

University of Connecticut

Department of Economics Working Paper Series

Schumpeter and Personal Capitalism

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Working Paper 1996-05

March 1996

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Abstract

In an earlier paper, I criticized Schumpeter's account of the obsolescence of the entrepreneur in Capitalism, Socialism, and Democracy. That account rests, I argued, on a confusion about the nature of scientific knowledge and its role in the competences of the firm. This paper is an attempt to take up the argument again, moving it away from the doctrine-historical into the provinces of the economics of organization. Drawing on the work of Max Weber, as well as on a case study of the Swiss watch industry, the paper argues for the ineradicable role of personal capitalism, properly understood.

Introduction.

What kind of capitalism creates rapid and sustained economic growth? One perspective on this question, going back at least to Adam Smith, has focused on those background institutions of civil society that are able to channel the rent-seeking proclivities of individuals into the production of new wealth rather than into the redistribution of existing wealth. Somewhat more recently, however, a perspective has arisen that stresses the role in economic growth not of abstract institutional structures but of the concrete institutions of business organization, notably the modern business firm. Preeminent among living proponents of this latter view is Alfred Chandler (1977, 1990), who retells the story of recent (nineteenth- and twentieth-century) economic growth in the now-developed countries as a history of the rise of managerial capitalism. In at least some understandings of Chandler, this managerial capitalism, in which trained professional managers run large multidivisional organizations, is to be contrasted with the more backward structures of "personal" capitalism, in which firms are controlled by individual owner-managers.

Before there was Chandler, of course, there was Schumpeter, whose work is a source not only of an important view similar to that of Chandler but also — perhaps astonishingly — of the opposite view, namely that the source of economic growth is indeed to be found in the behavior of individuals — of entrepreneurs — who create new wealth, often at the expense of old wealth, within the constraints of a particular kind of civil society. In an earlier paper (Langlois 1987), I presented an argument (not yet well absorbed by members of the Schumpeter Society[1] let alone by the profession at large) that, contrary to the

[1] On the first page of his interesting new book, our esteemed President Gunnar Eliasson (1996) tells us that, in "his dismal (1942) analysis of the capacity of large firms to routinize innovative behavior," Schumpeter gave up his "Austrian" account "of the innovator and the unpredictable entrepreneur." In fairness, Eliasson associates the

conventional wisdom, these two visions of capitalism and economic growth do not track the difference between an earlier (or "Mark I") and a later (or "Mark II") Schumpeter; rather, these two views coexist in a way that is remarkably consistent over time in Schumpeter's work. Like Chandler (McCraw 1988), Schumpeter was heavily influenced by Max Weber's theory of bureaucracy and social progress (Csontos 1991). In both his early (1934) and his later (1950) work, Schumpeter consistently espoused the view that "progressive rationalization" in Weber's sense would make innovation a matter of routine, thus rendering obsolete the personal capitalism of the entrepreneur and bringing to dominance in economic growth the role of the large bureaucratic organization.

In that earlier paper, I criticized Schumpeter's account of the obsolescence of the entrepreneur on the grounds that it reflects an illegitimate shift of underlying epistemology or, to put it another way, that it rests on a confusion about the nature of scientific knowledge and its role in what we would nowadays call the competences of the firm. In this paper I take up this argument again, moving it away from the realm of the doctrine-historical and the epistemological into the provinces of the economics of organization. Using a detailed historical account of the Swiss watch industry as a focusing device, I will suggest that the notion of personal capitalism is a far more subtle and complex one than its detractors have recognized. Moreover, far from being a primitive holdover from pre-corporate times, personal capitalism — properly understood — is in fact an important engine of economic change and growth.

"Austrian" Schumpeter with the 1911 first German edition of the *Theory of Economic Development*, and the obsolescence thesis did not appear in its full form until the second German edition (Csontos 1991). Nonetheless, I resist the idea that Schumpeter "gave up" anything in his 1942 book that he hadn't given up essentially from the very beginning.

Schumpeter and Weber.

The broad outlines of Schumpeter's theory of entrepreneurship are of Weberian provenance.[2] Indeed, one might say that Schumpeter's schema is an application of Weber's social theory to the problem of economic growth. Schumpeter's innovation is to associate Weber's category of charismatic leadership with the concept of entrepreneurship.

As it is for Weber, capitalist development is for Schumpeter a march from traditional behavior to rational behavior. In "the circular flow of economic life," Schumpeter's version of equilibrium in early capitalism, behavior is rational only within the bounds of traditional or habitual behavior.

> The assumption that conduct is prompt and rational is in all cases a fiction. But it proves to be sufficiently near to reality, if things have time to hammer logic into men. Where this has happened, and within the limits in which it has happened, one may rest content with this fiction and build theories upon it. It is then not true that habit or custom or non-economic ways of thinking cause a hopeless difference between the individuals of different classes, times, or cultures, and that, for example, the "economics of the stock exchange" would be inapplicable say to the peasants of to-day or the craftsmen of the Middle Ages. On the contrary the same theoretical picture in its broadest contour lines fits the individuals of quite different cultures, whatever their degree of intelligence and of economic rationality, and we

[2] The influence of Weber is explicit in the second German edition, but the references were largely expunged from the English translation, probably because Schumpeter saw methodological fashions, and his intended audience, as having changed in the interim (Csontos 1991).

> can depend upon it that the peasant sells his calf as cunningly and egotistically as the stock exchange member his portfolio of shares. But this holds good only where precedents without number have formed conduct through decades and, in fundamentals, through hundreds of thousands of years, and have eliminated unadapted behavior (Schumpeter 1934, p. 80).

This picture of economic behavior as guided by routines — indeed, by routines that seem to be the result of some kind of selection process — is the inspiration for much of the association of Schumpeter with modern evolutionary economics (Nelson and Winter 1982), an association that, *pace* Hodgson (1993), is not at all unwarranted despite Schumpeter's negative remarks about evolutionary biology (Langlois and Everett 1994).

