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PALACE POLITICS: RESOURCE ALLOCATION IN RADICALLY INNOVATIVE FIRMS

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The work of Max Weber (1947) on "traditional authority" forms the basis for a theoretical analysis of resource allocation decisions in radical-product innovative organizations. Decisions to support particular projects must be made on arational criteria, because radical product innovation destroys existing competencies and is not subject to economic calculation. The limitations of both bureaucratic and charismatic models of the political processes governing this kind of innovation in large organizations are described. This is followed by a discussion of the traditional practices of selling offices, favoritism toward fellow kinsmen, and nonmerit evaluation criteria in the allocation of resources to innovative projects. The politics of innovative units is better characterized by reference to medieval structures of palace favorites, liege lordship, and fiefdoms, rather than to more familiar bureaucratic concepts. The argument concludes with a discussion of both the theoretical implications and the advantages and disadvantages of traditional approaches to the allocation of resources for radical product innovation.

It has become a truism that radical product innovation is difficult to sustain in large established organizations. The formalized budgetary systems, time horizons, compartmentalization of work, established routines, and strategies of large organizations appear to be hostile to radical innovation (Abernathy & Utterback 1978; Goldman 1985; Moore & Tushman 1982; Quinn 1985). Large organizations are accused of inevitably stifling radical innovation with their "inertia"—their commitments to established strategies, structures, and relationships which reinforce resistance to fundamental change (Miller & Friesen 1982; Tushman & Romanelli 1985). While the incompatibility of radical innovation and formal organizational practices has been widely noted, no one has provided an adequate under-

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standing of how radical innovation can be successfully managed. In this article, a theoretical framework for the management of radical innovation is suggested.

It is important to note that the present argument is focused on a particular kind of innovation—what has been called “radical product innovation.” Until recently, innovation was a generic concept for virtually any kind of technological development, and radical product innovation was often confused with other forms. Radical innovations render previous technologies obsolete and establish new dominant technologic designs for entire industries and markets—the “scientific revolutions” that punctuate long periods of regular development (Abernathy & Clark 1985; Tushman & Nadler 1986; Moore & Tushman 1982). In contrast, “regular” innovation features incremental enhancements of existing technologies, resolves technologic imbalances between interdependent processes and components, and explores areas in the technology which display potential (Abernathy & Clark 1985).

Theoretical attention to the organizational dilemma of fostering radical product innovation in large organizations has been framed as a problem of corporate strategy (Foster, 1986; Miller & Friesen 1982; Quinn 1979). One of the best examples of this approach is offered by Burgelman & Sayles (1986), who distinguish the Induced Strategic Behavior of top-driven organizations in relatively stable product environments from the Autonomous Strategic Behaviors characterized by mid-level “champions” of new products in the radically innovating firms. Yet their dichotomy itself suggests that strategic differences are not the central dilemma for these large intendedly-innovative organizations. Rather, the quandary is related to internal resource allocation and control. Large organizations simply must find a different way to allocate resources if they want to produce genuinely new innovations (Kanter 1988).

Therefore, for a theoretical understanding, the problem of maintaining creative large organizations is better framed as one of internal power and politics. Yet, as will be detailed below, our theories of resource allocation in these organizations remain largely atheoretical and anecdotal. The literature on power and politics, as was recently the case in strategy, has developed to explain the interplay among stakeholders more characteristic of organizations operating in more stable product environments (examples include Pfeffer 1981, and Stevenson, Pearce, & Porter 1985). While researchers have consistently called attention to the importance of politics in the process of innovation (Kanter 1983, 1988; Miller & Friesen 1982; Norman 1971; Sapolsky 1972), they have not focused on the quite different processes in radical innovation. The present article offers a framework for placing the political processes in the development of genuinely radical innovations within a larger theoretical context.

Insight into this very modern management problem can be best understood with reference to turn-of-the-century sociological theory. Max Weber (1947, English translation) provided the first comprehensive analysis of the modern form of organization, which he named “bureaucracy.” For Weber, this new organizational form was more a reflection of modern ways of thinking and viewing working relationships, including such familiar assumptions as “the rule of law” and “rewards according to merit.” His seminal theory of the bureaucratic form was the foundation for the discipline of organization theory, and his analysis of charismatic religious movements has played a role in theories of leadership and corporate culture (for example House 1976). However, his analysis of tribal or feudal

societies has been neglected in our twentieth century theories of management, largely because these forms are assumed to have disappeared in the developed world's organizations. The primary exception is Ouchi's (1980) characterization of certain corporate cultures as similar to tribal "clans."

