

The Critical *techne* of the Structural Frame and Equipment (pragmata)

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As an idea, "critical practice" has a blissful, singular existence. The concept characterizes an idealized state of architectural production guided by crystalline, intuitive judgement toward changing circumstances. In academic literature, however, there appears to be discordance regarding, among various issues, the "critical" role of technology. For instance, Kenneth Frampton, the leading critical technologist of the 1990's, often singles out the poetics of building structure or "frame"--a notion stressing the experiential geometry of structure.¹ He notes, "It is surely this *tectonic* essence that serves to distinguish architecture from all other arts."² Following this outlook he distinguishes "between 'heavy' and 'light' tectonic expression, between concrete frame on one hand and light, predominantly metal construction on the other."³ In contrast, Reyner Banham, the leading critical technologist of the 1970's, points to the humanism of environmental technology or, more generally, to building equipment, *pragmata*.⁴ With *pragmata* relating to dwelling, Banham is concerned with the culture-servicing performance of equipment.

Of course, Frampton is interested in more than the structural frame just as Banham is intrigued by more than *pragmata*. But the curious possibility that two tectonic aspects of architecture--viewed separately--correspond to distinct lines of inquiry warrants the distillation of each critic's analytic approach in consideration of how these two lines of inquiry operate in contemporary discourse. These authors' divergent views toward technology reveal the colorful panorama of critical practice's worldly existence when they are explored in this finite fashion and without the common privileging of one position. This paper explores Frampton's and Banham's views and concludes with a case study considered from both critical positions.

A curious textual situation juxtaposes the views of Frampton and Banham. In his 1972 book review, Frampton castigates Banham's study, *The Architecture of the Well-tempered Environment*⁵; however, twenty years later, Frampton appropriates the subject of this book in his examination of Louis Kahn's "unprecedented attitude toward the mechanical services."⁶ Frampton's uncharacteristic refer-

ence to this anonymous *pragmata*--to be examined later--relates to intriguing architectonic politics.

Sympathetic with the critical issues pertaining to anonymous technologies, John Kouwenhoven points to this political polarity. In "Architecture as Environmental Technology," his review of Banham's study, Kouwenhoven notes:

The Architecture of the Well-tempered Environment is an important book and will therefore be ultimately influential, although it may be sniped at severely in the meantime by those whose dogmas it challenges. Banham succeeds in demonstrating that "outside the culturally protected circle of what is taught in architectural schools and discussed by architectural pundits" there has been, for almost a century, a tide of innovation in the technology of environmental management which has "dragged architecture with it, willy-nilly."⁷

According to Banham, the historical resistance of the culturally conservative faction to innovations in environmental technologies relates to the conceptual or philosophical difference associated with structural and mechanical technologies. Banham begins his study by expressing regret for the existence of the schism:

In a world more humanely disposed, and more conscious of where the prime human responsibilities of architects lie...(it) would have been apparent long ago that the art and business of creating buildings is not divisible into two intellectually separate parts--*structures*, on the one hand, and on the other *mechanical services*. Even if industrial habit and contract law appear to impose such a division, it remains false.⁸

Banham attributes the rationalized division of the structural and mechanical technologies to the archetypal practical choice facing primordial beings: the pragmatic choice between the "structural" or "power-operated" solution to environmental conditions.⁹ In other words, would a social group repel a wintery chill by using the nearby timber resources to build a shelter or a fire?

In answering this question, Banham suggests that West-

ern culture is predisposed towards the “structural solution” seeing it as the more permanent, long-term resolution, while the “power-operated solution” is viewed as an immediately satisfying but short-term resolution. The former results in buildings rendered in timber or stone which tend to endure not only *physically*, but also *metaphysically* through the building’s structure-related geometry. Building geometry tends to be repeated providing a cultural record of choices made. Conversely, “Western” architects view the power-operated solution as fleeting by defining, for example, the campfire as transient, both in its un-rooted spatiality and its rapid consumption of resources. Accepting Banham’s oppositional framework, it follows that the meaningful debate over the cultural merit of the “structural” or “power-operated” solution occurs when the campfire is moved indoors occupying the hearth and requiring a means of exhaust.