Economic growth can take place only when the circular flow is upset, which requires the entrepreneur. Since — in early capitalism, at least — rational action can occur only within the bounds of evolved habit, the behavior of the entrepreneur must be non- or extra-rational; it must be a matter of intuition.

> What has been done already has the sharp-edged reality of all things which we have seen and experienced; the new is only the figment of our imagination. Carrying out a new plan and acting according to a customary one are things as different as making a road and walking along it.
>
> How different a thing this is becomes clearer if one bears in mind the impossibility of surveying exhaustively all the effects and counter-effects of the projected enterprise. Even as many of them as could in theory be ascertained if one had

> unlimited time and means must practically remain in the dark. As military action must be taken in a given strategic position even if all the data potentially procurable are not available, so also in economic life action must be taken without working out all the details of what must be done. Here the success of everything depends on intuition, the capacity of seeing things in a way which afterwards proves to be true, even though it cannot be established at the moment, and of grasping the essential fact, discarding the unessential, even though one can give no account of the principles by which this is done. Thorough preparatory work, and special knowledge, breadth of intellectual understanding, talent for logical analysis, may under certain circumstances be sources of failure. (Schumpeter 1934, p. 85.)

I will return to the cognitive implications of this view presently. For the moment, however, the important point is that entrepreneurial action is an instance of charismatic leadership, which, for Weber as for Schumpeter, is central to the theory of social change (Parsons 1949, p. 663).

Weber is principally concerned with the religious leader or prophet, and to a lesser extent with military and political leadership; Schumpeter borrows heavily from that analysis in his characterization of the entrepreneur. Here we begin to see the outlines of Schumpeterian "personal capitalism," which in its pure form is the antithesis of bureaucratic organization. Consider Weber's account of the organization of charisma.

> The corporate group which is subject to charismatic authority is based on an emotional form of communal relationship. The

> administrative staff of the charismatic leader does not consist of "officials"; at least its members are not technically trained. ... There is no hierarchy; the leader merely intervenes in general or in individual cases when he considers the members of his staff inadequate to a task to which they have been entrusted. There is no such thing as a definite sphere of authority and of competence. ... There are no established administrative organs. ... There is no system of formal rules, of abstract legal principles, and hence no process of judicial decision oriented to them. But equally there is no legal wisdom oriented to judicial precedent. Formally concrete judgments are newly created from case to case and are originally regarded as divine judgments and revelations. ... The genuine prophet, like the genuine military leader and every true leader in this sense, preaches, creates, or demands *new* obligations. In the pure type of charisma, these are imposed on the authority of revolution [*sic*] by oracles, or of the leader's own will, and are recognized by the members of the religious, military, or party group because they come from such a source. (Weber 1947, pp. 360-361.)

But the charismatic organization is perhaps best understood in contrast to what it is *not*.

> Charismatic authority is thus 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, whether in its patriarchal, patrimonial, or any other form. Both rational and traditional authority are

> specifically forms of everyday routine control of action; while the charismatic type is the direct antithesis of this. Bureaucratic authority is specifically rational in the sense of being bound to intellectually analysable rules; while charismatic authority is specifically irrational in the sense of being foreign to all rules. Traditional authority is bound to the precedents handed down from the past and to this extent is also oriented to rules. Within the sphere of its claims, charismatic authority repudiates the past, and is in this sense a specifically revolutionary force. (Weber 1947, pp. 361-362.)

It is the charismatic, and therefore revolutionary, quality of entrepreneurship that makes it a source of economic growth, that allows it to play the role of "industrial mutation — if I may use that biological term — that incessantly revolutionizes the industrial structure *from within*, incessantly destroying the old one, incessantly creating a new one" (Schumpeter 1950, p. 83, emphasis original).

Recast in these explicitly Weberian terms, Schumpeter's theory of entrepreneurship looks something like this. In its undeveloped state, an economy is based largely on traditional behavior, which bounds the possibilities for conscious economic activity. Under the right institutional setting — bourgeois capitalism — charismatic leadership arises, in the form of the entrepreneur, to break the crust of convention and to create new wealth by "'lead[ing]' the means of production into new channels" (Schumpeter 1934, p. 89). Charisma is personal and revolutionary; "in its pure form charismatic authority may be said to exist only in the process of originating. It cannot remain stable, but becomes either traditionalized or rationalized, or a combination of both" (Weber 1947, p. 364). In the economic sphere, of course,

the tendency is toward rationalization. Not only do imitators rush in once the entrepreneur has blazed the trail, but also the problem of succession within the entrepreneurial organization leads (if the organization is to continue) to bureaucratization, that is, to the substitution of rules for personal authority; to the creation of abstract offices divorced from their individual holders; and to the increasing preeminence of specialized knowledge and spheres of competence (Weber 1947, pp. 330-334).

Progressive rationalization.

The transformation from the traditional to the rational takes place at two levels. At the level of each entrepreneurial organization, charismatic authority, having destroyed the traditional, must eventually give way to bureaucracy as the problem of succession arises. It is here that we can locate Chandler's notions of personal and managerial capitalism. What he finds wanting in personal capitalism is precisely the extent of rationalization in the Weberian sense. Compared with the foremost examples of managerial capitalism (*e.g.*, in the United States), the British, Chandler argues, failed adequately to extend hierarchical control and to create management based on abstract rules and spheres of competence.

> In most British enterprises senior executives worked closely in the same office building, located in or near the largest plant, having almost daily personal contact with, and thus directly supervising, middle and often lower-level managers. Such enterprises had no need for the detailed organization charts and manuals that had come into common use in large American and German firms before 1914. In these British companies, selection to senior positions and

> to the board depended as much on personal ties as on managerial competence. The founders and their heirs continued to have a significant influence on top-level decision-making even after their holdings in the enterprise were diminished. (Chandler 1990, p. 242.)

British personal capitalism thus represented a kind of half-way house between the charismatic founders and full rationalization on the American model. I will return to this strand of thought below.