Here, it will be argued that radical product innovation, since it is inherently not subject to rational economic calculations of profit or loss, cannot be managed by the modern bureaucratic organizational forms that are taken for granted nearly one hundred years later. Rather, radically innovative activities occur in subunits, or organizations run according to the traditional authority structures usually associated with simple tribal societies or medieval civilizations. The allocation of resources for product development in innovating organizations is better understood with reference to the methods of whim, favoritism, and kinship loyalty, rather than cost-benefit calculation and market analysis. These organizations function more like palaces than bureaucracies, and Weber's classic theory is extended to suggest why this seems to be the case.

This argument is illustrated with examples drawn from a study of a high technology computer firm, which will be called Multi-Graphics, Inc. (MGI). (For further information about MGI, see Dyer & Page 1988, and Page 1987.) The argument concludes with theoretical and management implications, focusing on the dilemma created by radical product innovators' needs to appeal to their bureaucratic-based society for the capital with which to innovate.

BUREAUCRATIC AUTHORITY

Weber (1947) articulated three forms of authority: "rational" or bureaucratic, charismatic, and traditional. Bureaucracies are characterized by a concern for efficiency, selection, and promotion of individuals on the basis of their merit (determined by objective means, if possible), by a strict separation of the resources controlled for the organization and for the individual, and by procedures or rules to be upheld regardless of the favorable or unfavorable outcome to individuals.

These familiar principles are based on the assumption that the work a bureaucratic organization is performing is "calculable," that is, predictable. There is a long tradition in organization theory suggesting that bureaucratic organizations are most efficient at repetitive tasks but need to be modified when faced with uncertainty. Galbraith (1977), Perrow (1979), Mintzberg (1979) and others have described these modified bureaucracies. Yet, however much these forms have been modified, they still retain some ability to forecast. For example, Mintzberg's (1979) "professional bureaucracies" cannot prescribe the professional "treatment" in detail, but they do plan for type of professional need, volume of services needed, and so forth. It is just this inability to predict, to plan, and calculate, that makes bureaucracies unsuited to the production of genuinely radical innovations. In fact, the arational character of radical innovation helps illuminate the extent to which organizational theorists have strived to accommodate unpredictability within Weber's classic bureaucratic forum.

Since regular innovations are inherently more predictable and do not destroy existing capabilities, these forms of innovation are compatible with the coalitional politics of resource allocation characteristic of bureaucratic organizations (see Stevenson et al. 1985,

for a discussion). Tushman and Romanelli (1985) emphasized that these organizations must balance the demands of numerous constituencies, thus ongoing regular innovation must involve the effective collaboration of the research and development, manufacturing, and marketing units, as well as major customers, suppliers, financiers, and relevant governmental agencies.

The political processes involved in regular innovation are well described by the existing literature emphasizing trade-offs and bargaining (Pfeffer 1981; Eisenhardt & Bourgeois 1988; Kanter 1988). These structures, relationships, and competencies not only become familiar and comfortable, but form the basis for members' contributions to the organization. Hickson, Hinings, Lee, Schneck, & Pennings (1971) have provided a powerful argument that those in organizations who solve their critical problems gain resources relative to others. Therefore, any change that threatens to make stakeholders' expertise obsolete, to make them irrelevant, threatens their livelihoods and would be expected to be resisted. These established stakeholders, empowered through the coalitional political processes in bureaucratic organizations, present powerful constituencies against radical change (Tushman & Romanelli 1985).

In addition, large organizations also choke radical product innovation through their need to present predictable, calculable revenue streams for those very important stakeholders, lenders, and investors. The long and inherently uncertain pay-back period for radical innovations makes them essentially arational from a present value viewpoint and violates criteria stressing short-term financial performance (Cummings, Hinton, & Gobdel 1975; Quinn 1985; Thompson 1965). Quinn (1979) notes that few managers of large organizations assume that they best represent stockholders' interests through continual efforts for radical product innovation. Instead, investors prefer their companies to be "analyzers" and adopt a strong second-to-market, risk-averse strategy (Miles & Snow 1978). Therefore, even if large organizations can manage their internal processes in such a way that innovation and collaboration are rewarded, their needs for externally-supplied capital will often dictate a less radically-innovative course.