The following example lends itself to illustrating this debate and further introduces Frampton’s position. The representation in architectural texts of Palladio’s Villa Foscari called the Malcontenta reveals the hierarchial canon favoring the structural solution over the power-operated solution. The front elevation of the Villa is typically represented

without the pair of chimneys which boldly pierce the skyline like minarets (fig.1). This occurs in Palladio’s 1570 drawing (fig.2) and later in the carefully measured drawings of the Villa by Ottavio Bertotti-Scamozzi begun in 1776 (fig.3). Apparently, the negative association of the front chimneys was of such conventional significance that eventually they were removed, probably in the eighteenth century in deference to the Palladio’s polemic elevation drawing. The most extensive measured drawings of the Villa were prepared under the auspices of the Department of Architecture at the Royal Academy of Fine Arts in Stockholm in 1962. These drawings show only the stubs of the original chimneys (fig.4). Although recently these chimneys were restored to their original form, it is useful to underscore that all of the cited elevations were rendered in complete awareness of the original chimneys. The *edited* drawings demonstrate the architectural value of “structure-related geometry”—here associated with the classical portico and humanist proportions—from which the representation of the “power-related geometry” detracted.¹⁰

It is of no minor significance that Banham’s oppositional framework takes as its spring-point the archetypal decisions



Fig. 1: Villa Foscari, according to G.F. Costa, *Le Delizie del Fiume Brenta*, 1750-62

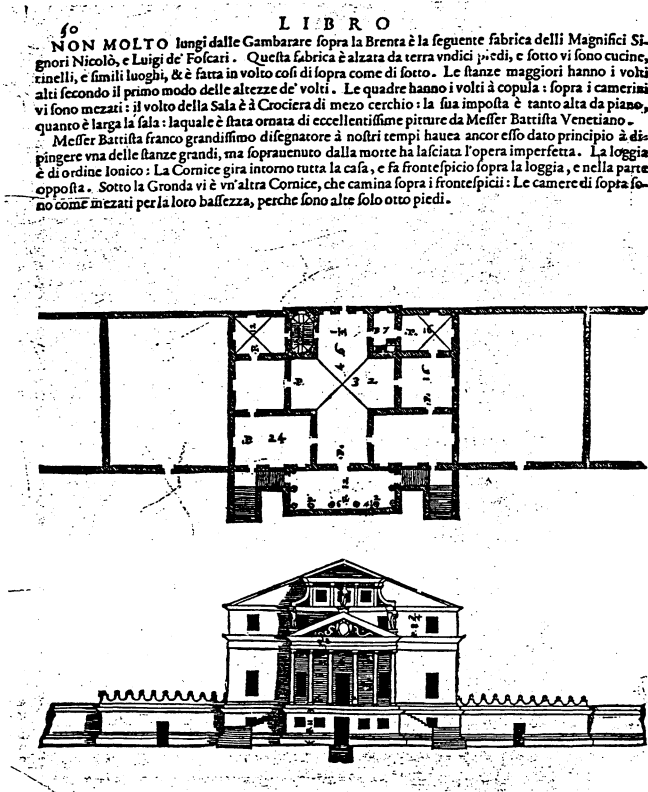


Fig. 2: Villa Foscari, according to Palladio's *I Quattro Libri dell'Architettura*, Venice, 1570

directly regarding the physiology of human comfort. In doing so he attempts to establish that those choices rendered empirically are the most pure and noble. Banham describes a convoluted decision-making process beginning with the excessive intellectualization characteristic of civilization in a state of advanced decay--a civilization where formal matters interfere with building performance. For Banham, academic conventions such the hierarchial distinctions between *structures* and *mechanical services* are conceptual corruptions leading to the misconstrued constructions symptomatic of contemporary architectural criticism.

