Turning the Black Box into a Great Gizmo

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"I propose to treat the architectural mode or presence as a classic 'black box,' recognized by its output though unknown in its contents."[1] So declared Reyner Banham, twenty years ago, in a striking assessment of architecture's own disciplinary knowledge. Architecture could be seen to exist but the processes that led to its existence were obscure, perhaps even deliberately obscured by the guild-like habits of the architectural profession. Impenetrable distinctions separated the products of the architectural mode from other seemingly adjacent modes of design. This wasn't to say that the content of architecture could not be taught. On the contrary, Banham argued, the activities and practices concealed within the black box were precisely those conveyed through studio instruction, through charrettes and lectures and reviews, to contrive a student's successful acculturation to the mode of architecture.

Banham's contention isolates a central question posed by this panel: how can a thesis produce disciplinary knowledge? As Banham's black box, architecture was a mysterious entity; visible, even palpable, but nevertheless resistant to explication. One might pursue qualities it undeniably contained—function, form, materiality—or attitudes it employed—efficiency, honesty, beauty—and yet come no closer to an overt knowledge of its operations. A "secret value system" remained at work, encountered with clockwork regularity at crits: "Sorry…It's very clever/beautiful/sensitive, but it isn't architecture, you know."[2] The vocabulary has been updated, but the sentiment remains a common enough refrain at thesis reviews.

The architectural thesis, in each of its institutional variations, inquires into disciplinary knowledge. It attempts to gain a knowledgeable perspective on architectural knowledge. The black box would seem to present an insurmountable obstacle to any such attempt, and yet the thesis historically and currently fosters the disciplinary conceit of the black box. It could even be considered one of the box's critical contents, a climactic test of a student's satisfactory acquisition of disciplinary habits and reflexes. An aura of induction into the secrets of the guild has long attached to thesis, from its historical incarnations as the Prix de Rome at the Ecole des Beaux Arts to the—literally—elevated position of thesis students at the many schools where their desks occupy the balcony or the top level of the studio. As a process through which several aptitudes and talents are purportedly assessed, but whose participants, students and faculty, can rarely explain how these aptitudes and talents are explicitly directed or taught, thesis certainly merits the adjective enigmatic.

There are more significant correspondences than just atmosphere between the prevailing formats of the architectural thesis and the disciplinary modes of the black box. Two of the historic limits of the architectural thesis have been, on the one hand, the demonstration of a precise competence in architectural design, and, on the other, the expression of an individual artistic volition. Taking Stanley Tigerman's Yale baccalaureate thesis as an example of the former and Hans Hollein's Berkeley master's thesis as an example of the latter, I would argue that both these presumed outer limits fit easily within the confines of the black box.

A thesis demonstrative of competence succeeds to the degree that it reproduces the practices of the institution that sponsors it. This thesis will "look like a thesis," recognizable for having adopted the design methodology, the programmatic concerns, and very likely the representational predilections

of its institution. Such a thesis could be successful on many levels, evidencing both skill and creativity in its design; and it would constitute a black box thesis precisely because the full measure of that success would consist of the prior concerns of its institutional setting. The emphasis placed on the demonstration of competence reinforces a mastery of the curricular components already in place, and success must be cast as their close reproduction. The posture of this thesis is one of imitation, irrespective of any formal novelty it might possess in its outcome, because it acts out the processes—Banham would say the rituals—of its institutional context.

The thesis that expresses individual volition will similarly "look like a thesis," though in this case often because of its charged unconcern for institutional dispositions and habits. In spite of its potential antagonism to its institutional or even disciplinary context, here again, the thesis fulfills the criteria of the black box. It does so in part because by wheeling from the institution toward the authorial subject it leaves the former intact and unaffected. The processes of the institutional context are not reproduced but nor are they interrupted. More than that, though, such a thesis strengthens the black box precisely because it insists upon subjective volition as a standard of evaluation, a personal knowledge even less susceptible to interrogation than an institutional one. This thesis adopts a moral imperative as it attitude, a posture that may be adopted or rejected but that cannot be refuted.