Page (1987) describes how MGI, despite its reputation for research on radical product innovations, could not sustain that focus when resources became more constrained. The early 1980s featured a dual crisis for MGI—the entry of powerful competitors and the collapse of a major market (airline deregulation led their large airline customers to reduce significantly their orders for MGI products). The founder ordered MGI engineers to abandon their more innovative products in order to push regular innovations on revenue-generating products. While these products were successfully delivered many engineers felt that the loss of creative people during this period left MGI unable to innovate radically in the future.

In practice, this external financial constraint would surface in the organization's political processes as competition between the "sponsors" of radical product innovation—the technical research and development staff—and the "sponsors" of efficiency and predictability—the financial and manufacturing staff. Each is simply representing its stakeholder, and in large externally financed organizations pursuing radical product innovations necessary for survival, these stakeholders maintain a precarious balance.

Thus, it is not surprising that the technical staff predominates in new organizations that are controlled by a dominant innovator. When the organization grows, develops more

constituencies, and—critically—when external financing is obtained, the balance of power shifts to include representatives of established product lines and external capital. Too often technical staff members develop flattering, yet fundamentally inaccurate, models of themselves as the lone “champions” of creativity surrounded by the “hostile forces” of inertia. The dilemma facing large intendedly-innovative organizations is how to allocate resources in such a way that they can foster radical innovation under these circumstances. An important step in addressing this dilemma is a more accurate understanding of the implicit “rules” for resource allocation in radically innovative groups. In fact, management by charisma, Weber’s second authority, is widely assumed to be the primary alternative.

CHARISMATIC AUTHORITY

Charismatic authority is the authority a charismatic leader has over followers who accept the leader as “supernatural, superhuman, or at least exceptional” (Weber 1947: 358). The leader is seen as possessing these qualities through magic or a “divine gift”—one can never “earn” charisma. At first, it would seem that radical product innovation, while clearly unable to develop in bureaucratic organizations, may be fostered in charismatic organizations. After all, the anecdotes and mythology surrounding such individuals as Steven Jobs of Apple, Bill Gates of Microsoft, and “John Brown” of MGI share many of the apocryphal characteristics of the best legendary religious figures. Kidder (1981: 16) characterizes the contradictory stories regarding de Castro’s departure from DEC to found Data General as “having by now acquired the impenetrable quality of myth.”

Dyer & Page (1988) report the oft repeated legend of the founding of MGI. It was started by two professors who became frustrated with their consulting clients’ reluctance to apply their radically innovative technologies. They quote one engineer: “John goes to market and identifies needs that the market isn’t even aware of. Then he goes back to the lab and designs something that fills that need. It’s a case of using a meta-level, being aware of needs and transcending that need” (Dyer & Page 1988: 3). The dominant image of innovating organizations is a charismatic one. The strong appetite for mythology and anecdotes about founders suggests that charismatic authority is the widely accepted “alternative to bureaucracy” among innovators.

Clearly, charismatic authority is involved in the process of radical product innovation, particularly at the level of face-to-face interaction. Further, charismatic authority, unlike traditional authority, remains both recognized and respected as a powerful dimension of leadership in our societies. Its influence is particularly noticeable in political and charitable voluntary associations, which are often characterized by a charismatic leadership (Pearce, forthcoming). Following someone with deep insight or personal persuasive powers continues to be a normal, understood part of our society. It is the acknowledged method for breaking out of routines, and so for radical innovation.