Published in the same year as *The Well-Tempered Environment*, Frampton's thoughtful essay "Labor, Work and Architecture" sets forth a critical theoretical position that is the mirror opposite of Banham's, one that extols rational precepts over empirical hermeneutics.¹¹ Following Hannah Arendt's seminal inquiry, *The Human Condition*, Frampton differentiates two principle activities of the "vita-activa"--human life in the public realm: labor and work.¹²

Labor is the activity which corresponds to the biological process of the human body, whose spontaneous growth, metabolism and eventual decay are bound to the vital necessities produced and fed into the life process by labor. . . Work is the activity which corresponds to the unnaturalness of human existence, which is not imbedded in, and whose mortality is not compensated by, the 'species' ever recurring life circle. Work

provides an 'artificial' world of things, distinctly different from all natural surroundings. Within its borders each individual life is housed while this world is meant to outlast and transcend them all.¹³

For labor the human condition is life itself, "impermanent and synonymous with the 'private' realm;" for work it is worldliness, "permanent' and synonymous with the 'public' realm."¹⁴

Frampton argues that the central dilemma facing architecture is that "the processes of labor, the processes of biological survival do at present largely dominate and determine our human environment."¹⁵ Whereas the prerequisite issues of biological survival, of shelter, are resolved by labor's mere buildings, the hope of culture depends upon the transcendental work of architecture par excellence. Unlike Banham's interpretation of origins, Frampton links architecture to the idea of "edifice" and thus to the verb "to edify" which carries the meanings "to educate," "to strengthen,"

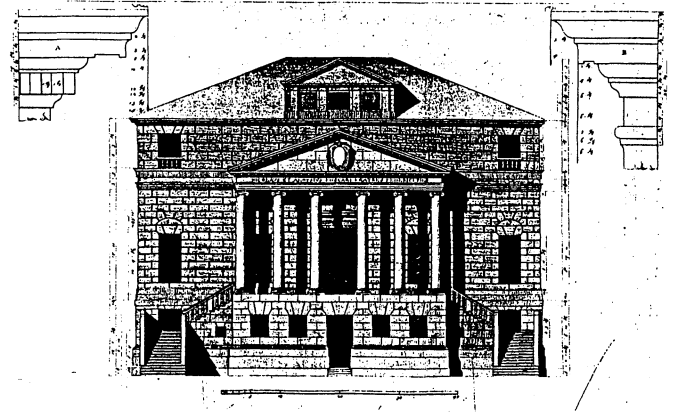


Fig. 3: Villa Foscari, according to Bertotti-Scamozzi's *Le fabbriche e i disegni di Andrea Palladio raccolti ed illustrati da Ottavia Bertotti-Scamozzi*, Vicenza, 1776-83

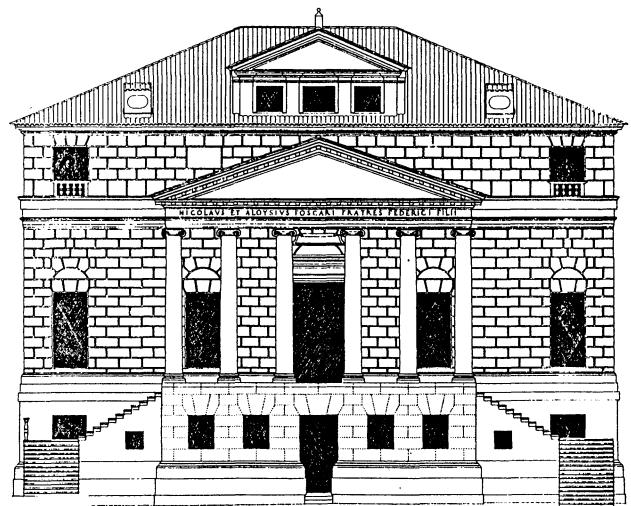


Fig. 4: Villa Foscari, according to Ove Hidemark and Goran Mansson in Eric Forssman's *Visible Harmony: Palladio's Villa Foscari at Malcontenta*, Stockholm, 1973

and “to instruct.” Etymologically, the Latin root of edify relates to *aedificare*, from *aedes*, a building, or originally, a hearth, and *ficare*, meaning to make a hearth. In all, the primordial act of architecture is the building of the hearth in order to edify.