At another level, however, resides the claim that progressive rationalization affects the entire economic society, eventually displacing traditionalism completely. The entrepreneur is both the agent and the victim of this transformation. In uprooting the deeply planted traditional ways of life, the entrepreneur prepares the field for rational authority.[3] But — and this is the heart of Schumpeter's thesis — once the hard work of crust-breaking has been done, charismatic leadership is no longer necessary, and the entrepreneur must ride into the sunset. The entrepreneurial role is then taken up by large bureaucratic firms, organized along rational lines, who can engineer change without need for charisma. The final result of the process of progressive rationalization, indeed, is a kind of bureaucratic socialism, since, without any substantive function or source of legitimacy, entrepreneurial capitalism as a system must ultimately follow the entrepreneur westward.

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[3] "A high degree of traditionalism in habits of life, such as characterized the labouring classes in early modern times, has not sufficed to prevent a great increase in the rationalization of economic enterprise under capitalist direction. ... Nevertheless, this traditionalistic attitude had to be at least partly overcome in the Western world before the further development of the specifically modern type of rational capitalist economy could take place." (Weber 1947, p. 167.)

At first glance, Schumpeter's brief in favor of large organizations seems consistent with Weber, who praised the efficiency of rational bureaucracy in the most lavish terms.[4]

> Experience tends universally to show that the purely bureaucratic type of administrative organization — that is, the monocratic variety of bureaucracy — is, from a purely technical point of view, capable of attaining the highest degree of efficiency and is in this sense formally the most rational known means of carrying out imperative control over human beings. It is superior to any other form in precision, in stability, in the stringency of its discipline, and in its reliability. It thus makes possible a particularly high degree of calculability of results for the heads of the organization and for those acting in relation to it. It is finally superior both in intensive efficiency and in the scope of its operations, and is formally capable of application to all kinds of administrative tasks. (Weber 1947, p. 337.)

Notice, however, that this *paean* does not portray bureaucracy as innovative. It is precise and reliable, but not necessarily dynamic. "Both rational and traditional authority," as we saw, "are specifically forms of everyday routine control of action" (Weber 1947, p. 361). Bureaucracy is designed for "imperative control over human beings," that is, making people do what the boss wants, but not necessarily for performing the multifold tasks of an entire economy. And it produces results that are "calculable" because it reduces internal variance, not

[4] Weber did not, however, see bureaucracy as generally good, and he worried about its stultifying effect on humanity.

necessarily because it (or rationalization more generally) extends the scope of human ability to "calculate" or predict the future.

Indeed, one could argue that Schumpeter goes well beyond Weber — into what, in my view, is illegitimate territory. Recall that, for Schumpeter, progressive rationalization seems to mean more than the Weberian idea of demystification; it seems also to mean that the growth of scientific knowledge will extend the bounds of rationality in the sense of Herbert Simon: with progressive rationalization, our "control of facts" becomes more perfect, and we become able "quickly and reliably" to calculate what had previously required intuition and a "flash of genius." Schumpeter is thus making a claim about the cognitive, not merely the command-and-control, possibilities of bureaucracy.

I doubt that we live in a wiser age; but I do think that we are perhaps more accustomed today than in Schumpeter's time to question the cognition-expanding character of conscious, scientific knowledge. The best and the brightest have too often failed to live up to their billing. As F. A. Hayek (1948) argued in the context of the socialist calculation debate, such stout claims for conscious scientific knowledge (on which the possibility of socialist calculation depends) are an insupportable *hubris* that ignores the large and ineradicable role of rules, of routine, of tacit knowledge. Rationality — or, more correctly, cognitive ability — is perhaps even more bounded today, in the avalanche of information that "progressive rationalization" has generated, than it was in more traditional times.

Interestingly, it is far from clear that Weber would have been on Schumpeter's side in this matter. For one thing, Weber, as we saw, stressed the static character of bureaucracy. Bureaucracy is about imposing rules, not about changing the rules. It is a way to marshal well-defined means in service of a

well-defined end; but, like the ideal type of traditional authority, rational authority is not dynamic. On the matter of bureaucracy replacing entrepreneurial capitalism, we can note that Weber came down explicitly *against* the possibility of socialist calculation, effectively endorsing the views of von Mises.[5]

Schumpeterianism: Mark I and Mark II.

We learn the most from writers like Weber and Schumpeter not when we approach them from the perspective of the antiquarian or of the adoring disciple but when we treat them as capable of engaging our own research programs. How, then, can we apply their ideas to the present-day discussion of capitalism, organizational form, and economic growth?

Much of the modern literature has focused on the idea of *organizational capabilities*, which provides a language large enough to encompass the ideas of Weber and Schumpeter. Broadly speaking, organizational capabilities are what organizations can do well; and Weber was arguably talking about organizational capabilities when he described the efficiency of rational bureaucracy.

The term "capabilities" was first used by G. B. Richardson (1972, p. 888) to refer to "the knowledge, experience, and skills" of the organization. In Richardson, however, the import of the concept was not to emphasize the *extent* of organizational capabilities but rather to stress their *limitations*. Because of what are effectively cognitive constraints, all organizations must specialize; and,

[5] This was not an intellectually fashionable view in the 1930s and 1940s, when Weber's ideas began filtering into the English-speaking academic world. In a fit of early political correctness, indeed, Talcott Parsons found it necessary to insert into his translation of Weber a footnote apologizing for his author's failure to hold views in accord with "the principal weight of technical opinion" on the subject (Weber 1947, p. 194n). That weight must not have been tied down very tightly, however, as it has lately shifted decidedly to Weber's side.

since the chain of production in an advanced economy requires a diversity of very different capabilities, the costs of integrating across many links in that chain are necessarily high, and firms must rely on various kinds of market arrangements to coordinate their activities even in the face of the "contractual hazards" emphasized in transaction-cost economics.