Yet this form is, at best, temporary. Charismatic authority holds a familiar place in our society and, therefore, provides a clear alternative to bureaucracy. However, it does not accurately characterize the actual resource allocation processes within innovative organizations of any size. Genuine charisma is very personal and ephemeral. It is incapable of sustaining organized action. It was Weber (1947: 361–362) who suggested that charisma is fundamentally opposed to routine, hence to organization:

Charismatic authority is thus specifically outside the realm of everyday routine and the profane sphere. In this respect it is sharply opposed both to rational, and particularly bureaucratic, authority, and to traditional authority. . . . Both rational and traditional authority are specifically forms of everyday routine control of action; while the charismatic type is the direct antithesis of this. . . . The only basis of legitimacy for it is personal charisma, so long as it is proved; that is, as long as it receives recognition and is able to satisfy the followers or disciples.

Thus, Weber suggested that charismatic authority's role is limited to originating movements or organizations and must be "routinized" into either bureaucratic or traditional authority if the organization is to sustain itself.

In fact, the reason why it may be difficult to sustain radical product innovation over time or to extend it to larger units is that we really only understand two organizational forms—the bureaucratic and the charismatic. When the size and complexity of technical problems or stakeholder pressures make the charismatic sect no longer viable it is difficult for executives to know what to do. Page's description of MGI suggests that they try to encourage the myth of the charismatic leader while running the day-to-day work bureaucratically.

This reliance on charismatic authority as the sole alternative model to bureaucracy creates severe dysfunctions in these organizations. At MGI the innovating scientists and engineers had developed an image of the charismatic (but now distant) John Brown as someone who would save them from the bureaucrats "if only he really knew what was going on." This collective fantasy (because, of course, stockholder John Brown knew exactly what he was doing) is too reminiscent of the peasants of czarist Russia to inspire confidence in its effectiveness. The Russian peasants did not wait forever for their benevolent patron who somehow never arrived, and creative staff members have even less patience. Large organizations working on complex radical innovations need an alternative way of understanding their resource allocations, and we suggest that it is traditional authority. Traditional systems of authority are ideal for the management of radical innovation and need to be better understood.

TRADITIONAL AUTHORITY

Under traditional authority obedience is claimed because "it has always existed." Leaders are designated according to established procedures and are owed personal loyalty. Traditional organizational work is managed by the chief's or king's personal retainers. These retainers do not occupy, nor are they loyal to, a "job" in the bureaucratic sense; they have no defined responsibilities. Most importantly, job incumbents are selected either because of their loyalty to the king (hence, kinsmen are favored over others), or they are appointed in return for a "gift" to the king (Weber notes that such gifts are often the sole source of income for kings and chiefs); positions are acquired because of loyalty or through purchase, not competence.

Once retainers or "favorites" occupy these positions, they are not expected to render impartial judgments or to make decisions informed by expertise; rather they favor their own loyal retainers or distribute favors in return for gifts. Thus, for example, in traditional societies "tax farming" was practiced, in which certain "farmers"—in return for a yearly gift to the king—were given a territory in which they were granted the right to collect as

much “tax” from the local populace as possible. This “selling of offices” was a long lasting practice; Weber (1947: 350) notes that the purchase of officers’ ranks in the British army continued well into the nineteenth century.

Certainly, traditional societies vary. Weber distinguished “gerontocracies,” in which the elders as a group exercised control, from the extreme personal control exercised under “sultanism.” At sultanism’s most extreme, all power was vested in the king or chief—completely and personally. Retainers had no individual claim on their positions; the king could interfere in their duties and could strip them of their very life on a whim. In practice, these archetypal traditional societies evolved into bureaucratic ones slowly, with the incremental addition of trained experts, such as court scribes or priests, and permanent “rights” accorded to particular members of society, such as to the hereditary aristocracy in England’s Magna Carta.

Although there clearly are important differences between the politics of radically innovative organizations and feudal societies, the analogy does provide insights into their resource allocation processes. Further, the metaphor provides a more useful way of thinking about their dilemma than the “lone-hero-against-the-world” model that innovators often adopt.

The most important limitation of the metaphor lies in the original source of an officeholder’s legitimacy. Clearly, authority in these relatively young innovative organizations is not given because “it has always been” or through lineage. Rather, authority derives from the contribution of the ranking members through their original innovative (or other important) contributions, which have generated a major product or product line. In effect, it is this “gift” to the group that determines prestige and positions of power. This pattern of “office purchase” predominates throughout the innovating organization.