Unlike Banham’s idea of the hearth as environmental interface, Frampton’s idea of hearth is linked to edifying social interaction. For Banham the construction of the hearth is an activity of labor where environmental conditions, physiological needs and solutions are embedded in the same earthly circumstances. As such, the hearth is a product of *animal laborans*--man the laboring animal who, Arendt notes, “labors and mixes with his product.” Conversely, the hearth of work, of *homo-faber*--man the maker, is not a useful product but an artifice intending independence from earthly circumstances.

(T)he human artifice erected by the homo-faber becomes a home for mortal men, whose stability will endure and outlast the ever changing movement of their lives and actions, only inasmuch as it transcends both the sheer utility of things produced for use.¹⁶

In following Arendt, as Frampton does, the inverse relation of transcendence to an artifice’s practicality suggests that for *homo-faber*’s hearth there is an opposition between environmental conditions and the edifying abstractions of a form language. Thus, the Malcontenta as a “public” representation of permanence and immateriality requires, not the “private” utility of chimneys but the language of the classical portico and humanist proportions which locate the bearing walls.

Yet Frampton notes:

To hope for a coherent language in a pluralistic age is no doubt wishful thinking, yet perhaps such a language would begin to “spontaneously” emerge if only designers would establish and express at every public scale discrete distinctions between the public and permanent as opposed to the private and impermanent aspects of our physical environment.¹⁷

For Frampton, the coherent language “spontaneously” emerges in relation to a rationalized building structure.

For instance, Louis Kahn’s form language “spontaneously” surfaced from the meaningful context of Viollet-le-Duc’s structural rationalism. In the pre-released chapter of Frampton’s forthcoming book, *Studies in Tectonic Culture*, titled “Louis I. Kahn and the New Monumentality, 1944-1972,” the critic attempts to show that French structural rationalism led Kahn to develop the hollow structural form in order to esthetically accommodate the mechanical services.¹⁸ The tetrahedral ceiling structure of the Yale Art Gallery in New Haven is given as the early well-known example of Kahn’s integration of the structural and mechanical systems. This examination under the banner of “structural rationalism” appropriates Kahn’s integration efforts as primarily in the service of “the structural solution” and not

the “power-operated solution,” that is, as the work of *homo-faber* and not the labor of *animal laborans*.

Frampton’s analysis transcends any possible utilitarian/biological connotations that “structural rationalism” may imply by concentrating on that aspect of Kahn’s design relating to geometrical abstraction. He overlooks the possibility of other intentions embodied in the pragmatism of Kahn’s integration of the mechanical equipment, such as the desire to specifically facilitate the performance and maintenance of the environmental system in order to best serve the user. The critic summarizes Kahn’s approach:

[The] precept of a hollow structural form will remain a perennial theme throughout his mature career...[because it] is based on the geometrical essences of archetypal, universal forms. For him they will appear as the ethical givens of culture without which one cannot create anything.¹⁹

Frampton’s analysis attempts to demonstrate that, in general, the *prime human responsibility* of the architect’s work is the creation of culturally significant structure-related geometry. In citing an unexecuted plan for the Yale Art Gallery’s structural ceiling the critic perceptively notes, “the overall ingenuity of the concept lay in the integration of the mechanical services running in the *octahedral* spaces within the *tetrahedrons* (italics added).”²⁰ Frampton’s acute focus on the *iconic* purity of the structure directs his analysis away from the pragmatic indexical realities associated with power-operated equipment whose performance requirements may not conform to the conceptual geometry, just as the Villa Foscari’s chimneys do not conform to Palladio’s expressed polemics. In apparent contrast to the Villa Foscari’s representation, the publication drawings of the Yale Art Gallery in a 1953 edition of *Perspecta 2* -- provided by the architect’s office--include the unique representation technique of transparencies showing the complete integration of lighting and ductwork with the structural ceiling.