This point has also been made in a slightly different way by Nelson and Winter (1982) and to some extent by the "dynamic capabilities" literature they helped to inspire (Teece and Pisano 1994; Langlois and Robertson 1995). In Nelson and Winter, economic action, even within large organizations, is a matter of rule-following behavior. Agents possess repertoires of routines, which are habitual patterns of behavior that consist in tacit, skill-like knowledge. These agents are "boundedly rational" and do not consciously survey their environments and choose a substantively rational course of action, except within the bounds of what routine behavior has made possible.[6] The parallels here with Schumpeter's account of traditional behavior in the circular flow should be obvious. The crucial difference, however, is that Nelson and Winter see such behavior not as limited to earlier society but as an inescapable implication of the mechanics of human cognition. Agents in advanced capitalism also follow rules and abide by habits. By implication, economic change in Nelson and Winter is a non-rational or entrepreneurial activity: it is taking a leap into the unknown, not a matter of conscious planning.

There are, however, some present-day writers who are inclined to take the notion of organizational capabilities in a different direction and to extract from it some very large claims for the efficacy of large organizations and for

[6] To put it another way, substantive or "optimizing" rationality of the neoclassical sort is itself a learned routine or set of routines.

their superiority to individual action and to smaller, more personal enterprises. For example, William Lazonick (1991), who likes his Schumpeter with a large dollop of Marx, presents what is arguably a historicist account of the progressive development of capitalism, which reaches its apex in "collective capitalism."[7] As in Schumpeter's account of later capitalism, large organizations in Lazonick's collective capitalism are not only effective at managing existing structures but are also prime engines of innovation. And, as in Schumpeter, the basis for the innovativeness and the wealth-creating character of large organizations resides in their ability effectively to break cognitive boundaries and consciously to reinvent the division of labor.

> The more technologically complex the innovation, the greater the need for innovative skills and the more extensive the specialized division of labor required to develop and utilize these skills. The organization must not only develop these specialized skills so that they can contribute to the innovation, but also coordinate them so that they constitute a collective productive power. *Organizational capability permits the enterprise to plan* and coordinate the development of these innovative skills, integrating them into an enterprise-specific collective force. As far as the innovation process is concerned, therefore, *organizational capability permits the planned coordination* of the horizontal and vertical division of labor required

[7] More recently, Lazonick has made clear that he includes in collective capitalism — or "organizational integration," as he now terms it — the activities of "individuals and groups who are employed by legally distinct firms that pursue common goals" (Lazonick and West 1995, p. 231). Taken seriously, however, this idea renders unhelpful if not tautological the notion of "collective capitalism," since it embraces activities that economists have viewed, and ought rightly to view, as reflecting the capabilities of markets (properly understood) rather than of firms, and thereby calls into question any implications in the analysis for the advantages of large firms *per se*. On this point see Loasby (1993) and Langlois (1994).

> to generate an innovation. (Lazonick 1991, p. 203, emphasis altered.)

It is not clear what are the details of how this planning and coordination takes place, but we are left with the strong impression that it is decidedly not the handiwork of some charismatic central individual, or of the firm's owners in any sense, but is instead the product of professional managers.

At the risk of parody, let me denote these two visions of organizational capabilities as "Schumpeterianism Mark I" and "Schumpeterianism Mark II." Which of these is closer to right? History may shed some light on the issue, even if it may never be decisive. Consider, for example, a case with some clear Weberian resonances: the development, over more than four centuries, of the watchmaking industry in John Calvin's Geneva and the nearby Jura mountains.[8]

From Friedrich Hayek to Nicolas Hayek.

Calvinism was in one sense responsible for the birth of the Swiss watch industry. Noted jewelry-makers and goldsmiths in the Middle Ages, Genevans found it necessary to apply their capabilities in new directions in the austere climate of Calvinism. Fortunately, "the same puritanical regime that condemned jewelry was willing to make an exception for watches: if Calvinists were not interested in time and its measurement, who was?" (Landes 1983, p. 232). The reconversion was accomplished under the tutelage of immigrant Huguenots who were fleeing persecution elsewhere in Europe.

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[8] This is a case that has attracted significant scholarly attention, which makes the facts relatively easy to assemble. However, most of the best interpretive histories, notably David Landes's brilliant *Revolution in Time* (1983), stop before certain recent events that will be of considerable interest to the theme of this paper.

In the sixteenth century, watch making was a skilled craft carried out in individual workshops. Despite the medieval ideal of the "compleat" craftsman, there was in fact considerable division of labor within the workshop, with various apprentices and journeymen carrying on relatively specialized activities under the supervision of the master (Landes 1983, pp. 206-7). The watch industry was already well established by the time Geneva, a most bourgeois and therefore mercantilist city, got around to forming a guild in 1601. Apart from normal restrictions on entry, the Genevan *fabrique* also sought to keep out immigrants and even their native-born children. In the face of success and growing demand, these restrictions generated an unintended incentive for evasion along with the intended economic rents. The result was the birth of the *établissage* system, in which a master watchmaker put out component fabrication to non-guild (and therefore cheaper) subcontractors outside the city gates. Soon the more routine tasks — like the production of the *ébauche*, the basic watch movement lacking finish and adjustment — were sent "offshore" to nearby France and Savoy, with the fine assembly reserved for Geneva (Landes 1983, p. 240-243).

The division of labor under *établissage* thus proceeded within a trajectory of vertical fragmentation and of heavy reliance on arms'-length coordination. Already by 1660 some craftsmen had begun specializing in the production of springs (Jequier 1991, p. 324), and by the end of the eighteenth century the industry could boast some thirty specialized trades (Enright 1995, p. 128). As Adam Smith would have predicted, the system of *fabrication en parties brisées* — separate-parts manufacture — was particularly conducive to the invention of specialized tools[9] (Jequier 1991, *loc. cit*.).

