, 1971 the jury deliberated over the 681 entries received from fifty countries.<sup>58</sup> In general, the jury found the results disappointing, considering the large number of entries. For such a high-profile competition, the entries although widely international and numerous, contained very few submissions by well-known architects and the jury felt that they reflected “a seriousness of study rather than strength and originality of invention.”<sup>59</sup> Entries could be grouped into two main categories of failure: “on the one hand, a tormented expressionism, extravagance, outburst and excess; on the other, sober practicality, spaces certainly functional but so commonplace as to be banal, compact and unarticulated volumes that could be interchangeably a hospital or a museum, housing or a library.”<sup>60</sup> Based on the former, the jury eliminated fifty or so projects from the start, proposals “characterized by an aggressive research into geometric forms or spectacular, majestic, and provocative sculptures.”<sup>61</sup> By unanimously eliminating “these spheres and cubes, these truncated

---

<sup>57</sup> *Concours international pour la réalisation du Centre Beaubourg: rapport du jury* (Paris: Établissement public du Centre Beaubourg, 1971), 21–23.

<sup>58</sup> Including 186 from France, 130 from the United States, 35 from Japan, and only 14 from Britain (Ibid., 12–13.) Many results were published in Paris Projet special issue, and in L'Architecture d'Aujourd'hui, no. 157 (Aug-Sept 1971) and no. 168 (July-Aug 1973). No complete archive exists because of flood damage.

<sup>59</sup> Ibid., 24–25.

<sup>60</sup> Ibid.

<sup>61</sup> Ibid., 25.



cones and cylinders, these pyramids (inverted or not), these giant ovoids” it rejected a particular monumental and figural approach.<sup>62</sup>

The thirty short-listed schemes were subjected to a scrutiny that was as obsessively meticulous and detailed as the competition program. Lombard had prepared a form of almost twenty pages that would need to be completed for each submission and which included tables for correlating floor areas to the program, schematic site plans where the juror could indicate how the proposal created links between the program and the urban environment as well as how the building would be perceived from six different angles of approach, a matrix of program elements on which the juror would indicate programmatic relationships and groupings, extracts from the program diagrams on which the juror could indicate degrees of flexibility for each activity group and interfaces between them, and tables for rating technical feasibility, climate control, and security.

On July 15, 1970, the jury awarded first prize to Piano, Rogers, and Franchini, with Ove Arup, held by the jury to be the clear winner, by a vote of 8 to 1.<sup>63</sup> But the Piano and Rogers scheme played havoc with the technical categories of assessment. The

---

<sup>62</sup> Ibid., 8.

<sup>63</sup> Ibid., 16. Prouvé later reasserted the unified front that the jury put forth (with only one dissenting vote). (H. Demorlane, “Jean Prouvé. Six ans après, les réflexions du Président du Jury sur la permanence d’un choix,” *L’Architecture d’Aujourd’hui*, no. 189 (1977): 48-49.) Prouvé also stressed the entire jury’s interest in the Cosco, East et al communications-based project. The only dissenting voice was Liebaers (Hélène Demorlane and François Barré, “Un double choix culturel et urbanistique. La genèse du Centre Pompidou. Paris et les équipements culturels,” *L’Architecture d’Aujourd’hui*, no. 189 (1977): 44-47.) but Mollard says it was Johnson. Prouvé liked it because of its engineering sensibility (he was an engineer, not an architect). The technical committee had a very influential role and strongly advocated the winning project. (Claude Mollard, personal interview, April 2008.) According to O’Byrne, it was Johnson who stirred up the jury by proposing the Piano and Rogers scheme. Prouvé had been lukewarm. Johnson spoke correct French and, according to one member of the jury, was charming, while Prouvé was a restrained leader who didn’t force his opinions on the jury. (Patrick O’Byrne, personal interview, November 2, 2007.)

handwritten notes in the completed Fiche technique for the winning entry, in many of the entries for floor area correctness, simply states “impossible to determine,” while the table rating the flexibility of the museums and library stated simply “Note: moveable partitions.”<sup>64</sup> The section of the report evaluating permeability between key activities gave the winning scheme high marks. In the section on the legibility of the relationships between activities to the visitor, where the authors of the brief were surely expecting to be evaluating the volumetric relationships between carefully defined forms, the notes state “Purely artificial, by means of audio-visual information on exterior facade,” (adding, enigmatically, “works very well in North America.”) The reviewer responded to the question of the most original aspects of the project with the observation that “the originality of the public linkages by way of escalators on the facade determines the success of the center.”<sup>65</sup>

Several aspects of the winning scheme stood out in the eyes of the jury. Most striking was its attitude to flexibility.<sup>66</sup> As the jury put it, “the program demanded from the start a building that was functional, flexible—that is to say, adaptable, in the broadest possible sense, to unpredictable changes in needs, techniques, and tastes.”<sup>67</sup> For the most part, the response to this demand in the thirty premiated projects relied on principles of

---

<sup>64</sup> “Fiche Technique II: Centre Beaubourg 493”, June 15, 1971, Archives CGP.

<sup>65</sup> Ibid.

<sup>66</sup> Johnson’s enthusiasm for the scheme developed his earlier critiques of Wright’s Guggenheim Museum in which he advocated unimpeded, flexible spaces. See “Letter to the Museum Director,” *Museum News* (January 1959), cited in Jean-Louis Cohen, “Monuments for a Mass Cult,” in *Rendezvous: Masterpieces from the Centre Georges Pompidou and the Guggenheim Museums* (Paris, New York: Centre Georges Pompidou, Guggenheim Museum, 1998), n.59.

<sup>67</sup> *Rapport du jury*, 94.

modularity and growth. In the project of Sérís (project 88, figure 2.11), for example, the volumes making up the building could be reorganized as new programmatic demands came in, and in the projects of Korokawa (project 456, figure 2.12) and Maher (project 539, figure 2.13), a macro-structure frame supports modules that supported flexibility by growth or plug-in modes.<sup>68</sup> In contrast, the winning scheme recognized a key requirement in the brief: there would be no extension to the building; its boundaries were finite and fixed, and so it demanded a model of change that preserved the building's footprint and volume. "The interior must continually move and change," Piano said, "and the space itself was conceived to this end. Exterior modifications are on the other hand more delicate."<sup>69</sup> Rogers pointed out building any extension to the building's complex exterior frame would be difficult, and so that the building had, despite the seeming endlessness of its suggested north-south axial extension, a very finite and bounded enclosure. The growing, spreading forms proposed in other projects were therefore frozen, rhetorical statements that spoke about flexibility without supporting it in actual performance. The jury recognized the unique aspect of flexibility in the winning scheme: "One can only dream of the potential uses of these great 'plateaux' 150 m long by 50 m wide, completely free of columns."<sup>70</sup> It was also astute enough to pick up on the fact that the

---

<sup>68</sup> Project numbers are correlated to the names of architects in the appendix of the jury report. (*Rapport du jury*.)

<sup>69</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 41.

<sup>70</sup> *Rapport du jury*, 95.

appearance of the building could be modified without compromising the overall aspect of the project or the degree to which the building expressed the philosophy of the center.<sup>71</sup>

Next was the scheme's attitude to the site. Projects that did not succumb to the singular monumental object proposed instead ensembles or megastructures that took over the site completely. Crompton's entry (project 535, figure 2.14) is the most extreme example of an approach that transferred flexibility and indeterminacy from the interior to the exterior through the construction of a surrogate urban topography, generally filling the site with a combination of crater and cascade of roof terraces, as in the project of Abraham/Saint-Florian (project 585, figure 2.15). In contrast, the Piano and Rogers scheme seemed to be miraculously open and permeable, with tentacular connections to the wider environment, thus delivering on the brief's desire for porosity and its privileging of integration over juxtaposition within a program in which, as Wouter Davids observes, "the concept of delimitation was [...] constantly and deliberately weakened."<sup>72</sup> But by leaving half the site empty and containing the building itself in one simple block, the scheme cleverly created an autonomous object that could be perceived as such. Indeed, the jury pointed out that leaving the site half-empty meant not only supporting a range of lively activities but also permitting views of the building as a whole, an effect underscored by the raising of the building on pilotis and the freeing of the ground plane.<sup>73</sup> It observed that while the overall form was simple, "seen from afar it is an immense

---

<sup>71</sup> Ibid.

<sup>72</sup> Wouter Davids, "Art Factories: Museums of Contemporary Art and the Promise of Artistic Production, from Centre Pompidou to Tate Modern," *Fabrications* 16, no. 1 (2006): 25.

<sup>73</sup> *Rapport du jury*, 92.

screen while, from close range, it is a mirror offering a constantly changing play of images and reflections.”<sup>74</sup> Moreover, the simplicity of the overall form belied the complex interplay with its environment, with its plazas, roof gardens, pathways, terraces, but in particular achieved within a very constrained overall footprint.

The jury also noted the approach to the broader urban environment, and argued that it was the only scheme that considered not just the site but also the systems that formed its surrounding environment. On the one hand, the scheme put forth a technophilic industrial language that critics wrote off as irredeemably hostile to the surrounding neighborhood; on the other, it manifested an almost New Urbanist approach in which the mass of the building is seen only in fragments, an aspect of the scheme that Banham pointed out in his 1977 review of the building.<sup>75</sup> The persuasive power of this picturesque aspect of the project and its potential for mitigating the technological language of the proposal should not be underestimated, particularly in the context of the battle over urban space that was unfolding at the time (see Chapter 1). Piano likened their scheme’s deliberately impure approach—the building as unfinished process, vague forms, programmatically indeterminate, urbanistically complex—to the heterogeneous beauty of historic centers of old cities, and Picon later pointed out that to create a parallel between the city and a building—to design a building with the essential attributes of a city, to incorporate those traits into its very substance, was a very architectural form of

---

<sup>74</sup> Ibid., 95.

<sup>75</sup> Reyner Banham, “Enigma of the rue du Renard,” *The Architectural Review* CLXI, no. 963 (1977): 277-9.

utopia.<sup>76</sup> In this way, the scheme met the brief's demands for complexity and exchange with what Piano later called "the profound unity within a diversity of appearances."<sup>77</sup>

The scheme closely paraphrased the program diagram, in that major activities were rendered generic while fine-grain, animated spaces of exchange and encounter were brought to the foreground and distributed throughout the urban environment.<sup>78</sup> Like an ant farm, it displayed the *bouillonnement* of its teeming life to the outside world, but it also allowed that teeming life to merge with that of the wider urban environment. It also noted the way in which this approach made the building accessible to its context without recourse to legible volumes. Lombard observed that where schemes such as those by Ducharme et al. (project 353, figure 2.16) and Choisy (project 31) allowed visitors to apprehend the building's programmatic organization through clearly differentiated volumes and zones (as at the Lincoln Center or in the cultural centers of Le Corbusier), the winning scheme avoided such articulation; instead, "the arrangement of activities is not expressed through architectural form, which here is generic, but through the scheme of panels on the facade, projections onto these panels, and by the arrival points of the escalators."<sup>79</sup>

This strategy was central to the scheme's rejection of a facile and gratuitous monumentality or figuration in favor of an architectural image that, according to the jury,

---

<sup>76</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 14.

<sup>77</sup> *Ibid.*

<sup>78</sup> *Rapport du jury*, 96.

<sup>79</sup> François Lombard, "Concours du Plateau Beaubourg: programmation architecturale et concours d'idée," *Architecture d'aujourd'hui* (August 1971): IX.

expressed the “spirit of our time.”<sup>80</sup> Lombard observed that the short-listed projects could be subdivided into two opposing responses to this problem. The first, exemplified by the winning project, involved the extroverted celebration of information, “where the idea of information and of broadcasting erupts even on the facade of the building, a luminous animated screen open onto the piazza and the city.”<sup>81</sup> In contrast, the second approach, exemplified by the project of Erickson and Massey (project 466, figure 2.17), asked the user to “penetrate the Centre, a tranquil amphitheater folded in on itself, to collect this information,”<sup>82</sup> the information center as vault or archive as opposed to luminous apparatus. The winning scheme’s celebratory, imagistic treatment of information technology was partly a response to the demands of an ideas competition in which boldness and apprehensibility of idea was more important than careful and meticulous resolution.<sup>83</sup> Yet, their approach delivered on this demand without recourse to the sculptural gesture. If the hot imagery of the information machine met the demands of an ideas competition, the reticent and generic interiors offered no less an concentrated and provocative response. As Andrew Rabeneck observed,

if it could become whatever one wanted, then one must want it q.e.d. The jury were not shy of anticipating such sophistry, however valuable it must have been to those they had to please: ‘Finally, if the winning project’s simplicity is striking... it is not simplistic. It is lucid. One would mistake the jury’s intentions if one thought that its choice... could be explained not

---

<sup>80</sup> *Rapport du jury*, 95.

<sup>81</sup> Lombard, “Concours du Plateau Beaubourg: programmation architecturale et concours d’idée,” VIII.

<sup>82</sup> *Ibid.*

<sup>83</sup> As Rice later put it, “The entry must not become too deliberate or too detailed, or too closely argued a response to the brief, because the jury will only have the briefest of time with each entry. It is the idea they will see and the spirit of the drawings.” (Rice, *An Engineer Imagines*, 26.)

by the force of its convictions but by preference given, out of despair, to reassuring simplicity, chosen out of resignation.’ (Rabeneck, “Process and purpose”, no page num)

As the jury report states, the winning project shows that the jury was not against simple geometric forms but rather rejected a kind of functionless monumentality in favor of a condition “in which emphasis is not the same as eloquence and in which art for art’s sake turns out to be the opposite of art.”<sup>84</sup> As Rogers later put it, “An architect is most emphatically not a sculptor. For my part, I believe that the architect must above all else deploy scientific and technical knowledge in the service of his or her contemporaries.”<sup>85</sup> But such a proposal, critics complained, “would only satisfy those who think that the solution to the crisis [of contemporary architecture] is of a technical order.”<sup>86</sup> Yet in some respects, the Piano and Rogers proposal did not go far enough. Despite his critique of the scheme, Joly pointed out that the entry by Schiedhelm (project 126) pushed a truly new technology, one based on inflatable structure and tensile cables.<sup>87</sup> Indeed, the technology of the winning scheme seemed unambitious and used banal or even artisanal techniques than advanced technology.

Piano and Rogers plainly stated that they wanted to avoid making a monument.<sup>88</sup> and argued that in opposition to monument one might propose “a space of freedom characterized by interweaving of functions which must stimulate curiosity in visitors and

---

<sup>84</sup> *Rapport du jury*, 25.

<sup>85</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 37.

<sup>86</sup> Joly, “Beaubourg: 700 projets pour rien,” 35.

<sup>87</sup> *Ibid.*, 36.

<sup>88</sup> Although the brief and the jury report repeat the desire to avoid monumentality, the word “monument” in English possesses a negative connotation that is less acute in French.



entertain them. To challenge a monumental approach was to break with a conception of culture as frozen, to seek a definition more flexible and playful.”<sup>89</sup> While in the eyes of the jury the winning scheme avoided a monumental approach, it nonetheless responded to the brief with clear parti, in the Beaux-Arts sense of a singular, simple concept that governed the entire project.<sup>90</sup> It thus carefully balanced on the one hand a rhetoric of indeterminacy and freedom and on the other a commitment to a modernist, coherent, technocratic project and the whiff of heroic monumentality latent in its principle precedent—Cedric Price’s Fun Palace. The success of the image of the scheme lies, then, as Banham argued in his critique of the finished building, in ability to construct a very large building in the spirit of Giedion’s new monumentality, one that asserted a monumental image without the monument’s stability or claims to permanence.<sup>91</sup> Yet the scheme did so without resorting to the tactics of clustering and modular growth that sponsored the terraced urban landscapes of Erickson and Safdie; rather, it shamelessly asserted a very urban façade reminiscent of such monumental mise-en-scènes as the Palazzo Farnese in Rome. This paradox was underscored by the fact that at the end of the 1960s, the tactics of urban terracing and metabolist aggregation behind many of the anti-monumental schemes now represented, as Porter pointed out at the time, “the desire to have an opportunity for a massive architectural expression.”<sup>92</sup>

---

<sup>89</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 12.

<sup>90</sup> This point is made in Cohen, “Monuments for a Mass Cult,” 25.

<sup>91</sup> Gregory Ulmer has recently discussed this paradoxical aspect of the information monument and the way information might enable the construction of a kind of “new monumentality.” See Gregory Ulmer, *Electronic Monuments* (Minneapolis: University of Minnesota Press, 2005).

<sup>92</sup> Quoted in Dave Porter, “A Value-Free Architecture,” *Architectural Design* (November 1970): 541.

## Sources and contradictions of the competition scheme

The competition scheme's amalgamation of cool, generic shed with hot, media-saturated frame reflects contradictions among its precedents. Where the vast interior floor plates and simple geometry has roots in research into the serviced shed and industrialized building by Rogers, Foster, and other British and American architects, the sweeping technological utopianism and pop imagery was rooted in the work of Archigram and Price.<sup>93</sup> Rogers would certainly have known Price through the AA, where they both taught and where earlier Rogers was a student, but Price's ideas were in general circulation among intellectually ambitious young architects in mid-1960s London, where he had acquired an almost cult status.<sup>94</sup> Archigram was part of the same group of like-minded young architects, all contemporaries.<sup>95</sup> From this segment of the British scene emerged ideas and forms that offered Rogers a framework for attacking the brief. But although they all shared an interest in technology, these sources also were the source of contradictions and paradoxes that demanded a closer consideration of architecture's role in the information society.

Price was the most eloquent spokesman for what Royston Landau called the "problem-solving" approach, the search for a "value-free" and image-neutral architecture

---

<sup>93</sup> Most observers writing in English point out the scheme's debt to Price's Fun Palace. As Rogers later put it, the project reflected the optimism of the 1960s and he openly cited Price and Archigram in their "importance of movement, flexibility, the playful character of their colorful assemblages, and the transformation of services into a free and tentacular system pushed to the envelope of the building, already present in the Fun Palace of Price, in Plug-In City, or in the project of Archigram for Monte-Carlo." (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 15.)

<sup>94</sup> Appleyard provides a thorough survey of the UK scene of which Rogers was a part. See Appleyard, *Richard Rogers*, 181–85.

<sup>95</sup> Cook and Rogers were one year apart as students at the AA.

understood as a “problem-understanding and question-asking process.”<sup>96</sup> Price had launched this search in response to what he described as the “transference of pre-war attitudes to post-war conditions” and the concomitant failure of architects “to realize that they are primarily concerned with providing a socially acceptable commodity.”<sup>97</sup> Postwar British architecture had responded to its situation by re-asserting values from an earlier modernism—whether the everyday realism of people’s detailing, the assertion of architecture’s classical roots, or a return to the modern masters—none of which adequately responded to a new condition, “a three cornered situation between the ‘apparent soulless, faceless entity of the vast state and local government client’, the ‘multitude of anonymous, homeless people’ and the architect.”<sup>98</sup> This “three cornered situation” transferred well to a French bureaucratic apparatus in the process of adjusting to critiques of top-down cultural policy in the post-1968 context, in which the building’s sponsors became an administrative abstraction and the “real” client was the user.<sup>99</sup>

---

<sup>96</sup> Royston Landau, *New Directions in British Architecture* (New York: George Braziller, 1968), 76. For a detailed analysis of these ideas in Price, see Mary Louise Lobsinger, “Cybernetic Theory and the Architecture of Performance: Cedric Price’s Fun Palace,” in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, ed. Sarah Williams Goldhagen and Réjean Legault (The MIT Press, 2001), 335.

<sup>97</sup> Quoted in Porter, “A Value-Free Architecture,” 541. Porter took stock of the situation in 1970: “It is about a determined effort by a small number of architects, mainly in Britain, to rid the procession of some of its hallowed values. It is a polemical stance; a reaction to a set of inherited values which, seen from within the profession, are inherent in the architect’s responsibility to society, but are in fact, a mere encumbrance that prevent the architect from coming to terms with the true nature of contemporary society.” (Ibid., 451.)

<sup>98</sup> Ibid.

<sup>99</sup> Lombard’s programming team further confused these categories because, from the perspective of the architects, it represented (and abstracted) both the client and the end-user and kept the architects at a distance from both.

At the heart of this approach were the mantras of change and indeterminacy. A supple and flexible architecture was the only suitable response in a problem-solving approach since preconceived solutions and prior forms imposed already obsolete and petrified configurations onto dynamic realms, and stopped them in their tracks.<sup>100</sup> In place of enduring monuments, buildings should be opportunistic and responsive to particular problems and situations, all of which would last only a few years at most. As Landau pointed out, “The importance of being able to accommodate the problem of change with a suitable hardware is basic to [Price’s] philosophy, which implies the need for seriously questioning that time-honored attitude to an architectural cornerstone principle which equates design excellence with top-quality long-lasting materials.”<sup>101</sup>

Price’s work also provided Rogers with ideas about institutional reform through technology that meshed easily with those of the brief. In an introduction to a workshop on “New thinking for new universities,” Price brought to the question of university building in the postwar era the very same invocations of populism, information, and flexibility that Rogers brought to Beaubourg five years later.

The concept of the University as a self-contained self-renewing entity is questioned. The translation of such a medieval idea into architectural terms results in the construction of impermeable, monumental

---

<sup>100</sup> Buckminster Fuller is an extreme example of a modernist belief that fusing operational needs and operational techniques would lead to pleasure and beauty of forms and would result in a quasi-biological condition; no intervening mental operations on the part of the architect were necessary or even desired. (See Alan Colquhoun, “Typology and Design Method,” *Perspecta* 12 (1969): 71-74.)

<sup>101</sup> Landau, *New Directions in British Architecture*, 77. Banham provided a convenient tie-in between the broad notion of an architecture that dealt with change through the rejection of permanent, durable materials, and the idea of a shift from defining of volumes and enclosure to technologies of servicing, whether services supplied air or information. His famous essay, “A Home is Not a House” of 1965 argued that, as Landau put it, “it is not the castle character of the dwelling that people are addicted to [...] but rather the comfort standards produced by the new, better, and more efficient servicing.”

structures.[...] ‘A collection of books’ must be replaced by a knowledge supermart. The university should be local and national. Available methods of teaching and information exchange are best served by a network of universities in their present form.<sup>102</sup>

Certainly, the rhetoric of the competition entry text owed much to these ideas, and the cross between “a computerised Times Square and the British Museum” was not far off Joan Littlewood’s “university of the streets” (a moniker for the Fun Palace, and one that Rogers later borrowed when later talking about the project) and which Rogers later borrowed.<sup>103</sup>

In contrast to Price’s architecture of problem-solving and performance, the work of Archigram offered an approach in which architecture’s role was to give concrete form and apprehensible image to contemporary technology. Archigram did so by merging Pop and Science Fiction imagery with the technological utopianism of Fuller.<sup>104</sup> The image-conscious work of Archigram drew upon the logic of advertising, the importance of which as a new form of information had not been lost on their mentors. To the Smithsons and the Independent Group, as Nigel Whiteley observes, “[a]dvertising represented dense, direct, and effective communication, and was strong in imageability.”<sup>105</sup> In 1956, the Smithsons argued that advertisements “are packed with information—data of a way of life and a standard of living which they are simultaneously inventing and

---

<sup>102</sup> Cedric Price and John Smith, eds., “New thinking for new universities,” *Architectural Association Journal* 80, no. 883 (1964): 6.

<sup>103</sup> Piano and Rogers, “A Statement.”

<sup>104</sup> The most complete overview of Archigram and these ideas is Simon Sadler, *Archigram: Architecture Without Architecture* (MIT Press, 2005).

<sup>105</sup> Whiteley, *Reyner Banham*, 134.

documenting.[...] And this transient thing is making a bigger contribution to our visual climate than any of the traditional fine arts.”<sup>106</sup> In one way, then, work of Archigram, like Nitzchke’s, proposed an architecture of information through the logic of the advertising billboard where the building is a neutral support for other media.

But where the form and image of Price’s architecture was inexpressive to the point of invisibility, Archigram’s was assertively imagistic in its borrowing of the forms and imagery of information technology hardware. Exemplified by Peter Cook’s Plug-in City and Dennis Crompton’s Computer City, both of 1964, this took the form of indeterminate megastructure, in which a permanent but unprogrammed frame of structure and services supported a constantly changing cluster of plug-in capsules. The Plug-in City was, as Landau points out, “a mechanistic concept based on ideas of systems and subsystems (megastructures and components).”<sup>107</sup> Mechanistic as it was, it also represented an attempt to give concrete form to computing’s hidden structures. Computer City proposed that information was the hidden nervous system of the city and flowed through an a priori system of wires, conduits and diodes like water or electricity.

According to Mark Wigley,

It was only with the post-1963 work of the young Archigram group that information flow became visible as such. Where the Metabolists emphasized the biological side of the biotechnological equation, Archigram emphasized the technological. Architecture became indistinguishable from communication. Warren Chalk and Ron Herron’s City Interchange project of 1963 is just a ‘net’ of intersecting forms of traffic, including invisible traffic[.]

---

<sup>106</sup> Smithson and Smithson, “But Today We Collect Ads,” 50. Quoted in Whiteley, *Reyner Banham*, 134.

<sup>107</sup> Landau, *New Directions in British Architecture*, 69.

Here was nothing less than a new regulating geometry. “In all these projects, the grid gives way to the web. Movement in the spaces defined between intersecting lines gives way to flow within lines.”<sup>108</sup>

Several Archigram projects suggested a synthesis of Price’s value-free architecture of performance and the hot imagery of pop culture. Ron Herron’s Oasis—the project that is perhaps Beaubourg’s most direct progenitor—was, like the Fun Palace, a large exoskeleton whose form was relatively mute compared to that of Computer City. Raised on pilotis and serviced by exposed pipes and elevators, Herron’s project does closely resemble the perspective offered to pedestrians and drivers on the Rue du Renard today.<sup>109</sup> Its neutral frame acts as a support for a host of clipped-on billboards and electronic displays. Like the Fun Palace, then, it blurred the boundary between generic container and highly articulated apparatus. In contrast to earlier engineered “sheds” (those of Albert Kahn, for example, or even Mies) which defined a limpid, empty space as the precondition for programmatic activity, these later projects assume from the start the inseparability of macro- and micro-, frame and attachment, structure and infrastructure. Yet, they did so within the confines of a clearly delimited volume rather than a sprawling megastructure.

The Fun Palace was informational in that it was conceived as a cybernetic organism. On the initiative of Joan Littlewood, the cybernetician Gordon Pask was

---

<sup>108</sup> Mark Wigley, “Network Fever,” *Grey Room*, no. 4 (2001): 107–108.

<sup>109</sup> Simon Sadler has pointed out the resemblances between Beaubourg and Oasis, along with the fact that during the making of an Arts Council film in 1980, the drawing of Oasis was held up for the camera in front of the finished building. See Sadler, *Archigram*, 164.

brought to the Fun Palace project. His design for a “cybernetic theater” involved relaying electronic messages from audience seats to a backstage computer, where they would be processed and fed back into the indeterminate performance.<sup>110</sup> This was later echoed at the Osaka 70 pavilion designed by E.A.T. and members of the Chrysalis group who would later join the Beaubourg design team, where audience and performance formed one organism held together by sensors and computer messages.<sup>111</sup> In Price’s circle, Cybernetics was the privileged form for such a cohesive, informational environment, since it proposed a model in which complex organisms would continually adapt to changing conditions through information messages: as Kenzo Tange put it, “communication is the factor that gives organic life to the organization.”<sup>112</sup> Price argued that information technology offered an important new amenity to a building’s users and a new way of modeling the continually changing, invisible structures of their activities.<sup>113</sup> The building’s job was to not get in the way.<sup>114</sup>

In Archigram’s work from the later 1960s, however, the preoccupation with the representation of hardware gives way to a more complex condition, and it was this

---

<sup>110</sup> Lobsinger, “Cybernetic Theory and the Architecture of Performance: Cedric Price’s Fun Palace,” 130.

<sup>111</sup> Chris Dawson, telephone interview, July 19, 2011. For a detailed account of the pavilion, see Billy Klüver, Julie Martin, and Barbara Rose, eds., *Pavilion by Experiments in Art and Technology* (New York: E. P. Dutton & Co., Inc., 1972).

<sup>112</sup> Kenzo Tange, “A Plan for Tokyo, 1960,” *Ekistics*, no. 12 (July 1961): 9-19. Cited in Wigley, “Network Fever,” 105.

<sup>113</sup> Landau, *New Directions in British Architecture*, 106.

<sup>114</sup> In his Oxford Corner House of 1966, the building was fixed and neutral, while the architectural solution lay in the study carrels and IT systems. Ron Herron would collage the word “study carrels – self pace skill and learning machines” [sic] into the Pop collage for his 1969 Urban Action—Tune Up project, a reminder not only of how experimental Seguin’s pragmatic speculations for the library were but also of how narrow the line was between avant-garde and technocrat.



condition into which Piano and Rogers' competition scheme was born.<sup>115</sup> Change and flexibility was increasingly seen as a problem of small-scale mobility and ephemera rather than large-scale reconfigurable megastructures. Within this shift was a growing suspicion of the Modernist architectural project, to which the early work of Archigram was still wedded.<sup>116</sup> Within it was also the suggestion of a concomitant transformation in the relationship between built form and its ephemeral modes of occupation. In contrast to the assertive hardware of Computer City, later projects treated information and feedback as both a cybernetic system of environmental control (which allowed the roof of Michael Webb's Cushicle (1966) to be reduced to a transparent plastic shell and the floor of his Magic Carpet (1968) to be reduced to a field of air jets) and a field of messages immersing the urban inhabitant (as in Herron's Oasis (1968)). In both approaches, information played a role in architecture's dematerialization.

To socially minded architects like Rogers who cut their teeth on both Price's technocracy and Archigram's utopian imagery, this condition suggested that, as Landau put it, "architects have a responsibility to their problems beyond simply providing the architectural hardware."<sup>117</sup> As Rogers reflected in 1972,

---

<sup>115</sup> This shift in the work of Archigram is chronicled in Sadler, *Archigram*, 90–138. A corresponding shift in the work of Price is discussed in Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace."

<sup>116</sup> By 1970, all architecture was questioned. In his editorial to Archigram 7, Peter Cook speculated that there might not even be any buildings in Archigram 8. For Nathan Silver, a telephone conversation could be architecture (Nathan Silver, "Architecture without Buildings," in *Meaning in Architecture*, ed. Charles Jencks and George Baird (Braziller, 1969).). Hans Hollein announced that everything was architecture ("Alles is Architektur" (1968), translated as Hans Hollein, "Everything is Architecture," in *Architecture Culture 1943-1968: A Documentary Anthology*, ed. Joan Ockman (New York: Rizzoli, 1993), 460-62.) Superstudio speculated on life without objects (most clearly articulated in their 1973 film, "Cerimonia").

<sup>117</sup> Landau, *New Directions in British Architecture*, 77.

We even have grave doubts that a building is really needed on this site. It is a beautiful and historical area.[...] If you really analyze it you find a different need altogether. Probably the correct answer to the competition would have been to propose a large open space of grass, flowers and trees.<sup>118</sup>

This was classic Price, of course, but it also alluded to the growing discourse in which projects like Archigram's "Ideas Circus," "Entertainments Tower," and "Arcades," and Price's Potteries Thinkbelt, were part of a more general critique that questioned the very existence of conventional institutions.<sup>119</sup> To assemble the fundamental functions of a cultural institution (education, collection, dissemination) in one spatially fixed and stable location, as Beaubourg was doing, was therefore to fail from the start. Indeed, one of the paradoxes of the Fun Palace was, for all its libertarian rhetoric, its great centralizing gesture.

At Beaubourg, this contradiction was addressed through the logic of the network. Kenzo Tange had earlier pointed out that, in the words of Mark Wigley, "paradoxical rationale of the network is that the possibility of infinite extension actually produces density."<sup>120</sup> In other words, by extending the network of activities and communications hardware into the city the project mitigated the centralizing effects of the brief and the monolithic appearance of the building. Yet, nothing could have been further from the

---

<sup>118</sup> Rawstorne, "Piano & Rogers: Centre Beaubourg," 407.

<sup>119</sup> The "Ideas Circus" was, in the authors' words, "a mobile educational facility to stage and feed back information from seminars, screening, exhibitions etc. Transported by one or several vehicles." ("Ideas Circus," *Archigram Archival Project* (University of Westminster Centre for Experimental Practice, n.d.), Project No: 108.) In all of Archigram's work, we find no libraries and only two competition entries for museums (Ulster and the National Gallery), both of which are leaden and uninspired attempts to get real work.

<sup>120</sup> Wigley, "Network Fever," 105.

urban network megastructure of Computer City, a model that Archigram had since abandoned. Unlike Tange's megastructures, this network was predominantly social, not electronic or tectonic. To be sure, Beaubourg's networks included information broadcast from its satellite dishes and brought directly to citizens via "happenings" and installations augmented with audio-visual equipment. Yet there were no triangulated figure of nodes and links to be found; instead, it was the user on the street and climbing the façade that created this social network.

The photo-collaged elevations owed more to Archigram than to Price, of course, both in the application of billboard images to the metal frame and in the more general sense that the building's "image" as an information machine was as important as its functional performance.<sup>121</sup> Price had always been suspicious of Archigram's image-conscious architecture, and so to take both the Fun Palace and Oasis as an inspiration was to introduce a contradiction that called into question architecture's status as a system of representation. To be sure, Price's criticism of image-conscious architecture was consistent with the search for an instrumental, pragmatic, and value-free, reticent architecture at the heart of Reliance Controls and of Piano and Rogers' stated intentions. Yet, an ideas competition demanded an easily apprehensible image, and the political agenda demanded some degree of physical duration. After all, the purpose of the building was, as the brief put it, to "endow Paris with an architectural and urban complex which

---

<sup>121</sup> Although Rogers' earlier work occasionally nodded to such Pop imagery—the bright colors and smooth corners of the Zip-up House and Wimbledon house, along with DRU rooftop addition—Piano's did not. Yet even for Rogers, steeped in the world of mid-60s techno-euphoria, the imagery and ideas put forth in the competition entry represented an altogether new leap into the world of pop culture, advertising, computers, and networks—an excursion that neither architect embarked upon again after the Centre Pompidou.

will mark our century.”<sup>122</sup> In this context, an architectural information machine would serve little purpose if it offered no overt representation of its operations that citizens and visitors could carry home with them.<sup>123</sup> For Rogers, as for Archigram, image was crucial in any architecture of technology. “The Centre must offer an image of change, made up of overlapping sequences, superimposed messages that reflect its changing organization.”<sup>124</sup> The competition drawings thus showed a building crowned with satellite dishes (which in the presentation drawings dwarfed the gantries and cranes quoted from Archigram and Price) and announced that “The Plateau Beaubourg information centre will be linked up with information dispersal and collection centres throughout France and beyond.”<sup>125</sup> Telecommunications was in the air, as it were, and its most potent monument for a British architect would have been the Post Office Tower, which had just opened and which, in 1965, was by far the tallest and most visible building in London.<sup>126</sup> Bristling with satellite dishes and antennae, the tower offered an image that was assertively technological since it was a telecommunications tower first and an office building second. Here was a building that offered the pure performance of Price with the added

---

<sup>122</sup> *Concours international d'idées à un degré (competition brief)*, 3.

<sup>123</sup> The design of the logo for the Centre by Jean Widmer tackled this problem literally, as we shall see in the next chapter.

<sup>124</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 41.

<sup>125</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text).”

<sup>126</sup> In 1965, the Architectural Association Journal published an article based on lectures given to AA students by John Harper, an administrator at the Post Office telecommunications branch, on the new technology of telecommunications. (John Harper, “On Telecommunications,” *Architectural Association Journal* 80, no. 892 (May 1965): 320-24.) Dennis Crompton, in his critique of the Centre, would later refer to the new computer network put in place by the Post Office as an example of the kind of information system the building should celebrate. D. Crompton, “Centre Pompidou: A Live Centre of Information,” *Architectural Design* 47, no. 2 (1977): 100-127.

bonus of a potent architectural image that was entirely unselfconscious. While Alan Colquhoun later criticized this search for forms equivalent to fundamental, functional operations—a search for what he called “onomatopoeic relationship between forms and their content”<sup>127</sup>—Peter Buchanan clarified High-Tech’s dual nature as both representation *and* performance: Archigram, with their “vitalist” forms, represented the former while Price held down the latter with an architecture “of ideas, not forms.”<sup>128</sup>

The image of information technology and its actual performance were inseparable. This was consistent with a British technological thinking that had emerged during the Industrial Revolution, a belief in universal Progress enabled by technological change and techniques that would usher in a utopian society without social stratification. In the 19<sup>th</sup> century, the symbolic and rhetorical aspects of technology were indispensable to its performance, as John Stuart Mill pointed out when he observed that, in the words of historian of technology Leo Marx, “the mere sight of a steam locomotive or other striking mechanical invention [...] wordlessly disseminates the belief that the present is (and hence the future is likely to be) an improvement on the past.”<sup>129</sup> In this way, in both Price

---

<sup>127</sup> Colquhoun, “Typology and Design Method,” 49.

<sup>128</sup> Peter Buchanan, “High-Tech,” *Architectural Review* (July 1983). Mathews has recently argued that the Centre Pompidou “is as much homage to the Fun Palace as it is a canonisation and domestication of its anti-aesthetics. Despite the superficial formal similarities between the two buildings, the connotations of anarchic interchangeability in the Centre Pompidou are largely rhetorical pretense. It is another of the ironies of the Fun Palace that the deliberate narrative stylelessness and readerly ambiguities of the design would give rise to High-Tech aesthetics as a new stylistic canon.” (Stanley Mathews, “Cedric Price as Anti-architect,” in *Architecture and Authorship*, ed. Tim Anstey, Katja Grillner, and Rolf Hughes (London: Black Dog, 2007), 146.)

<sup>129</sup> Leo Marx, “Information Technology in Historical Perspective,” in *High technology and low-income communities: prospects for the positive use of advanced information technology*, ed. Donald A. Schön, Bish Sanyal, and William J. Mitchell (MIT Press, 1999), 139. The false dichotomy of icon and performance is persistent. Comparing Constant’s New Babylon to High Tech, for example, Simon Sadler argues that “those architectures that have New Babylon in their blood [...] have functioned more iconographically than

and Archigram technology was “tacitly accorded autonomous power” such that it was understood as “inherently capable of making things happen.”<sup>130</sup>

The fundamental idea that bestowed autonomous power on the techno-utopian architecture of the 1960s came not from steam engines but from computers: the clean separation of software from hardware. As Simon Sadler explains it, “A metaphor from computing caught the mood. The distinction between the enclosure of space and the operation of space could be compared to that between hardware and software.”<sup>131</sup>

Flexibility was a much an issue for the designers of computing hardware as for architects. How could universal computers support a growing list of applications and uses on a universal hardware platform?<sup>132</sup> For the megastructuralists of the 1960s, software represented the use and dynamic life of the building, where hardware was its stable framework. Thus, when it came to explaining the intentions behind the Beaubourg scheme, Rogers stated,

We are not building a prestige building nor a monument but a tool sufficiently flexible to change uses in an extremely “soft” manner. It is a complex, difficult, and polemic proposition. We have no idea to what point it is polemical or realistic, but it nonetheless comes from the following idea: “what will one do in this building?”<sup>133</sup>

---

politically or behaviorally: they are representations and simulations of architecture as process.”(Simon Sadler, “The Indeterminate Utopia,” *Architectural Design* 71, no. 3 (2001): 92.)

<sup>130</sup> Marx, “Information Technology in Historical Perspective,” 137.

<sup>131</sup> Sadler, *Archigram*, 118.

<sup>132</sup> Until Von Neumann invented (with others) the stored program in the 1940s, computers needed to be rewired each time an engineer wanted to perform a different calculation.

<sup>133</sup> Sébastien Loste, “Statut du Centre Georges Pompidou”, n.d., Loste box 2, Archives CGP. Indeed, the design team later describe the flexibility of the Centre as a kind of process of rebooting: “you really could sweep your hand across the most entrenched activity, throw a lot of stuff out, and be able to start again.” (Abbot, Davies, and Stanton, “An Inside View.”) On this theme in the work of Norman Foster and High

But Archigram recognized a false dichotomy when it saw one. As Archigram 8 explained,

This oversimplification has the air—and necessity—of rhetoric at a particular moment in history.[...] Hardware has limitations. Software is being pitched against it in order to expose [the] architect's continued complete hang up on hardware. On[c]e the thing has coole[d] off [a] little we can get on with linking the two together as responsive systems. Electronics and the unseen motivation. Deliberate visual contras[t] of the "HARD" e.g.: Monument, New York, wall, machine, metal, plastic, etc: Against "Soft" e.g.: programme, wire, message, instruction, graphic synopsis, equation, mood, abstract.<sup>134</sup>

Indeed, the decade between 1968 and 1978 saw the emergence in France of a new discourse of the information society that culminated in Simon Nora and Alain Minc's famous L'informatisation de la société and the new technologies they called "télématique," an invisible technocracy of networked computers and telecommunications systems. No sooner had software been invented as a product and field of study than it was threatened by this new paradigm. As Nora and Minc described the situation,

Computer networks have begun to infiltrate business, decentralizing the collection of data, allowing employees as a whole access, in real time, to files and processing capabilities. It is at this point that the differences disappear between large and small machines, between access terminals and processing centers, while the seemingly natural boundary between hardware and software begins to fade away.<sup>135</sup>

---

Tech see C. Abel, "From hard to soft machines," in *Norman Foster: Buildings and Projects*, ed. Ian Lambot, vol. 3 (Hong Kong: Watermark, n.d.), 10-19. This powerful model was applied in all fields. See Rorty's deployment of it in cognitive science (Richard Rorty, "The brain as hardware, culture as software," *Inquiry* 47, no. 3 (June 2004): 219-235.)

<sup>134</sup> Archigram 8, 1968, quoted in Sadler, *Archigram*, 118. (Brackets in original.)

<sup>135</sup> Simon Nora and Alain Minc, *The Computerization of Society: A Report to the President of France*, trans. Daniel Bell (Cambridge, Mass: MIT Press, 1980), 13.

### Chapter 3: The Twilight of Megastructure

*A popular image that people would say this responded to, like Archigram, would be Cedric Price's work, the Fun Palace and so on, which again this has got nothing to with... at all.<sup>1</sup>*  
—Ron Herron of the Archigram group, visiting the Centre Pompidou

#### Megastructure and its discontents

In the Epilogue to his 1976 book, *Megastructure*, Reyner Banham argued that the Centre Pompidou was the epitome—at least where realized buildings were concerned—of the megastructure ethos.<sup>2</sup> Megastructure was a term coined by Fumihiko Maki between 1961 and 1964 and which Banham reviewed in his book of the same title. Maki's definition was seemingly straightforward: megastructure was “a large frame in which all the functions of a city or part of a city are housed. It has been made possible by present day technology. In a sense it is a man-made feature of the landscape.”<sup>3</sup> Megastructure was therefore architecture at the scale of the city but also containing the program of the city, with the heterogeneity and broad scope that this suggests. It was also fundamentally tied to technology, both in the means by which it would be realized but also in the models by which it organized space and activities. Piano and Rogers' competition scheme certainly conformed to Maki's definition. It was urban not only in scale but in the sweep of its ambition to operate as an urban simulacrum. It also proposed a close relationship between

---

<sup>1</sup> Archigram and Price's visit to the newly opened Centre is documented in Denis Postle, *Beaubourg: Four Films* (Arts Council of Great Britain/Tattooist International, 1980).

<sup>2</sup> Reyner Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper and Row, 1976). Alan Colquhoun reviewed Banham's book in Alan Colquhoun, “Frames to Frameworks,” in *Essays in Architectural Criticism: Modern Architecture and Historical Change* (Cambridge, Mass.: MIT Press, 1981).

<sup>3</sup> Quoted in Banham, *Megastructure*, 8.



architecture and advanced technology, both in image and in the techniques of its realization. Within a few years, as the megastructure movement outlined by Banham crystallized, a more precise definition of its tectonic strategies was possible, such as the one posited by Ralph Wilcoxon and quoted by Banham: beyond its sheer size, megastructure was “constructed of modular units,” “capable of great or even ‘unlimited extension’,” “a structural framework into which smaller structural units [...] can be built—or even ‘plugged-in’ or ‘clipped-on’,” and “a structural framework expected to have a useful life much longer than that of the smaller units which it might support.”<sup>4</sup>

Megastructure offered architects of the late-1960s a model for an architecture of the information age in two distinct ways. First, its frequent use of the network and the connected graph as an organizational principle proposed a homology between the structures of information technology and the topologies of architectural form, an approach encapsulated in, for example, Archigram’s *Computer City* and *Plug-in City*.<sup>5</sup> Second, megastructure’s fundamental premise—a long-duration, static macrostructure that supported rapidly changing and indeterminate uses—was based, as we have seen, upon the distinction between hardware and software in which the pulse of data and instructions flowing through the hardware of computers and networks offered a way of understanding the flow of life through a megastructural framework. It is therefore not

---

<sup>4</sup> Ibid.

<sup>5</sup> For a discussion of the problematics of this homology see Mark Wigley, “Network Fever,” *Grey Room*, no. 4 (2001): 82-122. For a discussion of its deployment in the French avant-garde, see Larry Busbea, *Topologies: The Urban Utopia in France, 1960-1970* (Cambridge, Mass.: MIT Press, 2007).

surprising that in building a “live center of information” Piano and Rogers drew from these ideas.

As Centre was reaching completion, Banham declared that “what is seen standing on the Plateau Beaubourg in the name of Georges Pompidou will be perceived to be a megastructure: it answers the ultimate acid-test of looking like one”<sup>6</sup> Although this argument based on image was for the most part a working through of a set of contradictions within Banham’s own theoretical schema, there was in fact little beyond image that could justify an argument for Beaubourg as megastructure, as we shall soon see.<sup>7</sup> But as the project developed during the years following the competition, its status as Megastructure as defined by Wilcoxson and Banham became less and less clear. While it retained the aspect of a structural frame supporting smaller, transient units it was in fact becoming less and less modular and mobile, and, as a kind of massive superblock compacted into one side of the site, was never in fact suggestive of great extension, let alone the unlimited kind. Banham himself pointed out some of the discrepancies between Beaubourg and “true” megastructure:

The project is not, in fact, of overweening size; dimensionally it is average for megastructures that got built: a shade longer than Cumbernauld, not so tall as Place Bonaventure, for examples. Conceptually it is a shade less adventurous than the Fun Palace of Cedric Price and Joan Littlewood, because it does have permanent fixed floor levels. Everything on these floors is movable, however, so that, mechanically at least, it comes close to the ludique character of Constant’s Neo-Babylone. However, it is far

---

<sup>6</sup> Banham, *Megastructure*, 214.

<sup>7</sup> On these contradictions see Nigel Whiteley, *Reyner Banham: Historian of the Immediate Future* (MIT Press, 2002); Todd Gannon, “Theory and Design in the Last Machine Age: Reyner Banham and the Paradoxes of une Architecture Autre, 1955-1988” (Doctoral thesis, UCLA, 2011).

less free-form or participatory in its proposed uses than Constant's Situationist programme would have demanded[.]<sup>8</sup>

The Archigram group, visiting Beaubourg in 1979, felt that the building was static and unchanging, and thus didn't accurately reflect their work, nor Price's. "One the key notions with Archigram," David Greene pointed out, "was of an architecture that would change and respond to events that happened within the building and without the building, and apart from the people on the façade [of Beaubourg] it is patently obvious that this building can in no way respond in its form."<sup>9</sup> Indeed, for Archigram and Price even traditional megastructures were too static and, as we saw in the previous chapter, they were in the process of rejecting them in favor of ephemeral events and "soft," immaterial technologies and modes of inhabitation. Beaubourg, on the other hand, seemed to become static and even monumental.<sup>10</sup>

The distancing of the project from the canonical strategies of 1960s megastructure primarily took place between the awarding of the project in July of 1971 and Pompidou's approval of the definitive project in March of 1973. Immediately following the competition, the team entered an intensive three month process of redesign that would take into account a newly compressed schedule and changes to the program, which had evolved during the competition since Lombard's programming team continued to work

---

<sup>8</sup> Banham, *Megastructure*, 211.

