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Evolution through *Heterarchical* Organization

In 1989 at a gathering of executives and intellectuals from the influential California-based management consulting firm Global Business Network (GBN), poststructural philosophy professor turned management consultant Jay Ogilvy presented the idea that an obscure model from midcentury cognitive science called *heterarchy* was an ideal way to conceive of organizational management for the information economy.[111] In his talk "People in the Nineties," Ogilvy emphasized that future corporations and employees would better cope with uncertainty through flexible, distributed authority and shared responsibility.

Heterarchy is best described in juxtaposition to hierarchy. In a hierarchy, one assumes that if A is over B, and B is over C, then A must be over C. In heterarchy, however, C may be over A even if A is over B. Importantly, heterarchy does not denote the absence of hierarchy; heterarchies are instead made up of circular loops of overlapping, and ever-changing, hierarchies. In a heterarchically organized structure there are no *ultimate* tops or bottoms even though superiority and inferiority exist.[112]

In the midcentury corporation, hierarchy, the assumed natural order for pyramidal organizational charts, came into question. Passed down from medieval theologians, hierarchy ruled corporations through rigid levels of authority. This inflexible management strategy directed by a single leader, once a bastion of midcentury corporate success, began to symbolize deterministic worldviews, the bane of innovation. The problem, as articulated by Ogilvy, was not "that there are no

[111] The debate over what constitutes the ideal model for decentralized organization continues today. Holacracy is one contemporary model, popularized by its use at Zappos. Using algorithmic software, authority is distributed through overlapping, self-organizing teams. See, http://www.holacracy.org/. Heterarchy is also the subject of contemporary sociologist David Stark's *The Sense of Dissonance: Accounts of Worth in Economic Life* (Princeton, 2009). For Stark, heterarchy allows for the organization of diverse values. Stark believes there is innovative potential in the friction between different values, a concept that "network" does not capture, and something that leads to innovation (p. 24). "Information economy" describes the mid-twentieth-century transformation in developed countries to systems of exchange where knowledge, information, and services are the primary sources of capital; it coincided with the proliferation of information and communication technologies. See, for classic examples, Daniel Bell, *The Coming of Post-Industrial Society* (New York, 1973); and Peter Drucker, *The Age of Discontinuity* (London, 1969), 247–56.

[112] Jay Ogilvy, "Heterarchy—An Idea Finally Ripe for Its Time," Stratfor, 3 Feb. 2016, https://www.stratfor.com.

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hierarchies, no preferences, no valuations of one thing over another; the problem is that there are too many."[113] Ogilvy positioned the corporation against master narratives based on universal preferences or solutions. It was not only the poststructuralists and feminists who read Jean-François Lyotard's *The Condition of Postmodernity* (1979); thwarting metanarratives also animated consulting strategies concerning how one could run a corporation in order to maximize conflicting values and contradictory preferences as potential sources of innovation and avoid destruction.

In cognitive scientist Warren McCulloch's 1945 experimental biological model for decentralized neural net communication—what he called "heterarchy"—Ogilvy saw a nondeterministic logic of relations that could serve as a model for complex organization not only in the mind, but also in the self *and* in the corporation. The singular hierarchical decision-model of the midcentury corporation would no longer contain the complexity of potential actions: "No one is captain: not in the self, not in the corporation, not in society, not in the cosmos."[114]

This essay describes how Global Business Network relied on the "scientific nature" of McCulloch's cybernetic "experimental epistemology" to legitimate its late-twentieth-century consulting business.[115] I use the history of heterarchy to show how GBN rehashed some of the central tenets of midcentury cybernetic thinking practices—specifically the claims to scientific legitimacy and universality—and modified them in the business consulting world in order to soothe the anxieties of late-twentieth-century business managers dealing with the organizational instabilities and contradictions of the information economy.[116] Heterarchy's abstracted "semiotic character" provided the necessary malleability, enabling the consultants to treat the heterogeneous knowledge and values of employees as potential resources.[117]

I follow heterarchy from the cybernetic philosophies of McCulloch to the self-described Hegelian philosophical musings of Ogilvy in the 1970s to the workshops in the human potential movement center Esalen Institute in the early 1980s, and finally into the business consulting meetings

[113] Jay Ogilvy, "The Postmodern Business," *The Deeper News* 1, no. 5 (1989), Stewart Brand Papers, Special Collections, Stanford University [hereafter, SBP].

[114] Ibid., 22.