[9] In fact, Smith did comment very briefly on watchmaking, in the context of the effect on real prices of the productivity improvements that arise in "consequence of better

This pattern was reinforced when, in the late eighteenth century, the industry took its next leap, from Geneva to the Jura. Following the lead of one Frédéric Japy, who had learned to mass-produce relatively uniform *ébauches* in nearby France, the Jura began producing watches using techniques of standardization and mechanization. Like the Genevans, the Jurassians relied on specialized tools. "But the Jura makers went their predecessors one better. They bought their tools and improved them; invented their own; and went on from individual tool making (each watchmaker his own) to production by specialist toolmakers for general sale. In so doing, they created for the first time on the continent an equipment branch to match that of Lancashire and generate new devices and techniques" (Landes 1983, p. 261). In short, the Jura had blossomed into a true Marshallian industrial district.

With its center of gravity displaced to the countryside, the Swiss industry bettered the already significant success and reputation that Geneva had earned. By 1790, the Jura had produced some fifty thousand units, a figure that would double by 1817 (Enright 1995, p. 129). The source of this dynamism was arguably the industry's structure. "That was really one of the great strengths of the Swiss industry: it was really a congeries of subbranches, of local *fabriques* specializing in watches of one or another variety or in one or another stage of manufacture. Whatever you wanted, someone somewhere could make. No run was too small, no order too special. As a result, the industry was able to cater to all markets, to experiment with novelty, to copy and exploit the inventions of others" (Landes 1983, p. 267).

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machinery, of greater dexterity, and of a more proper division and distribution of work" (Smith 1976, I.xi.o.1, p. 260). Real price reductions, Smith says, have been "most remarkable" in industries using the "coarser metals" as materials. "A better movement of a watch, than about the middle of the last century could have been bought for twenty pounds, may now perhaps be had for twenty shillings" (Smith 1976, I.ix.o.4, *loc. cit*.).

Like the other great Marshallian districts of history, including Lancashire and Silicon Valley, the Swiss watch industry relied on those benefits of decentralization praised by F. A. Hayek (1948). Its diversity permitted the effective use of a far greater amount of dispersed and tacit knowledge than could be contained within the boundaries of even a large organization; and its porousness permitted experiment, adaptation, and innovation. To most minds, moreover, the Swiss watch industry in the eighteenth and nineteenth centuries would represent a classic example of economic progress along the lines of Schumpeterian "early" capitalism. There was certainly plenty of (individual) entrepreneurship, which creatively destroyed older structures (as in the rise of the Jura over Geneva), although without, however, altering the fundamental paradigm of industry evolution. The extent to which the early history of this industry best fits Schumpeter's account of the entrepreneur is a matter to which I will return. Notice here that, although not at all "rationalized" in the sense of Schumpeter or Chandler — that is, organized along the lines of large, vertically integrated firms — the Swiss watchmakers of this era were certainly already rationalized in Weber's sense. They were definitely oriented toward the mundane and toward rational ends. As a group, they were hardly tradition bound, welcoming new ideas so long as they promised a profit.

To the extent that traditionalism played a role in the industry, it was traditionalism in the sense of Nelson and Winter not of Weber, that is, the traditionalism of habit and routine oriented toward a particular pattern of productive skill. As is clear in Jequier's (1991, pp. 324-5) account of one typical firm, that of the Le Coultre family, successive generations were often forced to fight the conservatism of their fathers in introducing new methods and technology, sometime to the point of open secession. But within the larger

system, old techniques could disappear and new ones replace them without fundamentally changing the structure of the industry. In the language of Tushman and Anderson (1986), innovation, including mechanization, was competence enhancing for the district as a whole, and usually even for the family firms it comprised. As Jequier (1991, p. 325) tells us, up until the mid nineteenth century, the "division of labor and the introduction of the first machines, operated by the worker's hand or foot, constituted no threat to the work communities of the Jura."[10]

The transition from hand-operated machines to machine tools to automatic machines, which necessitated the separation of the workshop from the home and eventually the erection of factories, was somewhat more disruptive (Jequier 1991, p. 326); but it the end the changes were absorbed with considerable success. In part, the transformation was propelled by external competitive forces, notably the rise of American firms employing the so-called American system of mass production and wielding innovations in marketing. At the same time, however, mechanization already lay along the trajectory the Swiss were following; and the Marshallian character of their industry allowed them in the end to outdo the Americans on their own ground.

The story of the American challenge in watchmaking introduces some bright Chandlerian threads into the tapestry. For the rise of American watch industry followed the pattern of many others discussed in *The Visible Hand*, albeit on a somewhat smaller scale. Lacking the pools of skilled workers and the

[10] By contrast, artisans in Geneva were more organized, and the Association of Watchcase Workers, founded in 1842, stood in the way of changes in the division of labor. But the result was the establishment of separate factories using the new machines. "Here," says Jequier (1991, p. 325), "we may note another characteristic of Swiss watchmaking: the appearance of new manufacturing processes did not eliminate old practices, and usually the two systems operated side by side, which explains the extraordinary heterogeneity of this sector, first as a craft and then as an industry."

webs of existing organization available in many European industries (like Swiss watchmaking), America had to create new capabilities administratively within vertically and laterally integrated organizations. Moreover, because of the lack of existing skills, American firms substituted physical for human capital or, to put it more instructively, shifted the locus of skill on the margin away from the workers and into the machines and the organization of production. This indeed is the task that the American system was intended to accomplish: to reduce the need for skilled adjustment by making the parts (relatively more) interchangeable and by using "skilled" machines that could turn out these more-standardized parts in large numbers (Hounshell 1984). We now know that these parts were far less interchangeable than advertised (Clarke 1985; Hoke 1989). But the approach placed American firms on a technological trajectory that spurred mechanization and produced a high rate of productivity improvement. American firms were thus able eventually to overtake and surpass competitors (like the British in some industries) who were not on such a trajectory. As we will see, however, this approach worked less well on the Swiss.