Retainers

To become a “king’s favorite,” one must “get the ear of the king.” In traditional societies, potential favorites were often distinguished by blood ties—relatives had greater access and visibility. Although ordinary nepotism is not absent, in this case kinship refers to sharing the same technologic vision and strategic commitments as the king/founder or elders/founders. Lodahl and Mitchell (1980: 187) provide indirect support for the importance of a vision-based kinship:

A spiritual commitment to the ideology is called for. The danger of organizational drift is that a shift in the type of commitment will occur from one based on ideology to one based on techniques, departments, or self-interest. . . . The founders must do whatever they can to ensure that the ideology is realized in practice; in other words, they must strive to prevent organizational drift.

This allocation of offices by technologic kinship, rather than current competence, occurred in MGI. Page (1987) reported that the founder selected his brother-in-law—a zoologist with no technical training in the area—to head the most promising “blue-sky” project at MGI. When pressed on this violation of the accepted bureaucratic principle of positions according to merit, John Brown responded that technical competence was less important than shared technologic vision. Apparently the best technical people often became committed to their own visions instead of his (Page, 1987). In other words, the

brother-in-law would be loyal, and loyalty (in this case, to the founder's vision) was more important than "merit."

Alternatively, positions as retainers can be purchased through gifts to the king or elders. In this context, the gift is in the form of an important innovation. Since the king, elders, and current retainers usually own substantial blocks of equity in the company, a profitable innovation is a valuable gift. This is usually characterized within these organizations as "building a track-record."

It is important to note that a proven track-record does not imply "current competence." In fact, by the time records of innovation are established, the individual's technical expertise may be obsolete (Maidique 1980). Robert Noyce, inventor of the integrated circuit and cofounder and chairman of Intel, noted: "Maybe you can do good technical work for ten years, if you work hard at it, but after that the younger guys are better prepared. It's a question of technical obsolescence, if you will" (quoted in Bylinsky 1976: 161).

Thus, the retainers in radically innovative organizations can be denigrated by their juniors as obsolete, that is, judged by bureaucratic models of merit as holding their positions illegitimately. However, by the criteria of traditional organizations (loyalty and purchase), they have every right to be there. They are not incompetent bureaucrats, simply competent in traditional "non-merit" ways.

In large organizations, these retainers are assigned their own "fiefdoms," that is, entrusted to sponsor the best and most promising of the available projects (Maidique 1980). To continue with the metaphor, they are given a title and lands, becoming liege lords. Yet, since radical product innovation is inherently incalculable, liege lords could not be expected to allocate resources to the best idea based on a careful cost-benefit analysis, but on an arational "faith" that they will know it when they see it. Quinn (1985: 83) quotes a liege lord who describes the decision making process he used in accepting and rejecting innovative projects:

Anyone who thinks he can quantify this decision is either a liar or a fool. . . . There are too many unknowables, variables. . . . Ultimately, one must use intuition, a complex feeling, calibrated by experience. . . . We'd be foolish not to check everything, touch all the bases. That's what the models are for. But, ultimately it's a judgment about people, commitment, probabilities. . . . You don't dare use milestones too rigidly.

Thus, the political process of "getting the ear" of the king, is duplicated within the fiefdoms.

Knights

In large organizations individual scientists and engineers find that they obtain resources to pursue their ideas by becoming "product champions"—what we shall call knights—by gaining the attention of a liege lord. The importance of such sponsorship is hard to underestimate. For example, Maidique (1980) found that in DEC, an innovative project had become "mired in red tape" until a liege lord attended the project review and openly questioned why such a promising project could find so little support. Afterward, the championing knight noted, "Suddenly the barriers to my project came down. What normally might have taken a year or more to complete became a six-month project" (Maidique

1980: 68). Similarly, Dyer & Page (1988) found that without liege lord sponsorship, championing knights often lacked the resources and personnel even to develop their idea to the point where it could be presented and defended in a project review. Burgelman and Sayles (1986) noted that this can easily become a vicious circle: in order to prove the value and defensibility of a new approach, the championing knight will need resources; however, resources are allocated to projects which have proven their value through good test results, which in turn require resources. Liege lords “arbitrarily” choose products which “catch their fancy” and save them from this circle.