[115] Lily E. Kay, "From Logical Neurons to Poetic Embodiment of Mind: Warren S. McCulloch's Project in Neuroscience," *Science in Context* 14, no. 4 (2001): 591.

[116] For more on the history of heterarchy, see Gerard Fairtlough, *The Three Ways of Getting Things Done: Hierarchy, Heterarchy and Responsible Autonomy in Organizations* (Axminster, U.K., 2007), 109. On how cybernetics became a universal discipline, see Geoffrey Bowker, "How to Be Universal: Some Cybernetic Strategies, 1943–70," *Social Studies of Science* 23, no. 1 (1993): 107–27.

[117] Orit Halpern writes about the "semiotic character" in her section on McCulloch and rationalization. Halpern, *Beautiful Data: A History of Vision and Reason since 1945* (Durham, N.C., 2015), 156.

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of GBN in the late 1980s.[118] Heterarchy's extendibility enabled GBN to suture the reputability of scientific-based organizational management models with the seeming "irrationality" of complex decision making that animated poststructuralism as well as information theory, easing the anxieties of executives in the face of creative destruction.

The Global Business Network was a California-based research and consulting firm that positioned itself as the vanguard of the future in the information era. GBN formed in 1987 to research and distribute information about global business through its network of individuals and organizations. Individuals in such fields as high technology and economics, artists and anthropologists, and business leaders and management scholars were assembled according to the expertise needed for the consulting project at hand. There were no ground rules for how it *ought* to function as the GBN founders loathed simplifying theories.

The network was cofounded by a group of entrepreneurs, including former Stanford Research Institute (SRI) business analysts Ogilvy and Peter Schwartz. Before starting GBN, Schwartz had led the scenario planning team at Royal Dutch/Shell in London while Ogilvy was the director of research at the Values and Lifestyles (VALS) research program at SRI, a successful niche marketing program. As historian Fred Turner has pointed out, GBN grew out of cybernetic theory and countercultural critique of hierarchy.[119] In contrast, I focus on the dual role that cybernetic discourses—as seemingly both *scientific* and *extendible*—played in GBN's effort to avoid the metanarratives that dominated organizational management literature of the period. This turn in organizational philosophy gained the attention of large multinational corporations: members of GBN included Royal Dutch/Shell, Motorola, AT&T, American Express, IBM, General Mills, Cisco Systems, Ford, and Hewlett-Packard.[120] Each paid an annual fee of twenty-five thousand dollars to receive in-house reports and gain access to GBN's biannual gatherings.

Heterarchy was first developed in 1945 by the polymath McCulloch in a five-page essay entitled "A Heterarchy of Values Determined by the

[118] On McCulloch's "experimental epistemology," see Kay, "From Logical Neurons." On the philosophical and epistemological concerns McCulloch brought to his experimental epistemology, see Tara Abraham, "Integrating Mind and Brain: Warren S. McCulloch, Cerebral Localization, and Experimental Epistemology," *Endeavor* 27, no. 1 (2003): 32–36. On Ogilvy's Hegelian inclinations, see Jay Ogilvy, "Futures Studies and the Human Sciences: The Case for Normative Scenarios," *Futures Research Quarterly* 8, no. 2 (1992): 5–65. Ogilvy's 1969 dissertation—under the supervision of philosopher Paul Weiss, a doctoral student of Alfred North Whitehead's—from Yale University, "Relations," was a metaphysical tome dedicated to the idea that to be is to be related.

[119] Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago, 2006), 181.

[120] Jay Ogilvy, *Creating Better Futures: Scenario Planning as a Tool for a Better Tomorrow* (Oxford, 2002), xiii.

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Topology of Nervous Nets." Like cyberneticians of the era, McCulloch sought an overarching, yet nondeterministic, logical model of relations in order to articulate how neurons worked as information processing units; in his paper on heterarchy he aimed for an abstracted model of preferences.

McCulloch simplified decision making into an abstracted model set of six neurons with overlapping valuations, which he described in a simple example: "Consider the case of three choices, A or B, B or C, and A or C in which A is preferred to B, B to C, and C to A."[121] Instead of assuming that the preferences could be evaluated on a hierarchical scale, McCulloch posited multiple overlapping scales of preferences. In his words, "An organism possessed of this nervous system—six neurons—is sufficiently endowed to be unpredictable from any theory founded on a scale of values. It has a heterarchy of values, and is thus interconnectively too rich to submit to a *summum bonum* [highest good]."[122] Heterarchy was part of McCulloch's larger project of building a logic of relations.