<sup>9</sup> Postle, *Beaubourg: Four Films*.

<sup>10</sup> See Banham's Epilogue to *Megastructure* as well as Simon Sadler, *Archigram: Architecture Without Architecture* (MIT Press, 2005).

throughout that period.<sup>11</sup> The outcome of this process would be the presentation in December of 1971 of the first *Avant projet sommaire*, which in French architectural practice was traditionally done as a kind of proof-of-concept by a separate *bureau technique* based on the schematic design provided by the design architect. Piano, Rogers, and Arups had successfully argued that the vision of the competition scheme could only be successfully realized if control remained in their hands and so the client, operating outside traditional models of practice, awarded the design team the responsibilities normally carried by the local production office.

The movable floors, so important in the competition scheme that the structural drawings focused almost entirely on them, were the first to go, since nobody at Arups was confident that the technical hurdles could be overcome in the time allotted.<sup>12</sup> The first *Avant projet sommaire* proposed, in place of the *raumplan* created by the mobile interior platforms, five identical floor plates, “delivering to the users vast plateaux equipped with all necessary services yet entirely generic.”<sup>13</sup> For Piano this change was not all bad, and he said that what was lost in articulation and openness was gained in the clarity of five identical, stacked floor plates “extending the activity of the city into the interior of the building.” Piano recognized that it was a radical solution, an impression underscored by

---

<sup>11</sup> Jean-Pierre Seguin, *Comment est née la BPI: Invention de la médiathèque* (Paris: Bibliothèque publique d'information, Centre Georges Pompidou, 1987), 63.

<sup>12</sup> T. Happold, “Beaubourg: Architecture or Engineering,” *Architectural Design* 47, no. 2 (1977): Unpaginated.

<sup>13</sup> Renzo Piano, Richard Rogers, and Antoine Picon, *Du plateau Beaubourg au Centre Georges Pompidou* (Paris: Editions du Centre Pompidou, 1987), 33.

Johnson's horrified reaction when he learned of it.<sup>14</sup> Yet, paradoxically, given that the floors were now fixed, the first Avant projet sommaire asserted a more explicit Archigram-like language, with its curved modules and terraced gardens, which, along with the reduced height of the overall building as a result of fire codes, led to its being dubbed, the "blancmange" scheme. The competition scheme had been based on the eradication of the middle ground between the logic of the whole and the logic of the detail. "In the overall design of a building," Rogers declared, "details are an essential concern, since there is no longer a scale of decision-making in-between and consisting, for example, of partitions. In my approach, composition is replaced by a constant back-and-forth between the overall parti of the whole and the structural details, equipment, and furniture.[...] Moreover, the furniture and equipment follows the same principles of legibility as those of the structure."<sup>15</sup> In contrast to the vague, veiling effect of the principle façades of the competition scheme, the new scheme offered clearly defined volumes that supplied the missing middle-ground of classical beaux-arts articulation Piano and Rogers' overall form + detail approach. Looking at the axonometric, one could now understand what was inside and out, what was solid or void (Figures 3.1, 3.2). Individualized forms separated themselves from the neutral frame as figures on a background.

Where the overall form of the first Avant projet sommaire now more closely resembled Archigram's clearly articulated megastructures, the piazza, roof terraces, and

---

<sup>14</sup> Ibid.

<sup>15</sup> Ibid., 37.

façades were now the scene of a high-technology festival complete with inflatable temporary pavilions and computerized information displays (Figures 3.1, 3.3). This aspect of the scheme was emphasized by the drawings made by a contingent of former Archigram students—Mike Davies, Alan Stanton, and Chris Dawson. Rogers had invited them to come to Paris from Los Angeles, where they were studying at UCLA and operating under the name Envirolab (and later, Chrysalis).<sup>16</sup> The younger team members brought to the project a belief that a true architecture of information was to be found in non-programmed events, small-scale information apparatus, and invisible networks. These information machines and happenings appear in the drawings—particularly in the transverse sections of the later schemes—as solvents of the megastructure’s solidity and of the coherence of the modernist “project.” The temporary, non-programmed, ephemera—technological in both their materials and the programs they housed—shown in the section drawings and axonometrics were directly inspired by Osaka as well as by early versions of Archigram’s Instant City (1969).<sup>17</sup> The *vie ludique* only hinted at in the competition scheme’s relatively stark and sparsely populated spaces now appeared to be fully embraced in a building that was a buzzing hive of activity. This effect was

---

<sup>16</sup> Chris Dawson, telephone interview, July 19, 2011. Stanton, Dawson, and Davies had been students at the Architectural Association. In 1968 Stanton and Dawson went to UCLA, Davies followed a year later. There they started “Envirolab,” a small research group based in the urban design/planning program and focused on the design and construction of inflatable structures, particularly in the desert. Dugdale, a fellow AA student who was working for Rogers, called them in Los Angeles in the Fall of 1971 and asked them if they wanted to come to Paris. The 18-month visas were up, so they accepted.

<sup>17</sup> Instant City was a “[s]peculative research project exploring possibilities of injecting metropolitan dynamic into other areas through temporary events, structures, mobile facilities and information technology.” (“Instant City (IC),” *Archigram Archival Project* (University of Westminster Centre for Experimental Practice, n.d.), Project No: 114.) Martin Pawley had extensively reported on Osaka in an issue of *Architectural Design* (Martin Pawley, “Architecture Versus the Movies, or Forum Versus Content,” *Architectural Design*, no. 6 (June 1970).)

underscored by the proposed mobile mezzanines, which compensated for the immobilization of the floor plates through a smaller scale apparatus that could be relocated at will and were clipped onto the main structure much in the spirit of Archigram's clip-on approach to megastructure.

This approach would be rather abruptly brought to an end with the more severe and pared-down second Avant projet sommaire, which was presented to the client on May of 1972, six months after the first version. A visit to the Paris office of the architects by Willem Sandberg in the winter of 1972 had brought the scheme back into alignment with the direction set out in the competition scheme. Sandberg felt that the legibility of forms was in fact at the expense of a conceptual clarity of the original scheme, which had been lost. This advice, coupled with the fact that the first Avant projet sommaire had gone far over budget (or rather, that the first systematic budget had finally been created and the scheme failed to meet it) resulted in a simplification of the highly articulated first scheme Avant projet. The escalators clipped onto the piazza façade, for example, lost their picturesque, switchback form and returned to the more diagrammatic Y-configuration of the competition entry.

But rather than return to the two open framework façades of the competition scheme, the second Avant project sommaire retained the high density and solidity of the first Avant project sommaire (Figure 3.4). In the competition scheme, the two main façades did not define a box but rather two semi-autonomous surfaces with a loose collection of activities distributed between and beneath them (Figure 2.7). The asymmetry of these activities—pedestrians on the piazza, services and goods on the

street—meant that the building had clear front and back, a reading encouraged by the siting of the building along the Rue du Renard and the projection of the façades well above rooflines of both the neighboring buildings and the volumes pinned between them.<sup>18</sup> In contrast, the second Avant projet sommaire showed, despite the openness of its frame, a box defined by a steel frame and filled in with modular units, each the size of one bay, which suggested a kind of chest of drawers (most easily seen from the aerial views of the model). The piazza was still shown as a flat, sunken space that flows under the main building, still elevated on pilotis and, as in the first Avant projet sommaire, is shown as a kind of festival of pavilions, rigging, and audio-visual apparatus despite no longer occupying the steel frame of the façade or the roof terraces to anywhere near the degree of density shown in the earlier revisions. Moreover, in the second Avant projet sommaire, the information displays on the façade were almost imperceptible gauzy films; instead, the steel framework dominated, as it does in the building visible on the Plateau today.

The Projet définitif, approved by Pompidou in May of 1973, continued the trajectory of the second Avant projet sommaire, both in its return to the spirit of the original scheme but also in the tendency toward densification of the frame and suppression of volumetric articulation (Figure 3.5). In place of the modules and mobile floors formerly visible through the frame on the piazza side was a minimal glass skin. In June of 1973, the fire department questioned the glass and required the addition of steel

---

<sup>18</sup> Banham later underscored the very different pedestrian effects of encountering the building from the East or West. (Reyner Banham, “Enigma of the rue du Renard,” *The Architectural Review* CLXI, no. 963 (1977): 277-9.)



fire shutters, a decision that made the building appear more dense and less transparent but also which, by virtue of adding another system and another material, added to the effect of a complex veiling and layering that was already occurring in spaces of the main façades. Exterior exit stairs were oversized and made more independent of the building, resulting in their vertical emphasis, and in general interior materials and furniture was incombustible.<sup>19</sup> Fireproofing on the main trusses, along with fire shutters on the glass walls separating the structure framework façade from the interior, gave the whole thing an increased density.

Most of these changes resulted in a more compact, dense building than that shown in the competition entry: according to the architects, the space within the overall frame, in the competition scheme 60% solid with clearly differentiated volumes, was now 90% solid.<sup>20</sup> As Rogers later recounted,

we had to remove the mezzanines that were to be hung from the main beams of the building. In this context, flexibility is shifted to the floor plates; a dimension was amputated from the building. We imagined [in the original scheme] an animated interior, with theatrical vertical openings.<sup>21</sup>

In the final scheme, as Piano later noted, the “saturation of the metal framework had the effect of making the building less transparent and of restricting the variety of spatial sequences offered to the public.”<sup>22</sup> The saturation of the frame and the immobilizing of the floors also had the effect of suppressing the autonomy of the two main façades and of

---

<sup>19</sup> Renzo Piano and Richard Rogers, “L’histoire du projet,” *L’Architecture d’Aujourd’hui*, no. 189 (1977): 54.

<sup>20</sup> *Ibid.*

<sup>21</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 33.

<sup>22</sup> *Ibid.*

drawing them more tightly into a dense, box-like matrix. The façades were still meant to be indexes of activities within, but the structure of the sign had changed. One no longer saw the discrete forms, the blocks, corresponding to the main functions but instead a uniform surface whose programmatic distinctions were articulated by lighting, signage, and the flow of people.

Despite this new solidity, the architects argued, the building still manifested a kind of transparency and openness. Although the *Projet définitif* was much less visually transparent than the original scheme, with its soaring glass façades and relatively small volumes pinned within them, the idea of transparency in the new scheme was based not on visually perceived effects but rather on the operations and dynamics of the building's use. "Beaubourg is meant to be used by 5000 people at a time. If you put 4000 people inside and 1000 in the distribution system — the escalators, the walkways, the elevators — you have a kind of transparent diagram of the building."<sup>23</sup> The bulk of this distribution system was on the West façade, with the services running through the corresponding matrix of the East façade, offering a similar kind of performative transparency.<sup>24</sup>

Rogers and Rice both stated that using a "technological vocabulary" in the *Projet définitif* led to a particular form of legibility in which one could simultaneously read the role of each individual element and the global function of a project without bias to one or

---

<sup>23</sup> Piano and Rogers, "L'histoire du projet," 54.

<sup>24</sup> Despite this phenomenal transparency, Piano felt that the building's greatest fault was the lack of concern for energy efficiency. A fully glazed exterior, he pointed out, was a conception of the years of cheap oil. (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 39.)

the other register.<sup>25</sup> But in contrast to the organic relationships of part to whole in the Beaux-Arts analytique, the proto-high-tech building jumped from detail to overall whole with no intervening volumetric or compositional logic. It was there that lay the paradox of the monument. In a great number of the other submissions, volumetrics was the source of their monumentality. Rogers was clear that the gap between detail and overall order posited by their design was intentional, and was a deliberate critique of compositional approaches to building organization.<sup>26</sup> The breaking down of the causal relationship between legible internal volumes and the tectonics of the façade—the disengagement of exterior language from interior operational logic—was furthered by the creation of a kind of colossal order from the diagonal bracing: where earlier schemes had shown one diagonal per floor-column bay, the *Projet définitif* doubled the scale of the bracing module with respect to the primary structural module. The final move in this direction was the transformation of the main exterior escalators clipped onto piazza façade—didactic diagrams of the building’s organization in earlier schemes—into a continuous, taut line running diagonally from one corner of the façade to the other (Figure 3.6). With the new escalator scheme, entrances to the various departments was now a matter of circumstance located merely where the escalator met a particular floor, and so the

---

<sup>25</sup> *Ibid.*, 16. Picon later pointed out that there is a risk of academicism in this approach.

<sup>26</sup> According to Bernard Colenbrander, the “electronic revolution” that started in the 1990s later made the athletic forms of Gehry and Libeskind questionable. OMA directly confronted the irony of building a library or museum in an electronic age, and opted for the dumb box. “This is why,” Colenbrander observes, “in OMA’s studies the sculptural gesture gave way to the presentation of culture as a solid block of knowledge in which all manner of notable incisions had been made from the inside. Inside these dumb forms the decisive battles between the classical and the electronic media can be fought.” (Bernard Colenbrander, “The short but intense life of a celibate machine: Centre Georges Pompidou, 1977-1997,” *OASE: tijdschrift voor architectuur*, no. 57 (2001): 27.)

escalator ceased to function as an externally legible diagram of the building's changing internal organization. The space of the steel framework façade, with its tubular circulation galleries, now performed the role of adapting the logic of the escalator—singular, inflexible and abstract gesture (one that would become so important in the construction of the building's iconicity)—to the indeterminate spaces of the sheds inside, but it did so almost invisibly within its dense framework, in much the same way that it adapted the macro logic of vertical ventilation shaft runs to the served spaces within.

But the building's relationship to the urban environment underwent perhaps larger changes. As a result of both budgetary constraints and the demands of fire codes to reduce the overall height of the building, the pilotis were eliminated and the building brought to the plaza level. At the same time, the plaza was no longer sunken one storey below the street in its entirety but now sloped down from the former Rue Saint-Martin on the west to the main entry level. The program activities that Piano and Rogers had taken pains to distribute as widely as possible toward the edges of the site—the children's activities, the Salle d'actualité, the temporary exhibition galleries—were brought within the compass of the main building. Likewise, the outdoor reception spaces that flowed out from under the pilotis were condensed into a large three-storey interior space at the heart of the building called the "Forum." As a result, the main building absorbed the activities of the larger environment within a single block, a simulacrum of the urban plaza, storefronts, post office, and other activities found in its context. The Forum would be a critically important space in the public image and rhetoric of the overall complex, and stood in metonymically for the intentions of the whole. It was, in the words of Jean-Louis

Cohen, “a place of interface between the general public and the ‘experiments’ of artists and designers.”<sup>27</sup> It promoted a particular kind of work (it seemed tailor-made for the sculptures of Jean Tingley, which were displayed there) and a relationship between observer and object that approached the commodity-spectacle of the international exhibitions and the covered arcades.

The Forum was the last remnant of the mobile architecture of the competition scheme.<sup>28</sup> In the section drawings for the *Projet définitif*, the contrast between the Forum and the five identical floors above it is striking. The Forum appears almost as a fragment of the Fun Palace—with its gantries, mezzaines, lighting, audio-visual projections, movable floors—embedded within a larger generic block; in contrast, the apparently spontaneous events unfolding in the generic floor plates of the museum and library above are indistinguishable from the office partitions and shelving—inflatable as office water-cooler (Figures 3.7, 3.8). Humming with activity, there is no doubt that the vast floor plates represent, as Rogers put it, “pieces of the world.”<sup>29</sup> But as in the urban environment outside, the installations and happenings would come and go with changing tastes and needs. In contrast, the floor plates clearly support indeterminate activities, they are also oblivious to them.<sup>30</sup> In 1977, Davies, Abbot and Stanton reflected on this shift from a

---

<sup>27</sup> Jean-Louis Cohen, “Monuments for a Mass Cult,” in *Rendezvous: Masterpieces from the Centre Georges Pompidou and the Guggenheim Museums* (Paris, New York: Centre Georges Pompidou, Guggenheim Museum, 1998), 34.

<sup>28</sup> According to Claude Mollard, the movable floors only ever appeared in the Forum, and even these were cancelled by the late-1980s. Claude Mollard, personal interview, April 2008.

<sup>29</sup> Richard Rogers, telephone interview, June 2009.

mobile and dynamic apparatus to generic box in which the dynamism is supplied by the users and by information systems:

[The building] still looks incredibly dynamic, it looks as if it's going to throb and take off, but in fact it doesn't. It does have the potential to be dynamic but it needs [...] the interior systems, the information systems, it needs the non-programmed activity back-up on the piazza and the forum and on the terraces, and it needs the networking into the neighborhood with the television sets in the streets around and then into Paris and the country as a whole—and then it becomes the urban machine it was supposed to be.<sup>31</sup>

The piazza, the Forum, the framework façade, and the roof terraces all entered the conversation after the competition since they were not originally envisioned in the brief. But by then Beaubourg's departmental managers had already cemented their roles and those of their departments, and nobody (particularly not the programming team) was willing to take on ownership of these non-programmed spaces. As a result, there was little official support for servicing them, and they remained unprogrammed rather than non-programmed.

In April 1974, Pompidou died before construction was completed. As a result, budget cuts made by d'Estaing introduced one last important change: the elimination of the outdoor, clip-on media systems. The outdoor screens were cut ostensibly for reasons of cost, but everyone knew that the real reason was political—that they raised too many questions about how they would be used, who would control the choice of information

---

<sup>30</sup> The mezzanines had to be scrapped because nobody could figure out a design for roller bearings with a two-hour fire rating. (L. Abbot, M. Davies, and A. Stanton, "An Inside View," *Architectural Design* 47, no. 2 (1977): Unpaginated.) The trusses that we see today were designed to carry these rolling mezzanines, and so they are a ghost of the modernist ideal of a mobile architecture.

<sup>31</sup> Ibid.

displayed there, and how French culture might be perceived if seen through this Anglo-American technological scrim. In contrast to the utilitarian messages directed at local citizens in the competition entry, the final building was merely a space for innocuous aesthetic experiments using audiovisual technology such as those of Xenakis and E.A.T. (Figure 3.9).<sup>32</sup> The elimination of the media façade ultimately resulted in its substitution with a simulation of urban activity.<sup>33</sup>

The result of all of these changes was a smoother, less volumetrically articulated building with no explicit information hardware on display. But as Happold put it in retrospect, “I do not think the building was conceived as a smooth monument. It was seen as an infinitely adaptable three-dimensional space enclosure held up by adjustable scaffolding acting also as huge information walls giving all the news, art and information to the city.”<sup>34</sup> Happold was disappointed in the end. The deterministic program and the model of sponsorship were to blame, he felt, since spontaneity and the indeterminate could not be administratively quantified.

A giant playframe for adults to perform on, where the event is more important than the object—the means rather than the end.[...] I think that was the architecture. What Paris has got is the engineering. Their cultural

---

<sup>32</sup> “The facade of the piazza,” a 1974 report stated, “is supplied with electricity and hanging systems permitting the installation of audiovisual or purely visual animations. This includes the performance studied by Xenakis. The illumination of the building at night also offers the opportunity for visual play.” (*Les activités et services du Centre Beaubourg*, December 17, 1974, Archives CGP.)

<sup>33</sup> Jean Lauxerois, *L’utopie Beaubourg, vingt ans après* (Paris: Bibliothèque publique d’information, Centre Georges Pompidou, 1996), 60. The urban simulacrum had already been explored by Prouvé himself, who in 1970, had been awarded first prize in a competition for the Ministry of Education building. This scheme, which *Architectural Design* reviewed under title “Deadpan” proposed a minimalist tower concealing three vast, stacked courtyards animated with escalators, trees, turrets, and suspended structures. As A.D. put it, “the architectural liveliness is altogether internalized—presumably in an altogether controlled environment.” “Deadpan,” *Architectural Design*, no. 41 (1971).

<sup>34</sup> Happold, “Beaubourg: Architecture or Engineering,” Unpaginated.

management system has achieved it. No client was appointed to use the façades, no money is available. I am sure Richard Rogers and Renzo Piano regret it the most.<sup>35</sup>

### **The revenge of the shed**

To read the *Projet définitif* as a compromised version of the competition scheme is to overemphasize certain aspects of the project's root and in particular, its roots in the imagery of Archigram. To be sure, the changes between competition and construction represented the compromises inherent in the construction of any building.<sup>36</sup> But they also reflect more general shifts in architectural attitudes toward the very issues that characterized megastructure to begin with—its relationship to the city and to advanced technology. In his assessment of the Centre Pompidou in the epilogue to *Megastructure*, Banham mistakenly took the drastically redesigned first *Avant* project *sommaire* for the competition scheme (probably because of its more overt affinities to Archigram) and therefore led him to overstate the demise of the *vie ludique* implied therein.<sup>37</sup> But the evolution of the project becomes more ambiguous and complex narrative of megastructure's decline when the competition scheme is included. Where Banham is correct to point out that the building “is best regarded as an extreme case of the conventional category of *édifice polyvalente* serving as a cultural centre in more or less the currently established sense in France, only far more flexible and well serviced in

---

<sup>35</sup> Happold, “Beaubourg: Architecture or Engineering.”

<sup>36</sup> Busbea notes that with Beaubourg's completion arrived “that most insidious enemy of all utopias: realization.” (Busbea, *Topologies*, 189.

<sup>37</sup> Banham, *Megastructure*, 212–13.



use”<sup>38</sup> he ignores the British and American sources that were less dramatic and imagistic than Archigram, ideas in fact that he had wholeheartedly supported a decade earlier. In response to David Greene’s assessment that the Centre represented a misunderstanding of change and indeterminacy, Alan Stanton, who had worked intimately with the non-programmed events and designs for the “festival” audio-visual apparatus, reminded us that in addition to the building’s roots in Price and Archigram—the two most quoted sources—“there was also the conversation about the ‘well-serviced shed’—in a way Beaubourg is six ‘sheds’ one on top of the other.”<sup>39</sup> The interest in the industrial shed in British architecture of the mid- and late-1960s can be seen as an attempt to renew the modernist search for an objectively functional, engineered architecture, the shed also brought with it a set of techniques and theoretical concerns with respect to social organization that were particular to a post-industrial age.<sup>40</sup> It also provided an architectural strategy in which certain contradictions could be resolved—the monumental versus the everyday, the planned versus the indeterminate, the concrete versus the immaterial.

The shift from a volumetrically articulated urban information machine to a shed-like “smooth monument” was also a shift from the vaulted, interconnected galleries of Durand and Schinkel to what Helen Searing refers to as *machines à exposer* with roots in the Crystal Palace and other late-19th century exhibition halls and in which the vast

---

<sup>38</sup> Ibid., 211.

<sup>39</sup> Postle, *Beaubourg: Four Films*.

<sup>40</sup> For an overview of the “shed” projects at the AA, and particularly that of Tony Dugdale (who worked with Rogers on Beaubourg) see James Gowan, ed., *Projects, 1946-71* (Architectural Association, 1974).

generic space originally conceived for the display of manufactured goods was adapted to the display of art.<sup>41</sup> It also revived the later connection made between such *machines à exposer* and the building for high culture in two theoretical and well-published projects by Mies, his Concert Hall Project, both of 1942, in which the idea of a serviced box with autonomous, mobile wall and ceiling planes that float free of the enclosure (Figure 3.10).<sup>42</sup> The concert hall makes explicit the architectural potential of the great sheds of Albert Kahn, which Mies uses to suggest a break from the modernist total technical machine environment: the engineered shed and the floating planes that mark “culture” are of two different orders. A historical relationship is also suggested between the preexisting shed (already part of modernism’s history) and the transcendental planes (sublime office partitions). Kahn’s spaces maintain a relationship of reciprocity, rather than subservience or neutrality, with respect to the modes of inhabitation suggested by the dynamic planes.

But the *machine à exposer* of Beaubourg derived from more prosaic sources. The earlier work of both Piano and Rogers had established this direction, and in many respects the Pop imagery of the first *Avant projet sommaire* (and even the competition scheme) constituted a leap into the unknown for both architects. Piano in particular considered his interests to lie in small-scale craft, to which he would return after the

---

<sup>41</sup> Helen Searing, “The Development of Museum Typology,” in *Building the new museum* (New York: Architectural League of New York, 1986), 18.

<sup>42</sup> Cohen, “Monuments for a Mass Cult,” 20. Indeed, one could argue that the shed was deeply embedded in an English approach to the relationship between program and space. See, for instance, the 14<sup>th</sup> and 15<sup>th</sup> century “sheds” of the Church of the Greyfriars in London and St. Nicholas, King’s Lynn discussed in Nikolaus Pevsner, *An Outline of European Architecture* (Middlesex, England: Penguin, 1963), 143, 163.

Pompidou.<sup>43</sup> Both Reliance Controls and the B&B Italia offices (officially under the name Piano & Rogers but essentially executed by Piano) were simple, exoskeleton sheds with few overt Pop sensibilities beyond an interest in color, nor any particular explicit interest in information technology beyond a general interest in systems and flexibility. This early work in what would become the High Tech movement—and Reliance in particular—was committed to the use of banal technologies and off-the-shelf components.<sup>44</sup> Indeed, the principle linguistic contradiction in the Centre Pompidou—the competing semantics of cast steel gerberettes and mass-produced standard components—stemmed from Rice’s insistence in eloquent detailing and interest in 19<sup>th</sup> century engineering. There would have been far fewer and the building much plainer had Anthony Hunt, with whom Rogers and Foster built Reliance Controls, been the engineer.<sup>45</sup>

But the importance of Reliance Controls lies beyond its kit-of-parts approach and its use of an unadorned steel tectonic language borrowed from the Eames, Ellwood, and

---

<sup>43</sup> Piano pointed out on numerous occasions that despite its technological pretensions, the building was a giant prototype made by hand. According to Piano, mass-production was overrated, and they strove more for an artisanal approach, which Prouvé had also put forward (his work was not the result of industrialized mass production but rather of the “atelier”). (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 25.)

<sup>44</sup> In his foreword to Kron and Slesin’s 1978 High-Tech, the book that inaugurated the term, Emilio Ambasz argued that the essence of High Tech lies in the re-use and adaptation of the industrial found object, not in the deployment of advanced technologies themselves. (Emilio Ambasz, “Foreword,” in *High-Tech: The Industrial Style and Source Book for the Home*, ed. Joan Kron and Suzanne Slesin (New York: C. N. Potter, 1978), ix-xi.)

<sup>45</sup> This was impossible, of course, since it was Arups who had approached Rogers about the competition to begin with. On Hunt’s role in the origins of British High Tech, see Angus J. Macdonald, *Anthony Hunt: The engineer’s contribution to contemporary architecture* (Thomas Telford Ltd, 2000).

the Smithsons.<sup>46</sup> Its importance both for Beaubourg and as a birthplace of British High Tech is in the relationship between detail, overall form, and its utopian social program, and it is in this relationship that the shed operates. Reliance Controls housed all activities—from offices to amenities to the factory floor itself—within one simple enclosure. This approach had practical advantages. A simple shed was quick to build (in the case of Reliance ten months between initial client meeting and delivery of the finished building) and the loose fit it provided between program and form resulted in a similarly loose relationship between user requirements and project planning where the shed subdivided by light partitions using only dry trades allowed user requirements to evolve up to the very end of construction.<sup>47</sup> But it was foremost a powerful rhetorical and ideological device, what Rogers later called a “great democratic umbrella” under which distinctions between management and factory worker (and at Beaubourg, expert and public) were suppressed. The shed was a seductive icon of egalitarianism, one that both Rogers and Foster would use again and again.

Piano’s views on the matter differed from those of Rogers, and were far less politically ideological. Piano had worked for two years immediately after graduation from Politecnico di Milano in the office of Franco Albini, who was anything but a polemicist, although his work was clear, rational, and bordered on didactic. But where for

---

<sup>46</sup> Ibid., 52. According to Rogers, Raphael Soriano taught him to use steel in a non-Miesian way and the Wimbledon house is the link between Soriano and Beaubourg. Equally important was Banham’s insistence on “dry trades.” (Rogers, interview.) Rogers is clear that the need for a clear distinction between servant and served spaces owes a large debt to Kahn’s Richards Laboratories (which he saw while at Yale) but also to Chareau’s Maison de Verre. (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 36.)

<sup>47</sup> Macdonald, *Anthony Hunt*, 58.

Rogers the central problem of culture was social and collective, Piano believed (as did his later patrons) that the experience of art was transcendental and therefore that a corresponding architecture should be pragmatic and neutral rather than transcendental in its own right. For Rogers, on the other hand, a building like Lloyds (and the Pompidou) was an opportunity not simply to enable a social reorganization but to celebrate it.<sup>48</sup> Despite these differences, the serviced shed was the chosen architectural approach for both since it was equally well suited to creating a transcendental space for individuals as it was for creating an egalitarian one for new collective formations.

Behind both positions, however, was the shed's capacity to clear away the volumetric articulation deeply-rooted in academic tradition: as Banham put it in 1962,

Among the academic kit of tools that every French architect (including Le Corbusier) and most American architects of Kahn's generation[...] have inherited from the Beaux Arts tradition is the idea of design as the assembly of so many 'Elements of Composition' as Gaudet called them. Each of these elements was, ideally, a volume or room devoted to a single function[...].<sup>49</sup>

In contrast to this tradition, for Piano and Rogers—as it was for later High Tech architects—the architect's mandate included only overall building organization and detail, and nothing in between: it was in this gap that the shed's indeterminacy lay. The shed was functional but not Functionalist: in place of forms tailored to specific human

---

<sup>48</sup> This was clear from their respective approaches to tectonic development. Rogers claimed to work “from whole to part” while Piano worked from part to whole. (Victoria Newhouse, “Paths from the Pompidou: Renzo Piano and Richard Rogers,” *Harvard Design Magazine* (Spring/Summer 2007): 47.) By this he meant that the big idea reigned. The detail of high tech building supported (rhetorically and literally) the big idea. For Piano, the detail was the DNA from which a larger solution emerged. After the experience of Beaubourg, Rogers would never do another museum again, while Piano became known predominantly as a museum architect.

<sup>49</sup> Reyner Banham, “On Trial 2: Louis Kahn: The Buttery Hatch Aesthetic,” *The Architectural Review* 131, no. 781 (March 1962): 203.

activities it proposed no forms at all. Like the generic floor plan of the American office building, the shed spoke of potential, both through its details and its openness: it was, as Rem Koolhaas has said of the office floor plan, “relentlessly enabling, ennobling background.”<sup>50</sup>

The enabling technology of the shed at Beaubourg was perhaps best expressed in the building’s mechanical systems. Although these systems are the source of the building’s image and are perhaps what the building is best known for today, the brief only mentioned air-conditioning in passing. The competition entry text discussed it in detail, however. Air handling was broken down into a 48 m by 12.8 m plan module, corresponding to a traverse section across the full width of the building and consisting of one main structural bay (shown cross-braced in the model). Air was treated by rooftop units and brought down through the two main three-dimensional façades and distributed laterally via branch ducts into the ceiling spaces of each floor. The architects’ statement on mechanical systems was straightforward: “Sub-division and zoning re-heat boxes or volume controllers may be readily incorporated within the ceiling space to suit final requirements.”<sup>51</sup> But read carefully, it contained the seduction of potential. Here, HVAC did not simply service a predetermined layout, however competently; rather, it suggested endless possibilities that conjured the same fantasies of openness and potential as those of the vast unimpeded floor areas. Commenting on the *Projet définitif*, Loste argued that the architectural conception was clearly functionalist, but went on to articulate what could be

---

<sup>50</sup> Rem Koolhaas, “Typical Plan,” in *S,M,L,XL* (New York: Monacelli Press, 1995), 337, 341.

<sup>51</sup> Piano + Rogers Architects and Ove Arup + Partners Engineers, “Plateau Beaubourg Centre Paris (competition entry text)”, June 1971, Archives CGP.

seen as the essence of high tech. Here, he argued, form did not emerge from a building's social performance and utility (since total flexibility rendered spaces completely generic) but rather from the building's technical performance, expressed through the repetitive, elaborate systems that supply these spaces.<sup>52</sup> Compared to Functionalist monuments such as Brinkmann's Van Nelle factory, Beaubourg identified a language for expressing potential activities rather than predefined ones.

As the mechanical system testifies, the scheme's "relentlessly enabling, ennobling background" did not restrict itself to a single floor. Zones within the matrix of the three-dimensional matrix of generic *plateaux* could be arbitrarily grouped into one activity of indeterminate shape simply by repositioning partitions but also by stitching together the various sections of floor area with escalators. The programming drawings testify to this, since somewhat surprisingly, the programming team drew as many elevations as plans. These elevations show program activities spreading formlessly through the stacked sheds. This played out most vividly in the library. At the start both Seguin and the architects agreed that the library would take up two of the generic floor plates, one for stacks and archives, the other for reading and reference. After some reflection, everyone saw the risk in this solution—no flexibility was possible if one or other of the two main functions changed its relative importance. Instead, the solution would be for the library to be housed on three identical floors at one end of the building.

The roots of this approach to indeterminate serviced space lay in various sources. Beyond the steel houses of the Eames, Soriano, and Ellwood, the importance of the

---

<sup>52</sup> Sébastien Loste, "Organisation sociale et organisation spatiale", 1976, Loste box 2, Archives CGP.

industrialized school systems of Ezra Eherenkrantz and his School Construction Systems Development (SCSD) project is immeasurable and has been pointed out on several occasions, not least by Rogers and Foster themselves.<sup>53</sup> In addition to its resolutely technological approach, SCSD offered a rhetoric of humanist potential, social egalitarianism, and negation of spatial differentiation.<sup>54</sup> In 1962, the Ford Foundation's Educational Facilities Laboratory (EFL) awarded a large grant to a team led by Eherenkrantz for the study and implementation of test cases for industrialized school building. Since 1958, the EFL had tackled the problems caused by increased demand and changing curricular ideologies in postwar American schools. Its primary area of research was "the design of the school as a complete environment that responded to the needs of teachers, students, and shifting social conditions."<sup>55</sup> The open-plan school was the

---

<sup>53</sup> Rogers, interview. Foster explicitly cited SCSD in his edited double issue of *Architectural Review* (1972) titled "Factory Systems Studies." School building in general was a hot topic at the time, and transcended boundaries between avant-garde and mundane. In 1968, *Architectural Design* launched an issue dedicated to the topic (May 1968), and it included contributions from Cedric Price, Peter Cook, as well as technocrats like Jonathan King of the Ford Educational Facilities Laboratory. The audio-visual self-study carrel was one of the totemic objects of this inclusiveness. (See, for example, the "Audio-visual learning centre and carrel" shown at the New York World's Fair in 1964, pictured in the same issue (p. 216).) It also represented one of the only realizations of the portable, personal, and fully wired architectural objects imagined by Archigram in the mid-1960s. As such, the study carrel represented both the libertarian ideals of institutional critique and the pragmatic, technocratic solution to the problems facing school planners. In the mid-1960s, Jean Prouvé had also studied a modular system for flexible schools—his so-called "tabouret" system (Jean Prouvé, "Bâtiments scolaires évolutifs industrialisés, type 'tabouret'," *Techniques et Architecture* (September 1968).)

<sup>54</sup> As a report to the EFL stated, "Old walls should not stifle new ideas. Identical boxes must not enforce the same program on all students and teachers; each is a unique individual. Fixed furnishings must not quash spontaneous inquiry. Dismal, spiritless, and uniform decors must not blight a child's creativity." Quoted in Amy F. Ogata, "Building for Learning in Postwar American Elementary Schools," *Journal of the Society of Architectural Historians* 67, no. 4 (December 2008): 581–82.

<sup>55</sup> *Ibid.*, 581. Many of these questions had been raised by William Caudill and his firm Caudill Rowlett Scott in William Wayne Caudill, *Toward Better School Design* (F.W. Dodge Corp, 1954). For a history, see Jonathan King and Philip Langdon, *The CRS Team and the Business of Architecture* (Texas A&M University Press, 2002).



primary innovation. Here, boxy classrooms disappeared and in their place were vast open floors, organized through the manipulation of furniture and temporary partitions, and generally artificially lit.

SCSD proposed relatively large (60-70 ft) spans that created spaces serviced entirely from above that could be reconfigured at will by manipulating mobile partitions and furniture. While these flexible spaces held firmly to EFL doctrines, the innovation of SCSD was its invention of a meta-design framework consisting of modular subsystems—all using dry trades, from structure and mechanical services to lighting and audio-visual installations—that participating architects would be required to use in designing the school buildings. This approach to systems building (and its invention) largely grew out of Ehrenkrantz's experience working at the British Building Research Station in the 1950s. There he was exposed to the latest in industrial building, and in particular to the CLASP system.<sup>56</sup> SCSD differed from the British systems in that where systems like CLASP attempted to design and control every aspect of the building, SCSD invited private-sector manufacturers to submit bids for the design of subsystems based on performance specifications with no conception of a prior solution. This was primarily a result of the dilemma that the demands of flexibility (long spans, movable partitions, full thermal environmental control, and an adaptive lighting system) were expensive to fulfill, particularly for school budgets. The solution was to ask manufacturers to bid on these

---

<sup>56</sup> The birth of systems building in postwar British school construction is covered in detail in Andrew Saint, *Towards a Social Architecture: The role of school-building in post-war England* (New Haven: Yale University Press, 1987); Barry Russell, *Building Systems, Industrialization, and Architecture* (London and New York: John Wiley & Sons, 1981).

subsystems in exchange for a production run that was large enough to justify the research and development costs. Like the CLASP project in the Britain, the EFL research played an important role in the invention of systems building. Within the EFL community there was a pervasive, cultish mystique surrounding both “systems building” and the term “systems” in general.<sup>57</sup> The EFL assessors found that among all of the project team and stakeholders there was “no commonly understood or accepted definition of what systems building is.” As a result, systems building was seen by the client as a mystical “promise” that would solve all of their problems, and paradoxically that it became “a refuge for clients who cannot or will not analyze their own building-related problems, and take responsibility for their decisions.”<sup>58</sup>

Ehrenkrantz’s approach contained all the paradoxes of Systems thinking—its unapologetic technocracy underwritten by an excessive humanism—yet it offered those who were willing to see past these faults a seductive architectural statement, encapsulated in two iconic images, both of which were produced by Ehrenkrantz for an EFL report. The first of these was the 1964 prototype of the SCSD system that Ehrenkrantz built on the Stanford campus (Figure 3.11). The end result was very Miesian, and both the intention and the language by which it was carried out would be explicitly used by Norman Foster in his building for IBM at Cosham, the most sophisticated and laconic of the High Tech sheds (Figure 3.12). As the report put it,

---

<sup>57</sup> As *Architectural Record* reported in 1970, “‘Systems’ is, of course, being talked about by everyone these days, even including the executive in the commuter-train bar car.” (Robert E. Fisher, “Building Process in the 1970’s: The Trouble With Systems,” *Architectural Record* (October 1970): 148.)

<sup>58</sup> *Ibid.*

The design attempts to show the systems in as pure a form as possible, and to minimize extraneous architectural expressionism. For this reason, the exterior wall is a complete curtain of very delicate design, though this will not be typical of the project schools.<sup>59</sup>

The powerful photograph of the reflected ceiling plan of this prototype, deployed later by Foster, showing the exposed roof structure with ducts snaking through it was at once an abstract diagram of an hidden system and an x-ray view of everything that would be later hidden by suspended ceilings (Figure 3.13). The second influential image to emerge from the early SCSD work was a one-point section perspective drawing, showing a core with no exterior, a servicing without architecture (Figure 3.14).<sup>60</sup> In this drawing, as in later drawings by Foster and Rogers modeled on it, the ground plane is reduced to an infinitely thin two-dimensional abstraction, while the ceiling and roof assembly dominates to an almost overbearing degree. The meaning was clear: the ground plane, which represented both the building's location and its conventional locus of programmatic planning (via the floor plan) was now rendered generic and immaterial in favor of the assertively concrete ceiling-roof assembly that provided life-support to the activity below.<sup>61</sup>

Ehrenkrantz wrote his first manifesto, *The Modular Number Pattern*, in 1956 during his tenure at the Building Research Station before returning to California to start

---

<sup>59</sup> Ezra Ehrenkrantz, "SCSD project, USA," *Architectural Design* (July 1965): 334.

<sup>60</sup> The one-point section perspective would become, of course, the definitive drawing of High Tech and systems building. Both images were published as a dramatic full-page layout in a 1967 article in *Architectural Design* that gave detailed treatment to Ehrenkrantz's work, a follow-up to a 1965 article in the same journal that showed heroic images of a rooftop air conditioning unit being lowered in by helicopter. (Christopher Arnold, "School Construction Systems Development," *Architectural Design* 37 (November 1967): 495-506.)

<sup>61</sup> Among the inventions that came out of this work was the packaged multizone rooftop air conditioning unit, designed by Lennox in response to one of Ehrenkrantz's performance specifications. The subsequent effects of this invention on the built environment have yet to be reckoned.

on SCSD (Figure 3.15).<sup>62</sup> Despite his embracing of technocracy, the first three items in the bibliography of his short book are Samuel Butler, Bertrand Russell, and Lewis Mumford, all warning about technology out-of-control.<sup>63</sup> Ehrenkrantz argued that his new theory of modularity would mitigate the effects of an overbearing, totalitarian standardization, a necessary evil in the world of the “long production runs” and industrial profitability. Ehrenkrantz was intelligent enough to recognize that standardization might be perceived as a creative straightjacket by architects steeped in the traditional modernist link between form and technology, and so restricted his sub-systems to internal or invisible systems. All exterior systems and aesthetic treatment would be left to the architect. His system of numerical proportion ensured dimensional compatibility among subsystems and therefore primarily concerned interfaces between manufactured parts. “The manufacturer and the designer,” he argued, “both have a common interest in the establishment of a new ‘keyboard’ for the building industry.”<sup>64</sup> Where theories of proportion from Alberti to Le Corbusier (and Ehrenkrantz cited most of them) treated number as a regulating system governing the totality of the building, the Modular Number Pattern concerned only the dimensional protocols for subsystems and components. In this way, he argued, the protocols for the parts had little effect on the

---

<sup>62</sup> Ezra Ehrenkrantz, *The Modular Number Pattern: Flexibility through Standardisation* (Tiranti, 1956). He later elaborated his views on systems building in Ezra D. Ehrenkrantz, *Architectural Systems: A Needs, Resources, and Design Approach* (McGraw-Hill, 1989).

<sup>63</sup> Ehrenkrantz, *The Modular Number Pattern*, 75.

<sup>64</sup> Ibid., 4. On the Ehrenkrantz and his approach to number, see Eva-Marie Neumann, “Architectural Proportion in Britain 1945-1957,” *Architectural History* 39 (1996): 197-221; Henry A. Millon, “Rudolf Wittkower, ‘Architectural Principles in the Age of Humanism’: Its Influence on the Development and Interpretation of Modern Architecture,” *The Journal of the Society of Architectural Historians* 31, no. 2 (May 1972): 83-91.

architectural approach to the whole, a radical departure from the tenets of modernist industrialized architecture. The question, he argued, “is whether or not standardization of the means increases or decreases aesthetic freedom. The answer is obvious when one tries to imagine an artist painting with unstandardized paint, where every tube of cobalt blue is a different colour and gives different effects every time it is mixed with another colour.”<sup>65</sup>

It would be understandable if one read the SCSD perspective drawing as a kind of *analytique* drawing of closely interrelated parts forming an organic whole. Yet here organicism to the extent that it exists cannot be read in the morphology of the parts; instead, the unity lies within an invisible system of protocols regulating the expected performance of each part and defining the interfaces between subsystems. Unionization meant that the construction of a classroom involved a multiplicity of laborers, all of whom had strict rules for the engagement and performance of their work.<sup>66</sup> Any subsystem can be removed and replaced with another of a completely different form or material without any compromise to the whole, as long as the interface protocols are respected and the performance requirements are met. This administrative basis for an architecture of change and flexibility is perhaps best expressed in the way manufacturers responding to SCSD ignored the didactic aspects of exposed details. Connections were concealed whenever possible and a “clip-on” architecture here implied a sleight of hand

---

<sup>65</sup> Ehrenkrantz, *The Modular Number Pattern*, 3.

<sup>66</sup> To meet the demands of flexibility, the construction systems had to be designed so that a door could be moved without first calling a carpenter, then an electrician, then a carpenter, then an electrician again. The result was a network of conduits with pluggable colonnettes in which the facing material was redefined as a “cover” so an electrician could move it without involvement of other trades. (Michel Bezman, telephone interview, February 4, 2008.)

in which the clip disappeared (Figure 3.16).<sup>67</sup> Here, the demountable partition did not celebrate its demountability but rather the illusion of smoothness and continuity, and the extreme case of this was the use of Velcro as a fastener for securing audio-visual service columns between the floor and ceiling.<sup>68</sup>

For all its pragmatism, the SCSD approach enacted the final collapse of deterministic form-function relationships. The selected lighting-ceiling system by Inland Steel Products Co., for example, performed seven different functions within one seemingly banal form. Each unit simultaneously performed as: source of illumination, finished ceiling, sound absorption, sound transmission barrier, fire protection for the structure above, support for demountable partitions below, and supply and return air diffusers serving the space below. Most of these functions had no outward physical manifestation. SCSD thus embodied an ad-hoc, pragmatic, impure approach that, compared to systems building in Britain, focused its attention on protocols and expected performance rather than the design of specific hardware. As one of the SCSD team members observed,

It was decided to develop systems where gains, financial or performance, were necessary and showed a good chance of success, rather than attempting to systematize the whole building.[...] It is the promise of the procedures that has captured the attention of discerning eyes, not the reality of the hardware.<sup>69</sup>

---

<sup>67</sup> See, for example, the clip-on detail in Ehrenkrantz, “SCSD project, USA,” 332.

<sup>68</sup> Bezman, interview. Velcro went into production in the late-1950s and was considered a high-tech fastener associated with the US space program.

<sup>69</sup> Arnold, “School Construction Systems Development,” 498.

Central to the logic of this administrative conception of change was the principle of interface. In Systems Engineering and computing, a complex system could be decomposed into smaller, autonomous subsystems connected by strictly defined interfaces.<sup>70</sup> Each subsystem could therefore be optimized according to its own performance requirements and cost without regard to its effect on the overall system, as long as it met the contract defined by the interface. The success of this approach depended on how well the interfaces between subsystems were defined. The EFL (and performance concept in general) specified that manufacturers who bid on subsystems would be required, as part of the bid, to demonstrate that they had met with the manufacturers of at least two other subsystems and that some basic interfaces had been clearly defined. One of the more successful cases, for example, was the identification of the 2 ft. x 4 ft. ceiling unit as the interface point between HVAC and lighting: manufacturers of lighting would integrate a diffuser into their fixture, to which supply ducts could be connected. The belief was that if interfaces were correctly defined, there would be no need for a general contractor, only a facilitator in the form of a project manager.<sup>71</sup> The building would, in a sense, be self-organizing (or at least self-assembling). But as *Architectural Record* pointed out in a critique of *Systems Building* in 1970, the real interfacing problem was in the information flows between architect, client,

---

<sup>70</sup> Here, interface is a more general concept than the “graphical user interface,” or even “user interface” that we are familiar with today. It designates an agreement between multiple components of a system, which may or may not include a human user, as to how they will interact. A standard electrical outlet or a fixed-gauge railway are examples of well-defined interfaces.