The principal exemplar of the American system in watchmaking was the Waltham Watch Company. In production, the firm moved beyond the relatively versatile machine tools then in use in the industry toward more special-purpose, high-volume devices. This often required Waltham to invent its own machines, as outside tool makers were hard-pressed to meet the tolerances necessary (Landes 1983, p. 315). The results were phenomenal. By 1877, Waltham was producing some 600,000 watches per year, with a cumulative output on the order of 10 million. Moreover, quality equaled or surpassed that of Switzerland, as Swiss representatives discovered to their great shock at the 1876 centennial

exhibition in Philadelphia, where American watches and watchmaking were on display (Landes 1983, p. 319; Jequier 1991, p. 326).

Waltham operated with a highly integrated structure that contrasted sharply with the Swiss industry. In one reading, this is rationalization à la Chandler (if not necessarily à la Weber) into large, formally articulated organizations. In this reading, Waltham, like so many other American firms in the late nineteenth and early twentieth centuries, succeeded because it represented an organizational structure inherently superior to the market it had replaced. In another reading, however, Waltham's structure reflected the inadequacies of existing American capabilities rather than the inherent superiority of its form. Because of the need systemically to reinvent the production process, and because of the lack of a ready web of outside suppliers, the Americans were forced to rely on integration as the best of actually available alternatives.[11]

In the specific case of watchmaking, the fragmented Swiss industry responded quickly to the American threat. "In spite of some inevitable resistance," Jequier (1991, p. 326) tells us, "the spirit of enterprise asserted itself"; and assemblers began building new factories and introducing the same kind of machinery as the Americans. In 1870, three-quarters of the 35,000 employed in Swiss watchmaking worked at home; by 1905, only a quarter of the more than 50,000 workers did so (Jequier 1991, *loc. cit*.). Nonetheless, when Switzerland regained the technological and market lead toward the end of the nineteenth century, it remained far less vertically integrated than the American industry; relied far more on outwork; and comprised thousands of firms to the dozen or so in America (Landes 1983, p, 323). Meanwhile, Waltham's highly integrated

[11] For an elaboration of this idea, see Langlois and Robertson (1995), especially chapter 3.

structure proved far less conducive to the routine administration of its operation than it had to bringing that operation into being, and the firm virtually collapsed under principal-agent problems (Landes 1983, pp. 329-334). Even its better-run competitors lost ground to the Swiss. Indeed, both Waltham and Elgin, Waltham's long-time domestic rival, are now Swiss owned.

> By 1910, the Swiss industry dominated the world.
>
> > The Swiss controlled the micromechanical export industry by cost competitiveness, superior manufacturing competency, high levels of precision, and extraordinary attention to details and style. The vertically integrated parts manufacturers achieved economies of scale through volume production. This benefit was passed on to assemblers in the form of low-cost movements. In the most labor-intensive aspects of the industry, the vertically disintegrated system of assembly and case manufacture kept overhead charges low (Glasmeier 1991, p. 471).

This happy situation was not, however, to last long. In the years after World War I, incomes declined, protectionist barriers went up, and the large Russian market disappeared; as a result, demand for Swiss watches fell sharply (Glasmeier, *loc. cit*.; Landes 1983, pp. 326-7). Like many other industries around the world, the Swiss watchmakers responded with cartelization, in an attempt to stabilize revenues and — importantly in this case — to halt the practice of *chablonnage*, the exportation of components to countries trying to create their own watch industries behind protectionist walls. The assemblers created the Fédération Horlogère in 1924 to safeguard their interests; the 17 makers of *ébauches* combined into the trust Ebauches, S. A. in 1926; and the component

makers grouped into the Union des branches annexes de l'horlogerie (UBAH) in the same year. By 1928, these associations had crafted cartel arrangements to set production, pricing, and export policies, especially, in the last case, with respect to *chablonnage* (Landes 1983, p. 327; Enright 1995, p. 130).

As is normally the case with private cartels, however, these arrangements proved unstable, especially once the Depression hit. The government of the confederation was called in, and, with the help of the banking industry, formed a huge holding company, called ASUAG after the acronym of its German name. The company bought up the majority of shares in Ebauches, S. A. along with a number of component makers (Landes 1983, p. 328; Glasmeier 1991, p. 472; Enright 1995, p. 130). The trust immediately put a halt to *chablonnage.* In 1934, the government obliged further with a statute that put the finishing touches on a cartel that Landes (1983, p. 328) rates as one of the strongest in history. In addition to setting up detailed regulation of output, the statute essentially forbade component import and export, and even prohibited the export of watchmaking machinery. Moreover, ASUAG got in the habit of buying up and subsidizing failing component makers.

By the late thirties, the industry was in recovery. But, as even cartels cannot create rents where none are to be had, this resurgence surely had less to do with cartelization than with the requickening of watch demand upon the end of the Depression and the arrival of the Second World War, during which the neutral Swiss were able to supply both sides. After the war, Switzerland found itself in a position very like that of the United States: standing almost alone as an unscathed competitor amid the devastation of war. And, like the U. S., Switzerland lived well on the resulting rents until the reemergence of German and (especially) Japanese industries by the early 70s.

America had one threat to offer in the post-war years. In the 'forties, a Norwegian immigrant named Lehmkuhl had taken over the near-defunct Waterbury Clock Company with an eye to making fuses for the war effort. At war's end, he refitted the company to make cheap mechanical watches on an updated American system, using newly developed metals in production and following a mass-marketing plan that bypassed the jeweler's shop for the five-and-dime (Landes 1983, p. 339). Timex — as the brand was called — swept the American market and made inroads in Europe. But this was the sort of challenge the Swiss had seen before; and, despite their sluggish cartel structure, it was one to which they could eventually respond.[12] The real challenge to the industry in the late 'sixties and early 'seventies came from a much less familiar source: electronics.