From 1946 through 1953, McCulloch chaired a series of meetings at the Macy Conferences examining the relationship between biology and computer science in communication processing.[123] English anthropologist Gregory Bateson, another Macy Conferences attendee, after listening to McCulloch's research on "experimental epistemology," helped to extend the experimental terms from neurophysiology to human behavior.[124] In Bateson's seminal text, *Steps to an Ecology of Mind* (1972), he made the speculative leaps that McCulloch never did, arguing that the mind existed in the larger environment.[125] According to media theorist N. Katherine Hayles, "He [Bateson] went into the inner world and turned it inside out, so to speak, so that the inner world became a metaphor for the outer world."[126] Bateson's work enabled the extension of McCulloch's neural nets to human behavior as well as Ogilvy's extension of heterarchy from human behavior to corporate organization.

[121] Warren S. McCulloch, *Embodiments of Mind* (Cambridge, Mass., 1965), 43.

[122] Ibid., 44.

[123] Stark, *Sense of Dissonance*, 26.

[124] N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literatures, and Informatics* (Chicago, 1999), 80.

[125] This insight was pivotal for Ogilvy: "Running throughout Bateson's essays one finds traces of cybernetic-ecological insight that total conquest over any adversary is a modern and intrinsically self-defeating fantasy. Because the unit of survival is always organism-plus-environment, any significant alteration of the environment is bound to affect the viability of the organization enacting pretensions of control." Jay Ogilvy, *Many Dimensional Man: Decentralizing Self, Society, and the Sacred* (New York, 1977), 359–60. See, e.g., Gregory Bateson, *Steps to an Ecology of Mind* (New York, 1972), 438: "We do not live in the sort of universe in which simple linear control is possible. Life is not like that."

[126] Hayles, *How We Became Posthuman*, 80.

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In 1977, Ogilvy stretched heterarchy from McCulloch's networks of neurons to society and the cosmos in his tome on decentralization, *Many Dimensional Man*. From that point onward, Ogilvy pursued the concept of heterarchy as one way to bridge, in his words, "the rationality of Enlightenment thinking" with the seemingly irrational processes of "consciousness, intuition, and affective sensitivity."[127] In a popular scenario planning book, *Creating Better Futures*, Ogilvy identifies McCulloch's argument that heterarchy worked "so well throughout evolution, without itself evolving" as a way to substantiate the claim that decentralized, nonhierarchical structures are "the natural solution of the organization of appropriate behavior."[128]

In *Many Dimensional Man*, Ogilvy wrote against the arguments espoused by Herbert Marcuse in *One Dimensional Man* (1964)—that capitalism in advanced industrial society demands one-dimensional, rigid identities and bureaucratic hierarchies. At the same time, Ogilvy opposed what he saw as the anarchistic politics advocated by the anti-authoritarian social movements of the 1960s, even if he admired their appeals to what he believed were personal values and pluralism.[129] He aimed instead for a theory of politics and change that exceeded the limits of the linear, hypo-deductive rationality that he thought dominated thinking, from cognitive science to corporate management.[130] More than this, he held strongly to the belief that business, and not politics, was the ideal location for large-scale social change.[131]

This attracted the attention of then SRI director Schwartz, who invited Ogilvy to work for SRI's Futures Group at the end of the 1970s. In 1979, Ogilvy and Schwartz expanded heterarchy in an SRI report for the VALS program entitled *The Emergent Paradigm: Changing Patterns of Thought and Belief*; in the report, they built their case for a complex, "indeterminate relational worldview," in contradistinction to the simple, determinate modern worldview. Identifying shifts in perspective in a wide range of experimental sciences, and written in the language of historian of science Thomas Kuhn's paradigm shifts, Ogilvy and Schwartz argued that the "billiard ball like models of structures" were no longer sufficient to describe the "uncertain world woven together by elaborate networks"; the collapse of certainty meant that new, more

[127] Ogilvy, *Many Dimensional Man,* 8.

[128] McCulloch, *Embodiments of Mind*, 397, quoted in Ogilvy, *Creating Better Futures*, 146.

[129] This sentiment is expressed best by Ogilvy: "The lack of a single and universal hierarchy of values does not entail our taking to the streets with bludgeons." Ogilvy, *Many Dimensional Man*, 118.

[130] Ibid., 7–8.