<sup>71</sup> Fisher, “Building Process in the 1970’s: The Trouble With Systems,” 152.

engineer, and builder and not the “cybernetic” (my usage) information flows between objects and materials.<sup>72</sup>

The SCSD project encapsulated several of the arguments Banham made in his “On Trial” essays that examined the general state of architectural design, and in particular the first essay of the series, “What architecture of technology?” in which he identified several trends in architecture’s shifting relationship to technology. Among these what he called the “rise of institutional approaches to architectural technology” (which CLASP and SCSD epitomized), and the challenge posed by these approaches to architectural authorship.<sup>73</sup> In particular, Banham singled out what he saw as the possible supplanting of the modernist idolatry of the curtain wall’s revolutionary potential to a more quiet and banal technology “that involves no sudden revolution. [...] The most striking example, the most striking for having passed almost without comment in the two decades or so that have elapsed while it has been establishing itself, is what we most inadequately term ‘the suspended ceiling.’”<sup>74</sup> In place of the preoccupation with exteriors and sunlight that informed modern architecture, the suspended ceiling responded to the increasingly common phenomenon that,

apparent form and space inside the building are subject to (sometimes unavoidable) manipulative techniques that are impossible outside [...] With a flexibility the more remarkable for going unremarked, they accommodate a greater variety of services than any other membrane (heating, lighting, ventilating, sound, fire-extinguishing, acoustic control)

---

<sup>72</sup> Ibid., 153.

<sup>73</sup> Reyner Banham, “On Trial 1: The Situation; What Architecture of Technology?,” *The Architectural Review* 131, no. 780 (February 1962): 98.

<sup>74</sup> Ibid.



and in the process they dispense a level of power output (expressed in wattage per square foot) that put them in a class of mechanical environmental controls that are commonly supposed to be a Utopian or Dymaxion dream.[...] Good, bad, or indifferent, the suspended ceiling is still architecture, and it sets a standard, a very hot standard, by which other attempts to tame technology can be assayed[.]<sup>75</sup>

At SCSD the suspended ceiling was elevated to a total architectural system through the development of the overhead service sandwich comprised of ceiling, services, structure, and floor/roof assembly, and it was the emblematic element of the SCSD approach (Figure 3.14). Like Tange's slightly later space frame canopy for the Festival Plaza at Osaka 70, the space it defined below was at once abstract void and intensified space of event—a piece of the world, captured to literally and metaphorically enable “the exchange of ideas and experiences between human beings.”<sup>76</sup> Yet Tange's canopy delivered on the exhibition theme of “Multiplicity and Harmony” by paradoxically offering its opposite: a homogeneous, somewhat brooding canopy. The overhead service sandwich minimized the physical imprint of the architecture on the ground plane and thus denied the programmatic determinism of the architectural plan. At SCSD, it regulated the space below through an invisible “plan” made up of plug-in points and protocols (Figure 3.17). It defined much more than a neutral and non-committal space of possibility: it proposed an active space of integration that brought together the social and the technical.<sup>77</sup>

---

<sup>75</sup> Ibid.

<sup>76</sup> Udo Kultermann, *Kenzo Tange* (Barcelona: G. Gili, 1989), 106.

<sup>77</sup> Picon suggested that in the goal of containing anything Beaubourg sought an architectural form anterior to those that would later be imposed upon it by transitory and “natural” social formations (and that in this way it was “Rousseau-ist”). (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges*

The spirit and the techniques of the SCSD system found their way into Beaubourg in several ways.<sup>78</sup> The section drawings for the *Projet définitif* clearly show that the service sandwich made its way into the scheme *tel quel*. On one level, the section reads as a series of trusses supporting the open floor plates above. On another level, however, each floor can be understood as a three-dimensional slot of space serviced from above by an integrated system. This latter reading is reinforced by the insistence on defining spaces and events by hanging things from the ceiling—mezzanines, lighting, signage, audio-visual equipment—rather than by placing them on the floor, of which the mobile exhibition walls of the museum are the most extreme example.<sup>79</sup> This approach also resulted in an expanded architectural mandate. The original contract assumed that Piano and Rogers would provide only the shell and services and that the client would be responsible for the interior walls, ceilings, and furniture. The architects successfully fought for an expanded role, and in the end the furniture and interior systems was made

---

*Pompidou*, 33.) In 1966, Gérard Guez proposed a design for a “Musée mobile” that uncannily anticipated not only the form of the final building (albeit on only one floor) but also the rhetoric of its intentions. “Its goal,” the architect announced, “is not conservation but to be a passage connecting creative activity and the life of the city. The mobile museum is a realization of the complete flexibility of space and light.”[...] The mobile museum is a tool of architectural potential rather than a monument.” (“Le musée mobile,” *Techniques et architecture* 29, no. 2 (April 1968). See also Gérard Guez, “Le musée mobile,” *L’Architecture d’Aujourd’hui*, no. 155 (May 1971): xxxv.)

<sup>78</sup> Its approach to programming will be covered in the following chapter.

<sup>79</sup> This was too much even for Hultén, who didn’t want to mount an exhibit in which every painting was supported on walls that appeared to be floating on the feet of patrons on the other side. (Calvin Tomkins, “Profiles: A Good Monster,” *The New Yorker* 53, no. 48 (1978): 37-67.)

part of the overall contract. In a systems environment, the design of furniture and equipment was very much part of the architecture.<sup>80</sup>

The multifaceted definition of the “user” in SCSD (and in EFL work in general) also pointed to a way to reconcile the libertarian notions of freedom received from Price with the need for a certain degree of top-down control. The Beaubourg program had formalized the distinction between “utilisateur” and “usager,” both of which translate loosely as “user” but which convey different connotations. By *utilisateur*, the programming team meant the heads of the various departments (Hultén, Seguin, et al.) and the term is perhaps best translated as “operator,” while by *usager* they meant the anonymous visitor. (The distinction roughly corresponds to airline pilot and passenger, both of whom are “users” of the apparatus yet play very different roles.) In the SCSD schools administrators not pupils reconfigured the flexible spaces. Here lies one of the contradictions of flexibility at Beaubourg. As children of 1960s techno-utopianism, Rogers and Hultén both envisioned flexible spaces that were literally under the control of visitors. The most infamous example of this were the so-called “kinakothèques,” automated machines for displaying masterworks of 20th century painting. In response to a visitor’s keying in a selection via an electronic input device, the machine would automatically lower a painting into the museum from the space above, like a jukebox (Figures 3.18, 3.19). This was idealistic, of course, and although a few kinakothèques were built, they were used for archival storage only. But the source of the conflict over the kinakothèques was not merely a matter of their irreverence to great artworks: the

---

<sup>80</sup> Abbot, Davies, and Stanton, “An Inside View.”

fundamental concept of flexibility at the heart of the idea—spaces that responded immediately and spectacularly to each anonymous visitor—was in question.<sup>81</sup> By contrast, SCSD offered a model of invisible, bureaucratic change.

Where the service sandwich that defined the open floor plates borrowed directly from SCSD, the main façades expanded its logic and transformed it into an altogether new conception. Both the competition scheme and the *Projet définitif* proposed generic floor platforms delimited on their long sides by frameworks containing primary circulation and services. In so doing, they loosely restate the plan type of Price's Fun Palace and Foster's Newport School competition entry—a rectangular void lined on its two long sides by a thickened façade containing structure, horizontal and vertical circulation, and other services.<sup>82</sup> But where the competition scheme, in good megastructure fashion, suggested that the two façades were the primary, stable framework between which mobile floor plates were pinned and which supported change via the strategy of mobile, clip-on components, the definitive project could be read both as a megastructural frame and as a vast shed wrapped in a thin steel and glass envelope, in turn laminated on its long sides by an 6m deep façade, a complex, porous, but static skin that mediated between building interior and urban environment. The façades were thus a strategy for reconciling permanence and change.<sup>83</sup> Expanding on what was already

---

<sup>81</sup> In his documentary film, Denis Postle noted that the film crew had to wait 30 minutes for a Beaubourg security guard to find the key to the contraption. (Postle, *Beaubourg: Four Films.*)

<sup>82</sup> This was also the plan type used by Foster in the Sainsbury Centre (1974).

<sup>83</sup> As Rogers later put it, “the desire to reconcile permanence and change is one of the threads of our work.” (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 14.)

suggested in the two great veil-like façades of the competition scheme, the final building achieved this reconciliation through layering of surfaces and systems. In Rogers' words,

It is in the play of superimpositions, in the effect of shadow and light, that lies the possibility of an architecture that might resist transformations registered upon it by its users. These thicknesses have nothing to do with the massiveness of the late projects of Le Corbusier. They come instead from a certain complexity of assemblages, of which the Centre offers a good example, complexity inside which small perturbations wrought upon the building might be dissolved.<sup>84</sup>

The façade facing the piazza was particularly important given the architects' intentions of making the building a fun place to visit, like the Eiffel Tower.<sup>85</sup> It was a giant framework that drew the activity of the piazza up into the building, absorbing the teeming life and events proposed for the piazza into its smooth enclosure, while projecting back to the city a symbol of undifferentiated openness. In absorbing these literal and symbolic aspects, the façade acted as a kind of interface between building and city, between information machine and citizen. The fundamental purpose of the interface in any complex system was to make comprehensible, through the deployment of a diagrammatic metonym, the operation of the system and, more specifically, to make available to the user its affordances through a simplifying mental diagram.<sup>86</sup> The interface was thus much more than just the liminal, bounding surface between two spaces or domains: it defined a space of its own whose rules and attributes were independent of the

---

<sup>84</sup> Ibid.

<sup>85</sup> At that time, the public could travel up to the escalator to the roof free of charge, something that could not be said of the Eiffel Tower, nor for that matter of the building today.

<sup>86</sup> As Loste put it, a visitor's typical reactions might be 'It's funny, I like it because it's not like a building' and 'look how all the people move around on it.' The building is a diagram. People know how to read it instantaneously." (Sébastien Loste, "Statut du Centre Georges Pompidou", n.d., Loste box 2, Archives CGP.)

two spaces that it mediated. By the mid-1970s, interface design had acquired its own language, rules, and imagery.<sup>87</sup> Software had overtaken hardware as the space of interaction between human and machine and so the interface was relocated to a new, virtual space.<sup>88</sup> But elaborate user interfaces were not needed in complex systems where users were experts in the operation of the machine but only when the user was an anonymous non-expert.<sup>89</sup> The façade-as-interface thus acted as a mediator between the black-box interior—the windowless clear spans of the vast floor plates and the potentially alienating high-culture exhibited within them—and Beaubourg’s public, taken in its broadest sense.

The structural gerberettes—the large cast steel brackets that acted as hinges between the interior trusses and the exterior tension rods—played an important role in defining this interface. First, they defined the interface zone’s spatial extents since they were monolithic cast pieces whose length was coextensive with the thickness of the interface.<sup>90</sup> Second, they lent the building a didactic legibility. Looking at the structural section of the building, or visiting the building in person, one is struck by the visual dissonance between the Romanticism of the cast steel gerberettes and the more laconic overall form, interiors, and detailing. Ted Happold later felt that this was a mistake, yet

---

<sup>87</sup> Brad A. Myers, “A Brief History of Human Computer Interaction Technology,” *ACM Interactions* 5, no. 2 (March 1998): 44-54.

<sup>88</sup> Jonathan Grudin, “The computer reaches out: the historical continuity of interface design,” in *Proceedings of the SIGCHI conference on Human factors in computing systems: Empowering people*, CHI ’90 (Seattle, Washington, United States: ACM, 1990), 263.

<sup>89</sup> Grudin, “The computer reaches out.”

<sup>90</sup> Rice deliberately called them “pieces” (“I like the world piece, it makes me feel like an artist when I use it.” Peter Rice, *An Engineer Imagines* (London: Artemis, 1994), 32.

the humanist affect resulting from the use of shapely cast steel was intentional. Peter Rice had taken on the design of the gerberettes as a mission, and he felt that a deliberate return to 19th century artisanal elements would humanize the building to visitors approaching this otherwise alienating monument to culture.<sup>91</sup> Rice fell upon this approach while visiting Osaka shortly after winning the Beaubourg competition. To him, the triumph of Tange's Festival Plaza space-frame was not in its great umbrella-like gesture but in the way the cast-steel nodes by which it was assembled lent it the "the warmth, the individuality and personality of [its] nineteenth-century counterparts."<sup>92</sup> "The scale of the Centre Beaubourg," he added, "would be the scale of the pieces rather than the scale of the whole."<sup>93</sup> The language of the clip-on circulation systems and the interior trusses displayed none of the 19th century articulation of the gerberettes, and where the structural details of the interiors and façades were smooth and unarticulated, the interface zone deliberately strove for a didactic legibility—whether in the tapering of the gerberettes as an expression of their internal stresses or in the deliberate leaving gaps between each gerberette and the column over which it was dropped.<sup>94</sup>

---

<sup>91</sup> A detailed account of the development of the gerberettes is in Rice, *An Engineer Imagines*.

<sup>92</sup> *Ibid.*, 29.

<sup>93</sup> *Ibid.*, 30.

<sup>94</sup> In case the humanizing intentions of this zone were not already clear, Rice included in his discussion a photograph of showing visitors and the column-gerberette detail within one visual field (which he captioned "The 'piece' with the people." (*Ibid.*, 46.) (Figure 3.20) Reliance Controls, whose engineer was Anthony Hunt, had treated its exposed exterior structural frame in a quite different way. The exposed structure performed the dual role of giving the simple box a degree of articulation, but it was also tied to its performance as a flexible system since expanding the building meant attaching new structure to the existing exterior columns, wrapping with new cladding, and finally demolishing the former exterior cladding. (See Macdonald, *Anthony Hunt*, 55.)

By moving structure, services, circulation to the space of the three-dimensional façades, the architects created an exterior envelope that offered “affordances,” promises of performance and function. In 1977, by the psychologist of visual perception James J. Gibson coined the term “affordance” to describe all “action possibilities” an actor might perform with an object.<sup>95</sup> The notion of an object's affordances had grown out of an interest in the notion of “environment” and how it communicated to its inhabitants.<sup>96</sup> Gibson defined environment “as the surfaces that separate substances from the medium in which animals live” and speculated that in response to the questions “How do we go from surfaces to affordances? And if there is information in light of the perception of surfaces, is there information for the perception of what they afford?” one might answer that “the composition and layout of surfaces *constitute* what they afford [and] to perceive them is to perceive what they afford.”<sup>97</sup> In this light, Centre Pompidou is not static and monumental, as Archigram saw it, but rather is active and continually changing.

The operation normally attributed to the envelope of the Centre, that it reverses the normal relationship between the building’s innards and its skin, assumes the stable distinction between interior and exterior. When looking at Foster’s IBM envelope, the trope of “transparency” of interior function displayed as a sign on the outside is eclipsed by a compression of interior and exterior into the thin space of the envelope (Figure

---

<sup>95</sup> Gibson first set forth his theory in James J. Gibson, “The Theory of Affordances,” in *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*, ed. Robert Shaw and John Bransford (Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1977), 67-82. Gibson’s theories were foundational to the field of human-computer interaction, largely through his student, Donald Norman (whose best known work is Donald A. Norman, *The Design of Everyday Things* (Basic Books, 2002).)

<sup>96</sup> As in, for example, Kevin Lynch, *The Image of the City* (Cambridge, Mass.: MIT Press, 1960).

<sup>97</sup> James J. Gibson, “The Information Available in Pictures,” *Leonardo* 4, no. 1 (Winter 1971): 127.



3.21). The same holds true at Beaubourg. At what point in the boundary of this building is the climate of interior separated from that of exterior? In point of fact, the boundary condition varies depending on the subsystem under consideration, and that is the source of the building's richness. The escalator, for example, was changed in 2000 from "exterior" to "interior" by the simple manipulation of its point of access. No change to its morphology was required. The facades, then, operated in two directions: they drew the activity of the piazza up onto the building's enclosing surfaces, and they drew the servicing out from the interior.

When the audiovisual apparatus that was to have covered the facades was eliminated, the architects were at first disappointed. Rogers later observed,

On reflection, I think this incursion into the hypothetical permitted us, above all else, to conceive of something that departed radically from traditional models of the cultural center or museum. The demands of communication can not be solved by a facade in the form of a television broadcast station, or of such-and-such apparatus, however spectacular they may be. Instead, they demand new venues for culture and exchange, which could be linked to the Centre in a decentralized way. The theme of dispersal is for me more interesting today than that of centralization.<sup>98</sup>

For a cultural building, what was at stake was the façade as a system of communication. To some, the elimination of the facade as zone of symbolism and its transformation into an interface—fun to use yet utilitarian—left a profane space, a space of capital.<sup>99</sup> The elimination of the façade as a legible, hierarchical system inherited from the Renaissance

---

<sup>98</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 40.

<sup>99</sup> See, for example, Dutch critic Jochen Bub's assessment that the building failed because one could no longer create ennobling architecture in an age when God had been replaced by capital. (Quoted in Colenbrander, "The short but intense life of a celibate machine: Centre Georges Pompidou, 1977-1997," 23.)

resulted in an evenness and muteness in which library, storage, museum, circulation were treated as equivalent. Hierarchies were the bread-and-butter of both left and right, and it was as irritating to conservative high culture to see the museum lowered to the level of supermarket, as it was enraging to the radical left to see the street elevated (literally) to the level of high culture.

The pop-festival imagery of the competition scheme now represented aspirations to which not all progressively minded architects automatically aspired. Among the photo-collaged images on the elevation of the competition scheme was the title page from Martin Pawley's 1970 article in *A.D.*, "Caroline: go to Canvas City immediately - your friend Linda has been busted," pasted onto the elevation as a talismanic invocation of counter-culture (Figure 3.22; compare to Figure 2.3). Pawley's article did start as classic counter-culture, yet the cracks were beginning to show. His article quickly darkened:

Pop festivals are not utopian, paradisaical, wonderful precursors of a new and flexible life style. The squalor is not accidental, or something which can be 'sorted out' with co-operation from everyone concerned; it is integral with the abandonment of bourgeois individualism, career-structures, law and order, possessive love, forbidden sex and eroticism. It is part of the collapse of monumentality, dignity, self respect; all the delusionary values of the old narrow world unable to count its dead or see its wounds every night on TV.<sup>100</sup>

The contradictions in the utopianism and squalor of these festivals needed reckoning. The resulting questioning of the libertarian critique of the welfare state central to both the pop festival and the Fun Palace could not have been clearer:

---

<sup>100</sup> Martin Pawley, "Caroline: go to Canvas City immediately - your friend Linda has been busted," *Architectural Design* (November 1970): 564–65.

Thus all the trinkets of our technology are geared to keeping bits of ourselves alive in isolation. Divided we stand, united we fall. Our medicine is continual surgery between the parts of ourselves, and in that sense the drugs, the music, the cars, the mortgages, the police and the dope fiends are all together in the same voluntary concentration camp.

A guard once taunted Charles Manson in his jail, ‘Charlie, you’ll never get out of here.’ Manson replied, ‘Out of where?’ That is what one person saw and felt at [the third Isle of Wight festival]. And he doesn’t think it will be the last one—he thinks there will be more and more, and life servicing isn’t in it. From now on we are servicing death.<sup>101</sup>

The architectural possibilities for an escape route found a voice in Ron Herron and Peter Cook’s *Instant City*. The earlier version of the scheme—the technological circus caravans and mobile frameworks (the subconscious of megastructure) that had inspired the competition scheme was, by 1970, rejected by Herron, Crompton, and Cook as “too cumbersome, too slow, used [sic] too many vehicles.”<sup>102</sup> The problem, it seemed, was less the earlier scheme’s reliance on technology than the fact that it didn’t go far enough. In the later versions of the project, Herron and Cook abandoned the ground plane in favor of underground buildings and airships (Figure 3.23). With the *Instant City* airship, “the ground just slips away.[...] If it needs to be there all the time, it’s under the surface; if it’s occasional, it floats in and floats away[...].”<sup>103</sup> In other words, slowly-changing “permanent” aspects of the building went in an underground crater while transient events were supported by ephemeral hardware—and as little of it as possible—lowered to the empty site from above.

---

<sup>101</sup> Ibid., 565.

<sup>102</sup> Ron Herron and Peter Cook, “*Instant City in Progress: An Archigram Production Visualized by Ron Herron and Peter Cook*,” *Architectural Design* (November 1970): 568.

<sup>103</sup> Ibid., 570.

The minimalist box echoed this shift from the squalor of Canvas City to the schematic technological heroism of Instant City.<sup>104</sup> In its fluorescent-lit and mechanically ventilated spaces, the final scheme sublimated this desire to burrow underground while dematerializing then structure supporting the information networks and ephemeral events above. As with any megastructure, the scheme can be seen as a dialog between a slowly changing macro-structure populated with agile hardware that supports constantly renewing events. Yet, in the final scheme the high-tech pop-festival pavilions on the piazza—the information screens, stages, light and sound installations—are swept away and absorbed deep into the massive, monumental block that now played the role of the airship servicing the piazza without physically touching it.<sup>105</sup> This transformation was reinforced by the new topography of the piazza, whose awkward slope on the one hand evoked a humanist public space but on the other negated its capacity to host temporary structures.

In the end, Rogers felt that the pop imagery and mobility of the competition scheme was not the principle radical move.<sup>106</sup> To enable flexibility through physical demountability and re-pluggable systems had within it the seeds of a later, less material and more administrative notion of flexible space. Rogers later presented the movable floor plates as the penultimate stage of a complete dematerialization of the building

---

<sup>104</sup> Of the later Instant City airship, Herron and Cook mocked “Ha Ha! are we back to heroics then? The giant, pretty, emotionally evocative object, the Blimp, the airship, the beauty-and-disaster history. Back to the heroic and beautiful object?” (Ibid.)

<sup>105</sup> Davies, Abbot, and Stanton pointed out that the framework was specifically designed to support apparatus to service events in the piazza.(Abbot, Davies, and Stanton, “An Inside View.”)

<sup>106</sup> Rogers, interview.

limited only by technological progress. “We have not been able to go as far as we like [with the movable floors], of course. We are limited by money, by our own technology. But evolving technology could give us the tools we need to make a building disappear altogether if necessary. With hot, or cold, air curtains, electronic warning devices, and so on, there are no needs for walls, partitions. We only have to keep the weather out.” Rogers went on: “As I have said, we even have grave doubts that a building is really needed on this site... Probably the correct answer to the competition would have been to propose a large open space of grass, flowers, and trees.”<sup>107</sup> If Silver was right in claiming that a telephone conversation could be architecture too,<sup>108</sup> the serviced shed raised the stakes by proposing a kind of meta-architecture inside which the finer-grain architecture of the telephone conversation might unfold.

Albert Meister’s 1976 science fiction novel, *The So-called Utopia of the Centre Beaubourg*, posited the existence of an underground counter-utopia, directly below the Plateau Beaubourg, of the same volumetric extents as Piano and Rogers’ building.<sup>109</sup> “A concrete slab would divide two cultural universes,” the underground one an anonymous slab/space “without any architectural singularity” serviced with “circulation systems for

---

<sup>107</sup> Peter Rawstone, “Piano & Rogers: Centre Beaubourg,” *Architectural Design* 42, no. 7 (1972): 407. This was a clear tribute to the ideas in Reyner Banham and François Dallegret, “A Home is Not a House,” *Art in America* (April 1965).

<sup>108</sup> Nathan Silver, “Architecture without Buildings,” in *Meaning in Architecture*, ed. Charles Jencks and George Baird (Braziller, 1969).

<sup>109</sup> Meister published his book under a pseudonym. Gustave Affeulpin, *La soi-disant utopie du Centre Beaubourg* (Paris: Éditions Entente, 1976). It has recently been translated as Luca Frei, *The So-called Utopia of the Centre Beaubourg: An interpretation* (Paris: Éditions Entente, 1976).

people and fluids” and providing spaces only for production, not for “representation.”<sup>110</sup> “There are another 53 levels underneath this one, all equipped like this... which means they are illuminated and ventilated [artificially] but without division walls, apart from the toilets (laughter).”<sup>111</sup> “Neither chairs, nor desks, nor tables, nor ashtrays: people themselves would have to decide on the eventual usefulness of any furniture of equipment.”<sup>112</sup> Here Meister could be easily be describing Foster’s IBM building or Newport School project, or even Ehrenkrantz’s SCSD. According to Rem Koolhaas, the unprecedented capacity of “bigness” for programmatic (and therefore social) reorganization in buildings like the Centre Pompidou was made possible by a series of conceptual and technological breakthroughs: the elevator, air conditioning, steel, electricity, new infrastructures that had the effect of “randomizing circulation, short-circuiting distance, artificializing interiors, reducing mass, stretching dimensions.”<sup>113</sup> But the spaces of the shed were unlike the “typical plan” of the American corporate office building, which held within its organization the latent potential for hierarchical organization based on proximity to windows, a residual vitalism of modernism that privileged air and light.<sup>114</sup> In contrast, the serviced shed moved everything underground

---

<sup>110</sup> Ibid., 16.

<sup>111</sup> Ibid., 19.

<sup>112</sup> Ibid., 17.

<sup>113</sup> Rem Koolhaas, “Bigness, or the problem of Large,” in *S,M,L,XL* (New York: Monacelli Press, 1995), 498.

<sup>114</sup> Koolhaas, “Typical Plan.”

(either literally or virtually) in a mechanically ventilated and artificially illuminated egalitarian space.<sup>115</sup>

As Banham himself noted, the internal contradictions of megastructure made it unacceptable as a form of critical action by left-leaning radicals. “For the flower-children, the drop-outs of the desert communes,” as well as “the art-school radicals and the participants in the street democracies of the *événements de Mai*, megastructure was an almost perfect symbol of liberal-capitalist oppression” because it continued the “ancient architectural dream of imposing a grand order on a disorderly world.”<sup>116</sup> Piano and Rogers’ building contained the residue of this grand order. Rogers later noted that as an extrusion open at both ends, it gives the impression of the potential for infinite extension encompassing the globe (like Superstudio’s 1969 Infinite Monument had done). “The Centre seems large to me, perhaps too large,” he later reflected. “It carries the mark of the 1960s and its appetite for conquest as if the entire world should be architecture.”<sup>117</sup> But this effect of physical growth was being replaced by a more virtual model. Rogers observed that “the stakes have changed since the era of its construction. Today, it is no longer a matter of extension but of communication. From the start, the Centre was to be linked to other spaces, museums, universities, civic centers. This initial imperative must now be reassessed in terms of communication rather than [physical] extension.”<sup>118</sup> The

---

<sup>115</sup> In this sense it is closer to Archizoom’s No-stop City project.

<sup>116</sup> Banham, *Megastructure*, 209. For a discussion of Banham’s reflections on the rejection of megastructure by the avant-garde see Felicity D. Scott, *Architecture Or Techno-utopia: Politics After Modernism* (Cambridge, Mass.: MIT Press, 2007), Introduction.

<sup>117</sup> Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 40.

<sup>118</sup> *Ibid.*

shed provided a model because it encapsulated infinite change within a limited and (in comparison to earlier megastructures) modest volume. At Beaubourg, the megastructure came full circle to meet its antithesis—the mega-shed. Banham argued that a building containing a single vast room (he used the example of the Vertical Assembly Building at Cape Canaveral, “big enough to contain its own weather”) is not megastructure “because of its singleness of function and image.”<sup>119</sup> Functional multiplicity was housed within a building whose development converged within a “singleness of image” in which the fixed plateaux replaced the mobile mezzanines of the Fun Palace.

Despite the arguments of the architects that the principle façades of the shed created a kind of perceived transparency, these surfaces allowed users to see out but not in, and so they mimicked the behavior of the mirrored curtain wall, which Jameson later identified as emblematic of an architecture of late-capitalism.<sup>120</sup> The drawing of the crowds and circulation systems into the space of the matrix facade created a kind of cognitively generated reflectivity that mirrored the building’s urban environment. Unlike Norman Foster’s 1971 temporary IBM Pilot Head Office at Cosham, in which literally reflective glass surfaces blur the distinction between the artifice of the prismatic box and its bucolic surroundings (Figure 3.24), Piano and Rogers created what could be called a “phenomenal reflectivity.”<sup>121</sup>

---

<sup>119</sup> Banham, *Megastructure*, 7.

<sup>120</sup> Fredric Jameson, “Postmodernism, or The Cultural Logic of Late Capitalism,” *New Left Review*, no. 23 (August 1984).

<sup>121</sup> The possibility of a contrast between literal and phenomenal reflectivity is a play, of course, on Rowe and Slutzky’s conceit of literal versus phenomenal transparency.



## Chapter 4: From Functionalism to Functionality

*Starting in 20th century, program starts to be evaluated not just quantitatively but qualitatively. This is due partly to increased complexity of projects (making them “more susceptible to qualitative generalization and evaluation”) but also to a general social and psychological change in our time.<sup>1</sup>*

—John Summerson, *The Case for a Theory of Modern Architecture* (1957)

While Piano and Rogers were drawing up their competition scheme, Lombard and his team—Programmation et études—continued to work with the managers of the various departments to further rationalize and account for their future needs. Programming was central to the entire Beaubourg enterprise, and from the client’s perspective, it was one of the main techniques by which the “live center of information” might actually be realized. Architectural programming, as practiced by Lombard’s team, had never before been applied to a high-profile cultural building. As a systematic problem-solving activity, programming emerged only in the late-1950s as a new, primarily American architectural technocracy concerned with design process and human factors.<sup>2</sup> It was shaped on the one hand by a self-conscious interrogation of the process of design that questioned received ideas about the relationship between authorial intention and form, and on the other, by the absorption into the architectural discipline of a remarkably wide range of outside influences—the rise of computers and the resulting need for explicitness of inputs and expected outputs, practices of advocacy planning in which user participation was sought

---

<sup>1</sup> John Summerson, “The Case for a Theory of Modern Architecture,” *RIBA Journal* (June 1957): 307-310. Reprinted in Joan Ockman, ed., *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Rizzoli, 1993).

<sup>2</sup> Surprisingly little has been written on the history of programming in architecture. For an outline history of postwar methods of programming, see Edith Cherry, *Programming for Design: From Theory to Practice* (John Wiley and Sons, 1998).

as an input to design problems,<sup>3</sup> and a view of the built environment as a complex organism regulated by information flow.<sup>4</sup>

The architectural program, as a basic accounting of a building's functional needs, had always existed in one form another. As formalized at the École des Beaux-Arts the program identified a site and provided a list of rooms that the project should include, and such lists were essentially an anticipation of the room types (reception room, gallery, ballroom, winter garden, etc.) that one would expect to see in the final plan.<sup>5</sup> The architect's job was to arrange these fundamental building blocks into an agreeable composition: that the building required these particular functions was a foregone conclusion. The Beaux-Arts program thus constituted a kind of textual analog of the plan drawing, and so, despite its functional connotations, the program was part and parcel of the academic baggage from which Modern architecture sought to rid itself.

---

<sup>3</sup> Davidoff and Boudon are among the seminal works in this area. See Paul Davidoff, "Advocacy and Pluralism in Planning," *Journal of the American Institute of Planners* (1965); Philippe Boudon, *Lived-in Architecture: Le Corbusier's Pessac Revisited* (MIT Press, 1972).

<sup>4</sup> Architectural Design was the principle medium for the broad popularization of Cybernetic thinking in British architecture. Its "Sector" column reprinted cybernetician W. Ross Ashby 1969 paper in which he declared that, "every coordinated activity, whether in the movements of a tight-rope walker's limbs, or in the traffic-flows of a big city, requires an internal flow of information between the parts being coordinated." (W. Ross Ashby, "Information flows within coordinated systems," *Architectural Design* 39 (1969).)

<sup>5</sup> See for example, the full program written in 1866 for "A Town House in Paris for a Rich Banker", transcribed in Arthur Drexler, ed., *The Architecture of the École Des Beaux-arts* (Cambridge, Mass.: MIT Press, 1977), 507 n111. For a discussion of program at the Beaux-Arts, see Annie Jacques, "The programmes of the architectural section of the Ecole des Beaux-Arts, 1819-1914," in *Beaux Arts and Nineteenth Century French Architecture*, ed. Robin Middleton (Thames & Hudson Ltd, 1984), 280.

“The architect’s program” was put back on the table in a new light by John Summerson in 1957 in his famous essay, *The Case for a Theory of Modern Architecture*.<sup>6</sup> There, Summerson defined program as “a description of the spatial dimensions, spatial relationships, and other physical conditions required for the convenient performance of specific conditions.” Summerson argued, as Banham had, that the residual Palladianism and other regressive forms in Modern architecture was testimony to its incomplete transition from academicism to a fully contemporary, rational practice. For architects wanting to find the true “unity of Modern architecture,” as he put it, the answer lay in the program, which extracted ideas of the social from Modernism’s form-function problematic.

But if Summerson sought a place for program within architecture’s disciplinary problems, postwar programming would locate it elsewhere. During the early 1960s, the rise of programming marked the emergence of a new architectural subject: the user.<sup>7</sup> It also paralleled the rise of the “Human Factors” and “Ergonomics” movements in design culture.<sup>8</sup> In 1955, the industrial designer Henry Dreyfuss laid out his systematic approach to human factors in what would be his manifesto, *Designing for People*.<sup>9</sup> For Dreyfus, the user was the starting point for any design. The new science of the user shifted the

---

<sup>6</sup> Summerson, “The Case for a Theory of Modern Architecture.” For an analysis of Summerson’s view of program see Anthony Vidler, “Toward a Theory of the Architectural Program,” *October*, no. 106 (2003): 59-74.

<sup>7</sup> Habraken, Friedman, Team 10, and others placed the user front and center, and in 1969, Philippe Boudon published his famous study, using the techniques of the social sciences, of the changes wrought by users to Le Corbusier’s Pessac housing. (Boudon, *Lived-in Architecture*.)

<sup>8</sup> The first issue of *Ergonomics*, the official journal of the Ergonomics Research Society, was published in 1957, the same year as Summerson’s essay.

<sup>9</sup> Henry Dreyfuss, *Designing for People* (New York: Grossman Publishers, 1974).

emphasis from Functionalism's alignment of physical space with human activities to the detailed measurement of the total human-machine system. According to Dreyfuss, the job of the designer "is to make Joe and Josephine compatible with their environment."<sup>10</sup>

Where Taylorist methods brought physical space into alignment with predetermined activities, postwar ergonomics embraced the very undecidability of the user's spatial conditions. As Simon Sadler has noted, "Previously regarded as an inconvenience to the rational functioning of society and space, human variables offered a new challenge for progressive architecture."<sup>11</sup> Unlike the anonymous Taylorist subject, Joe and Josephine had names and faces: like Quetelet's *homme moyen*, they are concretely real (in that they are constituted from data) yet correspond to no specific individual.<sup>12</sup> More importantly, perhaps, Joe and Josephine had not only physical demands but psychological preferences and tastes.

Scientific programming was the primary avenue by which this new subject entered architectural discourse. The late 1960s saw the formal introduction of programming into the technical literature, predominantly through the work of the American firms<sup>13</sup>. It was aimed at large bureaucratic clients and at expansive, repetitive

---

<sup>10</sup> Ibid., 25. Dreyfuss refers to the user as "Joe and Josephine," a reference to the male and female figures in their wall-charts festooned with dimensions.

<sup>11</sup> Simon Sadler, "The Indeterminate Utopia," *Architectural Design* 71, no. 3 (2001): 89.

<sup>12</sup> Dreyfuss recounts how the office converged on the final representation for these figures, moving from the generic stick figure to pictorial detail. (Dreyfuss, *Designing for People*, 23.)

<sup>13</sup> Early articles on programming include William M. Peña and William W. Caudill, "Architectural analysis: Prelude to good design," *Architectural Record*, no. May (1959); Harold Horowitz, "The Program's the Thing," *ALA Journal* (May 1967): 94-100; Edward J. Agostini, "Programming: demanding speciality in a complex world," *Architectural Record*, no. September (1968).

projects (offices, schools, hospitals, housing).<sup>14</sup> Its user-oriented methods, such as interviews and post-occupancy evaluation promised a truly scientific solution to the functionalist agenda of modernism.<sup>15</sup> Programming in the form that we know it today was developed by primarily by one firm, Caudill Rowlett Scott (CRS) in College Station, Texas.<sup>16</sup> In 1959, William Peña and William Caudill published an article *Architectural Record* in which they introduced programming as a new technique available to architects.<sup>17</sup> The program was no longer a given, handed to the designer as the starting point of a project, but rather a process that was the first step in the architect's problem-solving mandate. Its key principle was the suspension of any preconceived notion of the solution until as late as possible in the process: it was a matter of understanding the problem domain independently of the possible range of material or organizational solutions. Indeed, the very essence of programming was this suppression of preconceived solutions, and it is a principle that it shared with Systems Engineering. (The extent to which this was possible or not is another matter, as Colquhoun later pointed out.<sup>18</sup>)

---

<sup>14</sup> Wolfgang F. E. Preiser, *Programming the Built Environment* (Van Nostrand Reinhold, 1985), 3.

<sup>15</sup> Hashim Sarkis, "The Paradoxical Promise of Flexibility," in *Le Corbusier's Venice Hospital*, ed. Hashim Sarkis, Case (Prestel, 2001), 82. By the early 1970s, methods such as programming were part of a movement to introduce the methods of the social sciences into architecture. See, for example, Donald Conway, *Architectural design and the social sciences* (American Institute of Architects, 1974).

<sup>16</sup> For a detailed if uncritical history, see Jonathan King and Philip Langdon, *The CRS Team and the Business of Architecture* (Texas A&M University Press, 2002).

<sup>17</sup> Peña and Caudill, "Architectural analysis: Prelude to good design." Peña expanded many of the ideas in William M. Peña, *Problem Seeking: New Directions in Architectural Programming* (Houston: Caudill Rowlett Scott, 1969). Subsequent editions were published by the AIA.

<sup>18</sup> Alan Colquhoun, "Typology and Design Method," *Perspecta* 12 (1969): 71-74.

Programming, as defined by Peña et al, was based on two main activities: an analysis of user requirements followed by the drafting of a specification for all aspects of the building's performance. The process started with the discovery of the problem to be solved, since all too often there was an assumed problem that hid the real one (as Price also pointed out).<sup>19</sup> Programme was therefore much more than a list of requirements: it identified new ways of inhabiting and occupying the future building.<sup>20</sup> This new definition of programming was extremely broad: it encompassed not only the specification for the building's space requirements but the totality of its functional performance, and went beyond even that to include the scheduling of events, opening hours, etc. At Beaubourg, the primary doctrine of *Programmation* was that a solution should be sought in one or any combination of architectural space, personnel, furniture, and equipment.<sup>21</sup> Indeed, the architectural team later correctly saw the program as “virtually a performance specification for the whole building.”<sup>22</sup>

The focus on performance and the concomitant suspension of any preconceived solution or prior forms suggested that architectural programming was a close relative of Systems Engineering, a new discipline that emerged in parallel to programming and that had grown out the broader discipline of Organization Theory that traced its roots back to

---

<sup>19</sup> Dreyfus had already proposed this approach; in his practice, every design project sees the world anew. So, for example, the designers of a new model of sewing machine take sewing classes in order to not only familiarize themselves with this exotic domain, but equally important, to clear their minds of preconceived solutions. Dreyfuss, *Designing for People*, 107.

<sup>20</sup> At Beaubourg, for example, the client had not foreseen the need for children's areas but programming made them happen. (Patrick O'Byrne, personal interview, April 2008.)

<sup>21</sup> Patrick O'Byrne, personal interview, November 2, 2007.

<sup>22</sup> L. Abbot, M. Davies, and A. Stanton, “An Inside View,” *Architectural Design* 47, no. 2 (1977): 140-151.

late-19<sup>th</sup> century practices of scientific management. Systems Engineering applied ideas from Cybernetics and Systems Theory to a holistic approach to the design of complex systems that challenged the reductivism of Taylor and other earlier models.<sup>23</sup> According to the doctrines of systems thinking, the building, its contents, and its users constituted a cohesive, complex system.<sup>24</sup> As a species of systems thinking programming followed what would become the canonical procedure of systems analysis:

1. Enumerate objectives for the system
2. Generate alternative systems
3. Evaluate alternative systems
4. Select a final system

Both architectural programming and, more generally, Systems Engineering followed this method, and it was the method followed by Ehrenkrantz in the SCSD work.<sup>25</sup>

---

<sup>23</sup> The classic overview of the field is Herman A. Affel, "System Engineering," *International Science and Technology* (November 1964): 18-26. On systems engineering as a form of utopian thinking see Robert Boguslaw, *The New Utopians, a Study of System Design and Social Change* (Englewood Cliffs, N.J.: Prentice-Hall, 1965). For an early and important discussion of systems engineering in the field of design methods, see Daniel Brand, "Systems Engineering: Definitions, Working Hypotheses, and Examples," in *Emerging methods in environmental design and planning: Proceedings of the Design Methods Group first international conference, Cambridge, Massachusetts, June 1968*, ed. Gary T. Moore (Cambridge, Mass.: MIT Press, 1970).

<sup>24</sup> Michel Bezman, with whom members of Lombard's programming team earlier worked, describes a school building as follows: "The schoolplant was approached as being a system by itself, defined as an environmental system, whose various integrated sub-systems perform static or active functions in order to create a specific environment." (Michel Bezman, "The 'Recherches en Aménagements Scolaires' (R.A.S.) Project - A case study - Strategy implemented for the development of a building system for educational facilities through the Performance Concept," in *Performance Concept in Buildings*, vol. 1 (presented at the Symposium on Performance Concept in Buildings, Philadelphia: National Bureau of Standards, Department of Commerce, 1972), 320.)

<sup>25</sup> White outlined the details of just such a method as it was applied at SCSD in Joseph C. White, "The Systems Approach: Steps in Generating a System," *Industrialization Forum* 1, no. 3 (April 1970): 5-10.

## Programming at Beaubourg

François Lombard brought scientific programming to the complex problem of Beaubourg. Lombard had been working in the Direction d'architecture at the Ministry of Culture, where he worked as a programmer for planning the Villes Nouvelles.<sup>26</sup> Building on the tenets of American programming research, Lombard proposed a group, Études et programmation, that would not only manage user requirements and space allocations but would be deeply involved in the design process. To build this team, Lombard turned first to Patrick O'Byrne, a family friend who had been working on editing performance specifications for a small engineering firm in Montréal (where Bezman, cited earlier, also worked) that went by the imposing name, l'Institut de recherches et de normalisations économiques et scientifiques (IRNES). Along with Ehrenkrantz, IRNES was one of the small group of firms funded by the Ford Foundation's Educational Facilities Laboratory.<sup>27</sup> Although its work for the Montréal Catholic school board was less photogenic than the techno-utopian projects going up at the Expo 67 site across the river, it shared the same concerns with indeterminacy, change, and flexibility. Lombard saw that the programming methods developed in the Ford research, until then limited to anonymous, industrialized building types, were applicable to Pompidou's prestigious cultural center and so he persuaded O'Byrne to return to Paris with him to form—along

---

<sup>26</sup> Skander Nouria, "Hommage à François Lombard," *Les Correspondances: Bulletin étudiant de l'ESA*, no. Winter (2005). In the October-November 1969 issue of *L'architecture d'aujourd'hui* dedicated to the Villes nouvelles, all of the projects included a programmer in the list of project team members.

<sup>27</sup> For a report on the work of IRNES for the Ford EFL see John R. Boice, *RAS: Recherches en Amenagements Scolaires*, Building Systems Information Clearinghouse Newsletter (Stanford, Calif: Systems Division, School Planning Laboratory, Spring 1969), [http://archone.tamu.edu/CRS/engine/archive\\_files/EFL/6000.1305.pdf](http://archone.tamu.edu/CRS/engine/archive_files/EFL/6000.1305.pdf).



with H el ene Dano, Serge Vanneyre, and Jacques Lichnerowicz—the core of the  tudes et programmation group (Figure 4.1).

Lombard later laid out his views on programming in two articles, in French in *L'Architecture d'aujourd'hui*, and in English in *Industrialization Forum*, an obscure technical journal dealing with issues of industrialized building.<sup>28</sup> There, Lombard argued that the programmer is more than a specialist consultant.<sup>29</sup> Like the architect, the programmer must have skills “in psycho-sociology, to establish behavioral criteria; in organization, for the functional criteria; in urbanism, architecture and technology, for the environmental criteria.” Lombard added, “[t]his control is not a negative action only; it can stimulate the design and ensure an interaction between brief and project, even if some of the givens in the brief have to be modified.”<sup>30</sup> Moreover, the programmer’s activities were homologous with those of the architect. “The activity of programming is continuous and goes on for the duration of the process that it structures, orients, motivates and controls.”<sup>31</sup> It is thus a mechanism for regulating the entire design and construction process.

At Beaubourg, the first matter of business was the preparation of the *Programme de base* that was included in the competition brief, starting with assembling a core group

---

<sup>28</sup> Fran ois Lombard, “La programmation en architecture et urbanisme,” *L'Architecture d'Aujourd'hui* 44, no. 160 (1972): 4-10; Fran ois Lombard, “An Organized Process for Programming—Application to the Centre Beaubourg,” *Industrialization Forum* 5, no. 5 (1974): 31-35.

<sup>29</sup> By 1985, a new law—loi MOP (Ma trise d'ouvrage publique)—made hiring a programmer obligatory for public projects and made it illegal to be programmer and architect in same project. Lombard had a role in promoting this law. (H el ene Dano-Vanneyre, personal interview, April 2008.)

<sup>30</sup> Lombard, “An Organized Process for Programming—Application to the Centre Beaubourg,” 33.

<sup>31</sup> *Ibid.*, 32.

of expert users—the managers of the future departments (see Chapter 1 in this study)—with whom *Programmation* would work throughout the process. These expert users were known as *utilisateurs*, while anonymous visitors were known as *usagers*. In turn, *usagers* were subdivided into a number of types: children, technicians, local residents, managers, painters, curators, etc. Where *Programmation* worked directly with the *utilisateurs*, working with *usagers* required development of an elaborate set of interviews and information gathering mechanisms along with “simulations” that attempted to mitigate their anonymity.<sup>32</sup> By July of 1970, *Programmation* in collaboration with the *utilisateurs* drafted the program that formed the basis of the competition brief. But while the competition process unfolded, *Programmation* and the *utilisateurs* continued their work, with the goal of arriving at a more detailed program that would be correlated with the winning scheme immediately after the competition. As a result, by the time of the judging the program and requirements had become more detailed and thus the criteria for judging the entries were even more precise than those outlined in the detailed brief, suggesting that the winning scheme, whichever it might be, would be already obsolete by the time a winner was announced.<sup>33</sup> Work on the Programme spécifique followed two main threads: architectural-technical programming (spatial areas and adjacencies, performance criteria for air-handling and structural systems) and equipment programming (computer systems, conveyor systems, loading equipment, furniture, etc.). By the time Piano and Rogers

---

<sup>32</sup> As Lombard noted, “The ultimate user (the public) is more difficult to deal with: to identify his behavioural requirements, it is only possible to draw on simulation experiments, surveys, and similar experience elsewhere.” (Ibid., 33.)

<sup>33</sup> The Programme spécifique is dated June 1971, one month before the judging.

started work on the Avant projet sommaire in the autumn of 1971, Lombard's team had developed a program for architecture and another for equipment and systems—two huge volumes of detailed diagrams and tables that made the competition brief look schematic and rudimentary.