Banham speculated that some hint of the inside workings of architecture's black box had recently been exposed to view. He pointed to Christopher Alexander's diagnosis that the tenets of his pattern language, even when adopted by architects, failed to overcome the predispositions of those architects; it had not "change[d] the nature of architectural design."[3] Banham concluded that Alexander's patterns succeeded insofar as they conveyed some authoritative force and were modified into other standard patterns in the event that those patterns conveyed a similar but greater claim of correctness or propriety: "In other words, each such pattern will have moral force, will be the only right way of doing that particular piece of designing—at least in the eyes of those who have been correctly socialized into the profession."[4] An expressionist thesis, such as Hollein's, depends entirely upon an imperative claim, not one explicitly underwritten by the discipline, but one that employs the black box in its reflexive demand to be seen as "the right way of doing that piece of designing."

The range of thesis projects situated between these limits, those that examine what Mark Jarzombek has called the "threshold . . . between architecture as a subjectivist fantasy and architecture as an intellectual discourse"[5] also place themselves within the confines of the black box, avoiding the extremes of these two boundaries but depending on evaluation through an assessment of correspondence to previously recognized patterns. The dependence upon the black box poses no fatal threat, but it does, I would argue, place severe limitations upon the epistemological potentials of the architectural thesis.

In many programs, the recent tendency has been to emphasize the role of thesis as a process of research. Research, broadly understood as speculative or open-ended examination of a body of objects and conditions, conflicts with the tendency of the black box to use any such material to analogize its disciplinary contents; it cannot value research as a way to replace those contents. As provisional evidence of this admittedly broad claim, consider the difficulty of incorporating technological research—whether into the material technologies of sustainability or the immaterial technologies of digital design—into the conventional format of the architectural thesis. Theses that rigorously pursue this research often arrive at a conclusion that is regarded as insufficiently architectural. They assume too much of the appearance of industrial design, perhaps, or of pure technology or applied research. The judgment that such projects are not "architectural" would indicate the presence of a black box, but the firmer proof comes when they <u>are</u> accepted as architectural, at which point they have almost invariably fallen short of the demonstrative requirements of technical research, such as reproducible results or falsifiable experimentation. The black box promotes correspondence and similitude as its persistent measures of evaluation, as its standard for legitimation, and so forecloses a variety of research procedures that necessitate other criteria.

In its uncomfortable relation to an expanded conception of research, the black box conspires against

architecture's prevailing disciplinary interest toward interdisciplinary and transdisciplinary explorations. The thesis may be defined as the project of revealing previously unseen or unknown aspects of the discipline or its institutions. But even a thesis that succeeds in such a revelation will likely maintain the prerogatives of the black box, which emphasize the act of discovering rather than the ramifications of the discovery. Among its mysterious contents, the black box will not contain the means for assessing the outcomes of such discoveries unless that assessment can be located within the processes of architectural design. For example, techniques of assessment used in industrial design, such as affordance, performance, or economy of means would be vital for the evaluation of a technological thesis, but would not be found inside the black box.

What, then, is the future of the model of disciplinary knowledge represented by the black box? Banham suggested that one available option for maintaining the black box would be to severely constrain disciplinary pretensions. One could, he suggested, concede that architecture was a discipline limited historically to a lineage tracing back to the Renaissance concepts of *disegno*, and by forsaking the claim of architecture's universal spatio-temporal relevance, maintain the black box as a preserve for the reproduction of a still vital albeit more narrowly-defined discipline. Though Banham himself did not endorse this definition—which he noted would be seen by some as a "crippling limitation on building's power to serve humanity"—it would certainly ease the current pedagogical burden of thesis, because the distinction between disciplinary knowledge and knowledge of other technological or social dimensions would be sharply drawn, and the former would become more obviously the objective of the thesis.

Though we shouldn't dismiss offhand a recalibration of the black box thesis along these lines, many of the broad explanatory theories of our contemporary moment—globalization, say, or digitalization—seem to compel architecture, and thesis in particular, to engage with and participate in tendencies outside the boundaries of its own disciplinary knowledge. To outline another potential formulation of thesis, let me turn to another, earlier essay by Banham entitled "The Great Gizmo."[6] Published in 1965 in the journal *Industrial Design*, the essay valorizes a mode of invention but makes only sidelong reference to architecture (and then only to reinforce Banham's disapprobation of the technological immaturity of architecture.) A "gizmo," Banham explains, is a device created expressly to obtain mastery over some uncontrolled or disorganized set of circumstances. And it obtains such mastery not through brute force, overwhelming size, or great complexity but through expedience, adroitness, and economy. So the Hoover Dam is not a Gizmo, but the Evinrude outboard motor that propels a boat across Lake Mead definitely is.