[131] This is similar to Turner's assessment of GBN. See Turner, *From Counterculture to Cyberculture*, 181.

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indeterminate ideas and metaphors were necessary.[132] In the report, Schwartz and Ogilvy list heterarchy as one feature of organization in what they called "the relational paradigm":

> Heterarchy is a shift from the rule by one to several rules by some . . . a system of mutual constraints and influence. The whole system goes not where any one interest would take it. Rather than merely a compromise or average of all the interests, there is a movement that is unpredictable and different from those of the particular component interests.[133]

In the late 1980s, Ogilvy, by then the director of VALS, collaborated with the futurist and planner Donald N. Michael on a series of workshops on appropriate governance entitled "Making Heterarchy Work" at the human potential movement's California-based Esalen Institute.[134] Together, Ogilvy and Michael were interested in the question of how to govern organizations while relying on a delicate balance between autonomy and interdependence; they believed heterarchy the perfect metaphor for the task.[135] Echoing Ogilvy's previous work, the group argued that the shifts from mass production and mass marketing to niche marking in the information economy meant new organizational structures were also necessary, to allow a move from standardization to innovation.[136] The problem was that there were few concepts of governance to guide "an increasingly interconnected world in a time of incoherence" defined by "turbulence and disruption."[137] Heterarchy offered the right mix of "ambiguity" and "complexity" while encouraging the expansion of the global economy.[138]

McCulloch's heterarchy, like the philosophical abstractions of indeterminate, self-organizing systems of cybernetics, was packaged for late-twentieth-century business leaders as a means by which they could manage heterogeneous values and encourage innovation. It represented a move away from the supposed stagnation that accompanied top-down

[132] Ogilvy, *Creating Better Futures*, viii–ix; Peter Schwartz and Jay Ogilvy, "The Emergent Paradigm: Changing Patterns of Thought and Belief," *Values and Lifestyles Report*, no. 7 (Menlo Park, Calif., 1979), 13, SBP.

[133] Schwartz and Ogilvy, "The Emergent Paradigm," 13.

[134] Fairtlough, *Getting Things Done*, 109.

[135] Esalen Institute, "Esalen's Half-Century of Pioneering Cultural Initiatives, 1962–2012," Center for Theory and Research and Special Projects, Esalen Institute, Sausalito, California, 2012, http://www.esalen.org/sites/default/files/resource_attachments/Esalen-CTR-Pioneering-Cultural-Initiatives.pdf.

[136] Don Michael, "Neither Hierarchy nor Anarchy: Notes on Norms for Governance in a Systemic World," in *Rethinking Liberalism*, ed. W. T. Anderson (New York, 1983), 82.

[137] Ibid.

[138] Esalen Institute, "Esalen's Half-Century." Ultimately, the Esalen Group abandoned the term—when a participant looked it up in the Oxford English Dictionary and discovered that it meant to "rule by aliens." Ogilvy, "Heterarchy."

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hierarchical bureaucracy. In this, GBN joined cybernetic biological metaphors and business strategy in the information era—an attempt to be, in the words of Ogilvy, "more biological, less exclusively mechanistic; more psychological than purely rationalist; more metaphorical, less literal; qualitative as well as quantitative; more ecological, less military."[139] The extendibility of cybernetics, what Geoffrey Bowker calls a kind of "distributed point of passage," aided GBN in naturalizing the idea of the corporation as capable of innovating quickly, flexibly, and efficiently.[140] This helped to solidify GBN's expertise in navigating the uncertain terrains of the information age.

The history of heterarchy shows how GBN relied on extended speculative cybernetic thinking practices to strengthen its consulting expertise. The "scientific nature" of heterarchy helped to legitimate GBN's consulting business. It also raised important questions about how different scientific models are utilized to think about the proper functioning of the corporation. Ogilvy presented heterarchy as an answer to the problems of earlier mechanistic scientific models that supported large, rigid bureaucratic structures of the earlier twentieth century. Regardless, Ogilvy's model was itself a scientific model, albeit an antimechanistic one. GBN presented heterarchy as the best model for organizing diverse knowledge and values. The abstract, logic-based character of heterarchy, however, ultimately did not disrupt the hierarchical distribution of power within organizations.

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BRETTON FOSBROOK is a doctoral candidate in the history of science and technology at York University. His dissertation charts the rise of corporate scenario planning as a business strategy for managing uncertainty.

[139] Ogilvy, *Creating Better Futures*, 58.
[140] Bowker, "How to Be Universal," 108.

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