The first steps for the architects in developing the Avant projet sommaire therefore involved the careful coordination of the latest program with the competition scheme. The architects met daily with Lombard and his team during tedious process of matching the constantly changing requirements to the constantly changing building design.<sup>34</sup> It was painstaking work, and the architectural team struggled to keep up (Figure 4.2). The programming work was then subdivided again, this time into four main areas: architecture/technical systems, equipment, operations (a kind of operating manual), and environment (used by the city and urbanists). The goal of this phase was the drafting of the Programme définitif, a document whose purpose was roughly that of the Projet définitif: it would be a primary input for the contract documents. The goal was not therefore a perfect translation of the brief into architectural documents from which bids could be requested, but rather the development of an architectural solution that was relatively open along with a set of program documents that, taken all together, formed a performance specification to which contractors would respond with bids and museum curators with exhibition designs. The architectural solution was meant to remain open as long as possible to support continually changing and emerging needs. Even as

---

<sup>34</sup> Stanton and Franchini worked closest with Lombard's team. (Richard Rogers, telephone interview, June 2009. See also Jean-Pierre Seguin, *Comment est née la BPI: Invention de la médiathèque* (Paris: Bibliothèque publique d'information, Centre Georges Pompidou, 1987), 66.)

construction started, teams forming the future departments started to assemble in the offices of the Blvd de Sébastopol to start conducting “préfigurations” and “simulations” to test and discover new activities.<sup>35</sup> The final job of *Programmation* was the organizing of pre-commissioning simulations that prepared the managers to take over the building.

As a species of Systems Engineering, programming assumed that the first step in the attack on the problem-space was its decomposition into subsystems. To Lombard, the program described a set of social functions, each of which could be defined by a set of specific activities centered on exchange of one sort or another. Each of these primary social functions made up what he called, in characteristic fashion, an “ensemble mathématique.”<sup>36</sup> The programmer’s first task was the translation of these functions into subsystems and the identification of the relations between them.<sup>37</sup> Tying these subsystems together were, as Lombard put it, “the organic or ‘nervous’ systems which supply the building with fluids and energy; the transport and handling systems; the communications and information systems; the screening systems, the support and display systems; signage, security, supervision, [and] control.”<sup>38</sup>

The building’s activities fell into three main categories:

The function of welcome and information (A), brings together the activities that provide a link between the Centre and the neighborhood,

---

<sup>35</sup> The Atelier des enfants was one of the activities that emerged during this process. (See figure in Germain Viatte, *Le centre Pompidou: Les années Beaubourg* (Paris: Gallimard, 2007), 26.)

<sup>36</sup> Lombard, “La programmation en architecture et urbanisme,” 4.

<sup>37</sup> François Lombard, “Elaboration du programme spécifique”, n.d., 5, 1992037/001, Archives CGP.

<sup>38</sup> Lombard, “An Organized Process for Programming—Application to the Centre Beaubourg.”

and—inside the Centre—between the various sectors. The function of presentation and exchange (B), allows the public to come into contact with artistic creation at different stages and in different forms. The logistic function (C), ensures the Centre's functioning.<sup>39</sup>

Activities were identified by classifying the beneficiary of the exchange, the object of exchange (artwork, musical performance, document), the manner in which the exchange is transacted, the necessary personnel to support the exchange, and the spatial context of the exchange.<sup>40</sup> Inevitably, many of these activities coincided with a priori departmental categories (“museum”, “library”), but many new activities were also proposed (for example, the “Salle polyvalent” and “Salle d’actualité”).

This approach demanded a rethinking of modes of architectural representation. The rudimentary bubble diagram in the competition brief was transformed into a novel graphic language for representing exchange and information flow, a unified language for the representation of interactions between people, spaces, objects, and documents. The danger of pictorial representation was that it encouraged the use of prior solutions. Even in the program text, innocuous terms like “library,” “civic center,” or even “city” were risky because they imposed prejudice and bias on positivist problem-solving. Instead, the design of a complex systems could only be achieved, as Raymond Studer put it at the time, “by developing an entirely new taxonomy of problem formulation.”<sup>41</sup> The graphic attack on the problem involved defining a taxonomy of interactions such as desirable and

---

<sup>39</sup> Ibid., 36. Parking (D) was included within the “logistic function” (C), which also included security and IT systems.

<sup>40</sup> Lombard, “Elaboration du programme spécifique.”

<sup>41</sup> Raymond G. Studer, “On Environmental Programming,” *Arena* (May 1966): 293.

undesirable views, flows of people, goods, and documents, and sound isolation. It then involved analyzing each activity, mapping out the interfaces and flows by which it cohered. Once each activity was sufficiently well defined, the programming team described interfaces between one activity and another and developed a graphic system for mapping the flow of objects and information between activities. The most ambitious and complex of the diagrams in the Programme spécifique are those visualizing the “functional groupings” corresponding to the functional clusters in the program’s table of activities (Figures 4.3, 4.4, 4.5). Through their colorful, curvilinear forms permeated with notations representing flows of people, information, and materials, these diagrams gave compelling visual form to Lombard’s doctrines. Their curvilinear forms and web of interconnections attempted to show architectural relationships without specifying architectural form—consciously avoiding rectilinearity so as not to compete with the architecture, as one member of the team put it<sup>42</sup>—their shapes connoting a kind of child-like innocence as if seeing the world anew.

In these diagrams, the curvilinear boundary lines that define activities represent not walls but interfaces. The resulting taxonomy of interfaces included both material and immaterial attributes—the invisible protocols by which administrative or social behavior coagulated and at the reification of those agreements through visually, acoustically, as well as the physically permeable, semi-permeable, and impermeable boundaries (Figures 4.6, 4.7). Interfaces were catalogued by the nature of the agents they mediated (people and machines, people and artworks, documents and archives), the specific quality or

---

<sup>42</sup> Dano-Vanneyre, interview.

parameter being controlled or exchanged (natural light, views, access privileges), the degree to which the interaction was required or desired, and the degree of allowed overlap (adjacent, partially overlapping, embedded). This taxonomy of interfaces also included a representation of flows across the boundaries between activities. Each type of flow had a direction (non-directional, unidirectional, bidirectional), actors and objects (people, information, artworks, food, cars, natural light, views), and qualities (unrestricted, restricted, high-density, low-density). Translucent black line drawings of subsystems such as telecommunications and flows of materials could be overlaid onto the colorful base drawings (Figures 4.8, 4.9). Additional graphs tracked these flows through the institution, and flows of visitors, information, documents, artworks, equipment, even garbage and waste, were rendered equivalent and subject to the same analytical and organizational regimes (Figures 4.10-4.13). *Programmation* was careful to avoid suggesting a broadcast of information from center to periphery: the audio-visual material flows, for example, showed interactions between activities that flowed in two directions: read left-to-right, an item is ingested into the information center, processed, and exhibited internally; read right-to-left, an item is produced within the information center, packaged, and disseminated to the outside (via, for example, mail-order sales). Interfaces between activities were thus conceived as including both boundary surface and flows across it, qualitatively defined and materially reified.

The diagrams of the Programme définitif borrowed heavily from principles of graph theory and interaction matrices, which in Systems Engineering allowed designers

to visualize complex relationships between parts of a system.<sup>43</sup> Connected graphs describe a finite set of nodes (represented by circles) symbolizing any object of concept in particular domain—the irreducible parts of a large-scale system<sup>44</sup>—and a finite set of connections between them (represented by lines), which can be labeled with a qualitative or quantitative weight and which can be given arrows to indicate a direction for the relationship (Figure 4.14). Systems engineers recognized early on the value of graphic representation over tabular representation; in particular, graphs like the Beaubourg programming diagrams made apparent relationships that were much more difficult to excavate from tabular data, such as indirect relationships in which a node is related to another via a middleman. The first-order relationships were obvious and could generally be identified by talking to users and other stakeholders. Second-order relationships, in which a department might be related to another in an organization via a third intervening one, were much harder to discern since nobody “on the ground” had the viewpoint that saw these globally. At Beaubourg, where interdisciplinarity and synthesis were central to the idea, these sorts of second- and third-order relationships were crucial: anyone could see the connection between a music performance lab and a contemporary art museum, particular at that time of cross-disciplinary artistic practices, but who could see more subtle emergent relationships such as the connection of music lab to industrial design gallery through the intervening relationship of IT services?

---

<sup>43</sup> For a detailed discussion see the chapter on graphs and diagrams in Andrew P Sage, *Methodology for Large-Scale Systems* (New York: McGraw-Hill, 1977).

<sup>44</sup> *Ibid.*, 13.



The application of graph theory to architectural design was launched by Christopher Alexander in 1964<sup>45</sup> and was embraced by Negroponte, Friedman and Price among others.<sup>46</sup> In a 1970 article in *Architectural Design* summarizing his book of the same year, Jean Cousin characterized the application of graph theory to architecture as a “topological” as opposed to “geometrical” approach to spatial organization. In such a graph, “points are taken to represent architectural spaces, lines connecting the points indicate a common border of limit between these spaces.” (Figures 4.15, 4.16)<sup>47</sup> For believers like Cousin, this topological approach offered an alternative to the appeals to intuition and geometry when dealing with the complexity of the design of complex environments. It also made the physical environment computable, and therein lay its almost magic power. Topological organizational schemas, by virtue of their representation in the nodes and edges of graphs, were easily ingested into recently developed computer graphics machinery.<sup>48</sup> At Beaubourg, however, the graphs were drawn by hand and any computational processing for which they were intended was done by humans, not computers.<sup>49</sup> Indeed, the approach was deliberately slow, low-tech and

---

<sup>45</sup> Christopher Alexander, *Notes on the Synthesis of Form* (Harvard University Press, 1964).

<sup>46</sup> Nicholas Negroponte, *The Architecture Machine* (M.I.T. Press, 1970); Yona Friedman, *Toward a Scientific Architecture*, trans. Cynthia Lang (MIT Press, 1975).

<sup>47</sup> See figure in Jean Cousin, “Topological Organization of Architectural Space,” *Architectural Design* (October 1970): 491.

<sup>48</sup> For a discussion of ideas of computability of diagrams at the time, see Anthony Schnarsky, “Some computer-aided approaches to housing,” in *Proceedings of the June 1971 design automation workshop on Design automation - DAC '71* (presented at the the June 1971 design automation workshop, Atlantic City, New Jersey, United States, 1971), 491.

<sup>49</sup> Hélène Dano-Vanneyre recounts that the graphs were spontaneous, not based on any theory beyond those of programming in general. She was asked by Lombard to do them because she had just finished architecture school and could draw. (Dano-Vanneyre, interview.)

handmade, allowing sufficient time and a sufficiently vague language for the users and architects to reflect on their prior assumptions. Yet the diagrams shared the conviction of promoters of computable versions of graphs that such representations would allow previously unforeseen solutions—either latent or synthesized anew—to emerge by releasing problem-solving from the grip of geometric thinking.

Given the success with which Piano and Rogers' scheme adapted to the needs of *Programmation*, it was therefore paradoxical that it seemed based in a rational, geometric approach. How exactly then did the topological graph relate to the architectural plan?<sup>50</sup> Cousin described the relationship between graph and form in the topological approach through a simple pair of diagrams, the first representing a graph of two spaces and their relationship, the second a plan of the actual spaces (Figure 4.17).<sup>51</sup> The graph is not homologous with the plan. Where the graph shows a linear element linking two nodes, the plan shows the “common limit” surface between the two spaces running 90 degrees to the connection between nodes. The graph thus describes the quality and attributes of the spatial boundary as it is transgressed, not the geometry of the boundary itself, and it was

---

<sup>50</sup> The opposition of topology to geometry in architecture was, of course, the subject of Reyner Banham's famous essay of fifteen years earlier. There, Banham proposed a somewhat literal connection between the topological figure and architectural organization. On the Smithsons' Sheffield University scheme Banham wrote, “Composition might seem pretty strong language for so apparently casual a layout, but this is clearly not an ‘unconceptual’ design, and on examination it can be shown to have a composition, but based not on the elementary rule-and-compass geometry which underlies most architectural composition, so much as an intuitive sense of topology. [...] As a discipline of architecture topology has always been present in a subordinate and unrecognized way—qualities of penetration, circulation, inside and out, have always been important, but elementary Platonic geometry has been the master discipline. Now, in the Smithsons' Sheffield project the roles are reversed, topology becomes the dominant and geometry becomes the subordinate discipline. The ‘connectivity’ of the circulation routes is flourished on the exterior and no attempt is made to give a geometrical form to the total scheme; large blocks of topologically similar spaces stand about the site with the same graceless memorability as martello towers or pit-head gear.” (Reyner Banham, “The New Brutalism,” *The Architectural Review* (December 1955): 361.)

<sup>51</sup> Cousin, “Topological Organization of Architectural Space,” 491.

precisely this relationship that the Beaubourg diagrams suggested. Indeed, *Programmation* went to great pains to make it clear that walls are only one way of reifying the boundary surfaces shown on the diagrams. It should also be noted that the diagrams were three-dimensional matrices, not plan drawings, so that two lobes making up one activity might represent spaces that were in separate floors in the final building, and the arrow between them represented not a door or corridor but an elevator or stair. The “organic” forms in the diagrams are merely an accident of technique. Their computational logic is an intermediary, invisible one, whose effects on architectural form are indeterminate and ultimately undecidable since both rectangular spaces and organic unfolding shapes are both valid formal outcomes of the graph’s topological logic.<sup>52</sup>

The complex relationship between program diagram and architectural form is most clearly seen in the schematic sections (Figures 4.18, 4.19). Drawn as part of the process of matching the programmatic requirements to the building design, these sections show the great degree of sympathy between the activities of programming and the direction taken by the Piano and Rogers. There is no apparent architectural order beyond the column grid and floor planes: activities are fitted into the matrix as if solving a puzzle, and the resulting organization clearly divorces architectural form and programmatic signification since activities are housed following a logic of pure

---

<sup>52</sup> Cousin himself seemed confused on this point, and his article ends with an awkward meditation on the new organic forms that emerge from the more complicated graphs: “The reader may organize rectangular spaces if he wishes,” he correctly observes, but goes on to say that “[t]he general shapes of these drawings appear ‘organic’. It might be interesting to look at them in terms of some future inflatable structures or spaces. The artistically minded might find in the incredible number of unfolding shapes created by the composite diagram and its dual, some new topological art...”, before concluding, somewhat perplexingly, that “The future belongs to the computer.” (Ibid., 493.)

opportunism According to such a regime there was no possibility for any external volumetric representation of the program's inner logic. The clip-on facades and mezzanines were originally supposed to perform this signifying function.<sup>53</sup> The escalators were plugged into the facade to provide access but also to point to important programmatic activities behind the façade. But even this clip-on approach was too cumbersome to keep up with the constantly changing requirements. The ultimate solution—the three-dimensional matrix facades, with a relatively static vertical circulation system and interleaved circulation tubes and mechanical services—thus offered a solution that, while not physically mobile, created an interface between the visitor approaching from the city and network of activities housed inside.

The Beaubourg program diagrams lie halfway between topology and geometry, and this is their intelligence. Their agency lies in bridging the gap between their own visual language and architectural form. The diagrams attempted to reconcile the abstraction of the graph with the risks of architectural representation, and among their achievements was bringing visual form to practices of systems design and their abstractly mathematical discourses.

What was the role of the architect in programming's schema? In 1972, in the heat of the Beaubourg project, Lombard co-authored an article with Jean-François Sérís (an architect who had submitted a systems building to the competition (project 88)) that surveyed the status of industrialized building and synthesized French, American, and British

---

<sup>53</sup> See Chapter 2 in this study.

experiences into manifesto on systems building and its relationship to programming.<sup>54</sup> Like other contributors to Industrialization Forum, Lombard accepted without question the necessity for industrialized building; his article, however, was a defense of the systems approach at a tense time, when the results of the first wave of industrialized building were being assessed, frequently unfavorably, and when the initial momentum of programming at Beaubourg was dwindling. Lombard and Sérís' response was sweeping and utopian, and included a meditation on the role of the state in mitigating the effects of the Liberalization of the building industry in France during the postwar years—the so-called *trentes glorieuses*. At its heart was the problem that hardware-based approaches to industrialized building excluded the softer issue of user needs and requirements. This could be easily seen in the fact that industrialized building was dominated by two principles: the production run and dimensional standardization. In both, the central concern is the fabrication and assembly of material components based on the logic of standardized dimensions, and in both their attendant oversimplifications did not adequately address the conditions in 1972, with its fluctuating markets and complex new programs. What then was the role of industrialized building in a post-industrial society?<sup>55</sup>

According to Lombard and Sérís, the development of industrialized systems and their deployment in a building could be initiated in one of three ways: by a manufacturer

---

<sup>54</sup> François Lombard and Jean-François Sérís, “Industrialization and the User; the Case for a Center of Research and Practice,” *Industrialization Forum* 3, no. 4 (April 1972): 35-41.

<sup>55</sup> Today a similar critique can be found in discourses of mass customization. See, for example, the 2004 exhibition at the Centre Pompidou, “Architectures non standard,” curated by Frédéric Migayrou and Zeynep Mennan. More recently, see Mario Carpo, *The Alphabet and the Algorithm* (Cambridge, Mass.: MIT Press, 2011).

or builder in response to a call for bids, by a building owner in response to an identified need, or by a designer in response to a conventional architectural mandate. The first, in which components are manufactured based on general, speculative requirements and then marketed to the building owners and architects, fails because it aligns architecture with the logic of Fordism and the laws of supply and demand, which discouraged innovation and introduced the inevitable redundancies and inefficiencies inherent to any free-market system.<sup>56</sup> The third option—the systems project initiated by the designer—fails because the architect’s reliance on prior forms and types imposes upon solutions a preconception that holds back innovation.<sup>57</sup> So where the manufacturer focused too much on the marketing of hardware components and the designer was motivated too much by “idea”, only the second option could produce good results. In this preferred scenario, the building owner emerged as the unlikely hero, leading an interdisciplinary team to carefully program the requirements.<sup>58</sup>

Their proposed solution was to create what they dubbed “The Center for Research and Practice in the Industrialization of Building,” a utopian institution that would encapsulate the various facets of disciplinary expertise in the construction industry,

---

<sup>56</sup> This was no simple anti-Americanism: the French variant, according to Lombard, was far worse since while the Anglo-American model offered a wide range of flexible components, the French practice had the added disadvantage of marketing whole “models”—systems rather than parts—and was thus fatally resistant to change.

<sup>57</sup> Although Lombard grudgingly admits that “the advantage of this procedure is that it can allow an ‘idea’ to be applied, without too costly ‘pre-design’” and that “sometimes interesting results are obtained,” he criticizes this leap from idea to solution as bypassing the all-important step of careful programming. (Lombard and Séris, “Industrialization and the User,” 39.)

<sup>58</sup> As Lombard mentions (“Variants of this method has [sic] been used in the anglo-saxon countries, particularly for school-building programs”), this was the technique that was at the heart of the Ford EFL projects. (Ibid., 37.)

including architects. Programming was the glue, the core principle by which the information out of which “innovation” would be born could be created and flow. Clearly inspired by Lombard’s immersion at that time in the machinery of Beaubourg, this research center would do to the construction industry what Beaubourg would do to culture: it would propose new modes of authorship and collaboration based on the idea of a utopian information center. And like Beaubourg, it carved out a new role for the state within an overall theory of industrialized building.

The question remained as to what the appropriate scale or focus was for innovative research and where the architect could intervene. A systems building consisted of a four-level hierarchy: materials were arranged into components, components assembled into sub-systems, and sub-systems organized as an overall “system” or “model”. For Lombard, it was obvious that the optimum level at which the systems builder should innovate was the sub-system, and it was the sub-system that was key to programming. Components were too closely related to “products” and as such were bound up with the constraints of manufacturing and were overly determined by inherently unstable markets; at the other extreme, whole systems (i.e. buildings) were prone to “idea.” For Lombard the programmer, innovation was only possible at the level of the “sub-system,” a piece of the overall complex system but larger and more complex than the individual component or material. Sub-systems were central to Lombard’s minimal, technocratic definition of the architectural project: “the set of sub-systems which answers the needs of a program of building requirements.”<sup>59</sup> “If, by ‘architects’,” Lombard

---

<sup>59</sup> Ibid., 40.

concluded, “one means people having a basic education in the domain of architecture, subsequently orienting themselves towards project management, or programming or design or research in some particular sector, then it is clear that they have key roles to play in the domain of industrialized construction.”<sup>60</sup> The theories of Lombard the engineer, programmer, and technocrat were a somewhat bitter assessment of the role of the architect, a fact stemming partly from a long-standing envy of the prestige he perceived was received by his brother, Pierre, who was an architect.<sup>61</sup> Relegated in his diagram of the utopian research center to the marginal and supporting realm of “execution” (along with the coordinator and contractor), the architect is replaced by the building owner (responsible for the “Evolution of Needs”) and manufacturers of components and sub-systems (responsible for the “Evolution of Industry”) as the central engine of architectural innovation.

*Programmation* nevertheless maintained a good working relationship with the architects.<sup>62</sup> They felt that the young, international firm adapted well to their often-strict methods largely because of absence of any obvious single author. Piano and Rogers, too, were generally positive about the collaboration. At the most basic level, they felt that *Programmation* made their job easier by quantifying the needs of a complex set of users, and in many respects *Programmation* took on many of the architects’ tasks.<sup>63</sup> After the

---

<sup>60</sup> Ibid., 41.

<sup>61</sup> O’Byrne, interview.

<sup>62</sup> Ibid.

<sup>63</sup> Claude Mollard, personal interview, April 2008; Renzo Piano and Richard Rogers, “L’histoire du projet,” *L’Architecture d’Aujourd’hui*, no. 189 (1977): 55.



building's completion in 1977, the architectural team gave a generally positive assessment of the pros and cons of the French bureaucratic system. "Here [France], there is a system within the actual building programme; whereas in England, once you win a competition you have to fight every department on your own."<sup>64</sup> Programmation thus not only protected users' interests against the young, idealistic, and inexperienced firm, but it consistently defended the architectural ideas of the project ensuring that the final building adhered as closely as possible to the competition scheme.<sup>65</sup>

The anxiety resulting from the gap between the architect's will-to-form or will-to-idea and the programmer's objective search for functional criteria was sublimated in the architectural concept of flexibility, which was central to the discourses of both programmers and architects. But why was flexibility so important? After all, such a carefully crafted technical specification as the Beaubourg program was surely sufficiently complete and detailed so as to allow the architect to propose a finely tuned, optimized solution for its requirements. For the architects, flexibility, beyond its instrumentality in a programmed, problem-solving world, had acquired its own status as autonomous virtue and architectural theory. As Harold Horowitz put it in 1967, "Flexibility, besides being important, has become identified with goodness."<sup>66</sup> Robert Venturi included the concept of the "multi-functioning element" as part of an attack on modernist purity through levels of "contradiction":

---

<sup>64</sup> Abbot, Davies, and Stanton, "An Inside View," 13.

<sup>65</sup> *Ibid.*, 14.

<sup>66</sup> Horowitz, "The Program's the Thing," 97.

The multifunctioning room is a possibly truer answer to the Modern architect's concern with flexibility. The room with a generic rather than a specific purpose, and with movable furniture rather than movable partitions, promotes a perceptual flexibility rather than a physical flexibility, and permits the toughness and permanence still necessary in our building. Valid ambiguity promotes useful flexibility.<sup>67</sup>

For the programmer, flexibility was much more than a criterion for the building's post-occupancy performance; rather, it was also a criterion of design method that demanded the accommodation of evolving requirements right through the design and construction process. In other words, the design was to be as flexible as the building. This view pointed to fundamental differences between Modernist ideas of function and postwar approaches to performance criteria. The systems approach acknowledged from the outset the undecidability of any complex problem, and it was clear that requirements were inherently unstable and changing.<sup>68</sup> Indeed, if a requirement did not change then there was a failure in the method since change was not merely a parameter but an actively sought outcome. Postwar programming embraced this loose fit between function and form.<sup>69</sup> Part of programming's role was to educate the client, to train them in methods of self-criticism, self-awareness and introspection. Once educated in this way, it was expected that such reflectivity would continue, and as the client's activities changed the

---

<sup>67</sup> Robert Venturi, *Complexity and Contradiction in Architecture* (New York: Museum of Modern Art, 1966), 40.

<sup>68</sup> Systems Engineer C. West Churchman pointed to this phenomenon as characteristic of what he called "wicked problems" in C. West Churchman, "Guest Editorial," *Management Science* 14, no. 1 (December 1967). Rittel and Webber offered planners a more formal definition in their canonical paper, Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences*, no. 4 (1973): 155-169.

<sup>69</sup> As Hashim Sarkis has noted, "Even before programming, flexibility was built into the functionalist discourse of architecture as the margin of error between form and function." Sarkis, "The Paradoxical Promise of Flexibility," 82.

building would need to accommodate newly discovered practices. Like megastructure, programming proposed buildings that were only completed when inhabited by their users.

Working with *Programmation* had its problems, however. Among them was the fact that the designers were distanced from the actual users. In the eyes of *utilisateurs* like Seguin, Lombard's team had developed its own autonomy, and it often lost sight of the larger aims, paradoxically proposing strict and narrow solutions.<sup>70</sup> The design team eventually "developed a mentality which said, 'OK, it's supposed to be a flexible space, so it doesn't really matter that we aren't in close contact with the users.'<sup>71</sup> More troubling, however, were the competing architectural visions put forward by the two teams. While the serviced shed effortlessly accommodated *Programmation's* demands for flexibility, Piano and Rogers disagreed with them over the non-programmed events so dear to their hearts.<sup>72</sup> "We want to have a vast number of non-programmed activities and to mix people as much as possible so that there can be a constant exchange of ideas, emotions, programmes," Rogers said in 1972.<sup>73</sup> But by then, after having worked for over a year on the definitive project, the architects were well aware that, while the non-programmed activity delivered on the performance specified in the brief, they didn't fit well within the brief's technocratic systems of control.

---

<sup>70</sup> Abbot, Davies, and Stanton, "An Inside View," 16. Interestingly, from the perspective of *utilisateurs* like Seguin, there were two large (and unruly) teams—programming and the architects/engineers—and the *utilisateurs* ultimately felt alienated by both. Seguin, *Comment est née la BPI*, 67, 77.

<sup>71</sup> Abbot, Davies, and Stanton, "An Inside View."

<sup>72</sup> As Lombard characteristically put it, "ready adaptability is a salient feature of the brief, and the building responds by separating macrostructure from services and divisions." (Lombard, "An Organized Process for Programming—Application to the Centre Beaubourg," 31.)

<sup>73</sup> Peter Rawstorne, "Piano & Rogers: Centre Beaubourg," *Architectural Design* 42, no. 7 (1972): 407.

There is no mention of non-programmed events in the brief. But, for us, they are of equal importance to the things actually demanded. We are worried about the lack of a budget for this (we're trying to get one) but we know that the building will only work if these activities flourish.<sup>74</sup>

They saw their building as an infrastructure for spontaneity:

Although we have supplied a wide variety of support systems, i.e. electricity, water, anchorage points, external pedestrian galleries, escalators, viewing points, etc. and have recommended numerous activities beyond the confines of the four specific activities [i.e. museum, library, design center, music center], we have not got the support we hoped for, and much still depends on the new organisation which takes over in March 1977 as to whether the project becomes an elitist cultural activity or a university of the streets.<sup>75</sup>

At the April 28 1972 meeting between architects, *utilisateurs*, and *Programmation*, Rogers felt compelled to deliver a talk that was at once a motivational speech for his own team and a critique of the direction he felt the project had taken with respect to the original goals of the competition scheme.

Those beautiful programming drawings," he declared, "show exactly what happens in each department, but who says there should be departments?... Why should the art books be in the library and art solely in the museum? Why do we need an A1 Reception [function]? Can not all information normally offered here be on the façade, on the moving stairs, on the galleries, on the closed television system, on the dial-yourself videophone?<sup>76</sup>

Seguin and other users saw that it had some humor, and it was generally well received by the *utilisateurs*, if not by *Programmation*.<sup>77</sup> In some ways, Rogers' position was

---

<sup>74</sup> Ibid.

<sup>75</sup> Renzo Piano and Richard Rogers, "A Statement," *Architectural Design* 77, no. 2 (1977): unpaginated.

<sup>76</sup> "Changements culturels et conséquences architecturales - Résumé des notes lues par Monsieur Richard Rogers lors de la réunion des Utilisateurs du vendredi 28 avril 1972", May 9, 1972, Loste box 3, Archives CGP. This document was circulated to Loste, Lombard, and O'Byrne.

<sup>77</sup> Seguin, *Comment est née la BPI*, 77.

consistent with the doctrines of programming. According to O'Byrne, a solution can be found in one or any combination of space, personnel, equipment/machinery. Peña, Foster, and Price all said at one time or another that architectural action does not necessarily entail a building.<sup>78</sup> Rogers' pep-talk nevertheless fell back on cultural and architectural stereotypes of which both the architects and the administrators had deployed; indeed, the tension between the architects and *Programmation* partly stemmed from differences between Anglo-American and French models of administration and of their critique.<sup>79</sup> *Programmation* applied the French talent for administration to the organization of culture, and Lombard's was a rationalist, controlling method for generating freedom and choice (which was not in fact so remote from Price's). It was in the tradition of Positivism and Rationalism that went back to Godin and Saint-Simon.<sup>80</sup>

But it was a system under which the architects chafed.<sup>81</sup> Where for Rogers it was indisputable that the live center of information would need to be built on principles of individual freedom and the erasure of hierarchies and disciplinary boundaries, Lombard had the more difficult task of negotiating between these Anglo-American principles and the project's broader cultural and political context.<sup>82</sup> The French model of modern

---

<sup>78</sup> As a later technical text on programming noted, "The program may indicate organizational changes or functional realignment of the organization's existing space without necessarily indicating a new design project or building." (Preiser, *Programming the Built Environment*, 3.)

<sup>79</sup> The architects reflected on these distinctions in Richard Rogers, Alan Stanton, and Mike Davies, "The difference between English and French bureaucratic systems," *RIBA Journal* 84, no. 1 (1977): 13-16.

<sup>80</sup> As O'Byrne later observed, "the process was very Cartesian." (O'Byrne, interview.)

<sup>81</sup> Dano-Vanneyre, interview.

<sup>82</sup> Claude Mollard pointed out the two extremes into which the new configuration among departments at Beaubourg risked falling: on the one hand, mere juxtaposition of activities within a unified container; on

organization theory was set out fifty years earlier by Henri Fayol, who in the words of Claude George, “viewed the organization as an abstract or a legal entity that grew out of and was directed by a rational system of rules and authority... The work of an administrator involved five facets: planning, organizing, commanding, coordinating, and controlling.”<sup>83</sup> Thus, while Taylorism had focused at the worker level, Fayol was concerned with reform of management from the top down. This was consistent with *Programmation*’s privileging of the *utilisateur* over the *usager*, and indeed, Lombard considered the latter outside the control of programming and more in the domain of behavioral studies, and area with which program had only limited overlap.<sup>84</sup> Programmation thus faced an aporia: a Fayolist approach to critical reorganization entailed the reinforcement of departmental identity and therefore of boundaries while the neo-humanist religion of interdisciplinarity demanded their erasure. Friedman, Price, Archigram, and other techno-utopians of the 1960s had by-and-large sidestepped this problem since their libertarian doctrines refused any organizational unit larger than the individual user. But the assumed role of programming was to provoke members of the state bureaucracy into questioning its givens, and so the “department” was a necessary component in a critical discourse of organizational reform: it was less a matter of eliminating departments and other broad organizational categories than of exploring ways

---

the other, the sacrifice of all disciplinary autonomy in favor of an overbearing hierarchy. (Sébastien Lose, “Procès-verbal de la réunion du 24 septembre 1974”, October 14, 1974, Lose box 1, Archives CGP.)

<sup>83</sup> Claude S. George, *The History of Management Thought* (Prentice-Hall, 1972), 114. In the 1970s, the large organization in France was increasingly the subject of study as a complex system. See, for example, Michel Crozier and Jean-Claude Thoenig, “The Regulation of Complex Organized Systems,” *Administrative Science Quarterly* 21, no. 4 (December 1976): 547-570.

<sup>84</sup> Lombard, “An Organized Process for Programming—Application to the Centre Beaubourg,” 33.

might new relationships between them be put into play.<sup>85</sup> Without departments, there could be no interfaces between them and thus no space of exchange.<sup>86</sup>

In 1967, Alan Colquhoun published an essay, *Typology and Design Method*, which he attacked the fundamental tenets of programming and other practices that were part of the emerging “design methods” movement.<sup>87</sup> That his essay appeared in the *Architectural Association Journal* made it all the more pointed since the AA was the primary locus of discourses on the serviced shed. In the article, Colquhoun argued against the rejection of type-forms by practices (such as architectural programming) that attempted to sweep away all preconceptions, biases, and prior solutions in the search for solutions to complex problems. His argument was partly an attack on what he saw as the logical inconsistencies and other fallacies within Functionalist claims. Like the engineers of complex systems, Colquhoun argued that “[t]he characteristic of our age is change,” but unlike them went on to point out that “it is precisely because this is so that it is necessary to investigate the part which modifications of type-solutions play in relation to problems and solutions which are without precedent in any received tradition.”<sup>88</sup> It was

---

<sup>85</sup> The stakeholders (*utilisateurs*) must become responsible. The programme is there to make people talk, to provoke, to reflect. This echoes Peña, who argued that users were asked to reconsider their preconceived notions of what particular spatial functions were in order to disrupt formal biases. (O’Byrne, interview.)

<sup>86</sup> This trajectory is coincident with the development of Object-Oriented programming languages, which decomposed problem spaces into autonomous components (“objects”) and messages flowing between them. Architect Joshua Prince-Ramus has recently pointed out that modernist uniform flexibility tends to privilege the first activity housed within a space, which grows to subsume all other activities. He proposes instead “compartmentalized flexibility,” which pre-assigns blocks of the programmatic spectrum to groups of activities, which can then internally change as needs change. (Joshua Prince-Ramus, “Joshua Prince-Ramus on Seattle’s Library (TED2006)”, February 2006.)

<sup>87</sup> Colquhoun, “Typology and Design Method.”

<sup>88</sup> *Ibid.*, 49.

precisely the job of scientific programming to offer a method of holding off type-solutions as long as possible, even indefinitely. Yet, as Colquhoun pointed out, if one looked at examples of systems design in particularly complex domains (such as aeronautics) it quickly became clear that prior forms offered the only way to mitigate the intractably complex givens of these problems.

But for Colquhoun, the stakes went far beyond these internal contradictions and lay in the very imperative of the tendency toward a reductivism that threatened architecture's status as a meaning-bearing, linguistic system and by extension its very being as a coherent discipline. Technological tools, he argued, "only provide the framework, the context within which we operate."<sup>89</sup> It was beyond question that those architectural operations involved the organization of Gaudet's "elements of composition," which Banham so confidently felt had run their course, into a coherent linguistic statement. Of this, Colquhoun argued, both the programmer's scientific method and the architect's will-to-form that scientific design methods had tried so hard to sidestep were culpable since both rejected prior forms as a source for design and therefore denied architecture's basis in history.

---

<sup>89</sup> Ibid., 50.



## Conclusion

*Behind every outward image or symbol lies mechanical support, and if the immateriality of these images and symbols gives rise to a new approach to the relationship between human being and object, the analysis will be one of the individual's connection with the material support underlying the new culture of immateriality.<sup>1</sup>*

—Abraham Moles, *Design and Immateriality* (1988)

Shortly following the opening of the Centre Pompidou, Alan Colquhoun's stinging critique of the building appeared in the *Architectural Review*. Colquhoun's review was grounded in an attack on the functionalist imperatives of both client and its architect, arguing that even the architects of the Neue Sachlichkeit movement had been "less concerned with creating a rational architecture than they were with creating the symbolism for a new social and cultural order."

Once it is admitted that 'functionalism' is a system of representation and not a mere instrument, then it becomes a matter of legitimate discussion whether the values symbolised by this architecture are desirable or not. But such a discussion is cut short by the bland statement that architecture expresses nothing but its inherent usefulness. Any questioning of its forms can then be attributed to the fact that the questioner has not yet come to terms with the 'facts' of modern life.<sup>2</sup>

To Colquhoun, the building represented an abdication of the architect's fundamental obligation—to articulate its own 'content' through a language of forms. From its serviced shed approach to its deference of architectural expertise to the new bureaucracy of programming, the building embodied this abdication, which "suggests that architecture

---

<sup>1</sup> Abraham A Moles, "Design and Immateriality: What of It in a Post Industrial Society?," *Design Issues* 4, no. 1/2 (1988): 30.

<sup>2</sup> Alan Colquhoun, "Critique," *Architectural Design* 77, no. 2 (1977): unpaginated.

should not be conceived with any typology of spaces or human uses, but that these functions should be handed over to the spontaneous forces of life.”<sup>3</sup>

Rogers was hurt by his old mentor’s critique. He later responded,

flexibility is not a purely negative value, as Alan Colquhoun would like us to believe. It is not synonymous with the abdication of any architect who refuses to endorse conventional partitioning of space. The fact that we wanted from the start to avoid walls between departments doesn’t mean that we didn’t consider the contents of these departments and their arrangement. On the contrary, we wanted to facilitate contact between users, which involves quite a deep reflection upon the activities that are to be placed into relation with one another.<sup>4</sup>

In response to this critique of the refusal to articulate program in architectural form and the threat that refusal posed to architecture’s ability to speak, Rogers argued that the building was not “silent.” Rather,

If it didn’t paraphrase its program it did speak of tension and compression, of dynamism of glass and metal, of a certain euphoria of the machine, of the pleasure of encounter, all things outside the vocabulary of academic discourse that seeks a word-for-word correspondence between form and function. In place of this literal translation of an almost manic exactitude, we wanted to deliver another kind of message, something more free within which partial meanings might evolve and in which chance played a role.<sup>5</sup>

In place of the conception of an organized sequence of spaces as the basis for the composition of a work, Piano argued, was the axiomatic phenomena of “air, light, and sound.”<sup>6</sup>

---

<sup>3</sup> Ibid.

<sup>4</sup> Renzo Piano, Richard Rogers, and Antoine Picon, *Du plateau Beaubourg au Centre Georges Pompidou* (Paris: Editions du Centre Pompidou, 1987), 34.

<sup>5</sup> Ibid., 35.

<sup>6</sup> Ibid., 36.

The limits imposed on architecture as a system of representation by the project's functionalist regime stemmed from a more fundamental problem. For Colquhoun, the project was flawed from the start by its "attempt to combine the principles of laissez-faire liberalism with those of a normative conservatism."<sup>7</sup> The architectural form for this fusion was the generic box of the supermarket, with roots in the international exhibitions.

Instead of the multiplication of precisely defined organs of democratic life [...] all the organs of culture were now to be reduced to a single entity, the prototype of which was the self-service store—the emblem of the consumer society. Perhaps an even more potent image for the jury's concept of the cultural centre is the 19th century international exhibition, where the products of the world are displayed and were 'culture' is equated with 'information.'

But Colquhoun never went on to develop this tantalizing statement, and instead attacked the building along the themes of transparency, flexibility, and function. And he did so in a bland and somewhat fatigued manner, insisting on situating his critique in the basic premise that the doctrines of both client and architect did not substantially develop beyond a revisiting of Modern paradigms of the 1920s.

The second of the major critiques of the building in the British press came from Reyner Banham in the *Architecture Review*.<sup>8</sup> Although Banham pointed out some somewhat minor inconsistencies and compromises in the completed building, his review was far more complimentary than Colquhoun's had been.<sup>9</sup> Where Colquhoun attacked the

---

<sup>7</sup> Colquhoun, "Critique."

<sup>8</sup> Reyner Banham, "Enigma of the rue du Renard," *The Architectural Review* CLXI, no. 963 (1977): 277-9. There were no substantive reviews of the building in the American architectural press.

<sup>9</sup> On conflicts and contrasts between Banham and Colquhoun, see Kenneth Frampton's introduction to Alan Colquhoun, *Essays in Architectural Criticism: Modern Architecture and Historical Change* (Cambridge, Mass.: MIT Press, 1981).

building for its insensitivity to urban context, Banham praised its integration into its context by virtue of the way the building operated as a ubiquitous backdrop radiating its presence through the channels of the Marais, perceived only in fragments but constantly present, an aspect of the project that had been studied in detail (Figure 5.1).<sup>10</sup> And where Colquhoun had criticized the architects' abdication of symbolic language, Banham praised the way in which it reified Giedion's new monumentality achieved not through "Le Corbusier's increasingly geriatric understanding of monumentality as mere mass and impenetrable substance" but instead through "Giedion's vision of lightweight, highly coloured, mobile elements."<sup>11</sup> Banham did, however, share Colquhoun's suspicion of the cult of flexibility. "What is the point of producing a machine of perfect adaptability," Banham asked, "if it will not be imaginatively adapted—remembering that, the more nearly perfect the adaptability of the design, the fewer the clues the design will give on how adaptation should be wrought upon it."<sup>12</sup> These clues were to be found not in spatial articulation but in the expanded mandate of environmental design in which furniture, signage, and architecture merged (Figure 5.2). Yet, Colquhoun argued,

the relinquished control over one set of variables (the spatial subdivision), the architect is forced to take an even firmer control of the new set (furniture), otherwise the space will lose all visual coherence. We therefore arrive in the apparently paradoxical situation where as a result of making a building more 'democratic', and more sensitive to feedback we impose on it an even greater inflexibility, and turn it into *gesamtkunstwerk*

---

<sup>10</sup> Banham, "Enigma of the rue du Renard," 277.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid., 278.

of bureaucracy, infinitely more unpleasant than the gesamtkunstwerk of the artist which Adolph [sic] Loos opposed with such vehemence.<sup>13</sup>

If Banham's review betrayed an enfeebled commitment to technology, instead dwelling on problems of monumentality, detail, and urban context, Colquhoun's likewise insisted on a return to concerns proper to Academicism. In both cases, the authors consistently dwell on the building's relationship to past movements—whether Neue Sachlichkeit or Megastructure. In Banham's case this was all the more remarkable since it marked a shift from a discourse of resolute futurism to historical reflection. In some ways, of course, this reflects the broader pessimism in the cultural climate of the time and a questioning of 1960s idealism. The *Architectural Review*'s introduction to Banham's critical essay observed that,

The Centre reflects the supreme moment of technological euphoria in Western society: the moment when we genuinely believed that 'freedom' was to be got by providing ourselves with endless power-supplied facility: with servicing which would be so elaborate and so heavily duplicated that you could do anything you want, any where, at any time. We are wiser now; for we know that even if our resources allowed this sort of indulgence, the political machinery we would have to forge to operate it would be so offensive that it would remove true freedom from the face of the earth.<sup>14</sup>

Yet Colquhoun's and Banham's uncharacteristically confused and tentative critiques also reflected a destabilizing of the reliable idea of the "machine" behind earlier systems of representation in an architecture of technology, including the early visions of Archigram. For Banham, predictably, it came down to image, yet his review struggled toward its

---

<sup>13</sup> Colquhoun, "Critique."

<sup>14</sup> "The Pompidolium," *The Architectural Review* CLXI, no. 963 (1977): 272. Renzo Piano later felt that the building's greatest fault was its lack of concern for energy efficiency and that it was a conception of the years of cheap oil. (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 39.)

conclusion with the problem. After grudgingly accepting the fact that this building is indeed a monument, he asked,

But can one have a permanent image of change? The problem is one that has fascinated philosophers and poets as long as language has been able to distinguish the two concepts, but it has troubled architectural theory only since the Futurists at the beginning of the present century decided to celebrate the impermanences of technology. On the whole, the response has been to design permanent statues to *ideas* of permanence, but Piano + Rogers have gone further beyond that—impermanence, in the sense of adaptability, applies to everything except the most massive members of the structure. Maybe it was necessary to generate a fixed image at an early point, in order to keep the rest of the design process under control[.]<sup>15</sup>

Although an easily apprehensible image was required in the context of an ideas competition, the image offered by Reliance Controls and other more reduced and reticent versions of the serviced shed close to the hearts of Piano and Rogers required such a leap of imagination to consider it as an image that was catchy enough for the competition. The gantries and ducts servicing the empty space of the shed seemed to offer a source, but as Banham pointed out with respect to Kahn's Richards labs, even the seemingly clear servant-served relationship of this approach yielded static and monumental results.<sup>16</sup> The image of the competition scheme was provided by the interplay between static frame and mobile electronic equipment and architectural modules, but by 1973 that image had changed. Part of the problem, of course, was that the hardware of the information age to

---

<sup>15</sup> Banham, "Enigma of the rue du Renard," 278.

<sup>16</sup> Reyner Banham, "On Trial 2: Louis Kahn: The Buttery Hatch Aesthetic," *The Architectural Review* 131, no. 781 (March 1962): 203-206. Archigram themselves pointed this out, criticizing the color-coded services of the Rue du Renard façade. "It's in the tradition of our architecture, but it's formalized. It freezes it. It makes it like the old five orders of architecture: you know, instead of Doric, Ionic, Corinthian, etc., it's blue is for vents, red is for lifts..." (Denis Postle, *Beaubourg: Four Films* (Arts Council of Great Britain/Tattooist International, 1980).)

which earlier megastructures like Computer City alluded were becoming miniaturized and immaterial, as Archigram pointed out when they juxtaposed a transistor with an already obsolete magnetic core memory module on the cover of Archigram 7, thereby calling into question the status of hardware as a source of form. The visual effect of the Centre as both porous matrix of details and smooth monument thus alluded to a new kind of information hardware. The IBM 360 line of computers was famous not only because it established a standard software platform but because it was a uniformly designed product line with consistent aesthetics.<sup>17</sup> But in the early 1970s the emergence of large-scale networks suggested that the image of information technology was no longer in its hardware.

At the heart of Dennis Crompton's 1977 critique of the building was the assumption that the information systems making up a "live center of information" would need to have some sort of real architectural presence.<sup>18</sup> He pointed to Expo 67 in Montreal and Osaka 70 as examples of spaces in which information technology had been successfully given such a presence, and remarked that he had expected the Place Beaubourg to resemble much more closely the controlled chaos of the Festival Plaza at Osaka. This failure was due largely to internal contradictions in making an architecture of information. For Crompton, the issue was translation, which started with fundamental

---

<sup>17</sup> For a general history see Paul E. Ceruzzi, *A History of Modern Computing* (MIT Press, 2003). For a discussion of IBM 360 in the context of design see John Jeffrey Harwood, "The redesign of design: Multinational corporations, computers and design logic, 1945--1976" (Doctoral thesis, Columbia University, 2006). For a detailed discussion see B.O. Evans, "System/360: A Retrospective View," *IEEE Annals of the History of Computing* 8, no. 2 (1986): 155-179.

<sup>18</sup> D. Crompton, "Centre Pompidou: A Live Centre of Information," *Architectural Design* 47, no. 2 (1977): 100-127.

matters of representation: how, indeed, could one represent in a drawing a constantly changing information environment? But it also stemmed from the more general fact that any language used to discuss such a proposal would of necessity rely on one's ability to relate what one is seeing in drawings and models to some sort of prior experience. The fact was that while everyone was familiar with the fragments of hardware and software that might constitute a larger live center of information, nobody had ever seen what that totality might look like beyond the somewhat *sui generis* and fragmentary environments of the International Expositions. But the contradiction that Crompton most emphasized was information's very intangibility, which was at the heart of the problem of translation into architectural form or integration into an architectural environment. Crompton's critique rested precariously on the assumption that information technology and architecture constitute two distinct systems, and that the task of the architect was, as he put it, to "isolate the appropriate systems and get on with the task of designing them into the building."<sup>19</sup> Beaubourg represents an attempt on the part of client and architect to efface such a distinction. To introduce a network of Videotex terminals into the program of a building was much more than simply asking architecture to account for another subsystem within its existing set of mechanical and electrical systems. Information technology was part of a new class of often invisible and banal architectural equipment that included automatic door closers, signage and office partitions—that radically expanded the way in which users interacted with the building and suggested a redrawing of the boundaries of the architect's mandate.

