

Wheeling and Annealing

In a frequently cited footnote, Parsons pointed out a tension between authority and expertise, both components of Weber's ideal type bureaucracy. How experts are subject to authority, and why there is a need for authority, has been the subject of much research. One mainstream answer, summarized by Perrow (1979) and well illustrated by Goss (1967), is that the expertise of a boss does not conflict with the expertise of a subordinate when their domains of expertise do not overlap. The subordinate might be a technical expert, the boss an administrative expert. In Goss's medical case, doctors accepted the authority of administrators on matters of scheduling, but not on the handling of cases. Authority works here because the functions of each level can be neatly separated, and the tasks of each well defined.

We have been looking at situations in which the task or "expertise" of each level is not well defined, and the functions of each are not separated. Here we respond to Parsons's problem by claiming that authority is not the relevant mechanism in the relations between levels. Control is the central concern across and between position holders, who all share an interest in the same issue. Unlike authority, control among often highly energetic and ambitious position holders is a subtle matter. Rather than involving the ex ante direction of others, control often enlists others to make one's own ideas definite, with those enlisted depending conversely on you for the same purpose. With effective control, direction is jointly determined as is, perhaps more important, the sense of having achieved something. Learning from others and giving guidance, or the ex post and ex ante in social action, become hopelessly intertangled.

We have in mind a kind of acephalous control that is associated with loosely structured arenas of highly skillful wheelers and dealers, or "garbage cans" in now popular terminology (March and Olsen, 1976). It is control in the sense that the fluidly combining and dispersing position holders steer their organization toward outcomes, but there is no ex ante intentionality behind the outcomes.

There are no center-periphery directives, but only peripheries looking for a center. The cases we opened the chapter with provide

examples of such loosely structured arenas, though from a very narrow viewpoint.

This form of acephalous control is intrinsically incomplete, however. It is not mere coincidence that the opening accounts involved mainly high-level assistants, with the limited presence of their superiors. Arenas of wheelers and dealers require inducements for the individual energies, and stimuli for interlocking to form around. In short, the “garbage can” must be managed (see Cohen and March, 1974; Padgett, 1980, for detailed views on this topic). A second-order form of control is needed, consonant with the first-order, acephalous kind.

We propose a process of annealing occurs, as second-order control. Simulated annealing is a process that has found widespread application in the physical sciences, and, we argue, is well suited for the messy “multibody” problems facing the highest level of large-scale organization. It is applicable where no global solution is known, and where incremental improvement techniques stand the risk of getting stuck in a local optimum. In crystal formation, for example, a system of particles at high temperature can be cooled very slowly, allowing equilibrium configurations to form at each temperature change. At the temperature zone where crystals begin to form, the cooling process can be repeatedly reversed until a satisfactory initial configuration is obtained (which shapes the progressive refinements formed through further cooling). Reversal is key to the annealing process, as it allows one to avoid “bad” local optimums. Simulated annealing has also been used in such diverse areas as the placement of circuits on a computer chip (and chips on a board) and for reasonable solutions to the “traveling salesman” problem, where the salesperson seeks minimal travel costs on a trip through a given set of cities, passing through each only once (see Kirkpatrick et al., 1983).

Annealing can be found in our federal and multidivisional cases. The federal government “heats” up the system by suggesting the need for and offering to support new programs or press for reorganizations, with a crisis atmosphere. The range of funding mechanisms, from revenue sharing to categorical grants, varies in the degree of discretion federal administrative officials have in distributing funds and the restrictions imposed on their use. Revenue sharing with few use restrictions has been part of an effort to “heat up” the system. If it produces innovative programs, the system can be “cooled down” by perpetuating them through categorical grants. Proposals and alignments crystallize from the wheelers and dealers in

state and local governments through intermittent periods of “heating” and “cooling,” until reasonable alternatives surface. Howitt (1984) offers some excellent cases that illustrate the complex relations between funding mechanisms and levels of activity within state and local government.

Franklin Roosevelt illustrates a more self-conscious form of annealing. Roosevelt was a master of the annealing process, hovering over an arena of coalitions of cartelists, central planners, and anti-trusters that formed and dissolved as the Depression lingered on (see Hawley, 1966). Working within the very flexible framework of the New Deal, Roosevelt’s “true” leanings toward these completely inconsistent groups were prudently almost impossible to discern. Roosevelt was annealing, not directing.

Despite Bower’s (1983) insistence on a fundamental difference between political and technocratic management systems (though he concedes that there is much politics in business organization), annealing can also be found in our business cases. Transfer policy is a form of “temperature,” combined with other incentive systems, which can be used to induce more or less interaction between divisions. Mandated sourcing with no centralized pricing policy is a way to heat up the system, whereas formula pricing cools it down. In the case of corporate entrepreneurship, top management can control the volume of overall entrepreneurial activity, which is the corollary to temperature. Ventures are induced, supported, and dissolved at a high rate until a satisfactory array of business activities crystallize.

Annealing has the right imagery for our purposes. It is tailored for “multibody” problems with process indeterminacies and an irregular terrain of local optimums without known global properties (knowing where to encourage system “crystallization” may be the paramount skill of the very top). It involves no *ex ante* directives, which would interfere with the perceived autonomy of the wheeling and dealing “bodies” on which it operates. Annealing is thus fully consonant with a decentralized system, where effectively exercised control is diffuse in nature. Annealing is a form of contextual control of the wheeling and dealing arena, enacted without destroying the control properties of the arena itself.

Annealing should not be equated with the biological selection metaphor now popular in the organization literature (see Hannan and Freeman, 1977; Aldrich, 1979). Its reversal mechanism makes “selection” neither blind nor passive. As Weick (1979) and others have observed, selection alone can produce peculiar results, such as

superstitions. “Bad” local optimums are always a potential hazard in overly organized systems. Annealing involves actively making a system worse off in an effort to let it right itself. The management philosophy of “putting out fires,” or attending to only the most pressing problems and ignoring longer-range concerns, is also not what annealing is. Annealing involves starting an occasional fire so that extant patterns of interlocking will dissolve and form anew as things begin to cool down. If the situation does not improve, the process must be repeated.