The outboard motor that Ole Evinrude invented in 1909 struck Banham as one of the clearest examples of a great gizmo. It transformed the set of complicated mechanical and mathematical operations required to design and install a motor, a shaft, and a propeller inboard a boat into a trivial process of attachment and operation. The boatyard, specialized tools, skilled artisans and artisanal knowledge, forges, and traditions, all these were replaced by the clamps that attached a single piece of equipment to a boat's transom. The outboard motor thereby liberated the boat and the use of boats from any necessary proximity to the craft of boat-building, and so transformed thousands of indifferent waterways into particular routes of navigation. More recent examples of gizmos offered by Banham included the spray can, walkie-talkies, and Clark Cortez campers. The signal characteristics of such gizmos were their independence from larger infrastructural supports; their inducement of a free mobility; and their ability to transform, to recast the properties and potentials of their operational contexts.

If one considers Banham's gizmo in more general terms, independent of its particular instances, I would argue that the gizmo exemplifies a distinctive species of design and furthermore that it offers a useful conceptual model for the architectural thesis. Let me first underscore that I am not suggesting that the thesis should evolve into the invention of gadgetry. Rather, I am proposing that the gizmo mode of design could replace the black box mode of design as the underlying conceptualization of thesis.

The gizmo appears to prioritize invention, but it is actually more aptly described as an act of re-invention. First, the gizmo reinvents the context within which it performs, a point Banham illustrated by

suggesting that one could recognize "a device like a surfboard as the proper way to make sense of an unorganized situation like a wave."[7] The surfboard organizes the previously undifferentiated elements of the wave into a specific shape and pace, and therefore into a known and exploitable potential. Second, and more importantly for the present concern of disciplinary knowledge, the gizmo reinvents elements of the craft or the practices from which it derives. The Evinrude outboard extrapolated fundamental properties from the craft of boat-building, such as calculations of scale or propulsion, but reapportioned and condensed them into properties of the gizmo itself.

The two salient qualities of the gizmo mode of design are this appropriation of highly specific disciplinary practices and this outward reorganization of an indifferent context. It is because the gizmo inserts itself between, or better, fits between disciplinary habit and contingent reality that it may model a different epistemological possibility for the architectural thesis. If the task of thesis were to design a gizmo—again, not a gadget but an architectural proposal conceptualized as a gizmo—its prospective architectural knowledge would have two components. Its adaptation of existing disciplinary practices by the distillation and transformation of the intentions and capabilities of those practices would constitute a knowledge of architectural knowledge. The actual operation of the gizmo, which in the form of thesis would be its intended effects or outcomes, would deploy architectural knowledge outward toward social or physical conditions, toward human subjects, toward other disciplines or domains.

The gizmo offers a distinctive answer to the initial question, how can a thesis produce disciplinary knowledge. Its double orientation, at once reflective and projective, produces results that differ from those of applied research or the iterations of precedent. The gizmo produces an outward reorganization, already familiar to architecture as its social and material consequences, but focused more sharply by the gizmo as a process of reorganizing or reconfiguring a context. This diverges from applied research because the gizmo mode of design does not export an object or mechanism resolved abstractly in one field to situate it concretely in another. The gizmo emerges in three steps, not two, with the first being its transformative distillation of existing disciplinary practice. This already is its concrete act of design; no application is necessary to prove disciplinary knowledge, only to extend it through the additional step of an outward reconfiguration of context.

The gizmo should also be distinguished from the conventional renovation of precedent that many black box theses depend upon. The gizmo does not take up an object or event as a precedent to be modified and offered as a renewed object or event. It carries out a very particular kind of modification, which is the condensing of a prior system of dependencies—an object and its context—into the confines of the gizmo. This absorption of the systematic relationships of which practices are composed forestalls the reproduction of prior practices. Instead, the gizmo identifies and overcomes the limitations of those practices to render them obsolete or at least no longer indispensable. Unlike a black box thesis, the gizmo thesis would not aim to reiterate the ineffable as a demonstration of knowledge, but rather to translate the ineffable into a knowable and operable form.