A watch, even a mechanical one, is basically an oscillator: it divides time into pulses in order to calibrate the movement of the hands. By mid century, solid-state electronics was beginning to make possible a different kind of oscillator, one based on piezoelectric crystals that can be made to vibrate precisely and dependably under alternating current. By the late 1960s, microelectronics had proceeded to a point at which the vibration of a crystal (like quartz) could be used to calibrate microcontroller circuitry driving tiny electric stepping motors. Indeed, it became possible to hook the circuits to light-emitting diodes and then liquid-crystal displays, thus eliminating mechanical parts entirely. The quartz watch was born. This change, which took the better part of a decade to work itself out, proved far more competence destroying for the Swiss industry than anything that had come before. Although the Swiss

[12] In fact, however, the Swiss never really needed to respond. Although market share fell from a post-war high of 80 per cent to 40 per cent in 1970, total demand was growing fast enough to keep capacity utilization and profits high (Enright 1995, p. 133).

retained many capabilities relevant to analog quartz watches, the mechanical *ébauche*, a core Swiss competence, had been replaced by crystal, circuit, and motor.

The inability of the Swiss watch industry to respond to the electronic challenge represents a clear instance of industrial inertia.[13] The Swiss industry was a well-tuned system of capabilities for producing precise and reliable mechanical watches in all price ranges. But it is the inevitable corollary of having capabilities well adapted for one purpose that those capabilities are not well adapted to other purposes. As a result, as Schumpeter remarks, "new combinations are, as a rule, embodied, as it were, in new firms which generally do not arise out of the old ones but start producing beside them; ... in general it is not the owner of stage-coaches who builds railways" (Schumpeter 1934, p. 66). In this case, it was firms — in America and, especially, Japan — with relevant capabilities in electronics and electromechanical assembly that took up the banner of quartz. Initially, at least, the Swiss played down the threat, which, like most such threats, was far clearer in retrospect than in prospect. When the pressure began to mount, the Swiss industry responded with a burst of improvement in the productivity of mechanical watchmaking. "That," notes Landes, "is a universal characteristic of once-dominant technologies: they make some of their greatest improvements under sentence of obsolescence; the finest days of the sailing ship came after the advent of steam" (Landes 1983, p. 351). But these improvements were too little too late. With quartz technology, firms like Citizen and Seiko could make watches that were just as cheap — and far more accurate.

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13 On which see Langlois and Robertson (1995), chapter 6.

Although the decentralized character of the Swiss industry and its reliance on Marshallian external economies may have been sufficient cause for some inertia in the face of competence-destroying change (Glasmeier 1991), the rigid cartel structure must also take a good part of the blame for the extent of that inertia (Maurer 1985). By restricting imports and exports, and by tightly controlling what and how much could be produced, the cartel stifled incentives for innovation and closed off the once-porous structure from new ideas. "The result," as Enright notes, "is that the industry had neither the efficiency of a vibrant decentralized structure, nor the coordination advantages of hierarchy" (Enright 1995, p. 133). Swiss watch exports fell from a peak of 84 million units in 1974 to 51 million in 1980; in that year, Japanese exports, which had been less than 19 million units in 1974, surged past at 68 million units (Landes 1983, pp. 388-389). At the same time, employment in the Swiss watch industry fell almost by half, and the number of Swiss watch-making establishments declined by more than half (Landes 1983, p. 353; Enright 1995, p. 133).

The story does not end here, however. In the early 1980s, when the industry had hit rock bottom, a major, and perhaps even startling, reorganization took place. By that time, the equity of the major family firms — the "watch barons" — had declined to the point that they could not or would not oppose change; and the banks, which had written off hundreds of millions of francs, wanted out (Enright 1995, pp. 133-4). In 1981, the banks engaged Nicolas Hayek, an engineer and management consultant, to find a solution to the industry's problems (Taylor 1993, p. 99; Zehnder 1994, p. 4). His proposal was to consolidate and radically restructure the industry. At Hayek's suggestion, the banks, with the help of the confederation and cantonal governments, engineered in 1983 the merger of ASUAG with SSIH, another major holding company that

had been founded in the 'thirties. The new company was called the Société suisse de microélectronique et d'horlogerie (SMH). The banks toyed with the idea of selling Omega, one of SMH's major brands, to the Japanese, who had offered a considerable sum. Hayek argued against the move, and insisted that the reorganized firm could not only become successful but actually produce a full range of watches competitively from a manufacturing base in Switzerland. The banks insisted in turn that Hayek put his money where his mouth was, which he and a consortium of backers promptly did. SMH is owned 51 per cent by Hayek's group, and the banks no longer have an important interest. (Taylor 1993; Zehnder 1994).

Once in charge, Hayek set about reorganizing the firm, which now comprised a significant fraction of the Swiss industry.[14] He centralized manufacturing into a division called ETA, and marshaled existing and developed new capabilities in microelectronics, notably in the specialized 1.5 volt integrated circuits used in watches. He also reorganized and decentralized marketing according to brand, giving each a separate identity and "message." But the most visible result of the strategy was the creation of the low-end Swatch brand, which married creative marketing with high-tech fabrication. A design shop in Milan generates as many as 500 models a year. The 70 of these chosen for production are turned out at the rate of one every 67 seconds, some 35,000 a day (Taylor 1993, p. 104; Zehnder 1994, p. 8). By 1991, more than 100 million Swatches had been sold (Enright 1995, p. 135).

The result of this reorganization was a startling turn-around, transforming a 1983 loss of $124 million on $1.1 billion in revenues into a 1993

[14] In 1991, SMH was the largest watch company in the world, controlling some third of the Swiss watch industry by sales and a quarter of its employment (Enright 1995, p. 135).

profit of $286 million on $2.1 billion in revenues (Taylor 1993, p. 99). In 1992, SMH held 10 per cent of the world market (Zehnder 1994, p. 3).

Plausible personal capitalism.