---

<sup>19</sup> Ibid.



The problem of giving imageability to this non-artifactual machine was encapsulated in Jean Widmer's 1977 design for the Centre's logo (Figure 5.3). In 1974, the Swiss graphic designer won an international competition for the design of the Centre's graphic identity.<sup>20</sup> His scheme for the building's signage took its departure point from the collaged signs and images of the competition scheme, which recalled the *Maison de la publicité* (Figure 5.4). But having no experience in logo design apart from a prêt-à-porter line of clothing, he procrastinated until 1976, at which point the exterior of the building was complete. The logo therefore took inspiration directly from the as-built façade. But how could an iconic logo be derived from such a diffuse matrix? The ovoids and pyramids rejected by the competition jury in 1971 would seem to be easier to deal with. In response, Widmer focused on internal logic, not on overall outline or volume.<sup>21</sup> The logo and the building both gave form to a system. It is difficult to imagine this logo with the off-center, ad-hoc escalator scheme of the competition entry, even though in many respects it offered a more centralized and figural scheme. Earlier versions of the logo reduced the number of floors to three and the escalator to one flight in an attempt by Widmer to abstract the façade into an iconic image composed according to its own internal compositional rules (Figure 5.5). But a Beaubourg administrator had insisted on a more accurate representation of the building.<sup>22</sup> Widmer had already created poster and

---

<sup>20</sup> For a brief history of the logo design, see Catherine de Smet, "Histoire d'un rectangle rayé. Jean Widmer et le logo du Centre Pompidou," *Cahiers du Musée national d'art moderne*, no. 89 (Automne 2004): 5-23. On Widmer in general, see Herb Lubalin Study Center of Design and Typography, *Jean Widmer: A Devotion to Modernism* (Herb Lubalin Study Center of Design and Typography, 2003).

<sup>21</sup> Contrast, for example, the logos for the Sydney Opera House or Frank Gehry's Disney Concert Hall.

<sup>22</sup> de Smet, "Histoire d'un rectangle rayé," 17.

catalog designs for the CCI, work that was of course characterized by its rigorous and rational order—typical of Swiss graphic design of the time—but also by its use of bold shapes that appeared to refer to industrially produced objects but on closer inspection revealed themselves to be non-figurative—imagistic without depicting specific objects. The logo built on this approach, yet it also referred to other sources such as the “art concret” of 1940s Zurich, Op-art, military heraldry.<sup>23</sup> But its most direct reference, perhaps, was Paul Rand’s influential 1962 logo design for IBM (Figure 5.6). Rand claimed that there was no representational intent and that the characteristic scan lines were simply there to unify the three awkward letters.<sup>24</sup>

The architectural image of Beaubourg’s virtual machine was at the root of Jean Baudrillard’s venomous attack on the building.<sup>25</sup> Baudrillard was a member of the combative French contingent to the Aspen Design Conference of 1970, where he had argued that an emerging technocratic “environmentalism” was an ideological maneuver that masked true social and political problems.<sup>26</sup> Baudrillard, like Baldwin,<sup>27</sup> focused his

---

<sup>23</sup> Ibid., 17–18.

<sup>24</sup> Yet, as John Harwood points out, the scan lines clearly evoke bank notes—a symbol of authority, a legal connotation—as well as aesthetics of communication and technology (morse code, redundancy and repetition). (Harwood, “The redesign of design,” 69–76.)

<sup>25</sup> Jean Baudrillard, *L’effet Beaubourg: Implosion et dissuasion* (Editions Galilee, 1977). Translated as Jean Baudrillard, “The Beaubourg Effect: Implosion and Deterrence,” in *Simulacra and Simulation* (Ann Arbor: University of Michigan Press, 1994).

<sup>26</sup> The manifesto of the French contingent is reprinted in Reyner Banham, ed., *The Aspen Papers; Twenty Years of Design Theory from the International Design Conference in Aspen* (New York: Praeger, 1974). For a contemporary report in the journal of the CCI, see Gilles de Bure, “Les sommets d’Aspen,” *Crée*, no. 6 (June 1970).

<sup>27</sup> Nick Levinson, *Beaubourg: The Pompidou Center, Paris* (Open University/BBC, 1978).

attack on the semantics of pipes and tubes as one of the building's main operative metaphors for socialization and the operations of power.

Ventilation, cooling, electrical networks—the 'traditional' fluids circulate there very well. Already the circulation of the human flux is less assured (the archaic solution of escalators in plastic sleeves, one ought to be aspirated, propelled, or something, but with a mobility that would be up to this baroque theatricality of fluids that is the source of the originality of the carcass).<sup>28</sup>

For Baudrillard, flow was central to the operation of commodity culture.

Thus for the first time, Beaubourg is at the level of culture what the hypermarket is at the level of the commodity: the perfect circulatory operator, the demonstration of anything (commodity, culture, crowd, compressed air) through its own accelerated circulation.<sup>29</sup>

The human flow is ultimately what is at stake, and the building operates, according to Baudrillard, as a machine that processes the masses “whom the building treats like a converter, like a black box, or, in terms of input-output, just like a refinery handles petroleum products or a flood of unprocessed material.”<sup>30</sup> This dependence on the reductive metaphor of flow is one of the weaknesses of Baudrillard's critique. As we have seen, *Programmation* certainly relied on this notion of flows, which the diagrams clearly express; yet, the result was no simple black box with inputs and outputs but rather a complex set of interfaces and exchanges. The role of the tubes, the overt clip-on circulation, the envelope, creates a complex and contradictory condition of reflection and transparency in which the building performs as far more than a black box serviced by

---

<sup>28</sup> Baudrillard, “The Beaubourg Effect: Implosion and Deterrence,” 62.

<sup>29</sup> *Ibid.*, 68.

<sup>30</sup> *Ibid.*, 66.

pipes. Nor are the tubes and pipes merely conduits. As a reflection of the piazza, they define a place to loiter, to encounter, a space that projects as much as it absorbs.

For Baudrillard, the problems of center and decentralization were also key to his critique of the socializing agenda of Beaubourg. “It is a bit like the real danger nuclear power stations pose,” he argued, “not lack of security, pollution, explosion, but a system of maximum security that radiates around them, the protective zone of control and the deterrence that extends, slowly but surely, over the territory—a technical, ecological, economic, geopolitical glacis.”<sup>31</sup> The tropes of implosion-explosion and absorption-radiation were all matters of the center, and were key to Baudrillard’s understanding the hypermarket, which “centralizes and redistributes a whole region and population.”<sup>32</sup> Instead, Baudrillard argued, “it should have been a labyrinth, a combinatory, infinite library, an aleatory redistribution of destinies through games or lotteries--in short, the universe of Borges [...] in short a culture of simulation and fascination, and not always one of production and meaning.”<sup>33</sup> But the competition scheme and the final building proposed such an environment, as Baudrillard tacitly acknowledges in citing the Exploratorium as a model.<sup>34</sup>

Where for the architects, the supermarket offered a model for a new utopia, to Baudrillard, it was distinctly dystopian.

---

<sup>31</sup> Ibid., 61.

<sup>32</sup> Jean Baudrillard, “Hypermarket and Hypercommodity,” in *Simulacra and Simulation* (Ann Arbor: University of Michigan Press, 1994), 75.

<sup>33</sup> Baudrillard, “The Beaubourg Effect: Implosion and Deterrence,” 64–65.

<sup>34</sup> Ibid., 65.

Well beyond traditional institutions of capital the hypermarket, or the Beaubourg ‘hypermarket of culture,’ is already the model of all future forms of controlled socialization: retotalization in a homogeneous space-time of all the dispersed functions of the body and of social life (work, leisure, media culture), retranscription of all the contradictory currents in terms of integrated circuits. Space-time of a whole operational simulation of social life.<sup>35</sup>

But the stable relationship between producer and consumer at the heart of such criticisms would prove less stable in the information society, as FNAC testified.<sup>36</sup> Indeed, later Internet-based megatechnics like peer-to-peer networks and crowdsourcing suggest that a new popular culture was already emerging in which traditional boundaries between producer and consumer no longer held.

The fear that, as Banham put it, “a city or a large part of a city designed by one man, or by any group unified enough to produce a comprehensible design, would be a parlously thin, starved and impoverished environment, but visually and in larger, less precise cultural terms” did not in fact materialize at Beaubourg.<sup>37</sup> While many critics did feel that the environment was indeed starved in “less precise cultural terms” there was no doubt that the environment it created was more vibrant and more intense not only than what was there before but than the vast frames of Plug-in City could imagine if it were built. Rather, at Beaubourg, the unpalatability of megastructure lay less in its imposition of a

---

<sup>35</sup> Ibid., 67.

<sup>36</sup> Even megastructure embraced commerce. François Dallegret, in a project for Montréal’s underground mega-city, essentially a vast network of underground shopping malls, had early on recognized megastructure’s potential to bring together commerce and the *vie ludique*. (Reyner Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper and Row, 1976), 126.)

<sup>37</sup> Ibid., 216.

grand order than in an ideological sleight of hand in which that same grand order would appear to negate itself through the illusion of individual choice. Feenberg has argued that the information age was for the most part defined by the principles of a scientized society that had been at the heart of all technical utopias since Saint-Simon's, a vision that "legitimated the technocratic ambitions of states and corporations."<sup>38</sup> The French experiment with telematics starting in the late-1970s embodied just such a collapse of the distinction between freedom and power. On the one hand, the monopoly position of the telephone company along with their top-down control over their systems made the indeterminate architecture of the packet switching network and the ease to which computers could be added to it suspect; on the other, "the mating of a free market in services with the flexible terminal" at the heart of the Minitel system enabled the creative uses of the network that were unforeseen in the system's original design. In this system, as Feenberg observes,

'freedom' is the more or less informed choice among preselected options established by a universal instance, such as a technocratic authority, which defines those options and maintains the database. That instance claims to be a neutral medium, and its power is legitimated precisely by its transparency.<sup>39</sup>

Such were the paradoxes of "choice" offered to visitors to Beaubourg's post-1968 information utopia, and they directly posed a challenge to architects steeped in the libertarian traditions of 1960s techno-utopianism.

---

<sup>38</sup> Andrew Feenberg, "Subversive rationalization: Technology, power and democracy," *Inquiry* 35, no. 3/4 (1992).

<sup>39</sup> *Ibid.*

For Archizoom in Italy, “the factory and the supermarket become the specimen models of the future city: optimal urban structures, potentially limitless, where human functions are arranged spontaneously in a free field[...].”<sup>40</sup> But the shed—with its floors that were “pieces of the world” trapped within a superblock—was a simulacrum whose very neutrality encouraged the reproduction of existing power structures. Open spaces with no partitions meant that administrative bodies were separated by soft forms of regulation and agreement, and rule structures that govern what seems to be endless play within infinite flexibility would be enacted through administrative protocols. Colquhoun had recognized this and criticized the building for producing a kind of counter-immobility born out of fear of losing hard-won square footage.<sup>41</sup> If departmental autonomy and disciplined users no longer resulted from walls that created private space and doors that could be closed, then it would result from protocol. Galloway and Thacker have argued that the significance of networks lies less in their morphology than the way in which they operate, and operate as power, at “the microtechnical level of nonhuman, machinic practices.”<sup>42</sup> Protocol is the means by which control operates at in a world of networks. It “is less about power (confinement, discipline, normativity) and more about

---

<sup>40</sup> Archizoom, *No-stop City: Residential Parkings* (1969). Reprinted in Exit Utopia Martin Van Schaik and Otakar Máčel, *Exit Utopia: Architectural Provocations, 1956-76* (Munich: Prestel, 2005).

<sup>41</sup> Colquhoun, “Critique.” Piano later admitted that the arrangement of program in the Centre in 1986 was pretty much the same as it was at the building’s opening. (Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 35.)

<sup>42</sup> Alexander R. Galloway, *Protocol: How Control Exists After Decentralization* (MIT Press, 2004); Alexander Galloway and Eugene Thacker, “Protocol, Control, and Networks,” *Grey Room* - (October 2004): 6-29.

control (modulation, distribution, flexibility).”<sup>43</sup> Amy Ogata has observed that, “[u]nlike the domestic analogy of the 1950s schoolhouse, the closest model to the open schools of the late 1960s was the corporate office. Similar ideas about opening up the office with long-span steel frames preoccupied specialists in organizational behavior and interior design.”<sup>44</sup> Where the school aimed to support individual creativity and exploration, the office aimed to improve the flow of information. In both cases, this would be achieved by tearing down walls and replacing them with “soft” clusters of partitions and furniture. In the 1960s,

Quickbörner and manufacturers such as Herman Miller proposed that the ‘open office’ could be easily reconfigured to meet the rapid pace of change and encourage a democratic style in which the individual initiative was valued over corporate hierarchy. The same principles of flexibility, democracy and individualism of the open schools were implied in the arrangement of the open office.<sup>45</sup>

To Peter Buchanan, High Tech showed precisely that it is but a small step from the machinery of freedom and happiness to the apparatus of power and corporate control.

[W]hat freedom is offered by these costly contraptions of control? The freedom to fulfill Banham’s very ‘60s High-Tech-hippie dream of picknicking naked in nature unworried by cold, rain or bugs—yet constrained from gambolling like fauns or satyrs because of the prying eyes of voyeurs? Or freedom to move furniture and partitions in the corporation’s dream of an open plan panopticon which squeezes maximum productivity from a workforce under constant surveillance?<sup>46</sup>

---

<sup>43</sup> Galloway and Thacker, “Protocol, Control, and Networks,” 10.

<sup>44</sup> Amy F. Ogata, “Building for Learning in Postwar American Elementary Schools,” *Journal of the Society of Architectural Historians* 67, no. 4 (December 2008): 585.

<sup>45</sup> Ibid.

<sup>46</sup> Peter Buchanan, “High-Tech,” *Architectural Review* (July 1983).



At Beaubourg, programming in particular quietly slipped into the gap between *dirigiste* state and free individual. As John McMorrough has recently noted,

While program questions that which is essentially architectural, it also opens a new plane of comparison between the seemingly insurmountable division between ‘corporate’ and ‘avant-garde’ practices. Program connects the possibility of control (the rise of specific expertise in configurations of the corporate model) and the impossibility of control (the critical delimitations of program and the liberatory promise of advanced production).<sup>47</sup>

Yet by 1978, dichotomies such as this had become untenable, since the “power game” (Nora and Minc put it) in which IBM had taken the lead demanded a new role for government that would involve all three types of action: decree, regulation, and withdrawal.<sup>48</sup> Anticipating this development, Pompidou built a monument that embodied, in the words of Bernard Colenbrander, “the position that befits the political survivor in a late-modern democracy: the position in which yes can be said just as well as no.”<sup>49</sup>

---

<sup>47</sup> John McMorrough, “Notes on the Adaptive Re-use of Program,” *Praxis: Journal of Writing + Building*, no. 8 (2006): 110.

<sup>48</sup> Simon Nora and Alain Minc, *The Computerization of Society: A Report to the President of France*, trans. Daniel Bell (Cambridge, Mass: MIT Press, 1980), 7.

<sup>49</sup> Bernard Colenbrander, “The short but intense life of a celibate machine: Centre Georges Pompidou, 1977-1997,” *OASE: tijdschrift voor architectuur*, no. 57 (2001): 17.

## FIGURES

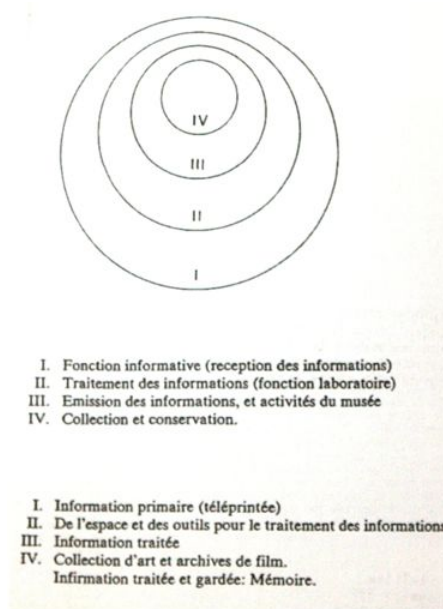


Fig. 1.1: Diagram of museum as information centre, from UNESCO conference. From Bernadette Dufrêne, ed., *Centre Pompidou: trente ans d'histoire* (Paris: Centre Georges Pompidou, 2007).



Fig. 1.2: Poster uncovered during Paris métro renovations, 2008. Photo by author.

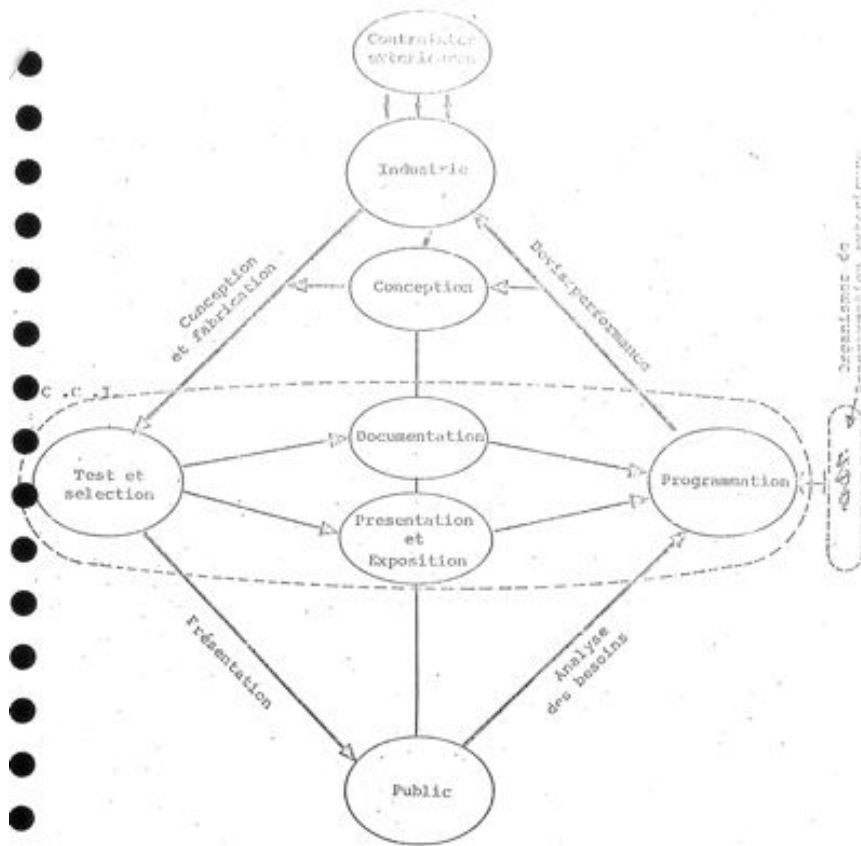


Schéma d Intervention du  
CENTRE BEAUBOURG dans le  
processus de Création Industrielle

Fig. 1.3: Diagram showing the role of the CCI in the process of industrial design. Archives CGP.

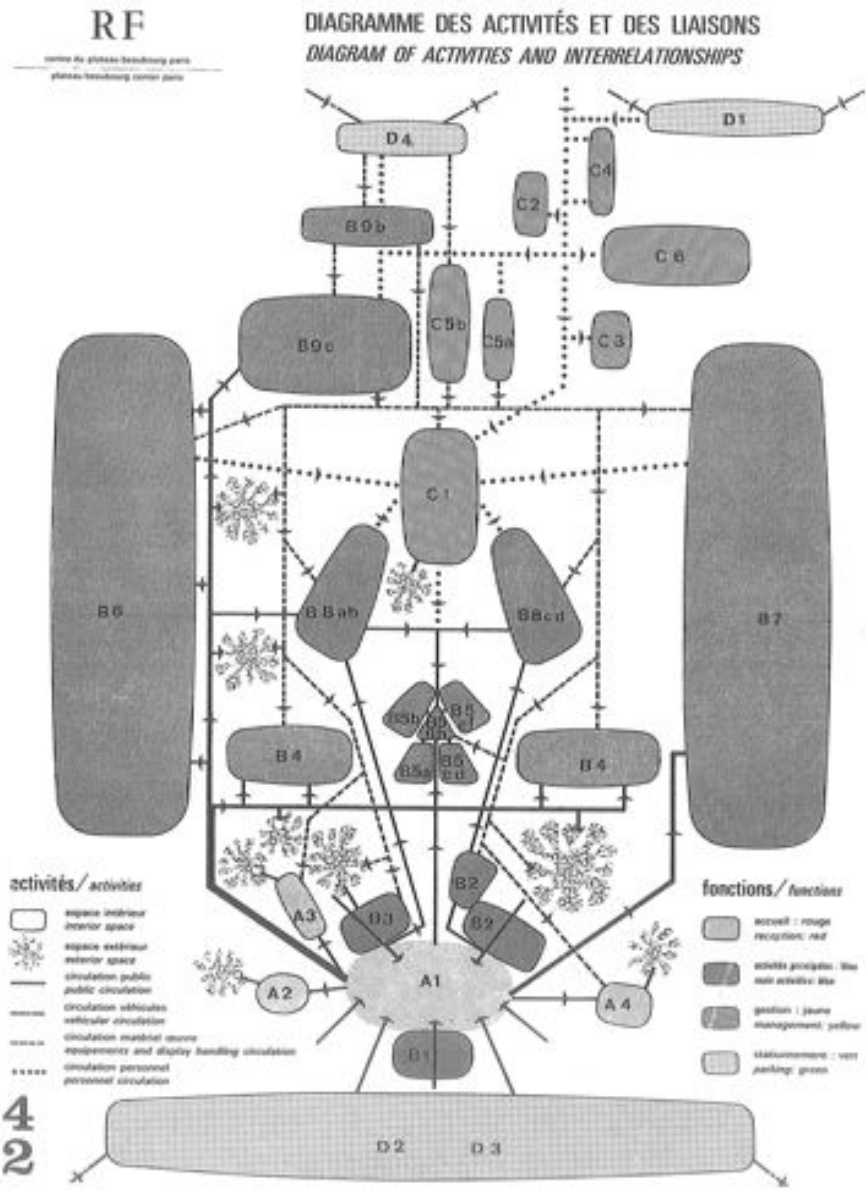


Fig. 1.4: Program diagram from the competition brief. From *Concours international d'idées à un degré* (competition brief) (Paris: France, Ministère d'état chargé des affaires culturelles, 1970).



Fig. 1.5: Catalogs from CCI exhibitions at the Halles de Baltard (1970-71). Graphics are by Jean Widmer, who later created the logo for the Centre Pompidou.

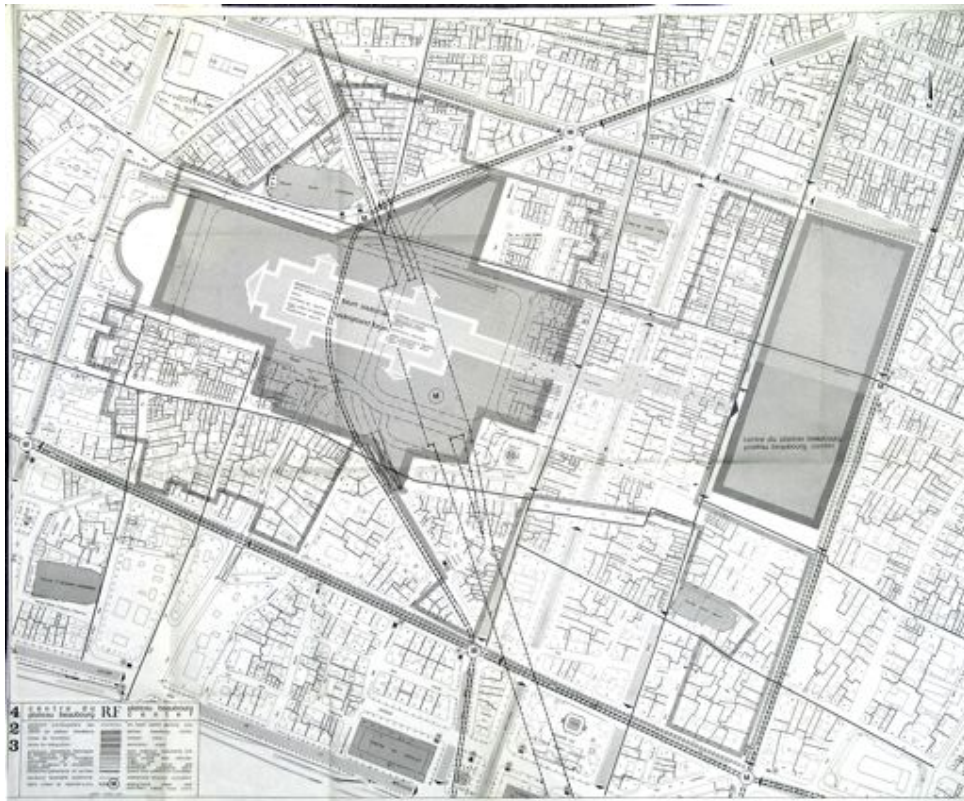


Fig. 1.6: Site plan from competition brief showing connections to infrastructure and underground access.

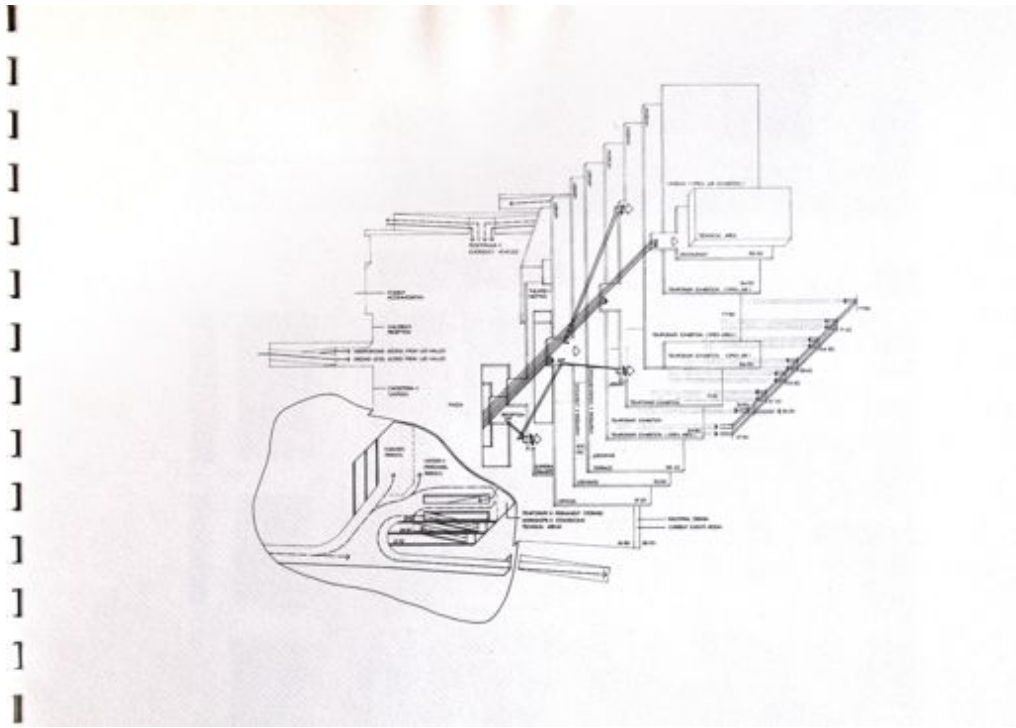


Fig. 2.1: Piano and Rogers competition entry. Archives CGP.

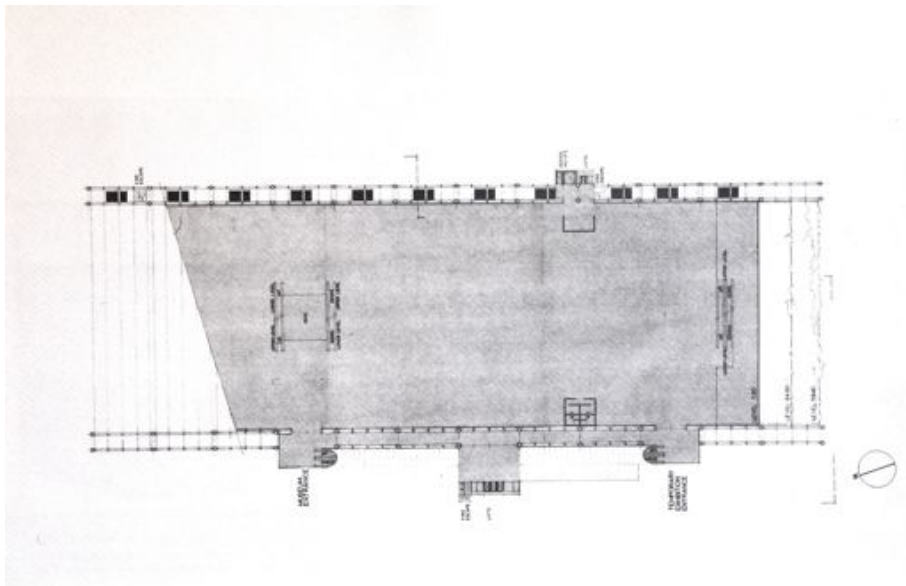


Fig. 2.2: Piano and Rogers competition entry – plan. Archives CGP.



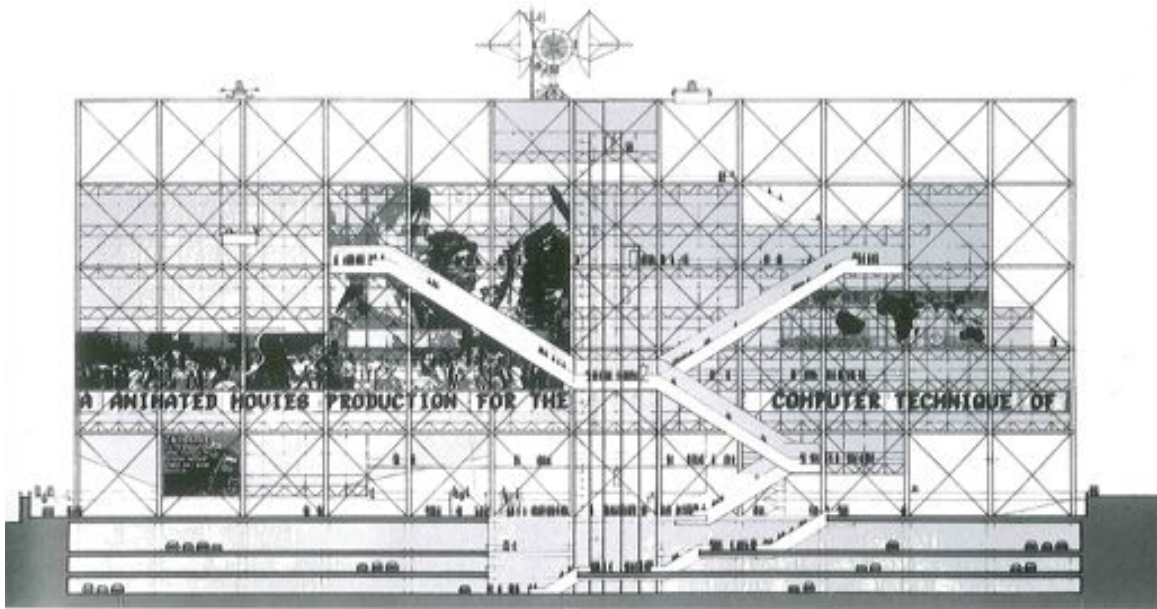


Fig. 2.3: Piano and Rogers competition entry – West (plaza) elevation. Archives CGP.

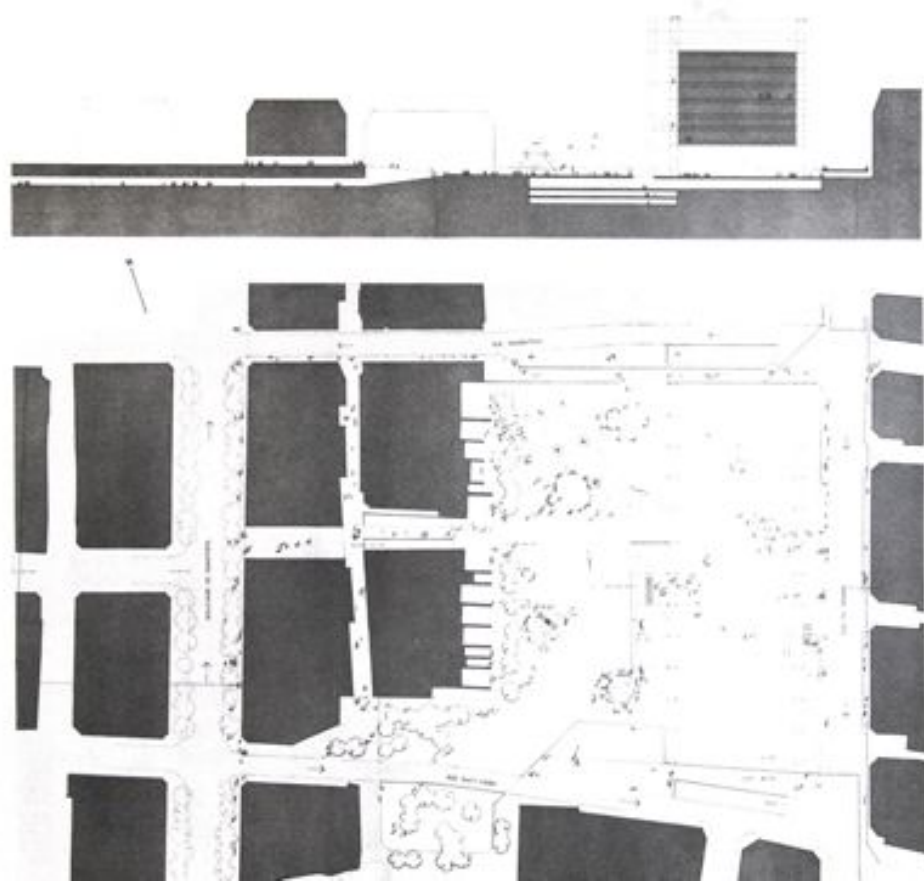


Fig. 2.4: Piano and Rogers competition entry – section and site plan. Archives CGP.



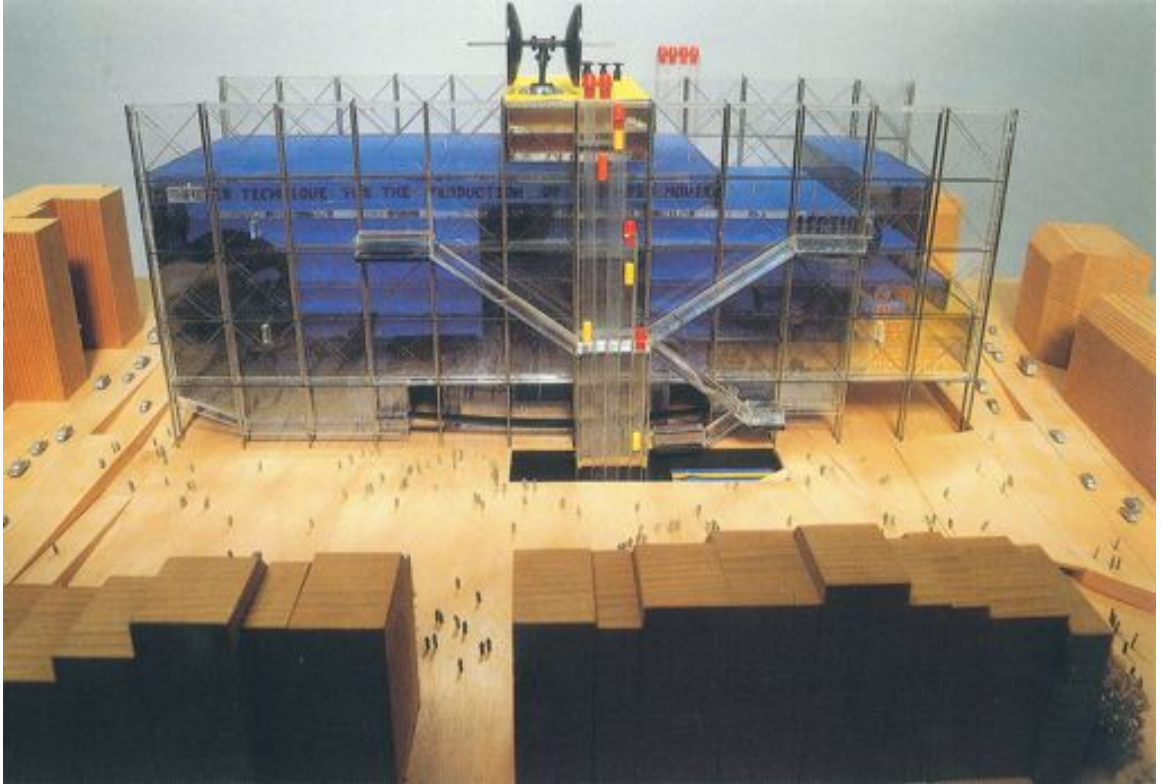


Fig. 2.5: Piano and Rogers competition entry – model. From Renzo Piano, Richard Rogers, and Antoine Picon, *Du plateau Beaubourg au Centre Georges Pompidou* (Paris: Editions du Centre Pompidou, 1987), 55.

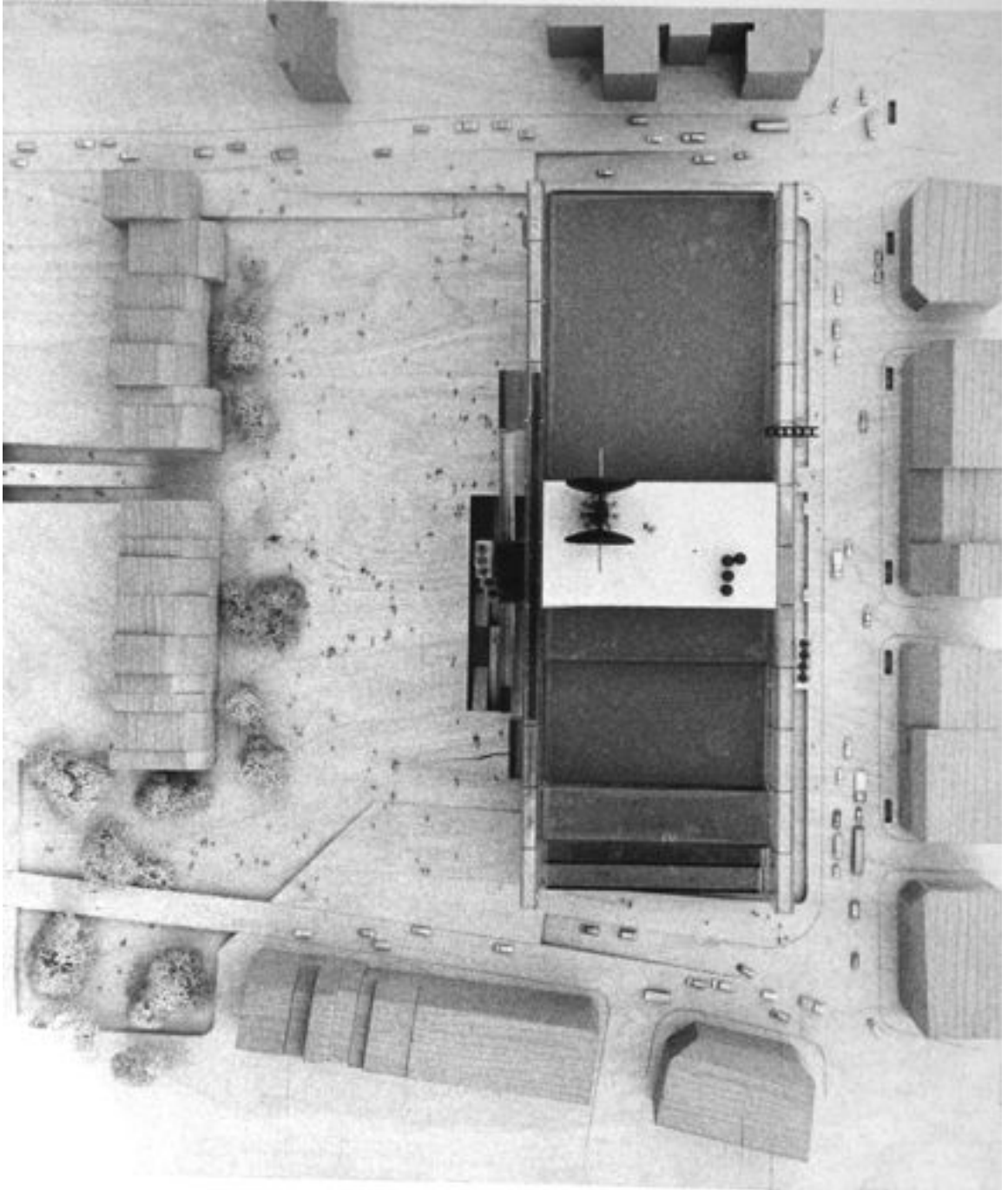


Fig. 2.6: Piano and Rogers competition entry – model. Archives CGP.

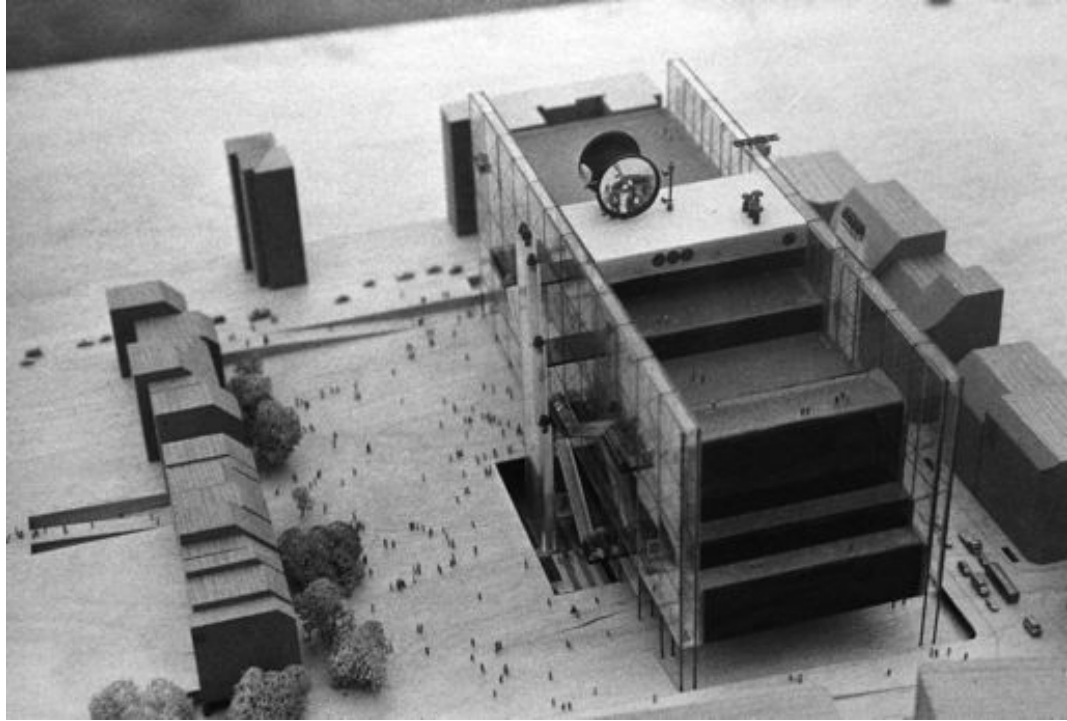


Fig. 2.7: Piano and Rogers competition entry – model. Archives CGP.

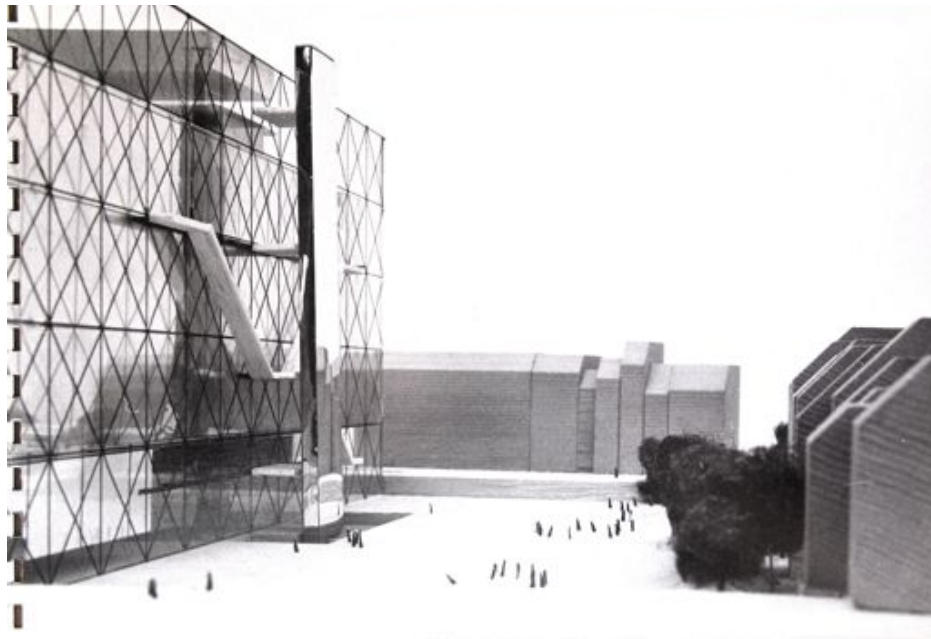


Fig. 2.8: Piano and Rogers competition entry – model. Archives CGP.