Novelty as such is not a gizmo concern, because of its inherent disposition toward re-invention. Because its primary aim is not to reinforce existing practice but to reinvent it, a gizmo would be far better suited as an instrument of research than a black box. Because its own discipline would be cast as a source rather than a beneficiary of knowledge, it would be more appropriate to the explorations of inter- and trans-disciplinarity. The epistemological potentials of the gizmo thesis are, therefore, considerably more appropriate to contemporary concerns—both inside and outside the discipline of architecture. And at the same time, the gizmo neither implies nor necessitates a renunciation of the discipline. Its purpose is to clear a path for the discipline into adjacent fields of expertise, conduct, and thought.

I'm proposing here a conceptualization of thesis, the realization of which within a thesis program would obviously have to take into account the highly varied approaches and resources of different institutions. While my description necessarily remains general, by way of conclusion I do want to offer a more concrete recommendation for cultivating the institutional conditions a gizmo thesis would require.

At the majority of schools, the design faculty has the primary responsibility for the supervision of thesis projects and the coordination of thesis program. Faculty in technology, history and theory, professional practice, or faculty from adjacent disciplines do participate in or advise thesis projects, but even so the thesis program has remained undeniably the prerogative of the design faculty. Most, if not all, Master of Architecture curricula that have a thesis requirement consider the thesis a culminating design studio. This view of thesis, though, perpetuates certain tendencies, such as a tendency to reproduce studio methodologies, which sustain the black box thesis, but not the gizmo thesis. To seize on the potential of the gizmo, I would argue that thesis should now be granted a distinct and independent identity in the curriculum as a course of reflection upon disciplinary knowledge. It should no longer be conceived as a final design studio, but as an independent space within the architectural curriculum.

To promote its engagement with the other pedagogical arenas of the architecture curriculum—technology, history and theory, professional practice, computation, and so on—the thesis should be offered as the common property of all of these different areas, with the understanding that individual theses will veer towards one or another of these as part of a larger project of design. Occupying this distinct space and supervised equally by a wide range of faculty expertise, the thesis would be able to foster an approach based on distillation, condensation or even simplification instead of the customary elaboration or creation of complexity. Recall that the gizmo characteristically condenses the systematic elements of an object and its context. The conventional sequence of design studios, however, progresses from simple, narrowly defined problems toward more complex, broader ones, so that the conventional thesis, in consequence, almost always presumes to adopt the most comprehensive view and to attempt to resolve the greatest number of variables. The gizmo thesis could incorporate equally as many criteria and factors, but its inclination will be to distill them, to find and overcome limits through rigorous processes of simplification. As this would run against the ordinary current of the cumulative studio sequence, the design of a thesis project must not be the apotheosis of what precedes it, but a different tendency altogether.

Because correspondence to institutional norms or to the propensities of the discipline itself would no longer serve as the evidentiary standard, as for the black box thesis, the gizmo thesis will have to develop and stipulate standards of experimentation and judgment against which it is to be measured. Corollary to this, a renovation of the format of thesis reviews will likely be required. The conventional review format seems unsuited to the presentation and assessment of the gizmo thesis because it so overtly assumes the priority of existing modes of reception. Trained ourselves in the habits of the black box, faculty on a thesis review "know" what is or is not a thesis precisely because we can recognize it. Recognizability, though, is not the virtue it may seem. Many valuable thesis projects have come out of the black box, but exceedingly few of them are now unfamiliar. If thesis could be transformed from a black box to a great gizmo, we might have to spend a bit of time learning how to use these projects, but we would also learn much more about the discipline they confront.

ENDNOTES

1. Reyner Banham, "A Black Box: The Secret Profession of Architecture." In *A Critic Writes: Essays by Reyner Banham* (Berkeley: University of California Press, 1996), 293.

2. Ibid., 295.

3. Ibid., 296.

4. Ibid.

5. Mark Jarzombek, "A Thesis." *Thresholds* 12 (Spring 1996): 6.

6. Reyner Banham, "The Great Gizmo." In *A Critic Writes: Essays by Reyner Banham* (Berkeley: University of California Press, 1996), 109-118.

7. Ibid., 110.