Perhaps the most famous example of the building services being integral to an “edifying” edifice is Kahn’s Richards Laboratory. Here the polemic idea of the building is inseparable from the representation of the mechanical stacks and stair towers. Yet, in his 1991 essay, “Rappel a l’Ordre: the Case for the Tectonic,” Frampton links this building and Wright’s Larkin Building through the genealogy of Viollet-le-Duc’s structural rationalism. His comparison does not suggest that both buildings are derived from a shared lineage of pragmatic sensibilities coupled with an edifying notion about architecture, but to a similar compositional geometry which includes both structure and mechanical services. Frampton argues about the two buildings:

...there is a similar ‘tartan,’ textile-like preoccupation with dividing the enclosed volume and its various appointments into “servant” and “served” spaces. In addition, there is a very similar concern for the *expressive rendering of mechanical services* as though they

were of the same hierarchic importance as the structural frame.²¹ (author's italics)

Hinted here is the same interpretative hierarchy described in relation to the Yale Art Gallery where the generally formless, earthbound mechanical services are given order following the rational order inherent in structure which in turn follows the spirit of transcendent geometry, in this case the tartan pattern. Although this hierarchy is consistent with Frampton's assessment of the work of *homo-faber* and the labor of *animal laborans*, his attempt to appropriate both the Larkin building and the Richards Laboratory as buttresses to his hermeneutics hints at the desperate battle he continues to wage. The battlefield is critical discourse.

Unlike Frampton, Banham does not consider utilitarian equipment and services to be a third tier aspect of architecture following structure and conceptual geometry. At his best, he suggests that all three aspects emerge "spontaneously." In *The Well-tempered Environment* Banham uses the Larkin Building as a demonstration and begins by referencing the tendency in critical discourse that he opposes.

Historical and critical writing has tended to concentrate exclusively on the felicity of the interior spaces and their relationship to the great monumental volumes of the exterior, without observing that the system of environmental management mediates crucially between interior and exterior form. Not only is the use of a vast single vessel of space ringed with balconies almost a necessity given the then state of artificial ventilation, but it was a flash of inspiration, about the disposition of the services to achieve that ventilation, that gave the magisterial form of the exterior.²²

In Wright's autobiography, he mentioned that upon seeing the plaster model of the office building he was finally able to realize--"in a flash"--the articulation that he desired. This involved building "the stair towers free of the central block, not only as an independent stair-towers for communication and escape, but also as air-intakes for the ventilation system."²³ Banham understands Wright's historical significance, architectural accommodation of the system of mechanical ventilation to be part of an irreversible trend set in motion by Modern Architecture. Banham's proposes Modern Architecture's cultural project to be the meaningful incorporation of civilization's technology. This movement towards the discreet embracing of technology occurs not only at the scale of the Larkin Building's service towers, but permeates the "environmental" fabric of a building and thus its form language.

In Banham's famous 1959 *Architectural Review* article "Neo-Liberty: The Italian Retreat from Modern Architecture" the critic abrasively accuses primarily two young Italian architects--whose work had been recently published in *Casabella*--of an "infantile regression" for their use of the Italian Art Nouveau form language known as Liberty.²⁴ Seeing this as the historicists' "retreat" from the technologi-

cal realities which his idea of modernism embraces, Banham scorns:

Art Nouveau died of a cultural revolution that now seems absolutely irreversible: the domestic revolution that with electric cookers, vacuum cleaners, the telephone, the gramophone, and all those other mechanized aids to gracious living that are still invading the home, and have permanently altered the nature of domestic life and the meaning of domestic architecture.²⁵

For Banham, mechanized household appliances are *environmental* equipment. In a 1969 article, Banham stresses that "A home is not a house," but an entirely technologically-dependent type of dwelling consisting of various mechanical, plumbing, and electrical systems for physical well-being, hygiene, communication and so on.²⁶ The critic's attack on Neo-Liberty supposes that a building representation associated with a pre-Modern technology is representationally inadequate as the Malcontenta without chimneys.