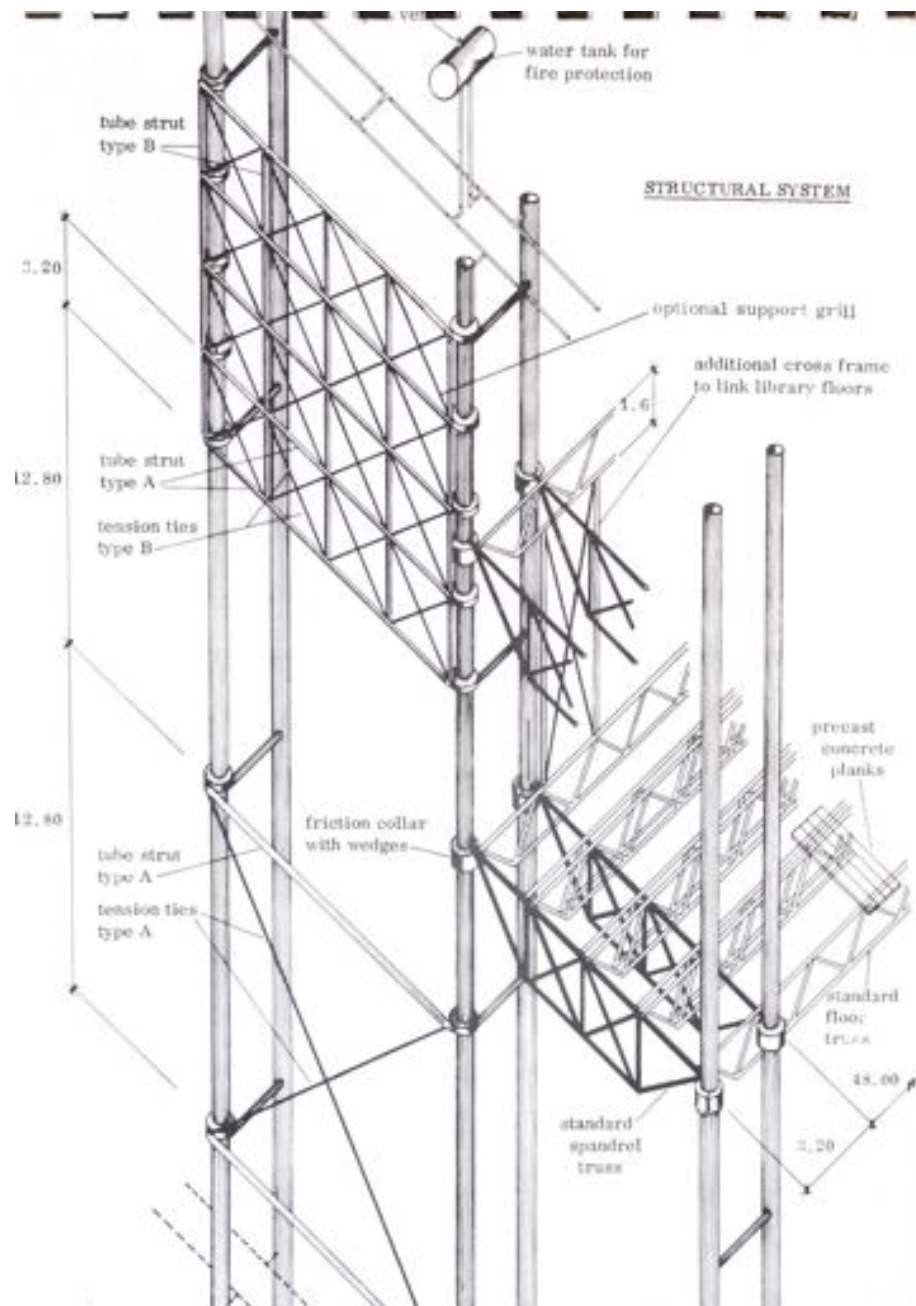


Fig. 2.9: Piano and Rogers competition entry – structural details. Archives CGP.

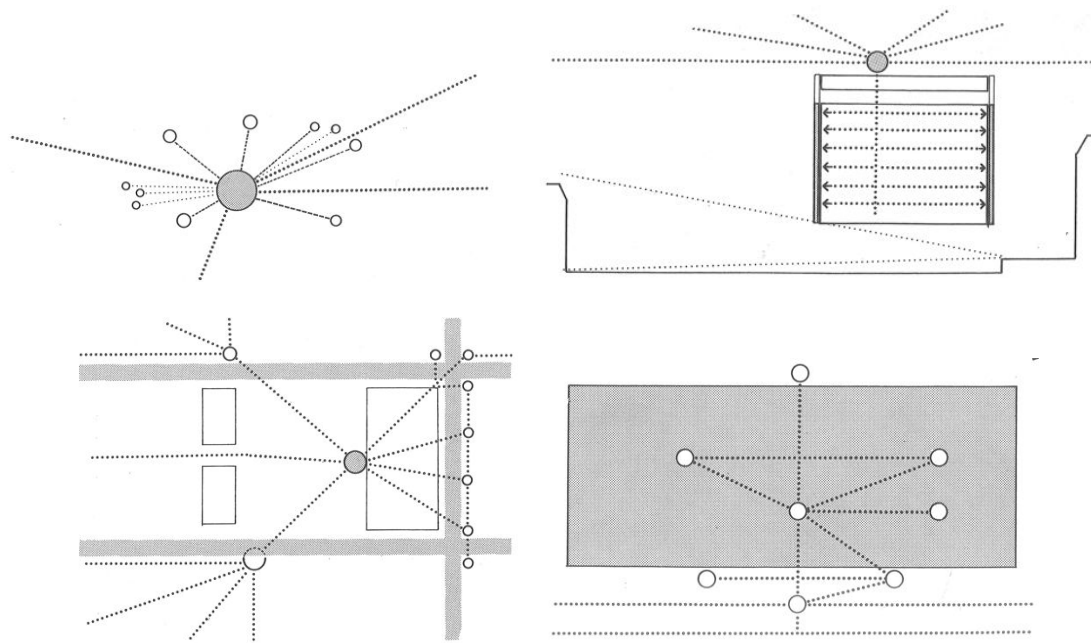


Fig. 2.10: Piano and Rogers competition entry – network diagrams. Archives CGP.



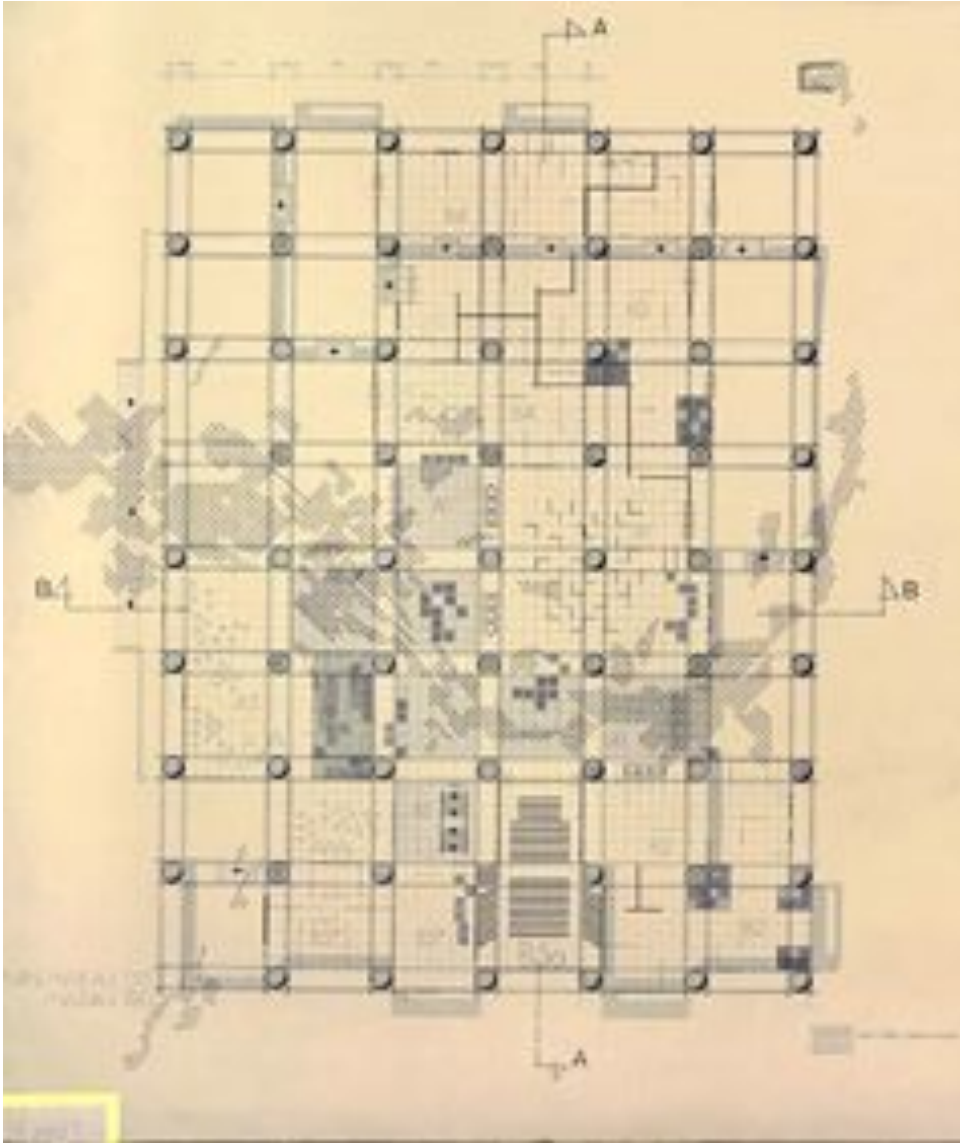


Fig. 2.11: Jean-François Séris et al. (project 88). Archives CGP (APH 00687),

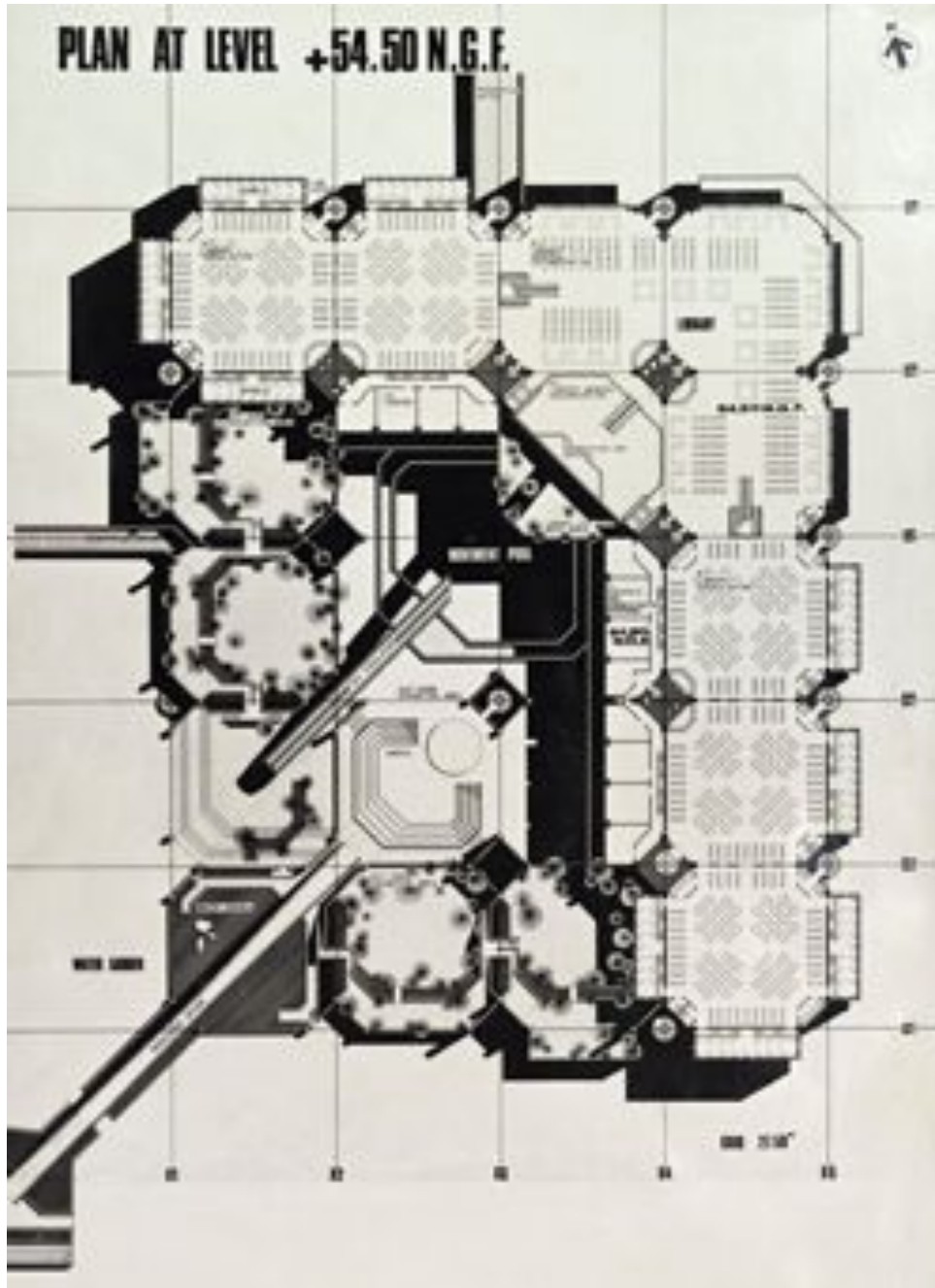


Fig 2.12: Kisho N. Korokawa (project 456). Archives CGP (APH 13394).

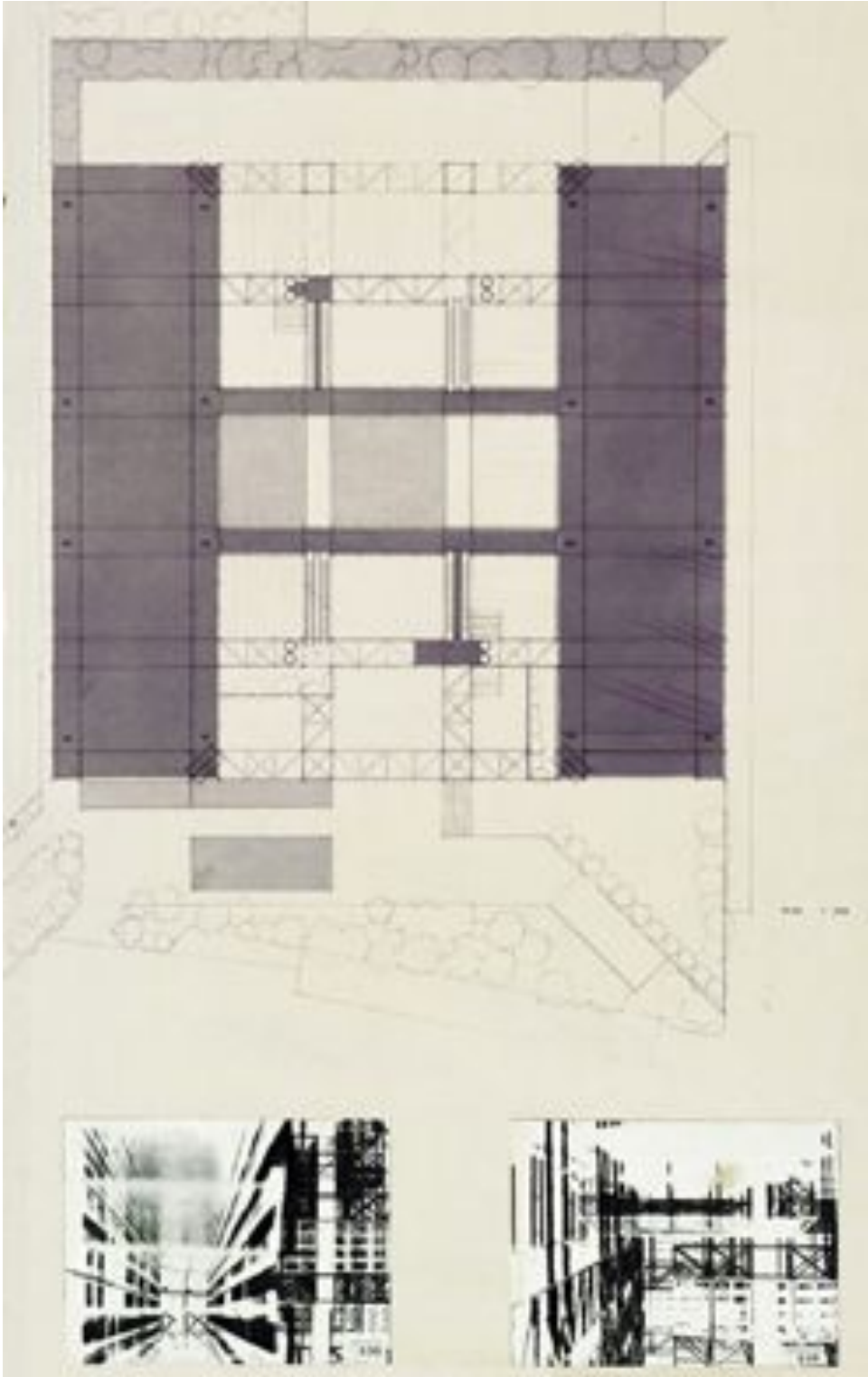


Fig 2.13: Ken Maher, C. Stewart, C. Burton, R. Apperly (project 539). Archives CGP (APH 13403).



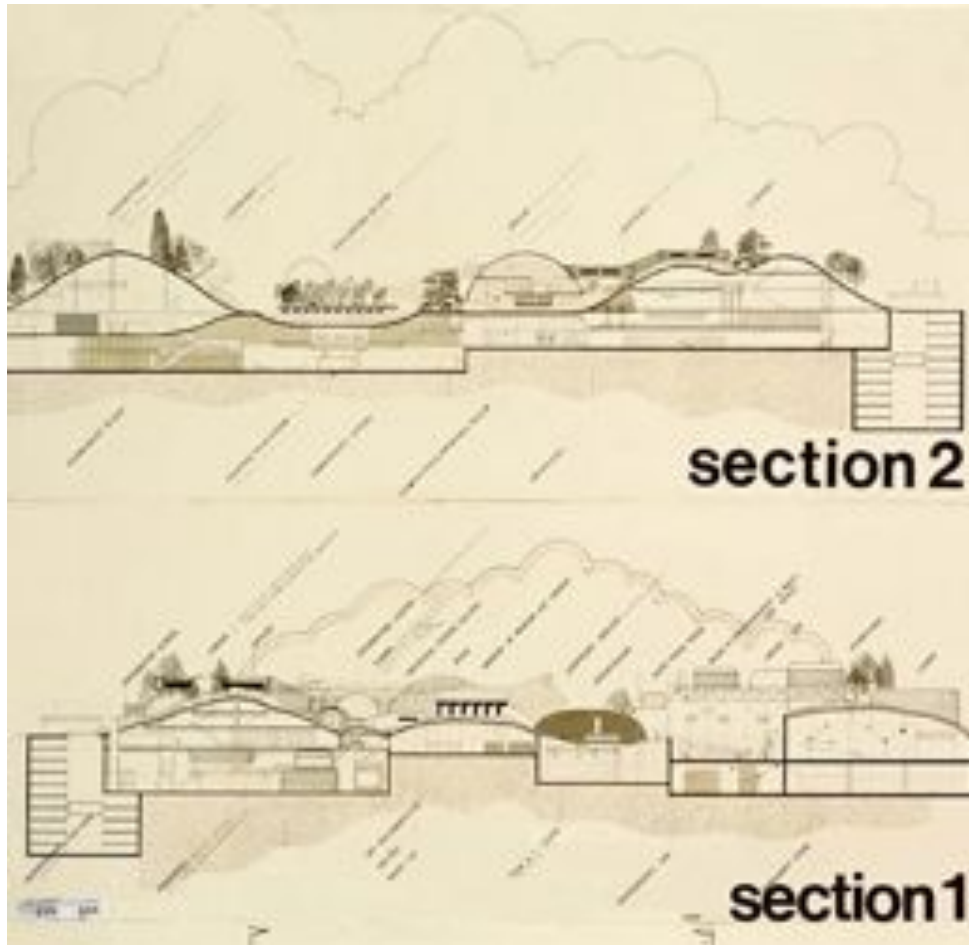


Fig. 2.14: Dennis Crompton, Nora Kohen, Will Alsop, Julius Tabacek (project 535). Archives CGP (APH 13402).

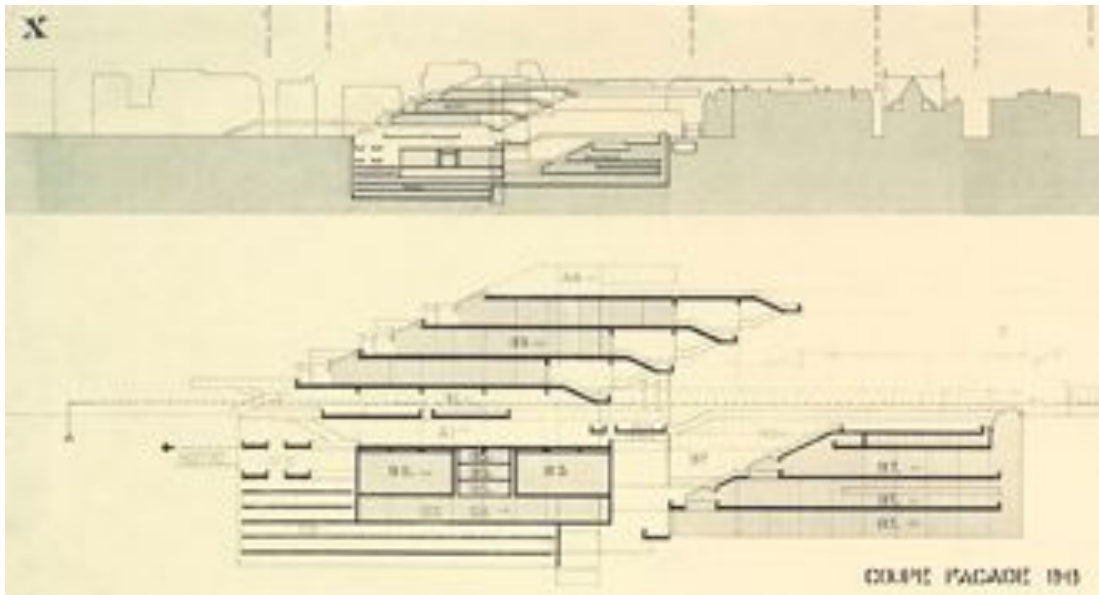


Fig. 2.15: Raimund Abraham, Friedrich Saint-Florian, et al. (project 585). Archives CGP (APH 13404).

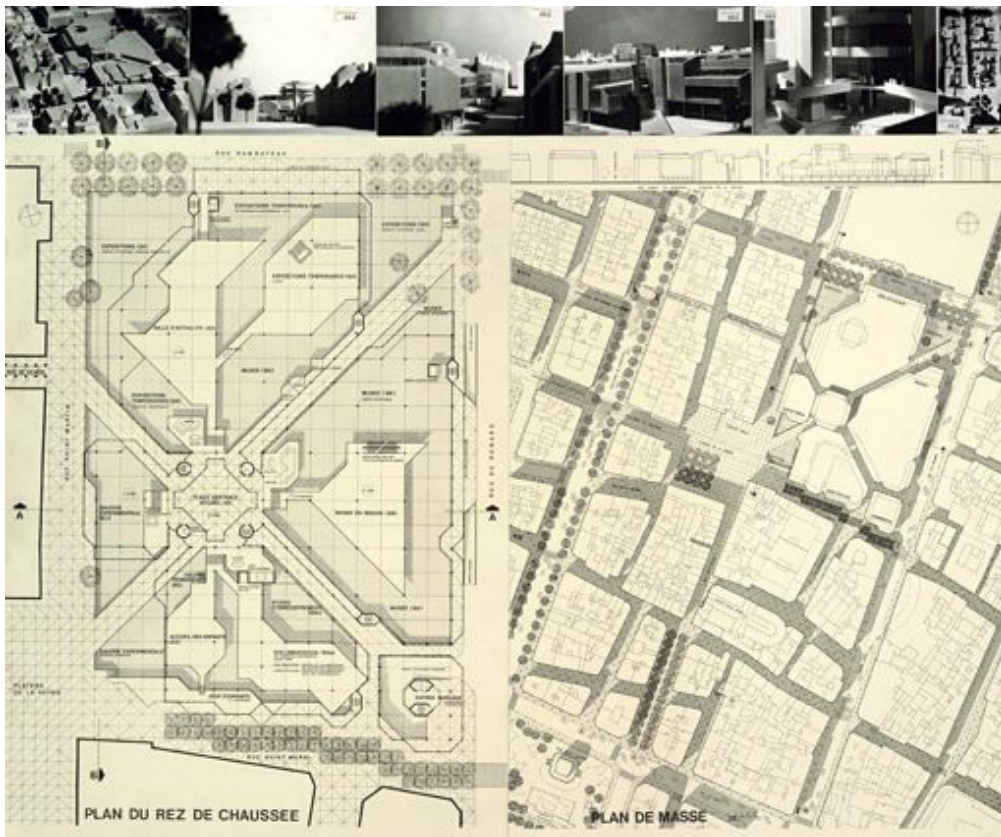


Fig. 2.16: Michel Ducharme et al. (project 353). Archives CGP (APH 00940).



Fig. 2.17: Erickson and Massey (project 466). Archives CGP (APH 13395).

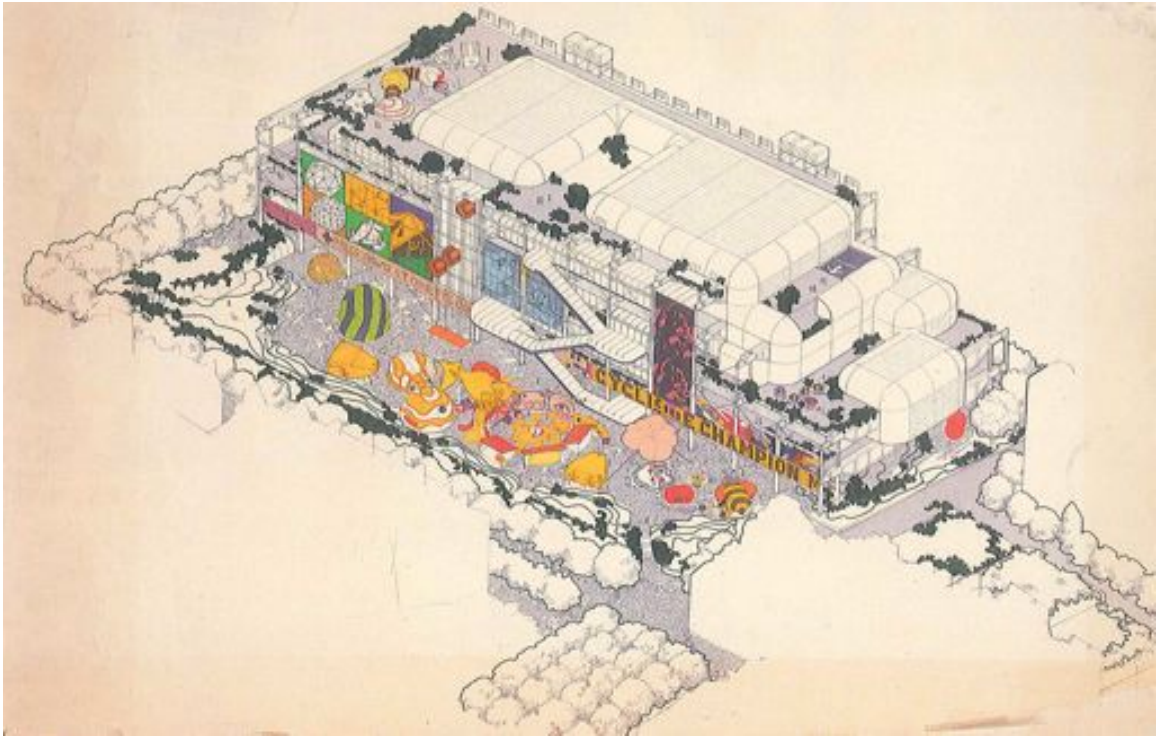


Fig. 3.1: First Avant projet sommaire. From Kenneth Powell, *Richard Rogers: Complete Works* (London: Phaidon, 1999), 107.

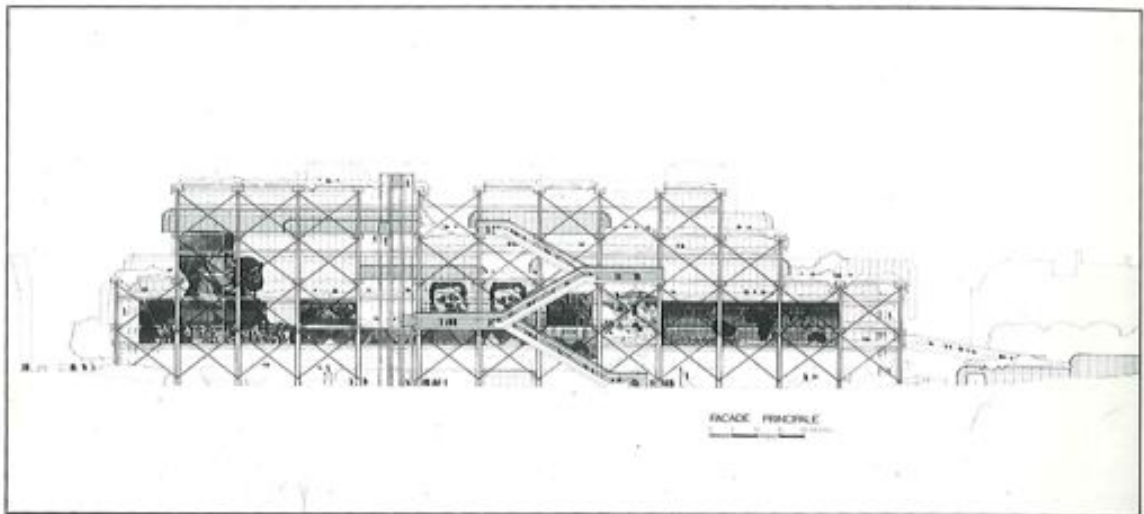


Fig. 3.2: First Avant projet sommaire. From Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*, 58.



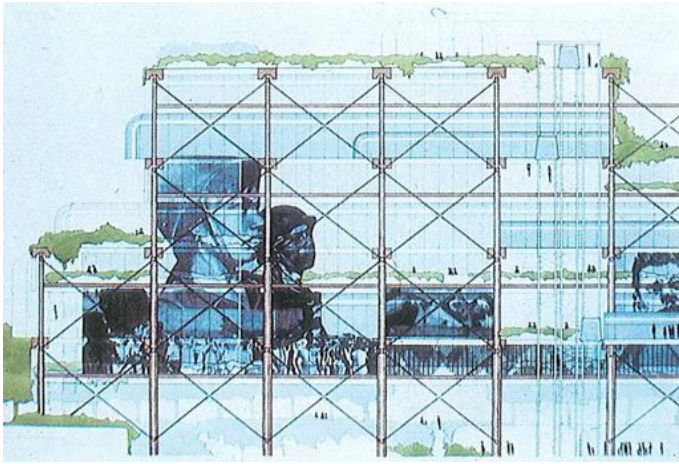


Fig. 3.3: First Avant projet sommaire. From Ibid.

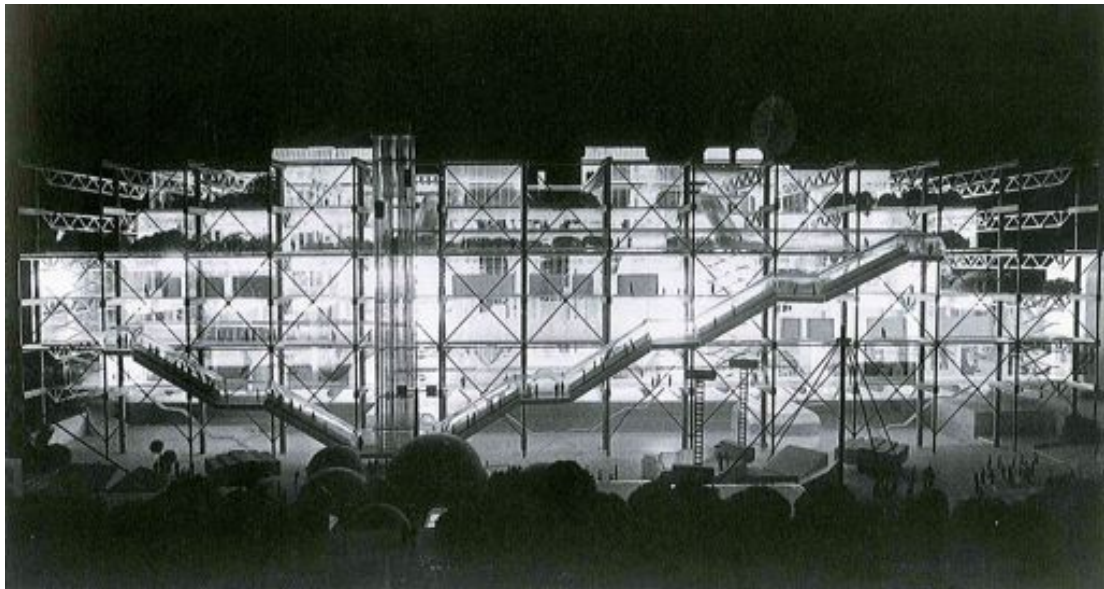


Fig. 3.4: Second Avant projet sommaire. From Powell, *Richard Rogers*, 107.

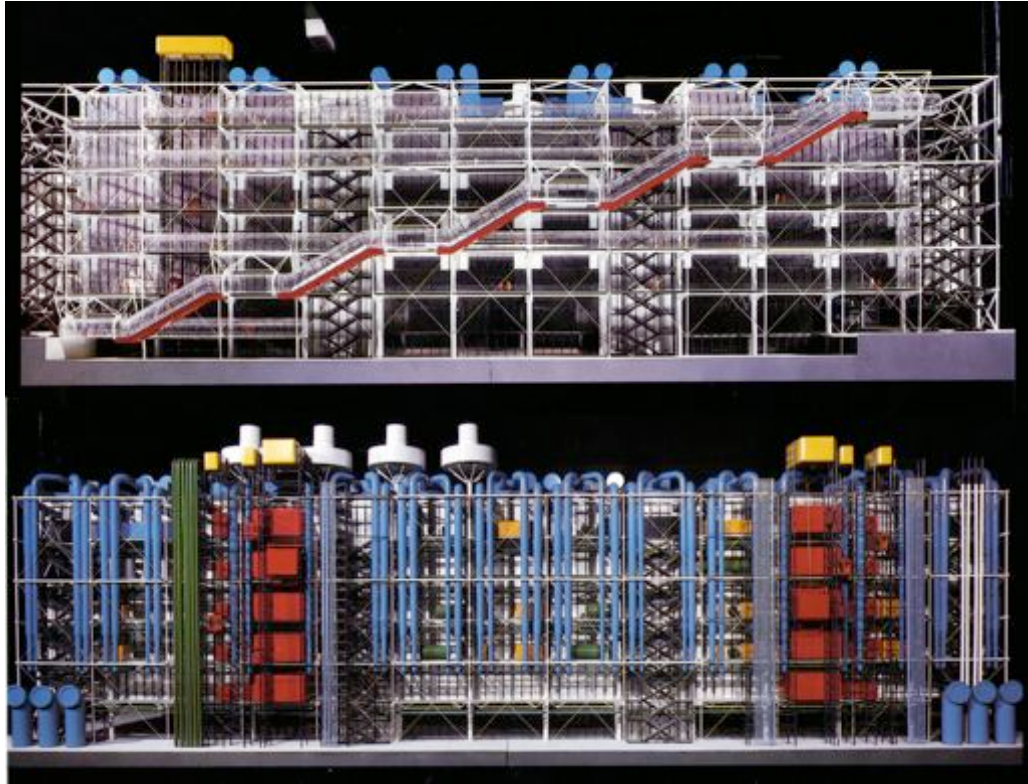


Fig. 3.5: Projet définitif. From Piano, Rogers, and Picon, *Du plateau Beaubourg au Centre Georges Pompidou*.

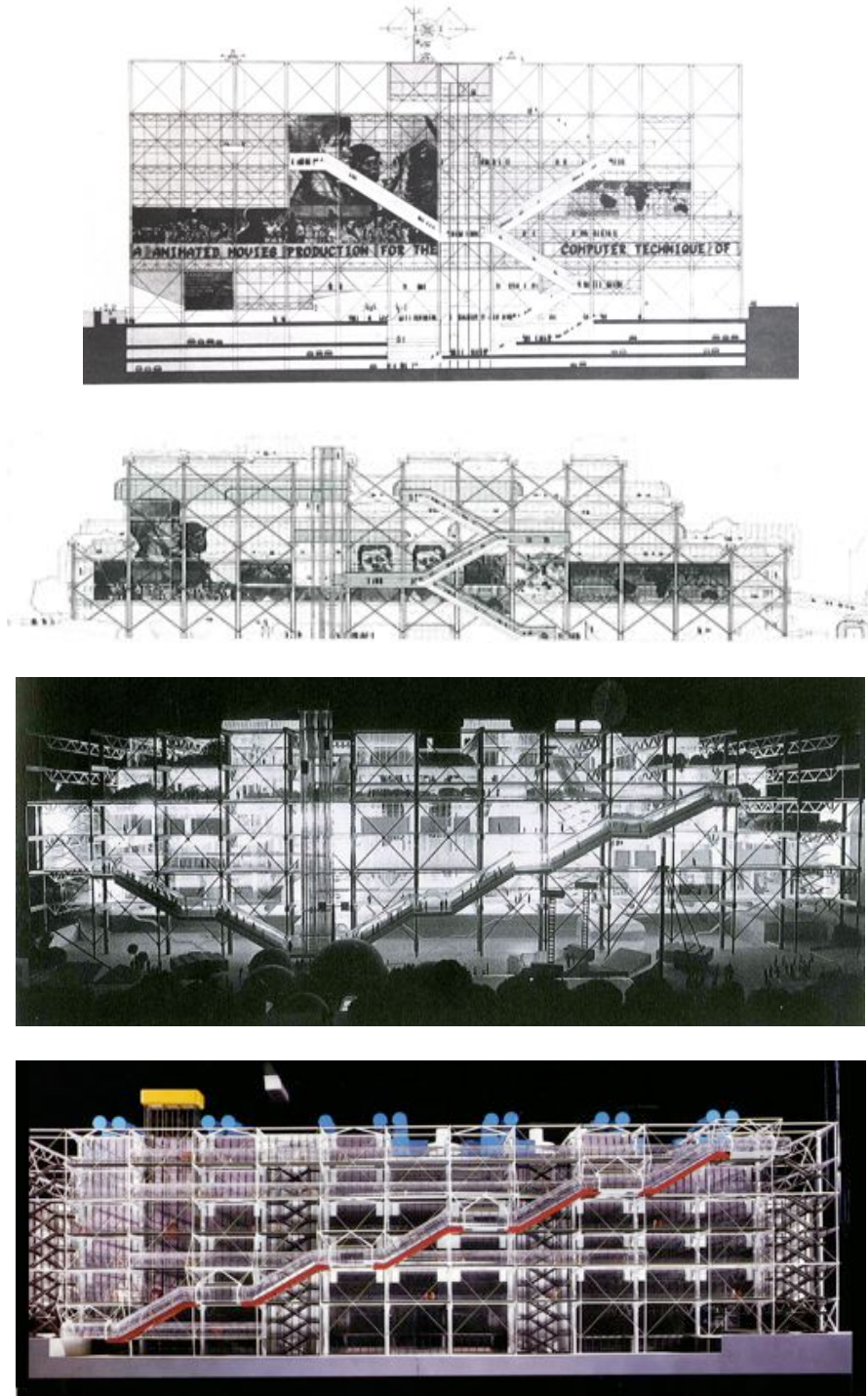


Fig. 3.6: Development of West elevation (from top): competition scheme, first Avant projet sommaire, second Avant projet sommaire, Projet définitif.



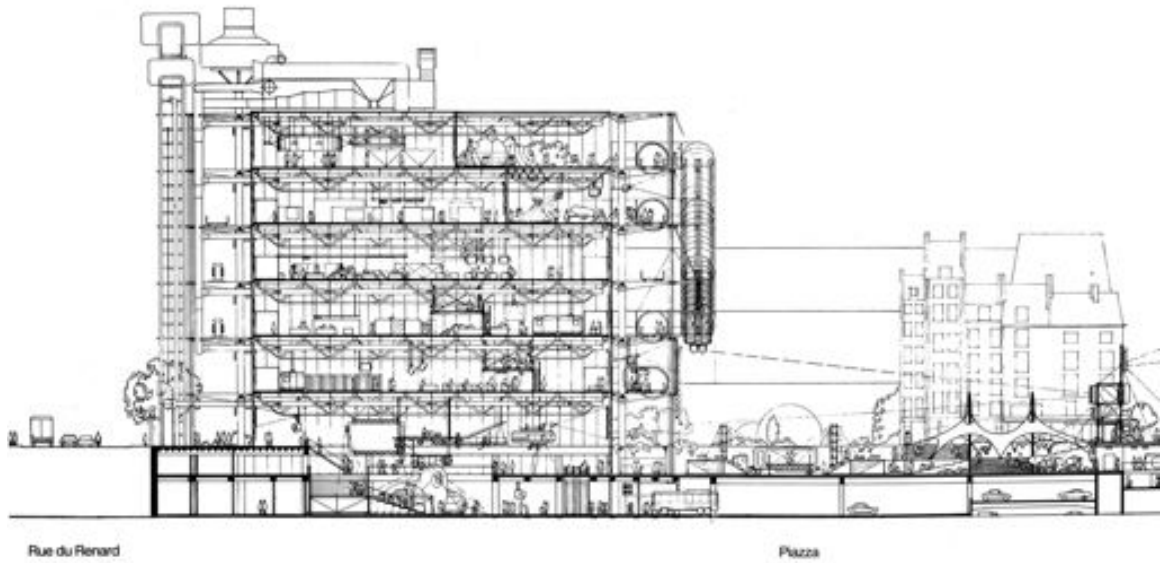


Fig. 3.7: Projet définitif – section. Archives CGP.



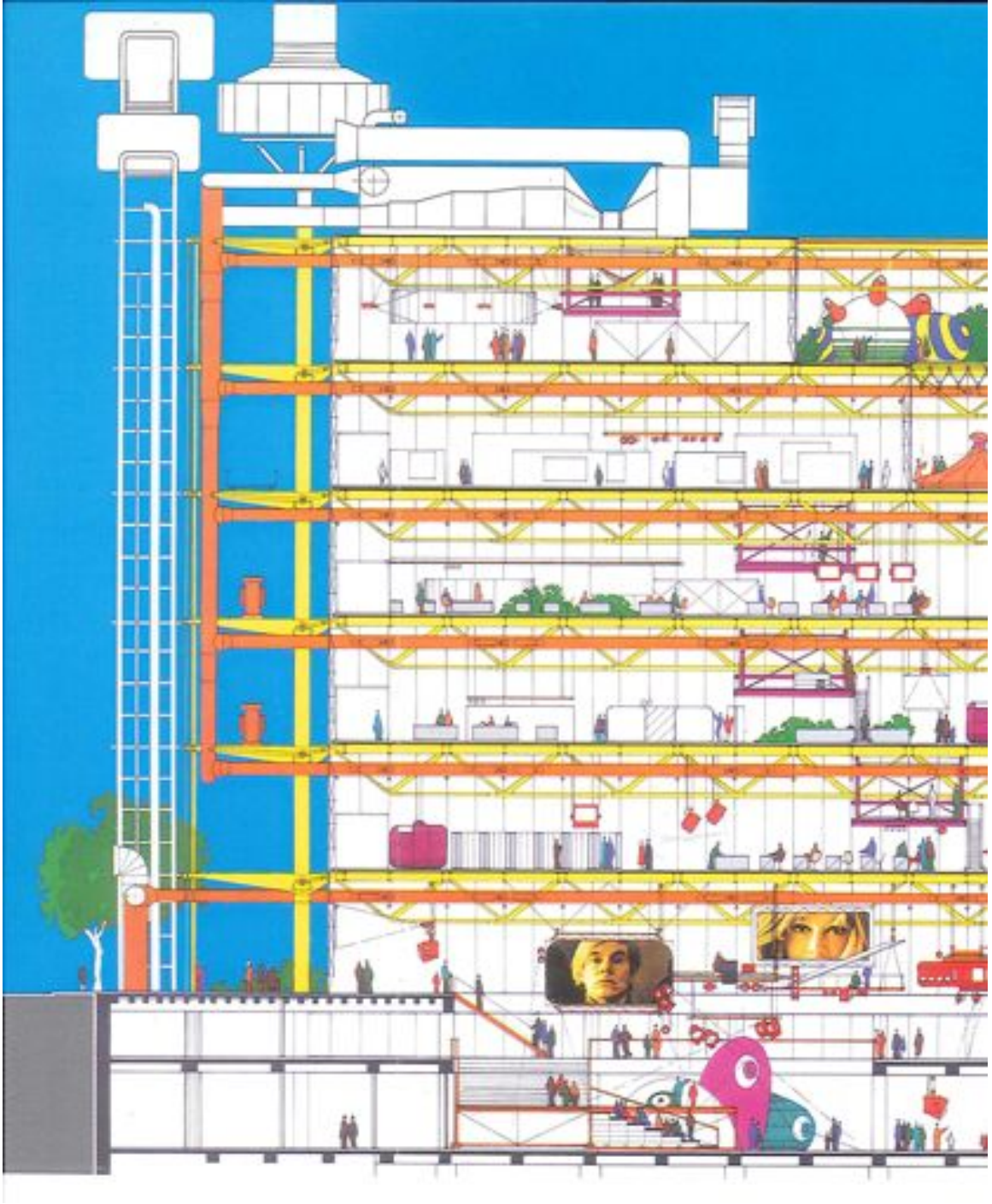


Fig. 3.8: Projet définitif – section (detail). From Powell, *Richard Rogers*, 110.

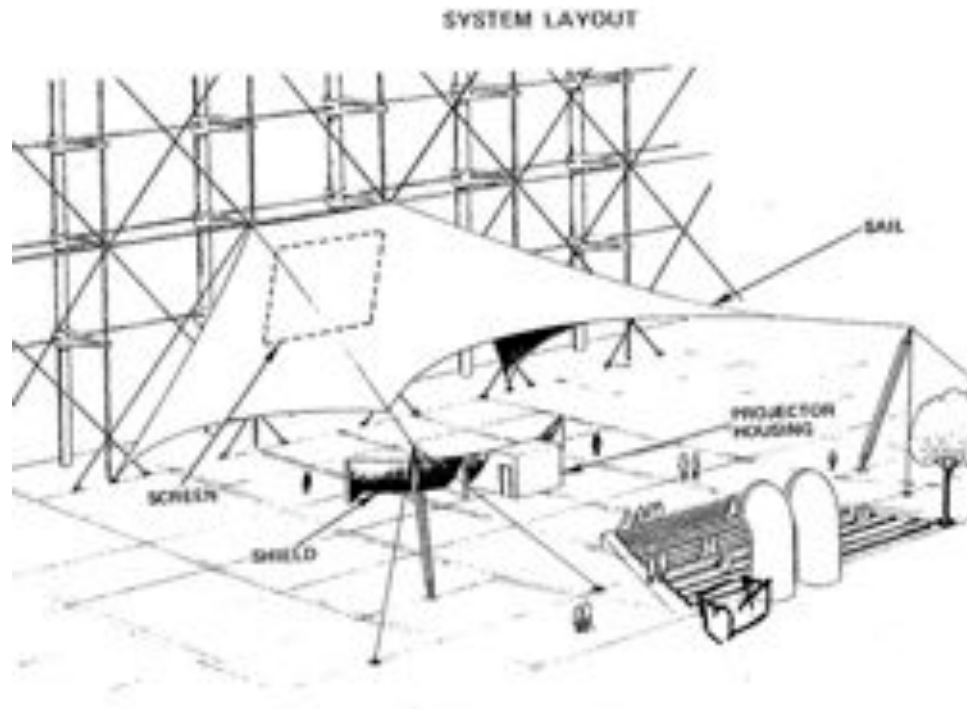


Fig. 3.9: Experiments in Art and Technology (E.A.T.) – piazza installation. From Dufrière, *Centre Pompidou: trente ans d'histoire*.



Fig. 3.10: Mies van der Rohe, Concert Hall Project (1942)





Fig. 3.11: Ezra Ehrenkrantz, SCSD Prototype, Palo Alto. From Christopher Arnold, "School Construction Systems Development," *Architectural Design* 37 (November 1967): 495-506.