Thus, the resource allocation process within radically innovative units cannot be based on bureaucratic precepts of calculation and merit (because future returns are inherently unknowable). It has more in common with the medieval palace than the modern bureaucratic corporation. Resources are allocated based on shared vision, and technologic kinsmen are favored over meritorious outsiders. Positions are purchased and then held as life-time sinecures to be managed based on personal tastes—until, that is, the retainer or retainer’s retainer falls out of favor.

Out of Favor

In a system based on arbitrary personal power, one can fall out of favor very quickly. Without the protections of expertise, competency-based performance, and the predictability of bureaucratic organizational life, tenure and—more importantly in this context—the resources to pursue innovative work can evaporate if your intuition fails and you lose the favor of your liege lord. Championing knights may bet their careers on the fortunes of an unproven technology, and their status in the eyes of their liege lord is determined accordingly (Burgelman & Sayles 1986). Similarly, those knights whose technologic vision and intuitive feel for ideas does not result in new gifts become vulnerable. Performance remains vital to profit-seeking organizations operating in rapidly changing competitive environments. Although “merit” cannot be assessed before the fact, performance is still necessary.

One junior engineer at MGI described what happened to his championing knight when the project failed:

The worst thing was that Wayne was left to wither on the vine after the group dissolved. . . . There was a total lack of direction from management. No one approached Wayne about finding something constructive for him to do. He was left to sit in his cubicle and stew for months without a mandate to do anything. Finally, he left the company. I can imagine the agony he went through (Page 1987: 17).

IMPLICATIONS FOR THE MANAGEMENT OF RADICAL INNOVATION

The successful management of radical innovation in large organizations requires an understanding of how these traditional forms operate within a bureaucratic society. Traditional systems of resource allocation have their own advantages and disadvantages in the management of radical innovation. The most conspicuous advantage is their complete neglect of forecasting and of attempts to use precise calculation in decisions regarding resource allocations. Since radical product innovation is, by definition, too new to use these

criteria, it is not forced to meet impossible standards. Traditional systems are flexible. Since resources are allocated on personal preference, vast amounts can be shifted to new projects with none of the inertia of bureaucracies.

No one expects palaces to be efficient. Excess and inequality are hallmarks of a court (at least, for those not trapped in a subsistence economy). When a hunch suggests that a project holds great promise, resources can be "taken" from other projects and lavished upon the new favorite. A knight who produces a large gift can be immediately elevated to the very top of the hierarchy with no thought to internal equity. When the standards of performance are unknowable and when only retrospective judgments about non-reproducible events can be made, traditional systems of resource allocation are preferable to rational ones.

Of course, there are serious disadvantages to traditional systems of resource allocation. Weber suggested that the uncertainty of relying on intuition can disrupt the long-term individual and organizational "investments" that may be necessary. Individuals may find it very unsettling to be unable to predict when they may suddenly fall out of favor. Certainly investors dislike this uncertainty (Miles & Snow 1978), hence the necessity of other ongoing revenue-producing products in large established organizations.

Second, because radically innovating units in large organizations must operate alongside other units relying on bureaucratic models, the points at which these interdependent units come into contact call for generosity and skill. In discussing lateral relationships among managers, Sayles (1985) suggested that the different routines and patterns of interaction in these separate units can lead to conflict. Clearly differing premises regarding the appropriate allocation of resources can lead to ineffective discussions of resource allocations among representatives of these units.

The difficulties characterizing contacts between innovators and nontechnical colleagues in these organizations are better understood by examining the fundamentally different premises these parties bring to the relationship. Burgelman and Sayles (1986) and Kanter (1988) argued that championing knights often undermined themselves by seeming arrogant and condescending. At some point promising innovations must be developed, that is, transferred to the more bureaucratic units within the organization, and the experience at MGI suggested that knights were often unwilling to see their innovations move there: "It's like handing over my baby, in good faith, and having it thrown back over a wall, all mangled" (Page 1987: 11). Since bureaucratic criteria are the ones important stakeholders prefer and are the best understood in our society, the representatives of the radically innovating units face difficult challenges in working productively with the rest of the organization.