To better appreciate the Banham's supports of Modern Architecture's cultural charge to discreetly incorporate *environmental* technology--including mechanical equipment, vacuum cleaners and telephones--it is useful to consider the historical context of his criticism. Banham's early interest in situational *environmental* equipment relates to, as Nigel Whitley astutely notes, "his quest to find a dynamic and persuasive *alternative* to the conventional thinking and operational lore that, in his view, blighted most contemporary architecture and design."²⁷ This quest is for what Banham refers to as "une architecture autre," a coinage following French critic Michel Tapié's reference to a tough-minded approach to art.²⁸ *Une art autre*, at its most dynamic and radical, brought together flux and unfinishedness as a state of being. This critical art eschewing high-minded and classical notions of Art consisted of a direct non-hierarchic and non-relational approach to materials and colors. For Banham, the architectural equivalent to this approach is that of the Independent Group formed in 1952.

The Independent Group was interested in a wide array of commonplace, proto-Pop phenomena: advertisements, science fiction, illustrations, robots, food, consumer goods and technology.²⁹ Banham's participation in the Independent Group seminars initially focused on the machine esthetics of the Modern Movement. His wartime experience in mechanical engineering at the Bristol Aeroplane Company's engine division coupled with an art history education at the Courtauld Institute under the tutelage of Nikolaus Pevsner uniquely prepared him to examine the relation between technology and art. In the later series of seminars (1954-55) popular culture became the dominant theme with Banham discussing the symbolism of Detroit car styling.

Later referencing this period the critic points out: We were against direct carving, pure form, truth, beauty and all that....what we favored was motion studies. We also

favoured rough surfaces, human images, space, machinery, ignoble materials and what we termed non-art.³⁰ The Group resisted the history-bound shackles of academic formalism (i.e. its conventional construction of pure form, truth, beauty). These restraints of the overly-processed limit the experience of the phenomenal world opened up by recent technologies. Banham's promotion of Pop-technologies subverted the rising mid-century trend in the critical press toward associating Modernism with pre-Modern social and technological conditions.

Apparently, the presentation of "Neo-Liberty" in *Casabella* was seen as part of this critical trend as was "classicism" in English language journals, with its connotations of timelessness, sophistication and cultural prestige. Although there are earlier instances of the positive association of Modernism to past forms and/or formal explorations, the endeavor began to take the form of a canonic interpretation in the late 1950's and early 1960's. Juan Pablo Bonta carefully documents this process relative to the interpretive history of the 1929 German National Pavilion in Barcelona designed by Ludwig Mies van der Rohe.³¹ Corresponding to the developing critical acceptance of the Modern Movement's pre-modern formal lineage, Colin Rowe references the opposition to this trend in his article, "Neo-Classicism and Modern Architecture." Addressing the appearance of Miesian-inspired residential pavilions of rigid symmetry Rowe notes:

Already in 1953, in a house whose symmetry a casual observer might then have dismissed as innocent, *Forum* was ready to detect 'Palladian' overtones; recently the *Architectural Record* has been able to designate similar manifestations as "Space-Time Palladian"; while in England, *The Architectural Review* has from time to time hinted to its readers of the formalistic dangers inherent in a neo-Palladian Program.³²

Banham's often overly-zealous journalistic attacks can be understood as part of this opposition. For him and other members of the Independent Group, the apparent historicism was out of touch with life in the most fundamental of ways. Writing in the *Architectural Review* in 1954, Independent Group members Alison and Peter Smithson characterize the desirable direction as:

It is necessary to create an architecture of reality...An art concerned with the natural order, the poetic relationship between living things and environment.³³