Fig. 3.12: Norman Foster, IBM Pilot Head Office, Cosham (1970)

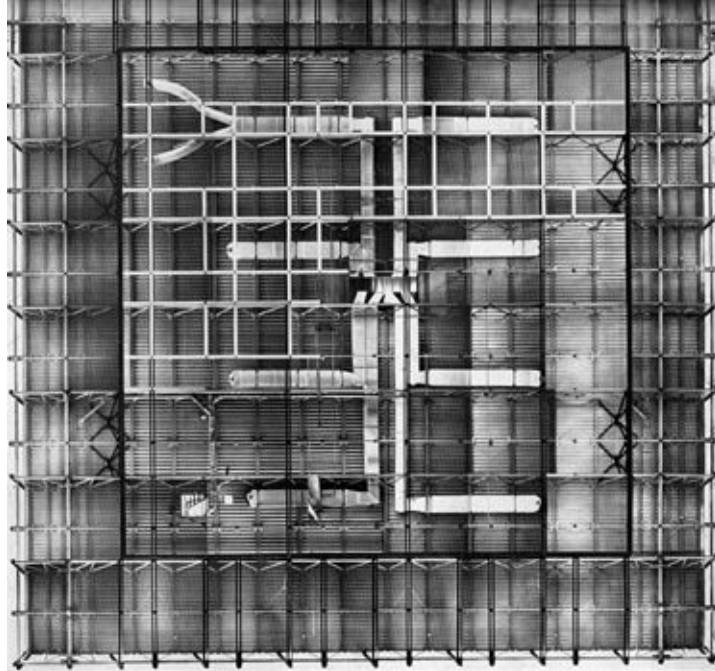


Fig. 3.13: Ezra Ehrenkrantz, SCSD Prototype, Palo Alto. From Ibid.

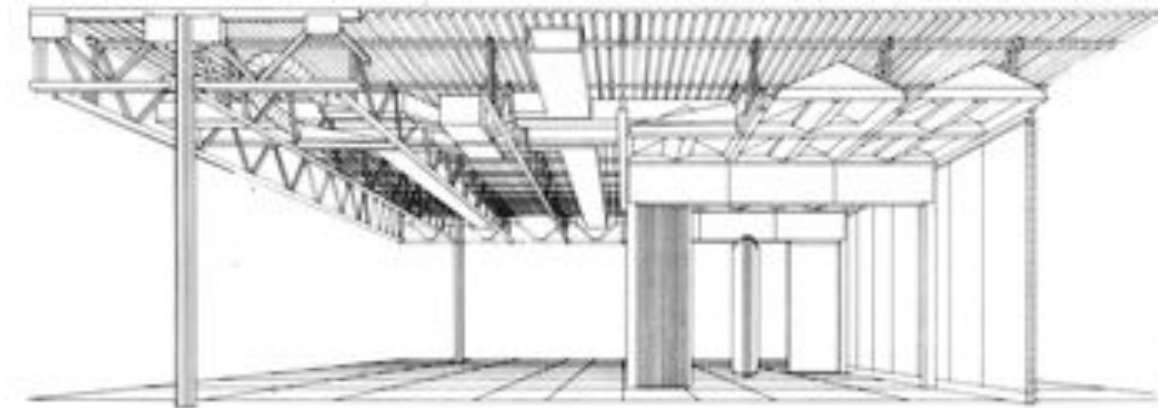


Fig. 3.14: Ezra Ehrenkrantz, SCSD Prototype, Palo Alto. From *SCSD: The Project and the Schools* (Educational Facilities Laboratories, n.d.), [http://archone.tamu.edu/crs/engine/archive\\_files/EFL/6000.0810.pdf](http://archone.tamu.edu/crs/engine/archive_files/EFL/6000.0810.pdf).

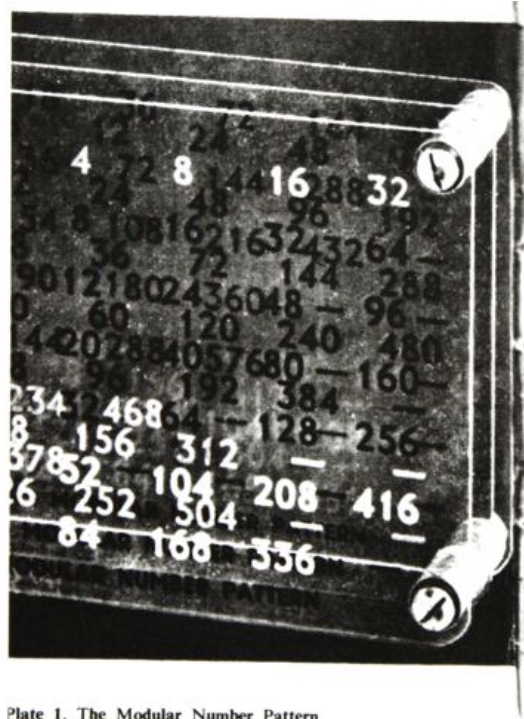


Plate 1. The Modular Number Pattern  
from inside back cover

Fig. 3.15: Ezra Ehrenkrantz, The Modular Number Pattern. From Ezra Ehrenkrantz, *The Modular Number Pattern: Flexibility through Standardisation* (Tiranti, 1956).



Fig. 3.16: Ezra Ehrenkrantz, SCSD schools.

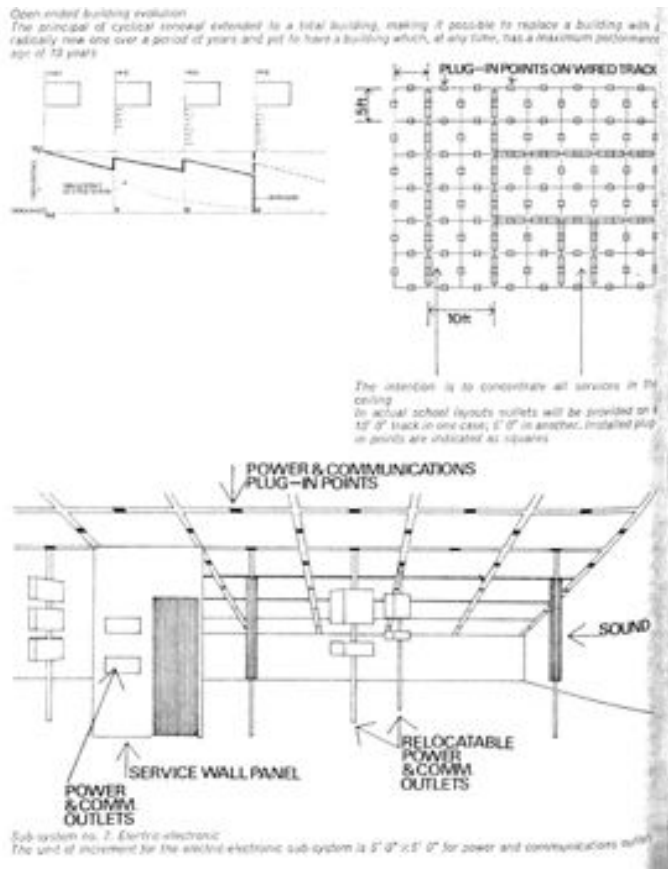


Fig. 3.17: IRNES, RAS project. From John R. Boice, *RAS: Recherches en Amenagements Scolaires*, Building Systems Information Clearinghouse Newsletter (Stanford, Calif: Systems Division, School Planning Laboratory, Spring 1969), [http://archone.tamu.edu/CRS/engine/archive\\_files/EFL/6000.1305.pdf](http://archone.tamu.edu/CRS/engine/archive_files/EFL/6000.1305.pdf).

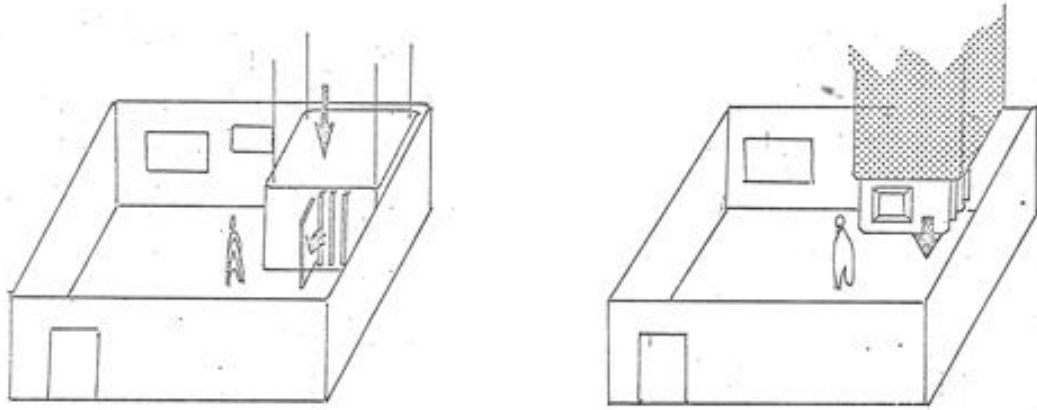


Fig. 3.18: Programme spécifique, *kinakothèque*. Archives CGP.

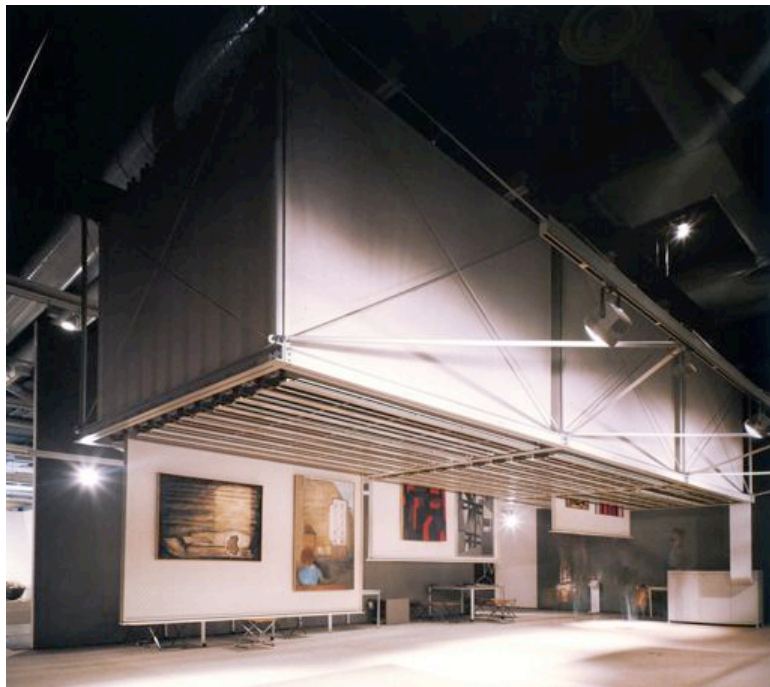


Fig. 3.19: Centre Pompidou, *kinakothèque*. Archives CGP.





Fig. 3.20: Peter Rice, gerberette detail. From Peter Rice, *An Engineer Imagines* (London: Artemis, 1994).



Fig. 3.21: Norman Foster, IBM Pilot Head Office, Cosham (1970)





Fig. 3.22: Title page from Martin Pawley, *Architectural Design* (November 1970).

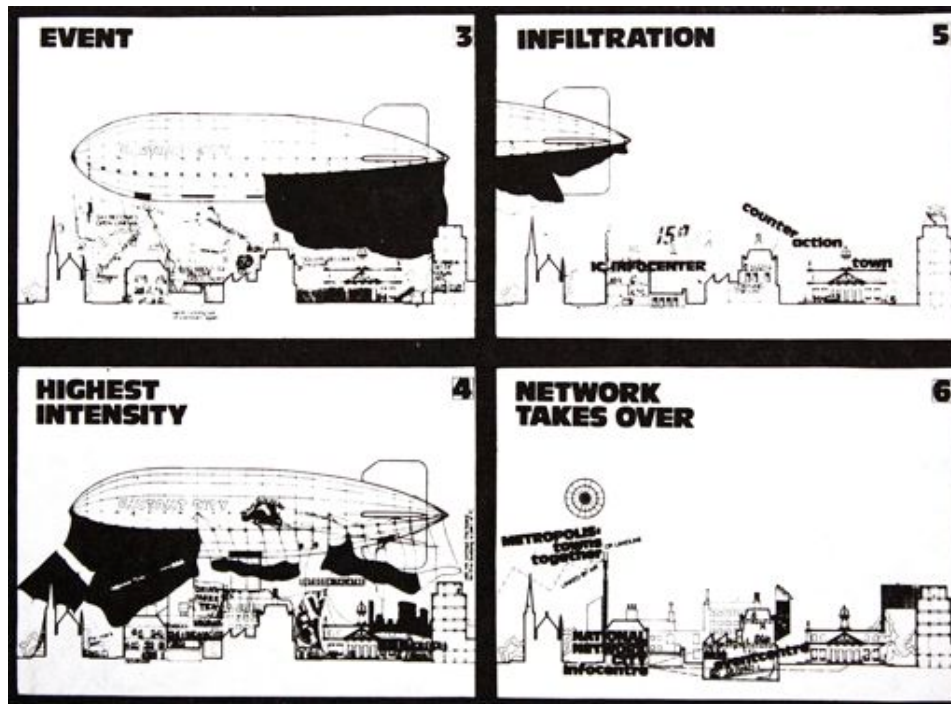


Fig. 3.23: Peter Cook, Ron Herron, Dennis Crompton, “Instant City” revisited (1970)



Fig. 3.24: Norman Foster, IBM Pilot Head Office, Cosham (1970)



Fig. 4.1: Beaubourg programming team (Lombard is second from right, O'Byrne is far right). Archives CGP.



Fig. 4.2: Lombard in conversation with Piano and Rogers. Archives CGP.

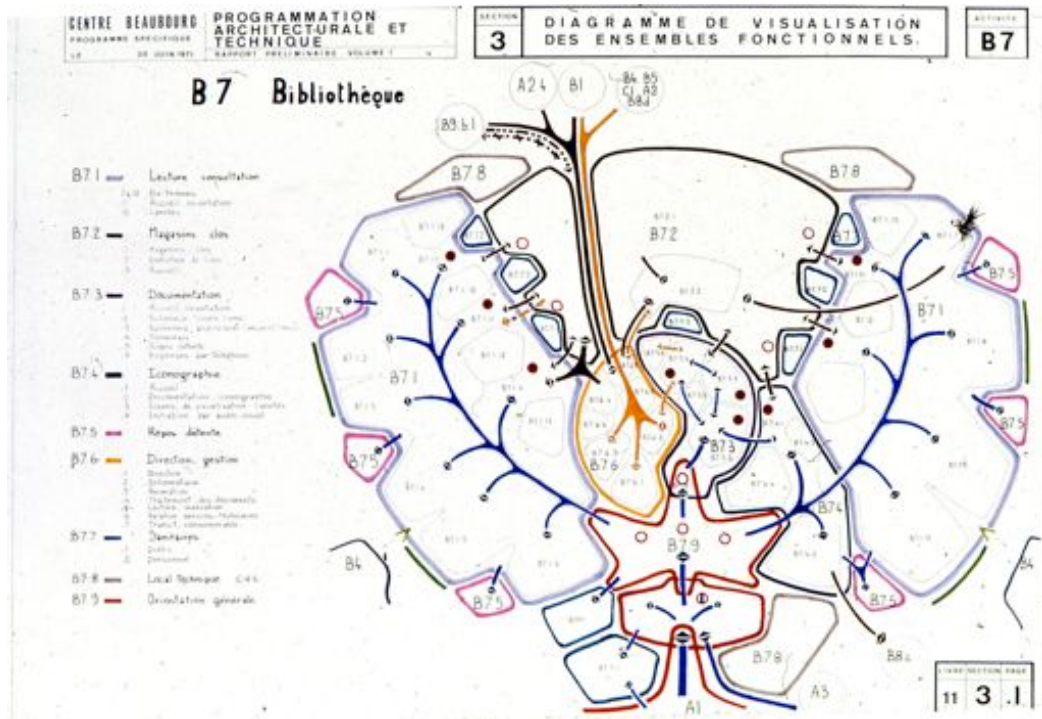


Fig. 4.3: Programme spécifique –Diagram of library functional ensemble. Courtesy of Patrick O’Byrne and H el ene Dano-Vanneyre.



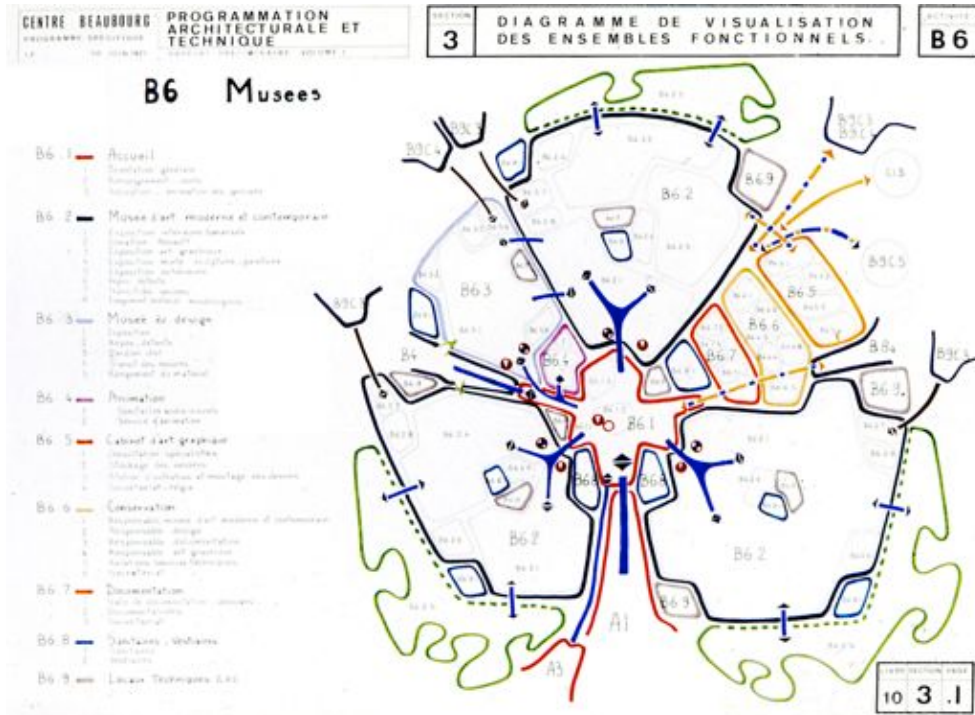


Fig. 4.4: Programme spécifique –Diagram of museum functional ensemble. Courtesy of Patrick O’Byrne and Hélène Dano-Vanneyre.

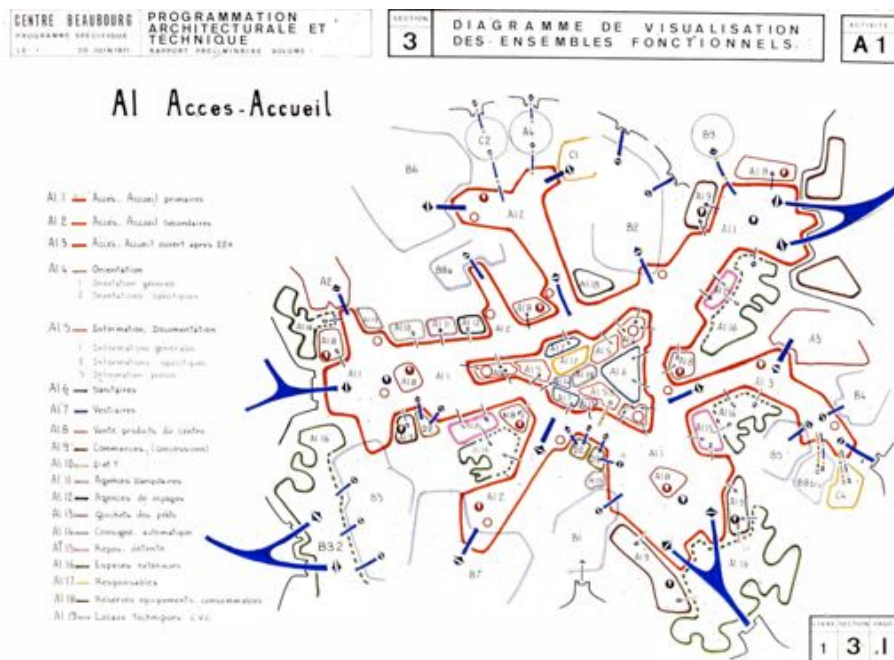


Fig. 4.5: Programme spécifique –Diagram of reception functional ensemble. Courtesy of Patrick O’Byrne and Hélène Dano-Vanneyre.

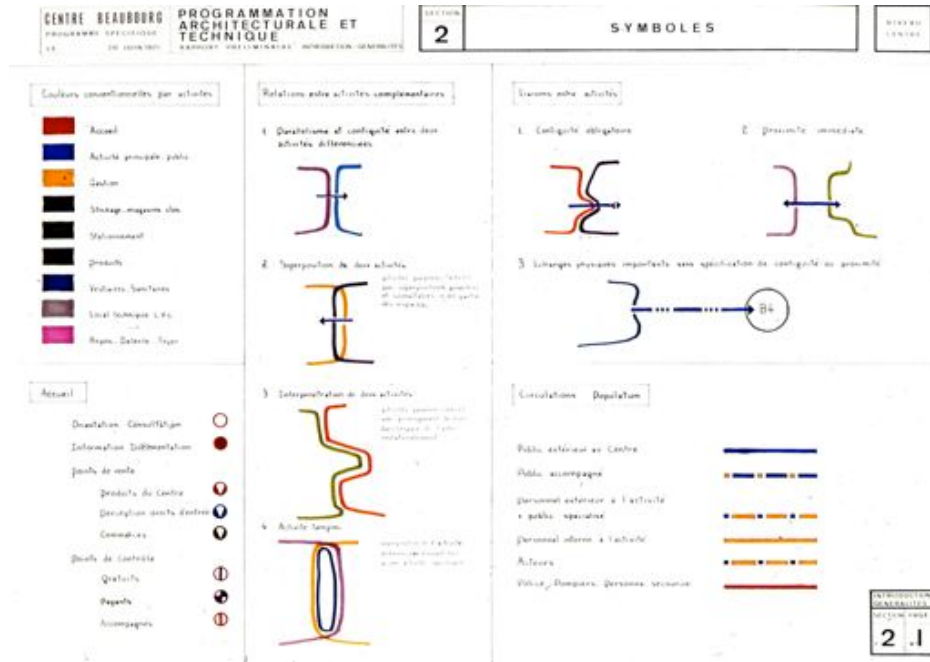


Fig. 4.6: Programme spécifique – Interfaces. Courtesy of Patrick O’Byrne and Hélène Dano-Vanneyre.

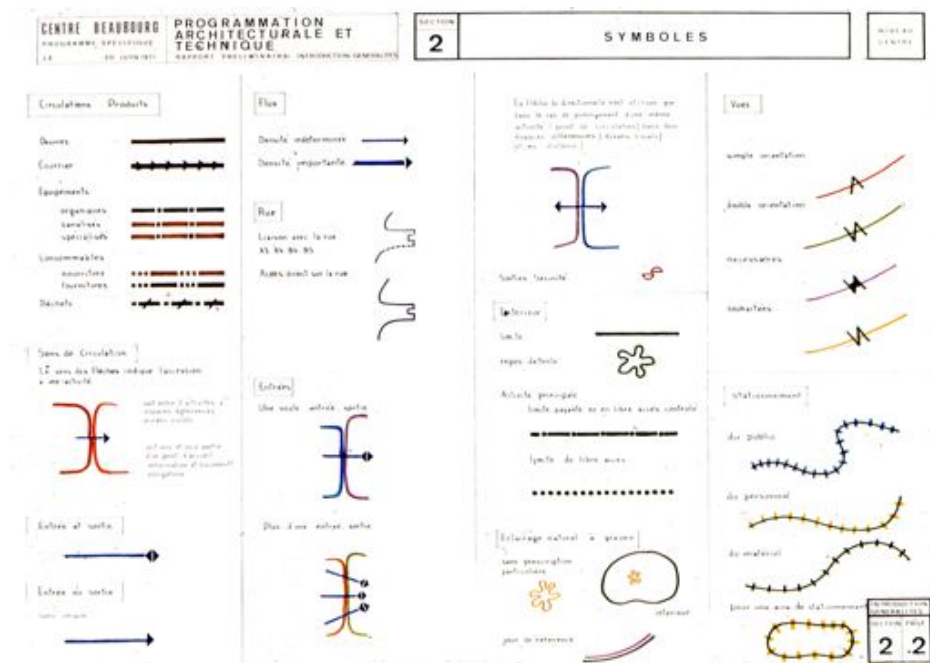


Fig. 4.7: Programme spécifique – Interfaces. Courtesy of Patrick O’Byrne and Hélène Dano-Vanneyre.

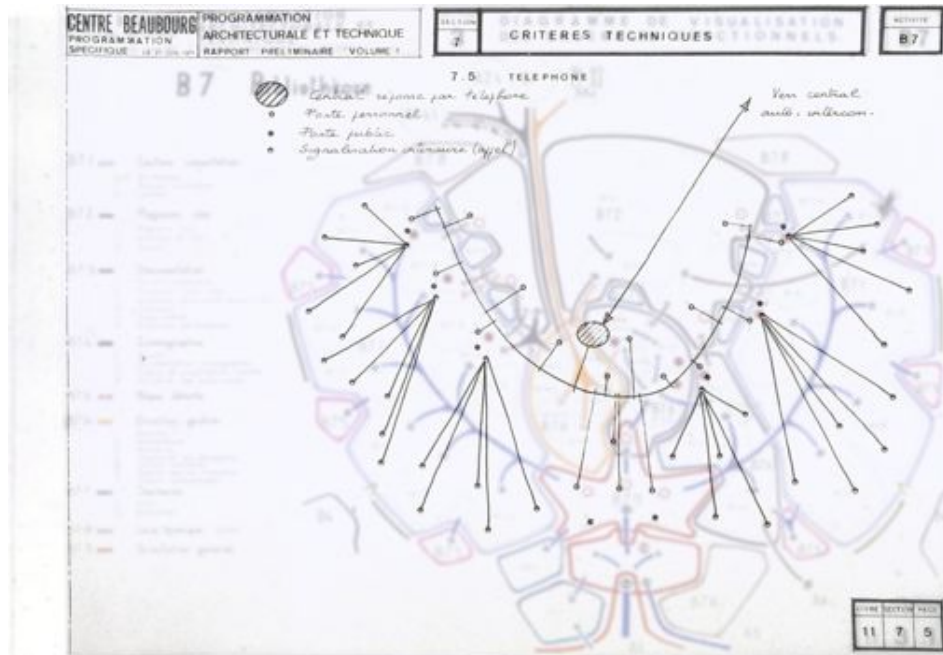


Fig. 4.8: Programme spécifique – Telephone systems in library. Courtesy of Patrick O’Byrne and H el ene Dano-Vanneyre.

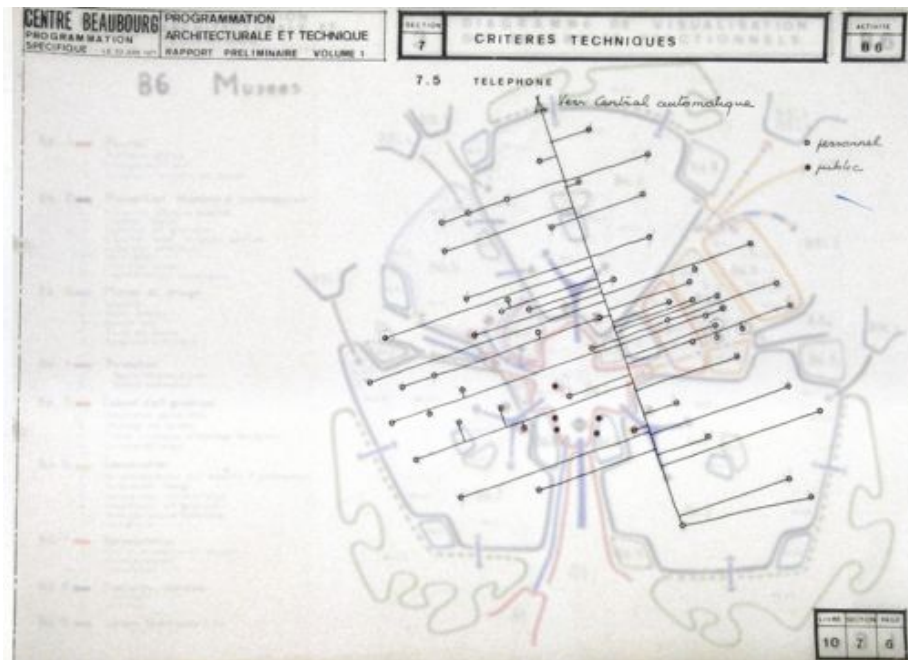


Fig. 4.9: Programme spécifique – Telephone systems in museums. Courtesy of Patrick O’Byrne and H el ene Dano-Vanneyre.

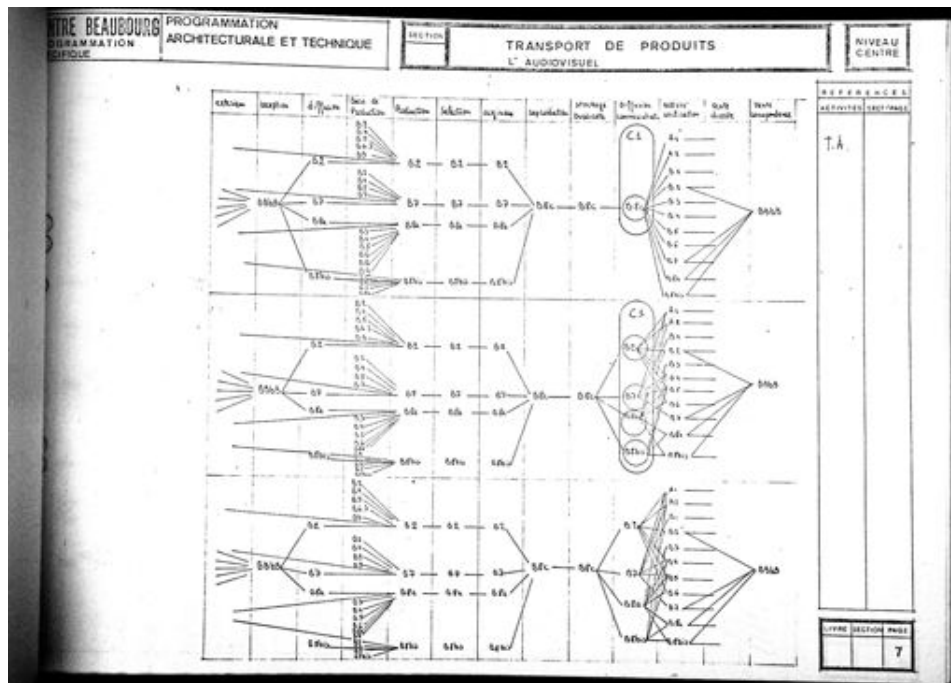


Fig. 4.10: Programme spécifique – Flow of audio-visual material. Archives CGP (Livre Marron).

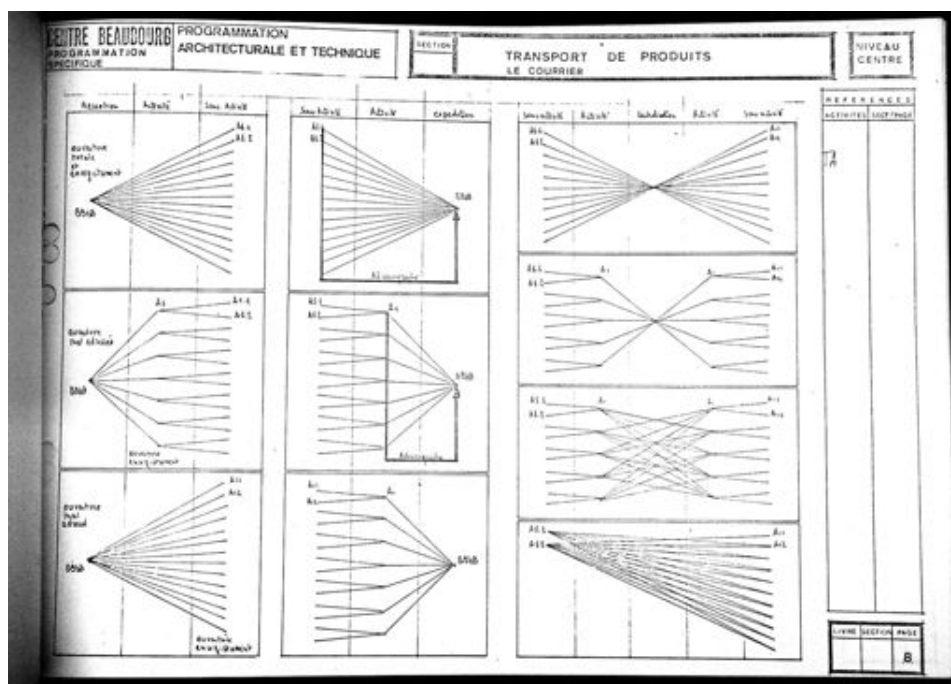


Fig. 4.11: Programme spécifique – Flow of mail. Archives CGP (Livre Marron).

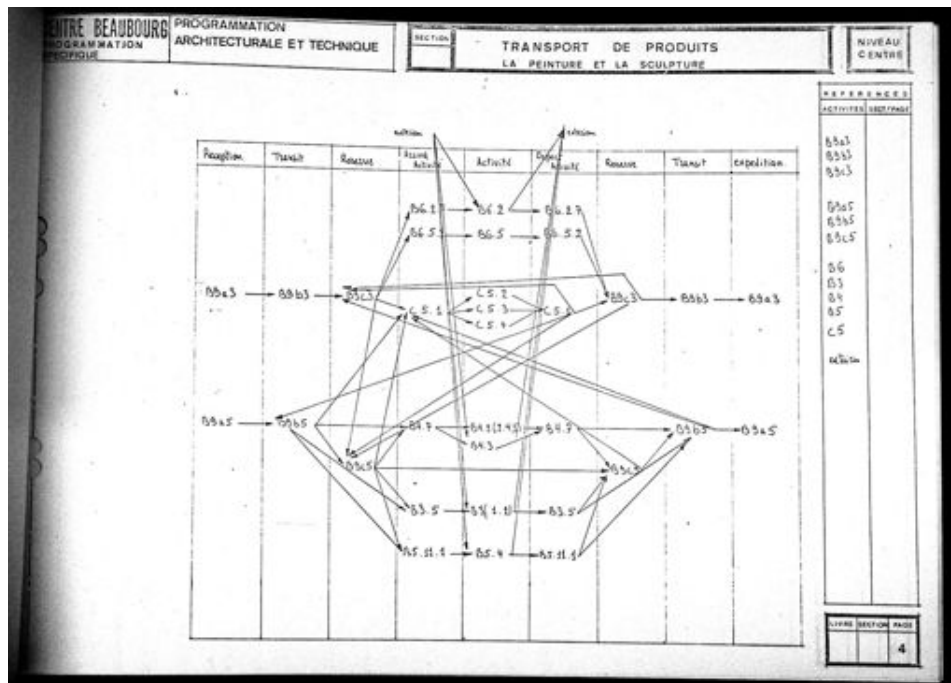
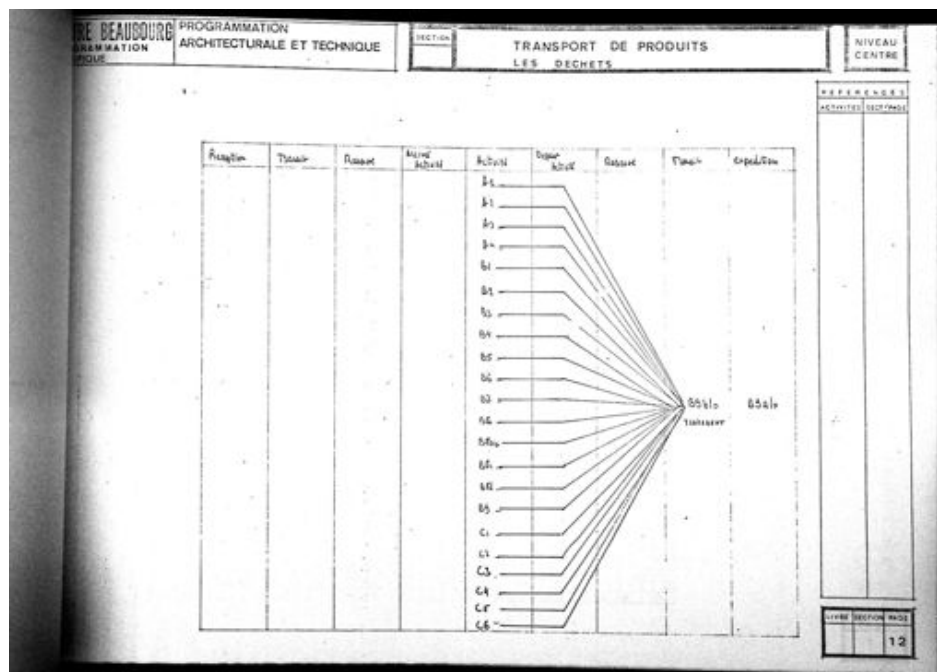
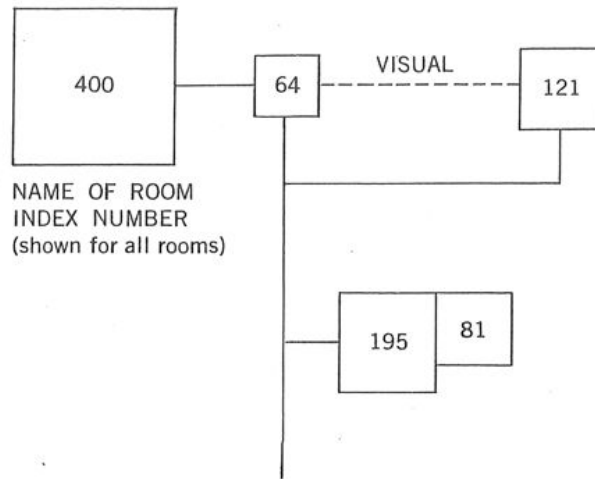


Fig. 4.12: Programme spécifique – Flow of painting and sculpture. Archives CGP (Livre Marron).





PROXIMITY/ACCESS CHART



NAME OF ROOM  
INDEX NUMBER  
(shown for all rooms)

Shown are square footage of rooms, access (lines), desired proximity (length of lines) and visual/auditory connections. Index number leads to description of room's requirements.

Fig. 4.14: Proximity diagram, from Harold Horowitz, "The Program's the Thing," *ALA Journal* (May 1967): 94-100.

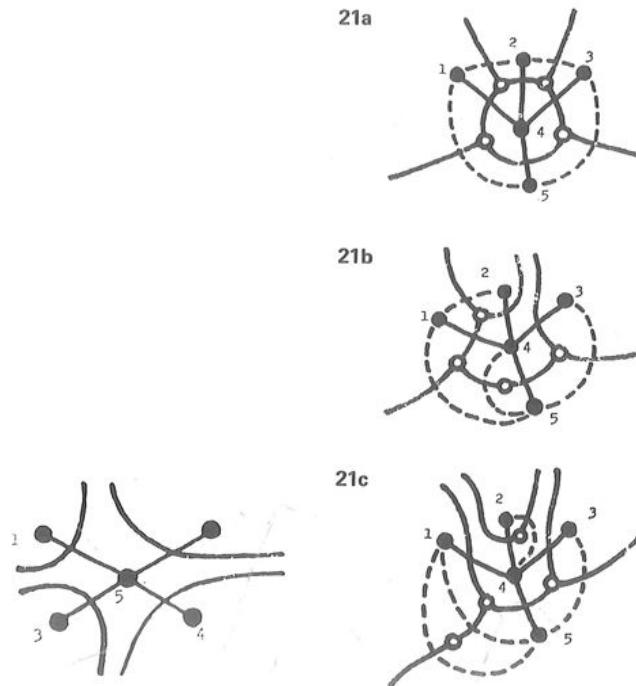


Fig. 4.15: Topological representation of spatial relationships, from Jean Cousin, "Topological Organization of Architectural Space," *Architectural Design* (October 1970): 491-493.

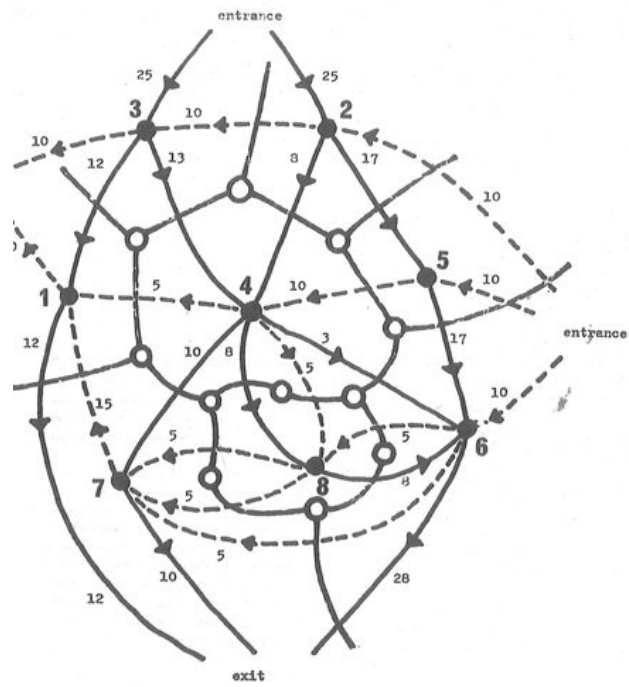


Fig. 4.16: Topological representation of spatial relationships, from Ibid.

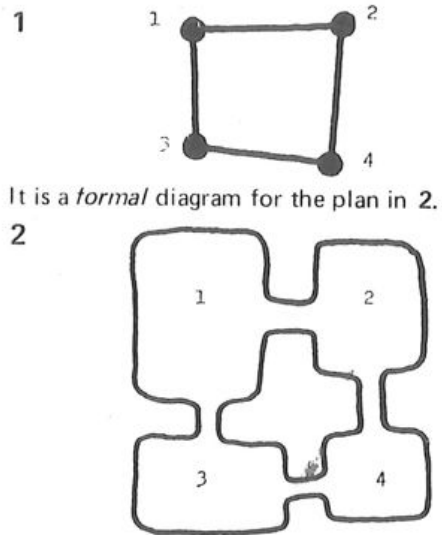


Fig. 4.17: Topological compared to geometrical representation, from Ibid.

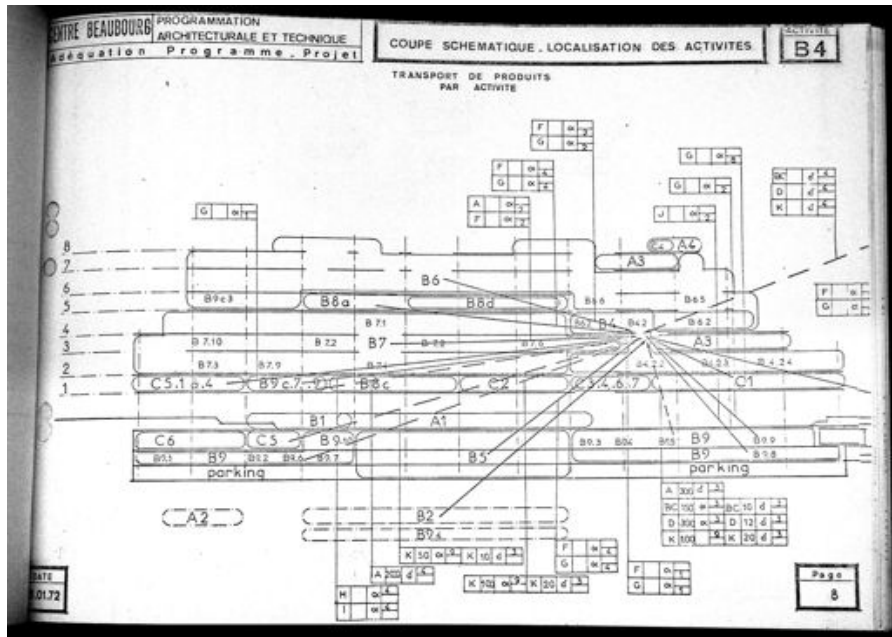


Fig. 4.18: Programme spécifique – schematic section – flow of objects by activity. Archives CGP (Livre Marron).

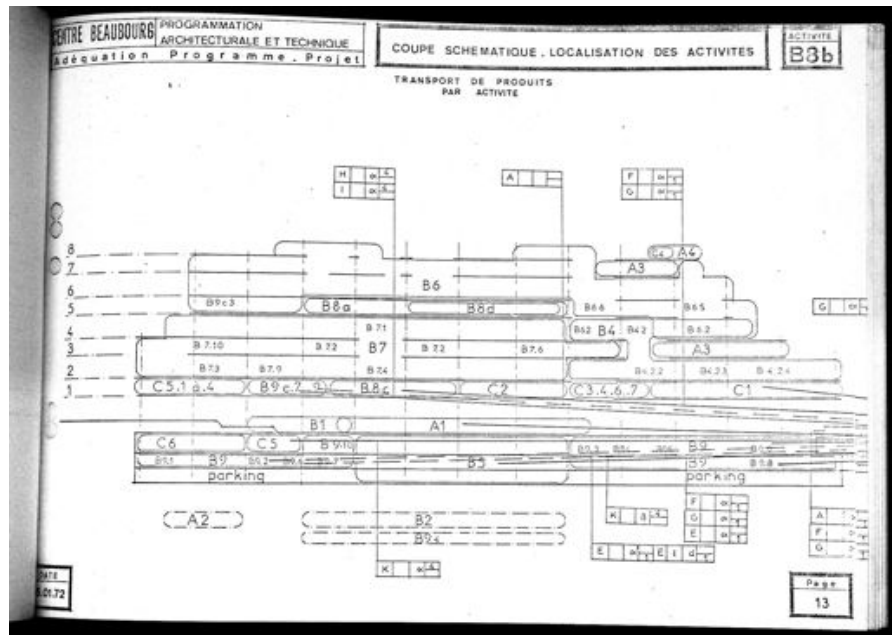


Fig. 4.19: Programme spécifique – schematic section – flow of objects by activity. Archives CGP (Livre Marron).

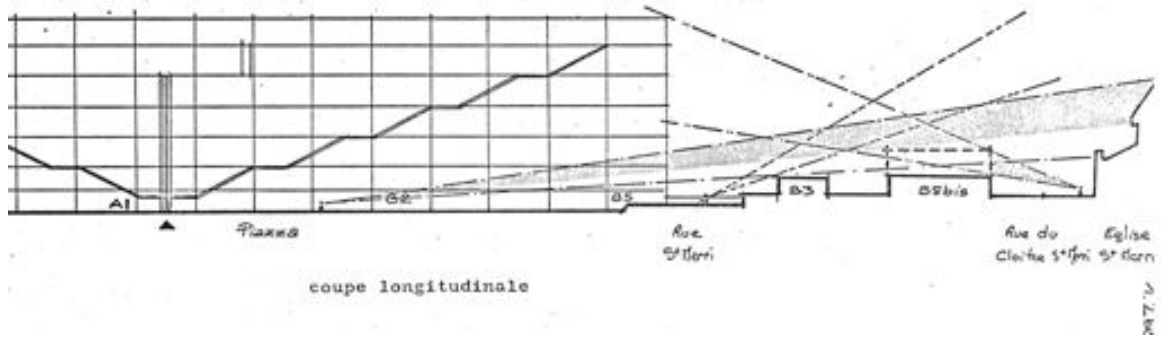


Fig 5.1: Study of visual perception of the building in the site. (“Integration de centre dans le site”, n.d., 2005100/7 “Notes et livres,” Archives CGP.)



Fig. 5.2: Jean Widmer, signage for Centre Pompidou (1976). Archives CGP.

