

## Diagrams, Comfort, and the General Economy

by Martti Kalliala

**Homeostasis** The human animal is a warm-blooded, tropical mammal. In a manner analogous to its taxonomical kin, this human animal's capacity to function and, essentially, to survive, depends on her body's ability to sustain a homeostatic condition, that is, keeping it's internal environment in a stable state regardless of changes in the external environment.

The primary function of homeostasis is thermoregulation—retaining a more or less constant body temperature. The successful colonization of the entire habitable surface area of the planet (including areas climatically hostile to the chemical processes essential to life) by a population of hairless mammals would not have been possible without the prosthetics of clothing and shelter that mediate the body's relationship to various external worlds. In a manner quite unlike any other species, instead of physiological adaptation, human thermoregulation happens in a largely “voluntary” fashion—through modulating the use of mediating external technologies like going inside a building, removing one's shirt, opening a window—rather than through “involuntary” mechanisms, such as using the body's internally stabilizing processes of shivering, sweating, vasoconstriction, and so forth.

**The Comfort Zone** The subjective experience of “comfort” is largely culturally conditioned. What is too hot, too cold, or too humid to one individual is acceptable or desirable to another; notably, individuals living primarily in highly conditioned interior spaces have developed a narrower subjective range of acceptable conditions. However, the basic underlying process is persistent: the less we consume energy through our bodies' thermoregulatory mechanisms, the more “comfortable” we feel.

When plotted on a chart, the parameters of temperature, relative humidity, and air flow—within which the statistically defined experience of comfort is achieved—delineate a field we call the “comfort zone.” The cultural variability of the phenomenology of comfort is reflected in the varying sizes and locations of measured comfort zones among different populations. However, much research has been conducted,

in the spirit of biological reductionism, to define a universal standard of comfort, an “optimal” human condition.<sup>1</sup> One could summarize the findings of this optimizing inquiry as follows: the less our individual homeostatic mechanisms consume (where individuals are imagined as passive recipients of control technologies), the more of our remaining energy, or labour, can be extracted for other productive activities.<sup>2</sup> In other words, in exchange for our productive capacity, our human-made environment ought not to demand anything of us.

**Diagram** In its capacity to visually depict the arrangement and distribution of programs on horizontal planes, the architectural plan once functioned as the main tool for designing built space. Exemplified by the modern prison, hospital, school, and other spaces of control, the plan was a *de facto* instrument of management: of ordering, separating, and compartmentalizing (re-)productive processes.<sup>3</sup> However, recent advances in construction technology, increasingly fluid forms of enterprise and their spatial analogues—from the “open” and “typical” plan to “any plan”—and a new managerial emphasis have shifted toward the provision of a more *general* condition of maximum flexibility. We have departed from compartmentalization towards the smooth flow of activities on unobstructed horizontal planes, with a far more totalizing idea of a standard-ized, predictable environment.

In connection to this transition, a very specific type of architectural representation has become increasingly ubiquitous: the diagrammatic section depicting the energetic and material performance of a building. A circuit of solar energy mediated by wind, water, and photovoltaics, encapsulated in biomass and fossilized organisms, and abstracted into electricity, rather than representing mere *extension* (as in a “bare” plan, section, or elevation drawing), the energy diagram offers a snapshot of a dynamic state or condition. This concept—a dissection of architecture as a material organization that regulates and brings order to energy flows—is not new.<sup>4</sup> Yet, in its present incarnation it is seen virtually everywhere an architectural project is presented, even if this type of image does not have a fixed, or widely agreed-upon name (search for images of “sustainability section,” “building energy concept,” or “sustainability concept” for a wide array of examples). We will simply call it here the “energy diagram.”

Without a doubt, the energy diagram's proliferation as a mode of architectural representation is a direct result of a general obligation to subscribe to a conduct of “sustainability.” However, rather than an instrument for evaluating the performance of this ideological commitment, it is essentially a logo-gram; the prime task of the energy diagram is to *associate* a project with the ethical code of sustainability.

Unlike the canonized rules according to which one draws and is able to read an elevation, plan, or section, the energy diagram should be read as an impressionistic portrait of a possible canalization of matter-energy. The hue of the cold airflow's blue, the size of the smiling sun, or the number of raindrops falling from the stylized cloud do not carry any measurable meaning in themselves. Even more importantly, regardless of the exact manner in which the dynamic variability of the flow of energy and matter ought to be retrieved, captured, and stabilized, the underlying promise of the energy diagram is always the same: the production of an interior environment adhering to an obscure standard indexing the naturalized notion of comfort.



**The General Economy** In his 1949 book *The Accursed Share*, Georges Bataille set out to develop a theory of a “general economy.” In opposition to the conventional economic models based on scarcity and utility that describe the conditions under which seemingly isolated ecologies and particular entities (such as a person, building, or city) exist, perform, and facilitate exchanges, Bataille set out to delineate the fundamental movement of biochemical energy on earth, structured around the notion of inescapable loss, or excess. According to Bataille, for life in general (“life” should be understood here in its barest form, that is, as the planet’s combined biomass) energy is always in abundance. This counterintuitive characteristic can be observed through the simple processes of growth and reproduction, neither of which would be possible if an organism did not have, after taking care of its own metabolic needs, a surplus of energy to spend. It is the benevolence, or imperialism, of the sun and its prodigious gift of an infinite stream of energy that charges terrestrial life with a problem of luxury, the necessary expenditure of an excess, the paradox of a profitless dissipation. Accordingly, the fundamental characteristics of a culture derive from the ways in which it consumes this surplus: as either growth (increasing its energy acquisition and physical extension) or expenditure, which itself can be glorious (inherently useless dissipations, gifts, sacrifice, sex) or catastrophic (war).

From this perspective, even if comfort is experienced as a sumptuous luxury, which it surely would have been for many pre-twentieth century human beings, the project of comfort is, essentially, the project of growth advanced by the increase of human creative-productive faculties. But what does the perspective offered by the general economy bring to light in the architectural energy diagram? Emphatically, with the aid of Bataille’s prescient analysis, we can see that representations of the circulation, exchange, and dissipation of excess energy in varying forms could be seen not just in architecture, but everywhere—often in a strikingly similar visual language. It would be difficult to miss the clear kinship between the depictions of the circulation of energetic and material resources in a building and the cartographic depictions of movement and material resources in

military operations diagrams. Indeed, is it not the case that the swirling blue, red, and yellow lines, the arrows, and the symbols of energy diagrams represent essentially *the same* energetic wealth as those vectors of force that attempt to map the theatre of war? In fact, we find that even the arched lines tracing the trajectory of a leaping tiger, or the dissipating force of a blow to the jaw illustrated with a swirl of jagged lines and stars in a *Ligne claire* comic, or, for that matter, any other swoosh, star, arrow, or dotted line employed to visually reproduce the investment of an energetic surplus, all share in the representation of the general economy. What we have then is the basis of a new schematic—an aggregate diagram of growth, glorious incandescence, dissipation, and death that we can only begin to trace one line at a time, in an energy diagram of a world indifferent to human comfort.×

#### Endnotes

- 1 This can be observed in the global convergence of interior conditions; see Emma Hinton, “Carbon, Control and Comfort: User-centred Control Systems for Comfort, Carbon Saving and Energy Management,” *Environment, Politics and Development Working Paper Series 30* (Department of Geography, King’s College London, 2010), 18.

#### Bio

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- 2 Ibid., 2.
- 3 See, most especially, Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (New York: Vintage, 1979).
- 4 Luis Fernández-Galiano, *Fire and Memory: On Architecture and Energy* (Cambridge: MIT Press, 2000), 4.