Independent Group's desire to create an art and an architecture embedded in natural order by seizing hold of the realities of the contemporary environment recalls Frampton's description of the desire of the *animal laborans* who "labors and mixes with his product." Yet Frampton's assessment of this aspect of the human condition does not admit the positive experiential merits of "mixing in" with the products of one's productive activity. The Independent Group's exploratory

interest in the contemporary artifactual milieu is similar to what Heidegger refers to as the interest in *pragmata*: "those entities which serve phenomenologically...those which are used or which are to be found in the course of production."³⁴ The Group's willingness to phenomenologically mix with those entities found in life is graphically expressed through the 1956 collage by Independent Group artist Richard Hamilton and later through the image Banham selected for *The Well-tempered Environment*. Hamilton's collage entitled "Just what is it that makes today's homes so different, so appealing?" consists of the type of pictorial objects that Robert Venturi called "honky-tonk elements:" symbols of communication and mass media (cinema, TV, recorder, telephone, newspaper, comic strip); symbols of civilization (automobile logo, vacuum cleaner, upholstered furniture, canned ham, lolly pop and a photograph of earth creates the ceiling) and the stereotypical sex idols occupy the home. Of equal phenomenological significance as the pasted-in societal objects is the reconciliation of them by the artist who is not beholden to the convention of high art. Hamilton proposes, "What is needed is needed is not a definition of meaningful imagery but the development of our perspective potentialities to accept and utilize the continual enrichment of visual material." For a concluding image in *The Well-tempered Environment*, Banham includes a photograph of two astronauts in their space suits with their portable air-conditioning units for use on the ground. In referencing the environmental realities of the astronauts' space suits he alludes to the undeniable role of the technological body/nature interface required when humanity confronts new cultural, phenomenological frontiers. For both Hamilton and Banham the various pop-technologies of the environment directly relate to the culture body and nature. Conversely, "Italian Neo-Liberty" and "neo-Palladian Program" appear--relative to *Une art autre--as convention-bound* and thus obstructionistic to the potentially fresh and exciting body/nature relations.

Interestingly, Jorge Silvetti's 1978 analysis of Banham's critique of "Neo-Liberty" connects British 'Pop,' Pevsner, Banham, and, significantly, Venturi to one critical genealogy. The association of Venturi's position to that of Banham is fitting as Frampton present Venturi as his "other." Of specific relevance to the development of Banham's genealogy is Venturi's comment in *Complexity and Contradiction in Architecture* regarding the relation of conventional industrial products (i.e. honky-tonk elements) to architectural order. He notes:

The main justification for the honky-tonk elements in architectural order is their very existence. They are what we have. Architects can bemoan or try to ignore them or even try to abolish them but they will not go away...

Modern architects have exploited the conventional element only in limited ways....Wright, for instance, almost always employed unique elements and unique

forms, which represented his personal and innovating approach to architecture. Minor elements, like hardware by Schlage or plumbing fixtures by Kohler of Kohler, which even Wright was unable to avoid using, read as unfortunate compromises within the particular order of the his buildings, which is otherwise consistent.³⁵

Venturi's pragmatic acknowledgement of the inevitability of industrial products and thus the call for the discreet incorporation of them architecturally is entirely compatible with both Banham's call for the architectural recognition of the pragmatics of equipment and the Heideggerian notion that *pragmata* serve phenomenologically. In all, Banham's critical genealogy has a concern for the specific pragmatic concerns of *animal laborans*. In terms of architecture these specific matters are represented with conventional form elements.

Conversely, Frampton's critical discourse addresses *homo-faber's* abstract iconic geometry which is considered to be more transcendent when free of the earthy conventions of utility. In other words, *homo-faber's* drive toward the permanent is more perfectly fulfilled with geometry. *Animal laborans'* efforts to engage what is directly relevant entails gravitating toward specific objects, which by definition are conventional signs. *Homo-faber's* critical discourse has no use for specific objects (door hardware or toilets) produced by specific manufacturers (Schlage or Kohler). *Animal laborans'* critical discourse has no use for general geometric notions such as "archetypal, universal forms." Ultimately, however, the practice of architecture demands the reconciliation of these two formulations of *techne* corresponding to these differing forms of critical discourse.