Finally, traditional systems of resource allocation are simply considered "unfair" or illegitimate by most members of our society. It is unfair to be so dependent on the personal preferences of individuals who may no longer be technically "current." Since these judgments are based on noncalculable criteria, they are difficult to explain and justify. The individuals working in and with innovating units simply do not understand or accept traditional authority. The problem is exacerbated by the fact that innovating individuals are often themselves members of the hyper-rational professions of science and engineering who see themselves as working at the leading edge of society. The legitimacy of feudal and tribal leadership analogies are particularly foreign to them.

IMPLICATIONS FOR ORGANIZATIONAL THEORY

This extension of Weber's typology to radical product innovation has implications for our theoretical understanding of organization design. As noted above, there is a large tradition in organization design seeking to understand how unpredictable work can be managed within bureaucratic organizations. Burns and Stalker (1961) proposed that unpredictability was managed in loose "organic" organizational forms in which the strict chain of command was not enforced. More recently, theorists have sought to describe how such work is isolated within the bureaucratic structure (delegated to professional experts), leaving only the points of contact conforming to bureaucratic requirements of predictability (Galbraith 1977; Perrow 1979; Mintzberg 1979).

Each of these theorists has provided important insights into how bureaucratic structures accommodate unpredictable work. However, arational criteria must sometimes be applied to decisions that cannot be simply left to professional expertise. These models were developed from nonprofit mental health organizations in which no one expected high rates of success. Yet radical product innovation is a kind of organizational work that cannot simply be labeled and then ignored. The experts themselves cannot adequately predict success, and success is necessary to the organization's continued viability. These theorists described organizations in which unpredictability was isolated and then, for practical purposes, ignored. Organizations dependent on radical product innovation for their survival in rapidly changing environments cannot afford this luxury.

Similarly, previous organizational theorists have not addressed the management of these isolated expert units. They are declared to be managed by professional criteria with no real explanation of how this actually functions. Organizational theory has not yet confronted the actual management of unpredictability. This initial attempt to address this process directly has helped to demonstrate how completely even our theories of organization are dominated by bureaucratic assumptions.

CONCLUSIONS

Thus, large innovative organizations must contain incompatible systems of resource allocation. Traditional authority systems operate on fundamentally different premises for the allocation of resources than do bureaucracies with their reliance on predictability and merit. Since genuinely radical innovation is not subject to economic calculation, decisions to allocate resources to projects are made on arational criteria. Yet these decisions must be made in a society that sees all non-merit, subjectively-based organizational decisions as inherently suspect. Members of small groups can believe in the legitimacy of the enterprise by believing in the "divine gift" of their leader, and this can be sustained as long as the enterprise is self-financed. However, once external financing requires that some representatives of economic calculation be placed in the organization, this introduces rational or bureaucratic criteria. The managerial difficulties created by this fundamental fact are compounded by our unfamiliarity with, and even distaste for, the alternative form of allocation suited to innovation.

In conclusion, we must reach back to a nineteenth century theorist writing about a form

of authority that was rapidly disappearing from the developed world to describe a process that is usually seen as at the very forefront of society. While the technical products may certainly be looking toward the twenty-first century, the management processes that can reliably produce them are more characteristic of the centuries prior to the industrial revolution. The potential for misunderstanding and for dissatisfaction under these circumstances is the inevitable result of an organizational form operating in a society that does not have a metaphor that enables it to understand what it is doing. It is a lack of insight into the organizational processes needed for radical product innovation, not the inherent impossibility of innovating in large organizations, that makes their successes so rare.

