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Paradoxical Efficiencies

Efficiency and Exorbitance in Architecture

Introduction

“It is obvious that the utilitarian role of an object never completely justifies its form, ... that the object always exceeds its instrumentality. Thus is it possible to discover in every object an irrational residue...”

-Caillois

Efficiency regulates architecture in a multiplicity of forms – witness net to gross ratio's, fast track construction, the aesthetics of the minimal, net zero buildings and mass pre-fabrication to name just a few. There is structural efficiency, spatial efficiency, energy efficiency, material efficiency, efficiency of construction and so on. Efficiency is ingrained in the language of architectural discourse. Efficiency is seen as a moral imperative. Efficiency even defines production in the academic studio – how much work in how little time.

More and more, instead of less is more, we want more from less. And perhaps this is as it should be in a world increasingly defined by a sustained crisis of economic and ecological scarcity. However, it is necessary to ask whether a positivist application of efficiency – more often driven by the ruthlessness of market forces than principles of enlightened stewardship – results in an unquestioned privileging of the quantitative over the qualitative. If efficiency is the overriding imperative in a contemporary culture predicated on the bottom line – on ever faster and cheaper – then what is lost and what is gained in the exchange? Whereas the Taylorization of labor and mass production were considered unambiguous advancements at the outset of the 20th century, they also reveal the double-edged nature of efficiency. The streamlining of workplace flows which promised to minimize drudgery often compounded it – necessitating new forms of control and devaluing the individual worker. At the same time, the rise of industrialized production stimulated the consumption of a proliferating array of disposable goods, magnifying the depletion of resources and the generation of waste.

But what if efficiency itself was interpreted as a paradox? If efficiency entails the coupling of any maximum to any minimum, then how might a reconsideration of efficiency become conceptually generative rather than restrictive? This studio will be driven by a critical re-evaluation of notions of efficiency in architecture – recognizing that every efficiency paradoxically implies a corresponding excess, exorbitance or waste. Efficiency of movement implies a surplus of circulation, optimization of daylight might generate a superabundance of apertures, efficiency of structural footprint might create an extreme density of structural members and so forth. This coupling of efficiency to its opposite creates a fertile contradiction – an irrational residue – that can be used to hijack a narrow functionalist conception of efficiency. In an era of performance-driven optimization, we will pursue extreme, perverse, or satirical efficiencies as a means of generating new programmatic and spatial opportunities. If the value of architecture exists to the precise degree that it transcends the strictly utilitarian, then we will seek the point at which efficiency folds back on itself, to the point where it generates a productive exorbitance.

Background:

An early critique of efficiency can be found in William Jevons 'The Coal Question', published in 1865 as an evaluation of Britain's coal-based iron industry. Jevons contended that, contrary to intuition, an increase in technological efficiency (of fuel consumption for example) results not in the conservation of resources but their accelerated depletion: stimulating demand and increasing use. The Jevons paradox, as it is now known, can be detected in a wide array of disparate phenomenon. For example, over the course of the last 25 years the efficiency of air conditioning in the U.S. has improved by more than 30%. However, rather than reducing consumption, energy use for cooling has nearly doubled over that same time period. Today, despite stringent energy codes we use more electricity to air condition our buildings than the sum total of all electrical use in 1955 before cheap, readily available cooling became prevalent. At a minimum, such phenomena call into question a simplistic understanding of efficiency and point to the wider chain of relations that impact it's real effects.

At least since the emergence of modernism however, the valorization of efficiency within architecture has been pervasive: from Mies' famous dictum to Le Corbusier's *machines for living in*, from the aesthetics of structural optimization to the streamlining of transportation flows in the multi-layered networks of contemporary cities. Principles of efficiency gradually permeated every scale and facet of architectural production, encompassing both the standardization of the American building industry in the aftermath of World War II as well as the application of scientific management to the intimate of spaces of the home. The 1926 Frankfurt kitchen, to give one example, was not only pre-fabricated to speed production, but utilized time and motion studies to minimize wasted movement in the preparation of meals. As the architecture of efficiency infiltrated home and workplace alike, it also became emblematic of the alienating effects of an increasingly technologized environment (a condition satirized in films like Tati's *Mon Oncle* and *Playtime* in which efficiency run amok generates a range of irrational effects and absurd situations). In architecture, a counter position to what Cedric Price termed the 'dreary Bauhaus logic' of doctrinaire modernism could be found in the work of groups like Archigram, who – without rejecting efficiency as a critical parameter- pushed it to radical extremes in projects like Plug-In and Instant City. In stark contrast to dystopian images of mechanization, here technological efficiencies were deployed in the service of new urban pleasures and liberating social effects.

Today, we see a resurgence in ideas of efficiency as new forms of computation promise the optimization of performance as a driver of architectural form. Mass customization and bespoke manufacturing processes seek to further speed and individualize production – increasing temporal and material economies. Meanwhile, the focus on sustainability reasserts the ethical necessity of conserving resources and minimizing energy consumption – spawning an entire architectural sub-industry predicated on new standards of environmental efficiency. At the same time, the bulk of building is subject to the demands of market driven economic formulas– generating a taxonomy of building types – from micro-hotels to big box stores, from automated parking structures to just-in-time distribution centers – typically outside of the purview of architects. This

studio will examine the multiple forms that efficiency takes in contemporary architecture, analyzing its role in current practices in order to generate alternative tactics and speculations. These speculations will take the form of precise architectural proposals.

Process:

An example of the unpredictable consequences of efficiency can be found in Invernizzi's Villa Girasole, built just outside of Verona in 1935. Here a simple imperative – to maximize exposure to daylight – produces an intricate series of decisions resulting in an exorbitant, if not illogical whole. In order to maintain optimal solar orientation during the course of the day, the house rotates on a massive landscape turntable supported by fifteen train wheels and powered by a series of low horsepower motors. This mechanical contrivance – imminently logical given the initial premise – triggers a series of repurcussive effects: the house is split in two – a spinning machine-like top over a solid masonry base- connected by a revolving circular stair and elevator core which combines vertical ascent and rotational motion. In the rotating portion of the house, domestic features are distorted according to the demands of mobility – plumbing is connected to tanks slung from the underbelly of the house, while storage, furniture and cabinetry are built into the walls. Conventional distinctions between front, back and side yards no longer apply as the house continually changes it's relation to the surrounding landscape. Doors may open onto different locations at different times of day and the sun can rise and fall in the same window, freezing shadows and warping the perception of time. Beyond the explicit intent of its creators, Villa Girasole demonstrates the pursuit of rational trajectories extrapolated to the point that they render a precipitate of unanticipated architectural effects.

While taking seriously the conservation of economic and environmental resources that underwrite impulses toward efficiency – we will examine the potential latent in a paradoxical understanding of efficiency to generate our projects. This process will be governed by three interrelated constraints: 1.) the isolation of a specific category of efficiency, 2.) the selection a programmatic type and 3.) the limits of a physical site located within Manhattan. Initially the student will derive a logic regarding a pairing of a given minimum/maximum as a generative principal - these investigations will frame a spatial proposal that will be coupled with a specific program selected by the student from a predetermined matrix. Finally, these programmatic studies will be intersected with a given site and reconciled with the idiosyncratic spatial restrictions of Manhattan. In these speculations, efficiency will be shadowed by its opposite in the form of the excessive, the residual, and the wasteful. Rather than seeking the elimination of these negative terms, we will attempt to leverage them as productive grounds for rethinking dominant narratives of optimization, catalyzing unforeseen couplings of form and program, function and inhabitation. Operating opportunistically, these tactics will open up new, imaginative potentials inside the rationalized spaces of contemporary systems.