NOTES

- ¹ Kenneth Frampton. "Critical Regionalism Revisited" in *Critical Regionalism*, ed. Spyros Amourgis, College of Environmental Design, California State Polytechnic University, Pomona California, 1991, p.36.
- ² Ibid, p.34.
- ³ Kenneth Frampton. "Paul Nelson and the School of Paris" in *The Filter of Reason: The Work of Paul Nelson*, New York, Rizzoli, 1990, p.11.
- ⁴ Following Heidegger and Merleau-Ponty, Peter McCleary outlines a theory of technology incorporating an interpretation of "pragmata." See "Metamorphosis of Perception through Techniques, Techniques, and Technology," paper presented to the University of Pennsylvania Faculty Mellon Seminar on Technology and Culture, April 22, 1985.
- ⁵ Kenneth Frampton. "On Reyner Banham's The Architecture of the Well-Tempered Environment" in *Oppositions*, Winter 1976, 86-89.

- ⁶ Kenneth Frampton. "Louis I. Kahn and the New Monumentality, 1944-1972," in *Design Book Reviews*, 28, p.6-13.
- ⁷ John A. Kouwenhoven. "Architecture as Environmental Technology" in *Technology and Culture*, January 1970, vol.11, no.1, p.85.
- ⁸ Banham, Reyner. *The Architecture of the Well-tempered Environment*. Chicago: 1969, p.11.
- ⁹ Ibid, p.19.
- ¹⁰ There are, of course, notable exception to this editing tendency. For example, the representation of the chimney is a significant aspect of Frank Lloyd Wright's residential work, usually acting as central compositional feature. It should be pointed out, however, the Wrightian hearth usually does not provide the dwelling its primary source of thermal comfort--a mechanical system provides for this. The Strafford Hall in Westmoreland County, Virginia is an example where the chimneys are both formally and functionally vital to the conception of the building.
- ¹¹ Frampton, Kenneth. "Labour, Work and Architecture" in *Meaning in Architecture*, editors Charles Jencks and George Baird, pp.151-168.
- ¹² Ibid.
- ¹³ Ibid, p.151.
- ¹⁴ Ibid.
- ¹⁵ Ibid, p.154.
- ¹⁶ Ibid.
- ¹⁷ Ibid, 163-4.
- ¹⁸ Frampton (note 6).
- ¹⁹ Ibid, p.10.
- ²⁰ Frampton (note 7), p.11.
- ²¹ Frampton, Kenneth. "Rappel a l'Ordre: the Case for the Tectonic," in *Constancy and Change in Architecture* edited by Malcolm Quantrill and Bruce Webb, Texas A&M Press, College Station, 1991, p.13.
- ²² Banham (note 6) p.90.
- ²³ Wright, Frank Lloyd. *An Autobiography*, New York, 1943, p.150.
- ²⁴ Reyner Banham. "Neo-Liberty: The Italian Retreat from the Modern Architecture," in *Architectural Review* vol. 125, April 1959, p.235.
- ²⁵ Ibid.
- ²⁶ Banham, Reyner. "A home is not a house," *Architectural Design*, 1969. January. pp.45-48.
- ²⁷ Nigel Whiteley. "Banham and 'Otherness,'" in *Journal of the Society of Architectural Historians of Great Britain*, Vol. 33, 1990, p.188-189.
- ²⁸ Banham, "The New Brutalism," *Architectural Review*, December 1955, pp.355-61.
- ²⁹ Ibid.
- ³⁰ Banham, "Futurism for Keeps," *Arts* (December 1960), p.33.
- ³¹ Bonta, Juan Pablo. *Architecture and its Interpretation*. New York, Rizzoli, 1979.
- ³² Colin Rowe. "Neo-Classicisim' and Modern Architecture I," in *Opposition*, No. 1, September 1973; also published in *The Mathematics of the Ideal Villa and Other Essays*, MIT Press, Cambridge, 1976, p.120.
- ³³ Alison and Peter Smithson, "Statement," *Architectural Review* (April 1954), pp.274-275.
- ³⁴ Martin Heidegger. *Being and Time*, trans. John Macquarrie and Edward Robinson, New York: Harper and Rowe, 1962, p.95.
- ³⁵ Venturi, Robert. *Complexity and Contradiction in Architecture*. New York: 1966, pp.42-3.