REFERENCES

- Abernathy, W.J., & Clark, K.B. 1985. Innovation: Mapping the winds of creative destruction. *Research Policy*, 14: 3-22.
- Abernathy, W., & Utterback, J.M. 1988. Patterns of industrial innovation. *Technology Review*, 80: 58-64.
- Burgelman, R.A., & Sayles, L.R. 1986. *Inside corporate innovation*. New York: Free Press.
- Burns, T., & Stalker, G.M. 1961. *The management of innovation*. London: Tavistock.
- Bylinsky, G. 1976. *The innovative millionaires*. New York: Charles Scribner & Sons.
- Cummings, L.L., Hinton, B., & Gobdel, B. 1975. Creative behavior as a function of task environment: Impact of objectives, procedures, and controls. *Academy of Management Journal*, 18(3): 489-499.
- Dyer, W.G., & Page, R.A. Jr. 1988. The politics of innovation. *Knowledge in Society*, 1(2): 23-44.
- Eisenhardt, K.M., & Bourgeois, L.J. III 1988. Politics of strategic decision making in high-velocity environments: Toward a midrange theory. *Academy of Management Journal*, 31: 737-770.
- Foster, R.N. 1986. *Innovation: The attacker's advantage*. New York: Summit Books.
- Galbraith, J.R. 1977. *Organization design*. Reading, MA: Addison-Wesley.
- Goldman, J.E. 1985. Innovation in large firms. In R.S. Rosenbloom (Ed.), *Research on technological innovation, management and policy*, 2: 1-10. London: JAI Press.
- Hickson, D.J., Hinings, C.R., Lee, C.A., Schneck, R.E., & Pennings, J.M. 1971. A strategic contingencies' theory of intraorganizational power. *Administrative Science Quarterly*, 16: 216-229.
- House, R.J. 1976. A theory of charismatic leadership. In J.G. Hunt & L.L. Larson (Eds.), *Leadership: The cutting edge*: 189-207. Carbondale: Southern Illinois University Press.
- Kanter, R.M. 1983. *The change masters*. New York: Touchstone Books.
- Kanter, R.M. 1988. When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organization. *Research in Organizational Behavior*, 10: 169-211.
- Kidder, T. 1981. *The soul of a new machine*. New York: Avon.
- Lodahl, T.M., & Mitchell, S.M. 1980. Drift in the development of innovative organizations. In J.R. Kimberly & R.H. Miles (Eds.), *The organizational life cycle*: 184-207. San Francisco: Jossey-Bass.
- Maidique, M.A. 1980. Entrepreneurs, champions, and technological innovation. *Sloan Management Review*, 21(2): 59-76.
- Miles, R.E., & Snow, C.C. 1978. *Organization strategy, structure and process*. New York: McGraw-Hill.
- Miller, D., & Friesen, P.H. 1982. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, 3: 1-25.

- Mintzberg, H. 1979. *The structuring of organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Moore, W.L., & Tushman, M.L. 1982. Managing innovation over the product life cycle. In M.L. Tushman, & W.L. Moore (Eds.), *Readings in the management of innovation*: 131–150. Boston: Pitman.
- Normann, R. 1971. Organizational innovativeness: Product variation and reorientation. *Administrative Science Quarterly*, 16: 203–215.
- Ouchi, W.G. 1980. Markets, bureaucracies, and clans. *Administrative Science Quarterly*, 25: 129–146.
- Page, R.A. Jr. 1987. *The evolution of innovation: A case study*. Working paper, Graduate School of Management, University of California, Irvine.
- Pearce, J.L. Forthcoming. *Volunteers: The organizational behavior of unpaid workers*. Winchester, MA: Unwin Hyman.
- Perrow, C. 1979. *Complex organizations* (2nd ed.). New York: Random House.
- Pfeffer, J. 1981. *Power in organizations*. Marshfield, MA: Pitman.
- Quinn, J.B. 1979. Technological innovation, entrepreneurship and strategy. *Sloan Management Review*, 20: 19–30.
- Quinn, J.B. 1985. Managing innovation: Controlled chaos. *Harvard Business Review*, 63(3): 73–84.
- Sapolsky, H.M. 1972. *The Polaris system development*. Cambridge, MA: Harvard University Press.
- Sayles, L.R. 1985. *Leadership*. New York: McGraw-Hill.
- Stevenson, W.S., Pearce, J.L., & Porter, L.W. 1985. The concept of coalition in organization theory and research. *Academy of Management Review*, 10: 256–268.
- Thompson, V.A. 1965. Bureaucracy and innovation. *Administrative Science Quarterly*, 1: 1–20.
- Tushman, M.L., & Nadler, D. 1986. Organizing for innovation. *California Management Review*, 28(3): 74–92.
- Tushman, M.L., & Romanelli, E. 1985. Organizational evolution: A metamorphosis model of convergence and reorientation. *Research in Organizational Behavior*, 7: 171–222.
- Weber, M. 1947 (English translation). *The theory of social and economic organization*. New York: The Free Press.