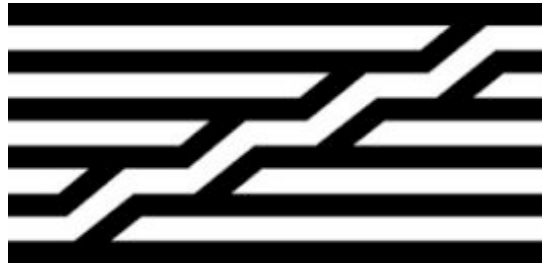


Fig. 5.3: Jean Widmer, Logo for Center Pompidou (1976). Archives CGP.

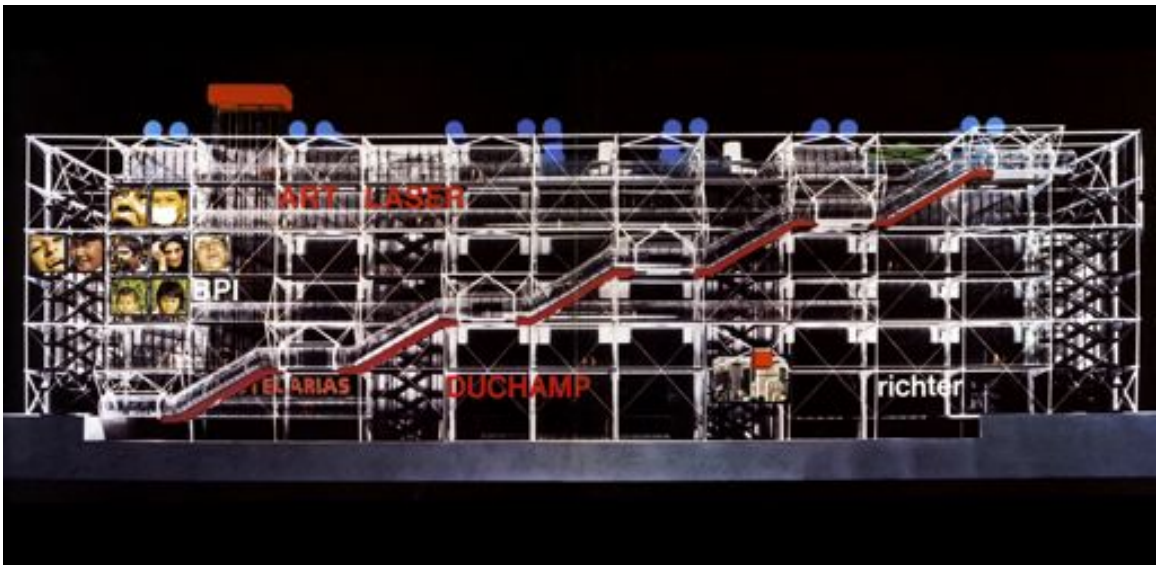


Fig. 5.4: Study for exterior signage (1976). From *Domus* 566 (January 1977).



Fig. 5.5: Jean Widmer, Studies for the logo for Centre Pompidou (1976). Archives CGP.



Fig. 5.6: Paul Rand, Logo for IBM (1962)

## BIBLIOGRAPHY

*A note on translations: All quotations from French sources are my translations unless otherwise noted in the reference.*

Abbot, L., M. Davies, and A. Stanton. "An Inside View." *Architectural Design* 47, no. 2 (1977): 140-151.

Abel, C. "From hard to soft machines." In *Norman Foster: Buildings and Projects*, edited by Ian Lambot, 3:10-19. Hong Kong: Watermark, n.d.

Abram, Joseph. "Oscar Nitzchke: Maison de la Publicité." *AMC Architecture mouvement continuité*, no. March (1984).

Affel, Herman A. "System Engineering." *International Science and Technology* (November 1964): 18-26.

Affeulpin, Gustave. *La soi-disant utopie du Centre Beaubourg*. Paris: Éditions Entente, 1976.

Agostini, Edward J. "Programming: demanding speciality in a complex world." *Architectural Record*, no. September (1968).

Alexander, Christopher. *Notes on the Synthesis of Form*. Harvard University Press, 1964.

Ambasz, Emilio. "Foreword." In *High-Tech: The Industrial Style and Source Book for the Home*, edited by Joan Kron and Suzanne Slesin, ix-xi. New York: C. N. Potter, 1978.

*An International Competition for a National Opera House at Bennelong Point, Sydney, New South Wales, Australia: Conditions and Programme*, 1955.

Appleyard, Bryan. *Richard Rogers: A Biography*. Faber and Faber, 1986.

Ardagh, John. *The New French Revolution*. Harper & Row, 1969.

Arnold, Christopher. "School Construction Systems Development." *Architectural Design* 37 (November 1967): 495-506.

Ashby, W. Ross. "Information flows within coordinated systems." *Architectural Design* 39 (1969).

"Autoroutes souterraines de Paris." *Le monde souterrain*, no. 57 (February 1950).



- Baker, Elizabeth C. "Beaubourg Preview: An Interview with Pontus Hulten." *Art in America* 65, no. 1 (1977): 100-2.
- Banham, Reyner. "A Clip-On Architecture." *Design Quarterly*, no. 63 (1965): 2-30.
- . "Enigma of the rue du Renard." *The Architectural Review* CLXI, no. 963 (1977): 277-9.
- . *Megastructure: Urban Futures of the Recent Past*. New York: Harper and Row, 1976.
- . "On Trial 1: The Situation; What Architecture of Technology?" *The Architectural Review* 131, no. 780 (February 1962): 97-9.
- . "On Trial 2: Louis Kahn: The Buttery Hatch Aesthetic." *The Architectural Review* 131, no. 781 (March 1962): 203-206.
- . "The New Brutalism." *The Architectural Review* (December 1955).
- Banham, Reyner, and François Dallegret. "A Home is Not a House." *Art in America* (April 1965).
- Banham, Reyner, ed. *The Aspen Papers; Twenty Years of Design Theory from the International Design Conference in Aspen*. New York: Praeger, 1974.
- Barber, D. L. A. "The European Computer Network Project." In *Proceedings ICCG*, 192-200. Washington, D.C., 1972.
- Barré, François. *Exposé de M. Barré sur le CCI (réunion d'information générale du 27/9/73)*, September 1973. 2005100/42. Archives CGP.
- Barré, François, C. Braunstein, and J.-P. Grunfeld. "Le débat à propos de la politique du Centre de création industrielle." *Crée*, no. 37 (November 1975): 43-4.
- Barthes, Roland. "Rhetoric of the Image (1964)." In *Image, Music, Text*, edited by Stephen Heath. New York: Hill and Wang, 1977.
- Baudrillard, Jean. "Hypermarket and Hypercommodity." In *Simulacra and Simulation*. Ann Arbor: University of Michigan Press, 1994.
- . *L'effet Beaubourg: Implosion et dissuasion*. Editions Galilee, 1977.
- . "The Beaubourg Effect: Implosion and Deterrence." In *Simulacra and Simulation*. Ann Arbor: University of Michigan Press, 1994.

- Bell, Daniel. *The Coming of Post-Industrial Society; a Venture in Social Forecasting*. New York: Basic Books, 1973.
- Bennett, Tony. *The Birth of the Museum: History, Theory, Politics*. London: Routledge, 1995.
- Bennis, Warren G., and Philip Slater. *The Temporary Society*. Harper & Row, 1968.
- Berners-Lee, Tim, James Hendler, and Ora Lassila. "The Semantic Web." *Scientific American* (May 2001): 29-37.
- Berstein, Serge, and Jean-Pierre Rioux. *The Pompidou years, 1969-1974*. Cambridge, UK; New York, NY: Cambridge University Press, 2000.
- Bezman, Michel. Telephone interview, February 4, 2008.
- . "The 'Recherches en Aménagements Scolaires' (R.A.S.) Project - A case study - Strategy implemented for the development of a building system for educational facilities through the Performance Concept." In *Performance Concept in Buildings*, 1:317-330. Philadelphia: National Bureau of Standards, Department of Commerce, 1972.
- Biasini, Emile. "Les Maisons de la culture en France." *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 64-67.
- Bibliothèque publique d'information, ed. *Le musée et la bibliothèque, vrais parents ou faux amis?* Paris: Centre Georges Pompidou, 1997.
- Blake, Peter. *Form Follows Fiasco: Why Modern Architecture Hasn't Worked*. Boston: Little, Brown, 1977.
- Boguslaw, Robert. *The New Utopians, a Study of System Design and Social Change*. Englewood Cliffs, N.J: Prentice-Hall, 1965.
- Boice, John R. *RAS: Recherches en Amenagements Scolaires*. Building Systems Information Clearinghouse Newsletter. Stanford, Calif: Systems Division, School Planning Laboratory, Spring 1969.  
[http://archone.tamu.edu/CRS/engine/archive\\_files/EFL/6000.1305.pdf](http://archone.tamu.edu/CRS/engine/archive_files/EFL/6000.1305.pdf).
- Boralevi, Alberto. "The Architectural Conception of the Museum in the Work of Le Corbusier." *Museum Management and Curatorship* 2, no. 2 (June 1983): 177-89.
- Borasi, Giovanna, and Mirko Zardini, eds. *Sorry, Out of Gas: Architecture's Response to the 1973 Oil Crisis*. Montreal: Canadian Centre for Architecture; Montova, Italy, 2007.

- Bordaz, Robert. *Le Centre Pompidou: une nouvelle culture*. Paris: Ramsay, 1977.
- Boudon, Philippe. *Lived-in Architecture: Le Corbusier's Pessac Revisited*. MIT Press, 1972.
- Bougnoux, Daniel. *Sciences de l'information et de la communication*. Paris: Larousse, 1993.
- Boulez, Pierre. "Maestro Computer: Exploring the new frontiers of sound." *The Unesco Courier* 33 (April 1980): 28-32.
- Brand, Daniel. "Systems Engineering; Definitions, Working Hypotheses, and Examples." In *Emerging methods in environmental design and planning: Proceedings of the Design Methods Group first international conference, Cambridge, Massachusetts, June 1968*, edited by Gary T. Moore. Cambridge, Mass.: MIT Press, 1970.
- Briet, Suzanne. *Qu'est-ce que la documentation?* Paris: EDIT, 1951.
- Brolin, Brent C. *The Failure of Modern Architecture*. New York: Van Nostrand Reinhold Co, 1976.
- Buchanan, Peter. "High-Tech." *Architectural Review* (July 1983).
- . *Renzo Piano Building Workshop: Complete Works*. London: Phaidon Press, 1993.
- Bucher, Bernadette. "An Interview with Claude Lévi-Strauss, 30 June 1982." *American Ethnologist* 12, no. 2 (May 1985): 360-68.
- Buckland, Michael. "What is a 'document'?" *Journal of the American Society of Information Science* 48, no. 9 (1997): 804-9.
- de Bure, Gilles. "Les sommets d'Aspen." *Crée*, no. 6 (June 1970).
- . "Signalétique pour le Centre Georges-Pompidou." *Crée*, no. 36 (1975): 48-53.
- Busbea, Larry. *Topologies: The Urban Utopia in France, 1960-1970*. Cambridge, Mass.: MIT Press, 2007.
- Bush, Vannevar. "As We May Think." *Atlantic Monthly* (July 1945).
- Capurro, Rafael, and Birger Hjørland. "The Concept of Information." In *Annual Review of Information Science and Technology*, vol. 37, edited by B. Cronin, 343-411, 2003.

- Cardinal, Roger. "Soluble City: The Surrealist Perception of Paris." *Architectural Design*, no. 2-3 (1978).
- Carlisle, Robert B. "The Birth of Technocracy: Science, Society, and Saint-Simonians." *Journal of the History of Ideas* 35, no. 3 (September 1974): 445-464.
- Carpo, Mario. *The Alphabet and the Algorithm*. Cambridge, Mass.: MIT Press, 2011.
- Caudill, William Wayne. *Toward Better School Design*. F.W. Dodge Corp, 1954.
- "Centre national d'art et de culture Georges-Pompidou: Adoption d'un projet de loi." In *Senat seance du 12 dec 1974*, 1974.
- Ceruzzi, Paul E. *A History of Modern Computing*. MIT Press, 2003.
- "Changements culturels et consequences architecturales - Résumé des notes lues par Monsieur Richard Rogers lors de la réunion des Utilisateurs du vendredi 28 avril 1972", May 9, 1972. Loste box 3. Archives CGP.
- Chaplin, Tamara. *Turning on the Mind: French Philosophers on Television*. University of Chicago Press, 2007.
- Chastel, André. "L'invention de l'Inventaire." *Revue de l'Art*, no. 87 (1990).
- Cherry, Edith. *Programming for Design: From Theory to Practice*. John Wiley and Sons, 1998.
- Choay, Françoise. *L'urbanisme, utopies et réalités*. Paris: Seuil, 1965.
- Churchman, C. West. "Guest Editorial." *Management Science* 14, no. 1 (December 1967).
- Claudius-Petit, Eugène. "LC., dernier projet pour Paris." *L'Architecture d'Aujourd'hui*, no. 249 (February 1987): liv-lv.
- Cleveland, Harlan. "The Twilight of Hierarchy: Speculations on the Global Information Society." *Public Administration Review* 45, no. 1 (1985): 185—195.
- Cohen, Jean-Louis. "Monuments for a Mass Cult." In *Rendezvous: Masterpieces from the Centre Georges Pompidou and the Guggenheim Museums*. Paris, New York: Centre Georges Pompidou, Guggenheim Museum, 1998.
- . *Scenes of The World To Come*. English ed. Flammarion, 1995.

- Colenbrander, Bernard. "The short but intense life of a celibate machine: Centre Georges Pompidou, 1977-1997." *OASE: tijdschrift voor architectuur*, no. 57 (2001): 16-29.
- Colquhoun, Alan. "Critique." *Architectural Design* 77, no. 2 (1977): unpaginated.
- . *Essays in Architectural Criticism: Modern Architecture and Historical Change*. Cambridge, Mass.: MIT Press, 1981.
- . "Frames to Frameworks." In *Essays in Architectural Criticism: Modern Architecture and Historical Change*. Cambridge, Mass.: MIT Press, 1981.
- . "Typology and Design Method." *Perspecta* 12 (1969): 71-74.
- Concours international d'idées à un degré (competition brief)*. Paris: France, Ministère d'état chargé des affaires culturelles, 1970.
- Concours international pour la réalisation du Centre Beaubourg: rapport du jury*. Paris: Établissement public du Centre Beaubourg, 1971.
- Conway, Donald. *Architectural design and the social sciences*. American Institute of Architects, 1974.
- Coolidge, John. *Patrons and Architects: Designing Art Museums in the Twentieth Century*. Amon Carter Museum, 1989.
- Copans, Richard. *Multimedia Library of Sendai by Toyo Ito*. ARTE France/Les Films d'ici, 2004.
- Le Corbusier, and W. Boesiger. *Oeuvre complète: Volume 2: 1929-34*. Zurich: Les éditions d'architecture, 1964.
- . *Oeuvre complète: Volume 8 Les dernières oeuvres*. Zurich: Les éditions d'architecture, 1970.
- Cousin, Jean. "Topological Organization of Architectural Space." *Architectural Design* (October 1970): 491-493.
- Crimp, Douglas. "On the Museum's Ruins." In *The Anti-aesthetic: essays on postmodern culture*, edited by Hal Foster. 1st ed. Port Townsend, Wash.: Bay Press, 1983.
- Crompton, D. "Centre Pompidou: A Live Centre of Information." *Architectural Design* 47, no. 2 (1977): 100-127.
- Crozier, Michel, and Jean-Claude Thoenig. "The Regulation of Complex Organized Systems." *Administrative Science Quarterly* 21, no. 4 (December 1976): 547-570.

- Cultural Affairs Committee of the Parti Socialiste Unifié. "Beaubourg: The Containing of Culture in France." *Studio International* 194, no. 1 (1978): 27-36.
- Dano-Vanneyre, H  l  ne. Personal interview, April 2008.
- Dauncey, Hugh. "A Cultural Battle: French Minitel, the Internet and the Superhighway." *Convergence: The International Journal of Research into New Media Technologies* 3, no. 3 (1997): 72-89.
- Davidoff, Paul. "Advocacy and Pluralism in Planning." *Journal of the American Institute of Planners* (1965).
- Davidts, Wouter. "Art Factories: Museums of Contemporary Art and the Promise of Artistic Production, from Centre Pompidou to Tate Modern." *Fabrications* 16, no. 1 (2006): 23-42.
- Davies, Colin. *High Tech Architecture*. New York: Rizzoli, 1988.
- Davies, Michael. "IRCAM." *Architectural Design* 77, no. 2 (1977): 134-137.
- Dawson, Chris. Telephone interview, July 19, 2011.
- Day, Ronald E. *The modern invention of information: discourse, history, and power*. Carbondale: Southern Illinois University Press, 2001.
- "De la Biblioth  que des Halles (1967)    la Biblioth  que publique d'information (1972)", n.d. Fonds Loste, Box 3. Archives CGP.
- "Deadpan." *Architectural Design*, no. 41 (1971).
- Demoriane, H. "Jean Prouv  . Six ans apr  s, les r  flexions du Pr  sident du Jury pour la permanence d'un choix." *L'Architecture d'Aujourd'hui*, no. 189 (1977): 48-49.
- . "L'IRCAM." *L'Architecture d'Aujourd'hui*, no. 189 (1977): 77.
- Demoriane, H  l  ne, and Fran  ois Barr  . "Un double choix culturel et urbanistique. La g  n  se du Centre Pompidou. Paris et les   quipements culturels." *L'Architecture d'Aujourd'hui*, no. 189 (1977): 44-47.
- DeRoo, Rebecca J. *The Museum Establishment and Contemporary Art: The Politics of Artistic Display in France after 1968*. Cambridge University Press, 2006.
- Drexler, Arthur, ed. *The Architecture of the   cole Des Beaux-arts*. Cambridge, Mass.: MIT Press, 1977.
- Dreyfuss, Henry. *Designing for People*. New York: Grossman Publishers, 1974.

- Dufrêne, Bernadette. *La création de Beaubourg*. Grenoble: Presses Universitaires de Grenoble, 2000.
- Dufrêne, Bernadette, ed. *Centre Pompidou: trente ans d'histoire*. Paris: Centre Georges Pompidou, 2007.
- Duthuit, Georges. *Le musée inimaginable*. Paris: J. Corti, 1956.
- Easterling, Keller. *Organization space: landscapes, highways, and houses in America*. Cambridge, Mass.: MIT Press, 1999.
- Edwards, A. Trystan. "A World Centre of Communication." *Town Planning Review* 5 (April 1914): 14-30.
- Ehrenkrantz, Ezra D. *Architectural Systems: A Needs, Resources, and Design Approach*. McGraw-Hill, 1989.
- Ehrenkrantz, Ezra. "SCSD project, USA." *Architectural Design* (July 1965): 324-339.
- . *The Modular Number Pattern: Flexibility through Standardisation*. Tiranti, 1956.
- Ellul, Jacques. *The Technological Society*. Translated by John Wilkinson. Knopf, 1964.
- Environmental Design Research Association, Henry Sanoff, and Sidney Cohn. *EDRA 1: Proceedings of the 1st Annual Environmental Design Research Association Conference*. Stroudsburg, Pa.: Dowden, Hutchinson & Ross, 1970.
- Evans, B.O. "System/360: A Retrospective View." *IEEE Annals of the History of Computing* 8, no. 2 (1986): 155-179.
- Evenson, Norma. "The Assassination of Les Halles." *The Journal of the Society of Architectural Historians* 32, no. 4 (1973): 308-315.
- "Exchange of views of a group of experts." *Museum* 24, no. 1 (1972): 5-32.
- La Farge, Paul. "Utopia & Dystopia." *Bookforum* (August 2010).
- Fayeton, Philippe, and Christian Ducrez. "Design et urbanisme." *Crée*, no. 4 (April 1970).
- Feenberg, Andrew. "From Information to Communication: the French Experience with Videotex." In *The Social Contexts of Computer-mediated Communication*, edited by Martin Lea. Prentice Hall / Harvester Wheatsheaf, 1992.

- . “Subversive rationalization: Technology, power and democracy.” *Inquiry* 35, no. 3/4 (1992).
- “Fiche Technique II: Centre Beaubourg 493”, June 15, 1971. Archives CGP.
- Fisher, Robert E. “Building Process in the 1970’s: The Trouble With Systems.” *Architectural Record* (October 1970).
- Flug, Eva. “American Memorial takes Form of Public Library.” *Berlin Sketches*, March 3, 2006. <http://berlinsketch.blogspot.com/2010/03/american-memorial-takes-form-of-public.html>.
- Fournel, Paul. “Computer and Writer: The Centre Pompidou Experiment.” In *Oulipo: A primer of potential literature*. Lincoln: University of Nebraska Press, 1986.
- France’s experience with the Minitel : lessons for electronic commerce over the Internet*. OECD Working Papers. Paris: OECD, 1998.
- Françoise Levie. *L’homme qui voulait classer le monde: Paul Otlet et le Mundaneum*. Paris-Bruxelles: Les Impressions Nouvelles, 2006.
- Frei, Luca. *The So-called Utopia of the Centre Beaubourg: An interpretation*. Paris: Éditions Entente, 1976.
- Friedman, Yona. *Toward a Scientific Architecture*. Translated by Cynthia Lang. MIT Press, 1975.
- Galloway, Alexander R. *Protocol: How Control Exists After Decentralization*. MIT Press, 2004.
- Galloway, Alexander, and Eugene Thacker. “Protocol, Control, and Networks.” *Grey Room* - (October 2004): 6-29.
- Gannon, Todd. “Theory and Design in the Last Machine Age: Reyner Banham and the Paradoxes of une Architecture Autre, 1955-1988”. Doctoral thesis, UCLA, 2011.
- Gautier, Blaise. “Sur Beaubourg.” *Revue de l’Art*, no. 34 (1976): 7-11.
- George, Claude S. *The History of Management Thought*. Prentice-Hall, 1972.
- Gibson, James J. “The Information Available in Pictures.” *Leonardo* 4, no. 1 (Winter 1971): 27-35.
- . “The Theory of Affordances.” In *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*, edited by Robert Shaw and John Bransford, 67-82. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1977.



- Goldschmidt, Denis, and Flavio Salamanca. "Le drugstore du trottoir: Essais sur une rationalisation de mobilier urbain." *Crée*, no. 4 (April 1970).
- Gowan, James, ed. *Projects, 1946-71*. Architectural Association, 1974.
- Grudin, Jonathan. "The computer reaches out: the historical continuity of interface design." In *Proceedings of the SIGCHI conference on Human factors in computing systems: Empowering people*, 261–268. CHI '90. Seattle, Washington, United States: ACM, 1990.
- Grumbach, Antoine. "La Bataille des Halles." *Architectural Design* (July 1971).
- . "Les équipements de la vie quotidienne." *Techniques et Architecture* (May 1969).
- Guez, Gérard. "Le musée mobile." *L'Architecture d'Aujourd'hui*, no. 155 (May 1971): xxxv.
- Haan, Hilde de, and Ids Haagsma. *Architects in Competition*. Thames and Hudson, 1988.
- Hall, Edward Twitchell. *The Silent Language*. Garden City, N.Y: Doubleday, 1959.
- Hamilton, Paul. *Historicism*. Psychology Press, 2003.
- Happold, T. "Beaubourg: Architecture or Engineering." *Architectural Design* 47, no. 2 (1977): Unpaginated.
- Harper, John. "On Telecommunications." *Architectural Association Journal* 80, no. 892 (May 1965): 320-24.
- Harwood, John Jeffrey. "The redesign of design: Multinational corporations, computers and design logic, 1945--1976". Doctoral thesis, Columbia University, 2006.
- Harwood, John. *The Interface: IBM and the Transformation of Corporate Design, 1945–1976*. Minneapolis: University of Minnesota Press, 2011.
- Herron, Ron, and Peter Cook. "Instant City in Progress: An Archigram Production Visualized by Ron Herron and Peter Cook." *Architectural Design* (November 1970): 566-73.
- Hollein, Hans. "Everything is Architecture." In *Architecture Culture 1943-1968: A Documentary Anthology*, edited by Joan Ockman, 460-62. New York: Rizzoli, 1993.
- Horowitz, Harold. "The Program's the Thing." *AIA Journal* (May 1967): 94-100.

- “Ideas Circus.” *Archigram Archival Project*. University of Westminster Centre for Experimental Practice, n.d. Project No: 108.
- Illich, Ivan. “Silence is a Commons.” *CoEvolution Quarterly*, no. Winter (1983): 5-9.
- “Instant City (IC).” *Archigram Archival Project*. University of Westminster Centre for Experimental Practice, n.d. Project No: 114.
- “Internal memo”, n.d. Archives CGP.
- Jacques, Annie. “The programmes of the architectural section of the Ecole des Beaux-Arts, 1819-1914.” In *Beaux Arts and Nineteenth Century French Architecture*, edited by Robin Middleton, 280. Thames & Hudson Ltd, 1984.
- Jameson, Fredric. “Postmodernism, or The Cultural Logic of Late Capitalism.” *New Left Review*, no. 23 (August 1984).
- Joly, Pierre. “Beaubourg: 700 projets pour rien.” *L’Oeil*, no. 203 (1971): 34-6.
- Keller, Sean. “Fenland Tech: Architectural Science in Postwar Cambridge.” *Grey Room*, no. 23 (Spring 2006): 40-65.
- . “Systems Aesthetics: Architectural Theory at the University of Cambridge, 1960-1975”. Doctoral thesis, Harvard University, 2005.
- King, Jonathan, and Philip Langdon. *The CRS Team and the Business of Architecture*. Texas A&M University Press, 2002.
- Klein, Julie Thompson. *Interdisciplinarity: history, theory, and practice*. Detroit: Wayne State University Press, 1990.
- Klüver, Billy, Julie Martin, and Barbara Rose, eds. *Pavilion by Experiments in Art and Technology*. New York: E. P. Dutton & Co., Inc., 1972.
- Koolhaas, Rem. “Bigness, or the problem of Large.” In *S,M,L,XL*, 495-516. New York: Monacelli Press, 1995.
- . “Typical Plan.” In *S,M,L,XL*, 334-353. New York: Monacelli Press, 1995.
- Kowalski, Alexandra. “From cathedrals to teaspoons: The Inventaire General and the cultural wealth of the French nation”. Doctoral thesis, New York University, 2007.
- Krauss, Rosalind E. “Postmodernism’s Museum without Walls.” In *Thinking about Exhibitions*, edited by Reesa Greenberg, Bruce W. Ferguson, and Sandy Nairne, 487. Routledge, 1996.

- Kuhn, Raymond. *The media in France*, 1995.
- Kultermann, Udo. *Kenzo Tange*. Barcelona: G. Gili, 1989.
- Kwinter, Sanford. "Beaubourg, or The Planes of Immanence." In *Requiem: For the City at the End of the Millennium*. Barcelona: Actar, 2010.
- L'espace collectif, ses signes et son mobilier*. Paris: Centre de création industrielle, 1970.
- "La Bibliothèque publique des Halles", n.d. 1992037/001. Archives CGP.
- "La plus chouette bibliothèque de France." *Etudiant*, no. 2 (November 1977): 35-46.
- Landau, Royston. *New Directions in British Architecture*. New York: George Braziller, 1968.
- Lauxerois, Jean. *L'utopie Beaubourg, vingt ans après*. Paris: Bibliothèque publique d'information, Centre Georges Pompidou, 1996.
- "Le musée mobile." *Techniques et architecture* 29, no. 2 (April 1968).
- "Le problème des bibliothèques en France." *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 24-26.
- Lebovics, Herman. *Mona Lisa's Escort: André Malraux and the Reinvention of French Culture*. Cornell University Press, 1999.
- Lemoine, Bertrand. *Les Halles de Paris*. Paris: L'Equerre, 1980.
- Les activités et services du Centre Beaubourg*, December 17, 1974. Archives CGP.
- Levinson, Nick. *Beaubourg: The Pompidou Center, Paris*. Open University/BBC, 1978.
- Littlewood, Joan. "A Laboratory of Fun." *The New Scientist* (May 14, 1964).
- Lobsinger, Mary Louise. "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace." In *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, edited by Sarah Williams Goldhagen and Réjean Legault, 335. The MIT Press, 2001.
- Lombard, François. "An Organized Process for Programming—Application to the Centre Beaubourg." *Industrialization Forum* 5, no. 5 (1974): 31-35.
- . "Concours du Plateau Beaubourg: programmation architecturale et concours d'idée." *Architecture d'aujourd'hui* (August 1971): VIII-X.

- . “Elaboration du programme spécifique”, n.d. 1992037/001. Archives CGP.
- . “La programmation en architecture et urbanisme.” *L’Architecture d’Aujourd’hui* 44, no. 160 (1972): 4-10.
- Lombard, François, and Jean-François Sérís. “Industrialization and the User; the Case for a Center of Research and Practice.” *Industrialization Forum* 3, no. 4 (April 1972): 35-41.
- Loste, Sébastien. “Note sur le Centre Beaubourg”, 1974. Box 3. Archives CGP - Administrative offices.
- . *Note: Formules de concours envisageables*, n.d. Archives CGP.
- . “Organisation sociale et organisation spatiale”, 1976. Loste box 2. Archives CGP.
- . “Procès-verbal de la réunion du 24 septembre 1974”, October 14, 1974. Loste box 1. Archives CGP.
- . “Propositions pour un jury (Plateau Beaubourg)”, July 1, 1970. Archives CGP.
- . “Statut du Centre Georges Pompidou”, n.d. Loste box 2. Archives CGP.
- Lyau, Bradford. “Technocratic Anxiety in France: The Fleuve Noir ‘Anticipation’ Novels, 1951-60 (Angoisse technocratique en France: les romans d’anticipation de la série Fleuve Noir de 1951 à 1960).” *Science Fiction Studies* 16, no. 3 (November 1989): 277-297.
- Lynch, Kevin. *The Image of the City*. Cambridge, Mass.: MIT Press, 1960.
- Lyotard, Jean François. *Soundproof Room: Malraux’s Anti-Aesthetics*. Stanford: Stanford University Press, 2001.
- Macdonald, Angus J. *Anthony Hunt: The engineer’s contribution to contemporary architecture*. Thomas Telford Ltd, 2000.
- Maki, Fumihiko. *Investigations in Collective Form*. School of Architecture, Washington University, 1964.
- Malraux, Andre. *Museum Without Walls*. New York: Doubleday, 1967.
- Manuel, Frank E. *The New World of Henri Saint-Simon*. Notre Dame: University of Notre Dame Press, 1963.

- Martin, Reinhold. *The Organizational Complex: Architecture, Media, and Corporate Space*. Cambridge, Mass.: MIT Press, 2003.
- . *Utopia's Ghost: Architecture and Postmodernism, Again*. Minneapolis: University of Minnesota Press, 2010.
- Marx, Leo. "Information Technology in Historical Perspective." In *High technology and low-income communities: prospects for the positive use of advanced information technology*, edited by Donald A. Schön, Bish Sanyal, and William J. Mitchell. MIT Press, 1999.
- Mathews, Stanley. "Cedric Price as Anti-architect." In *Architecture and Authorship*, edited by Tim Anstey, Katja Grillner, and Rolf Hughes. London: Black Dog, 2007.
- . *From Agit-Prop to Free Space: The Architecture of Cedric Price*. Black Dog, 2007.
- Mattelart, Armand. "Mapping Modernity: Utopia and Communications Networks." In *Mappings*, edited by Denis E Cosgrove. London: Reaktion Books, 1999.
- . *The Information Society: An Introduction*. Sage Publications, 2003.
- Mayr, Otto. *Authority, Liberty, and Automatic Machinery in Early Modern Europe*. The Johns Hopkins University Press, 1989.
- McLeod, Mary. "'Architecture or Revolution': Taylorism, Technocracy, and Social Change." *Art Journal* 43, no. 2 (Summer 1983): 132-147.
- McMorrough, John. "Notes on the Adaptive Re-use of Program." *Praxis: Journal of Writing + Building*, no. 8 (2006).
- Meadows, Donella H., Dennis L. Meadows, Jorgen Randers, and William W. Behrens III. *Limits to Growth: A report for the Club of Rome's project on the predicament of mankind*. New York: Universe Books, 1972.
- "Michel Guy sur le centre Beaubourg". ORTF, October 16, 1974.
- Michelson, Annette. "Beaubourg: The Museum in the Era of Late Capitalism." *Artforum* 13, no. 8 (April 1975): 62-67.
- Millon, Henry A. "Rudolf Wittkower, 'Architectural Principles in the Age of Humanism': Its Influence on the Development and Interpretation of Modern Architecture." *The Journal of the Society of Architectural Historians* 31, no. 2 (May 1972): 83-91.

- Mitchell, William J. *Environmental Design: Research and Practice: Proceedings*. Los Angeles: University of California, 1972.
- “Modernist Utopias.” *In Our Time*. BBC Radio 4, March 10, 2005.
- Moles, Abraham A. “Design and Immateriality: What of It in a Post Industrial Society?” *Design Issues* 4, no. 1/2 (1988): 25-32.
- . *Théorie de l’information et perception esthétique*. Paris: Flammarion, 1958.
- Mollard, Claude. Personal interview, April 2008.
- . *L’enjeu du Centre Georges Pompidou*. Paris: Union générale d’éditions, 1976.
- Moore, Gary T. *Emerging Methods in Environmental Design and Planning ; Based on the Proceedings of the Design Methods Group First International Conference, Cambridge, Mass., June 1968*. 1st ed. Cambridge, Mass.: MIT Press, 1973, 1973.
- Mounier-Kuhn, P.E. “History of Computing in France.” *IEEE Annals of the History of Computing* 11, no. 4 (1989): 237-240.
- Mumford, Lewis. *The Myth of the Machine*. Harcourt, Brace & World, 1967.
- Myers, Brad A. “A Brief History of Human Computer Interaction Technology.” *ACM Interactions* 5, no. 2 (March 1998): 44-54.
- Negroponte, Nicholas. *The Architecture Machine*. M.I.T. Press, 1970.
- Neumann, Eva-Marie. “Architectural Proportion in Britain 1945-1957.” *Architectural History* 39 (1996): 197-221.
- Newhouse, Victoria. “Paths from the Pompidou: Renzo Piano and Richard Rogers.” *Harvard Design Magazine* (Spring/Summer 2007).
- de Noblet, Jocelyn. “A propos de la valeur d’usage du Centre de création industrielle.” *Crée*, no. 36 (September 1975): 36,82.
- Nora, Simon, and Alain Minc. *The Computerization of Society: A Report to the President of France*. Translated by Daniel Bell. Cambridge, Mass: MIT Press, 1980.
- Norman, Donald A. *The Design of Everyday Things*. Basic Books, 2002.
- Nouria, Skander. “Hommage à François Lombard.” *Les Correspondances: Bulletin étudiant de l’ESA*, no. Winter (2005).
- O’Byrne, Patrick. Personal interview, November 2, 2007.

- . Personal interview, April 2008.
- Ockman, Joan, ed. *Architecture Culture 1943-1968: A Documentary Anthology*. New York: Rizzoli, 1993.
- Ogata, Amy F. "Building for Learning in Postwar American Elementary Schools." *Journal of the Society of Architectural Historians* 67, no. 4 (December 2008): 562-91.
- Pawley, Martin. "Architecture Versus the Movies, or Forum Versus Content." *Architectural Design*, no. 6 (June 1970).
- . "Caroline: go to Canvas City immediately - your friend Linda has been busted." *Architectural Design* (November 1970): 558-65.
- Peña, William M. *Problem Seeking: New Directions in Architectural Programming*. Houston: Caudill Rowlett Scott, 1969.
- Peña, William M., and William W. Caudill. "Architectural analysis: Prelude to good design." *Architectural Record*, no. May (1959).
- Petersen, Ad. *Sandberg, Typographer and Museum Pioneer: Graphic Design in the Netherlands 2*. 010 Uitgeverij, 2003.
- Pevsner, Nikolaus. *An Outline of European Architecture*. Middlesex, England: Penguin, 1963.
- Piano + Rogers Architects, and Ove Arup + Partners Engineers. "Plateau Beaubourg Centre Paris (competition entry text)", June 1971. Archives CGP.
- Piano, Renzo, and Richard Rogers. "A Statement." *Architectural Design* 77, no. 2 (1977): unpaginated.
- . "L'histoire du projet." *L'Architecture d'Aujourd'hui*, no. 189 (1977): 54-55.
- Piano, Renzo, Richard Rogers, and Antoine Picon. *Du plateau Beaubourg au Centre Georges Pompidou*. Paris: Editions du Centre Pompidou, 1987.
- Pike, David L. *Subterranean Cities: The World Beneath Paris and London, 1800-1945*. Cornell University Press, 2005.
- Pompidou, Georges. *Entretiens et discours, 1968-1974*. Paris: Flammarion, 1984.
- . Letter. "Letter to Edmond Michelet", December 15, 1969. 2005100/3. Archives CGP.

- . Letter. “Letter to Jacques Chaban-Delamas, Prime Minister”, June 23, 1970. 2005100/3. Archives CGP.
- Ponte, Alessandra. “Building the Spiral Stair of Evolution: The Index Museum of Sir Patrick Geddes.” *Assemblage*, no. 10 (1990): 46-69.
- Porter, Dave. “A Value-Free Architecture.” *Architectural Design* (November 1970): 541-42.
- Postle, Denis. *Beaubourg: Four Films*. Arts Council of Great Britain/Tattooist International, 1980.
- Preiser, Wolfgang F. E. *Programming the Built Environment*. Van Nostrand Reinhold, 1985.
- Price, Cedric, and John Smith, eds. “New thinking for new universities.” *Architectural Association Journal* 80, no. 883 (1964): 6-37.
- Prince-Ramus, Joshua. “Joshua Prince-Ramus on Seattle’s Library (TED2006)” presented at the TED2006, February 2006.
- Prouvé, Jean. “Bâtiments scolaires évolutifs industrialisés, type ‘tabouret’.” *Techniques et Architecture* (September 1968).
- . Letter. “Letter to Robert Bordaz”, May 25, 1971. 1992037/009. Archives CGP.
- “Qui va à Beaubourg”. A2, February 2, 1977.
- Rapport d’activité*. Etablissement public du Centre Beaubourg, 1973.
- Rapport d’activité*. Centre national d’art et de culture Georges Pompidou, 1977.
- Rapport d’activité*. Centre national d’art et de culture Georges Pompidou, 1978.
- Rawstorne, Peter. “Piano & Rogers: Centre Beaubourg.” *Architectural Design* 42, no. 7 (1972): 407-410.
- Rayward, W. B. “A history of computer applications in libraries: prolegomena.” *Annals of the History of Computing, IEEE* 24, no. 2 (2002): 4-15.
- Rayward, W. Boyd. *International Organisation and Dissemination of Knowledge: Selected Essays of Paul Otlet*. Amsterdam: Elsevier, 1990.
- “Réponse aux questions posées par la commission des affaires culturelles du sénat”, n.d. 2005100/42. Archives CGP.



- Rice, Peter. *An Engineer Imagines*. London: Artemis, 1994.
- Rieusset-Lemarié, Isabelle. "P. Otlet's Mundaneum and the International Perspective in the History of Documentation and Information Science." *Journal of the American Society of Information Science* 48, no. 4 (1997): 301-9.
- Rigby, Brian. *Popular Culture in Modern France: A Study of Cultural Discourse*. London: Routledge, 1991.
- Rittel, Horst W. J., and Melvin M. Webber. "Dilemmas in a General Theory of Planning." *Policy Sciences*, no. 4 (1973): 155-169.
- Rogers, Richard. Telephone interview, June 2009.
- Rogers, Richard, Alan Stanton, and Mike Davies. "The difference between English and French bureaucratic systems." *RIBA Journal* 84, no. 1 (1977): 13-16.
- Rorty, Richard. "The brain as hardware, culture as software." *Inquiry* 47, no. 3 (June 2004): 219-235.
- Rowdybush, James. "The hexagon and the Napoleonic state: a study of decentralization and regional reform in France". Doctoral thesis, University of California Berkeley, 1983.
- Russell, Barry. *Building Systems, Industrialization, and Architecture*. London and New York: John Wiley & Sons, 1981.
- Sadler, Simon. *Archigram: Architecture Without Architecture*. MIT Press, 2005.
- . "The Indeterminate Utopia." *Architectural Design* 71, no. 3 (2001): 88-92.
- Sage, Andrew P. *Methodology for Large-Scale Systems*. New York: McGraw-Hill, 1977.
- Saint, Andrew. *Towards a Social Architecture: The role of school-building in post-war England*. New Haven: Yale University Press, 1987.
- Sandberg, Willem. "De la conception architecturale d'un musée contemporain." *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 64-67.
- . "The Israel Museum in Jerusalem." *Museum* 19, no. 1 (1966): 15-30.
- Sarkis, Hashim. "The Paradoxical Promise of Flexibility." In *Le Corbusier's Venice Hospital*, edited by Hashim Sarkis. Case. Prestel, 2001.
- Van Schaik, Martin, and Otakar Máčel. *Exit Utopia: Architectural Provocations, 1956-76*. Munich: Prestel, 2005.

- Schivelbusch, Wolfgang. *The Railway Journey: The Industrialization of Time and Space in the 19th Century*. Berkeley and Los Angeles: University of California Press, 1987.
- Schmertz, Mildred F. "Design for the 1970's: A New Professional Conscience." *Architectural Record* (October 1970): 118-127.
- Schnarsky, Anthony. "Some computer-aided approaches to housing." In *Proceedings of the June 1971 design automation workshop on Design automation - DAC '71*, 57-67. Atlantic City, New Jersey, United States, 1971.
- Scott, Felicity D. *Architecture Or Techno-utopia: Politics After Modernism*. Cambridge, Mass.: MIT Press, 2007.
- Searing, Helen. "The Development of Museum Typology." In *Building the new museum*. New York: Architectural League of New York, 1986.
- Segal, Howard P. *Technological utopianism in American culture*. Syracuse, NY: Syracuse University Press, 1985.
- Seguin, Jean-Pierre. *Comment est née la BPI: Invention de la médiathèque*. Paris: Bibliothèque publique d'information, Centre Georges Pompidou, 1987.
- . "L'histoire et les grandes lignes du programme d'architecture de la bibliothèque des Halles: juin 1965-décembre 1969." In *Construction et aménagement des bibliothèques*, edited by Jean Bleton. Paris: Editions du cercle de la Librairie, 1986.
- . *Rapport de voyage, 1971, 1971*. 1992037/001. Archives CGP.
- . *Undated report*, n.d. 1992037/001. Archives CGP.
- Shannon, Claude E., and W. Warren Weaver. *The Mathematical Theory of Communication*. Urbana: University of Illinois Press, 1949.
- Silver, Nathan. "Architecture without Buildings." In *Meaning in Architecture*, edited by Charles Jencks and George Baird. Braziller, 1969.
- . *The making of Beaubourg: a building biography of the Centre Pompidou, Paris*. Cambridge, Mass.: MIT Press, 1994.
- de Smet, Catherine. "Histoire d'un rectangle rayé. Jean Widmer et le logo du Centre Pompidou." *Cahiers du Musée national d'art moderne*, no. 89 (Automne 2004): 5-23.

- Smithson, Alison, and Peter Smithson. "But Today We Collect Ads." *Ark* (November 1956).
- Solà-Morales, Ignasi de. "High-tech. Funcionalismo o retorica? (High-tech. Functionalism or rhetoric?)." *Lotus International*, no. 78 (October 1973): 66-79.
- Somol, R. E., and Sarah Whiting. "Notes around the Doppler Effect and Other Moods of Modernism." *Perspecta*, no. 33 (2002): 72-77.
- Stadhuis-prijsvraag Amsterdam 1967 (competition brief)*, 1967.
- Staniszewski, Mary Anne. *The Power of Display: A History of Exhibition Installations at the Museum of Modern Art*. Cambridge, Mass.: MIT Press, 2001.
- Studer, Raymond G. "On Environmental Programming." *Arena* (May 1966): 290-6.
- Summerson, John. "The Case for a Theory of Modern Architecture." *RIBA Journal* (June 1957): 307-310.
- Système d'information du C.C.I.: Cahier d'objectifs*, n.d. 2005100/50. Archives CGP.
- Tange, Kenzo. "A Plan for Tokyo, 1960." *Ekistics*, no. 12 (July 1961): 9-19.
- Teige, Karel. "Mundaneum (1929)." In *Oppositions Reader*, edited by K. Michael Hays, 589-597. New York: Princeton Architectural Press, 1998.
- Texier, Simon. *Paris contemporain: de Haussmann à nos jours*. Paris: Parigramme, 2005.
- "The Pompidolium." *The Architectural Review* CLXI, no. 963 (1977): 270-2.
- Toffler, Alvin. *Future Shock*. New York: Random House, 1970.
- Tomkins, Calvin. "Profiles: A Good Monster." *The New Yorker* 53, no. 48 (1978): 37-67.
- Torres-Vargas, Georgina Araceli. "World Brain and Mundaneum: the ideas of Wells and Otlet concerning universal access." *Vine* 35, no. 3 (2005): 156-65.
- Touraine, Alain. *The Post-Industrial Society*. Translated by Leonard F. X. Mayhew. New York: Random House, 1971.
- Tschumi, Bernard, and Martin Pawley. "The Beaux-Arts since '68." *Architectural Design* 41 (September 1971): 533-566.

- Turner, Fred. *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*. Chicago: University of Chicago Press, 2006.
- Typography, Herb Lubalin Study Center of Design and. *Jean Widmer: A Devotion to Modernism*. Herb Lubalin Study Center of Design and Typography, 2003.
- Ulmer, Gregory. *Electronic Monuments*. Minneapolis: University of Minnesota Press, 2005.
- Veinstein, André. "Les théâtres expérimentaux: organisation, architecture." *L'Architecture d'Aujourd'hui*, no. 129 (January 1966): 62-63.
- Venturi, Robert. *Complexity and Contradiction in Architecture*. New York: Museum of Modern Art, 1966.
- Viatte, Germain. Personal interview, April 2008.
- . *Le centre Pompidou: Les années Beaubourg*. Paris: Gallimard, 2007.
- Vidler, Anthony. "Toward a Theory of the Architectural Program." *October*, no. 106 (2003): 59-74.
- Vossoughian, Nader. *Otto Neurath: the language of the global polis*. Rotterdam: NAI Publishers, 2008.
- Walker, George. "Temples for a new humanism: the Maisons de la Culture." *Country life* 158 (July 10, 1975).
- Wall, Alex. *Victor Gruen: From Urban Shop to New City*. Barcelona: Actar, 2006.
- Walsh, John. "France: First the Bomb, Then the 'Plan Calcul'." *Science* 156, no. 3776. New Series (May 12, 1967): 767-770.
- Wells, H. G. *World brain*. London: Methuen & Co., 1938.
- Welter, Volker M. *Biopolis: Patrick Geddes and the City of Life*. The MIT Press, 2003.
- Wheeler, Clarence Herbert. *Emerging Techniques of Architectural Practice*. American Institute of Architects, 1966.
- White, Joseph C. "The Systems Approach: Steps in Generating a System." *Industrialization Forum* 1, no. 3 (April 1970): 5-10.
- Whiteley, Nigel. *Reyner Banham: Historian of the Immediate Future*. MIT Press, 2002.

Wigley, Mark. "Network Fever." *Grey Room*, no. 4 (2001): 82-122.

Williams, Rosalind H. *Notes on the Underground: An Essay on Technology, Society, and the Imagination*. Cambridge, Mass: MIT Press, 1990.

*Architectural Design*, no. 41 (1971): 531.