What can this story teach us about entrepreneurship and rationalization? There is certainly much of the story that has a familiar Chandlerian ring. From the first *établisseurs* to mechanized production in a Marshallian industrial district, business was a personal and family activity. Beginning with trustification and cartelization in the 1920s, however, this began to change, and the industry set off — perhaps too slowly — on a path of rationalization that led ultimately to a fully articulated and vertically integrated modern corporation. As Enright puts it in describing the emergence of SMH, "[c]oordination through much of the Swiss watch industry had passed from markets, to cartels, to modern corporate management" (Enright 1995, p. 137). This sequence is indeed in keeping with the general pattern Chandler observed in large segments of American industry.

> Nearly all enterprises that grew by merger followed the same path. They had their beginnings as trade associations that managed cartels formed by many small manufacturing enterprises. The federations then consolidated legally into a single enterprise, taking the form of a trust or a holding company. Administrative centralization followed legal consolidation. The governing board of the merger rationalized the manufacturing facilities of the constituent companies and administered the enlarged plants from a single central office. The final step was to integrate forward into marketing and backward into purchasing and the control of raw or semifinished materials. By the time it completed the last move, the

> consolidated enterprise was employing a set of lower, middle, and top managers to administer, monitor, coordinate, and plan for the activities of its many operating units and for the enterprise as a whole. By then the visible hand of management replaced the invisible hand of market forces in coordinating the flow from the suppliers of raw materials to the ultimate consumer. (Chandler 1977, p. 315.)

In this account, the rise of SMH represents the final act in a familiar Chandlerian drama.

One interpretation, then, would run along the following lines. The history of the Swiss watchmaking industry reflects precisely the sort of "progressive rationalization" Schumpeter described. The early history of the industry tells of Schumpeterian "early" capitalism, in which individual entrepreneurs provided the impetus for growth. The Chandlerian sequence, however, tracks an eventual transformation to Schumpeterian "later" capitalism, in which the collective enterprise takes preeminence over the personal element.

As the reader may suspect, I consider such an interpretation not merely wrong but close to backwards. Having taken Schumpeter back to his Weberian roots, we are in a position to see why.

Despite their similar Weberian influences, the Schumpeterian story of the obsolescence of the entrepreneur is not identical to the Chandlerian account of the rise of the visible hand. In Chandler, as in Weber, the emphasis is not on the innovative character of the large bureaucratic organization but on its ability to deliver the goods. The managers "administer, monitor, coordinate, and plan." They do not carry out new combinations. For Chandler, economic growth is

underpinned by an imperative to high-volume throughput; the personal element in organization stands in the way of fully realizing this imperative, for which an abstract and professional structure is required.

As we saw, however, Schumpeter's claims are much different. He associates "personal" capitalism with charismatic leadership. It is the entrepreneur who makes dramatic, and often creatively destructive, changes. In Schumpeter, those who come along and fill in the details are important, but it is the changes that really matter. The obsolescence thesis is a claim not that large, fully articulated enterprises may be necessary to realize the vision of an individual entrepreneur; rather, it is a claim that those enterprises will be the sources of change. Let us put it succinctly. In Chandler, large organizations are the result of economic change; in Schumpeterian later capitalism, economic change is the result of large organizations.

My contention is that, whereas the story of Swiss watchmaking may (with some reservations to be noted) fit the Chandlerian pattern, it does not at all fit the Schumpeterian one. To put it another way, the transformation of the Swiss watch industry in the 1980s is precisely a story of charismatic individual entrepreneurship.

The first, and most obvious, point is that it was an outside individual, not an organization, who was responsible for the reorganization of the industry. Lazonick is right in saying that genuine innovation involves reorganizing or planning (which may not be the same thing) the horizontal and vertical division of labor.[15] But it was not in this case "organizational capabilities" that brought the reorganization about. It was an individual and not at all a "collective" vision, one that, however carefully thought out, was a cognitive leap beyond the

[15] On the notion of "planning" within the firm, see Langlois (1995).

existing paradigm. If SMH now possesses organizational capabilities, as it surely does, those capabilities were the result, not the cause, of the innovation.

Moreover, the formation and organization of SMH reflects many more elements of genuinely personal capitalism than the Chandlerian account would suggest. First of all, Hayek is the owner, not a manager. "I put my money on the line," says Hayek, "along with money from our investors. The fact that our group controls a majority of the equity means we could make decisions that other people were scared to make" (Taylor 1993, p. 110). But the enterprise is personal in other ways as well. Even discounting the usual rhetoric of entrepreneurship, Hayek is clearly charismatic in the ordinary sense of the term — the *Harvard Business Review* (Taylor 1993, p. 99) called him "a genuine business celebrity" — and probably in the Weberian sense as well. Consider Hayek's own words.

> It is extremely important to lead by example, while at the same time provide young managers with human and emotional support. You can only really motivate and reward someone by showing that you really are his or her friend. You have to establish an emotional connection. You have to show your employees that you really care for them and that they can count on you. When somebody is in difficulties, I don't fire him or her, on the contrary I immediately jump at his or her side, provide support, and push him or her to do better. In that sense, I am a leader, one whose leadership extends beyond the usual. (Zehnder 1994, p. 9.)

The visible hand of management here seems to be relying on "an emotional form of communal relationship" (Weber 1947, p. 360).

But is not SMH, however created, now a vertically integrated bureaucratic organization along Chandlerian lines, and is that not the source of its superiority over the Marshallian industrial district it replaced? As I have argued elsewhere (Langlois 1992; Langlois and Robertson 1995, chapter 3), the benefit of centralization lies in the ability to bring about change, not in the ability to administer existing structures.[16] A centralized structure may remain centralized for reasons of path dependency or even of static transaction costs of the familiar sort. But, very often, an imperative of decentralization soon becomes clear even within the centralized organization once it has become well established. This is certainly true of SMH, which has 211 profit centers.[17] "Organizational structure," in Hayek's view,

> is the most inhuman thing ever invented. It goes against our nature as people. So we have clear boundaries and targets. Our brands work independently of one another. The people at Omega and Rado and Tissot have their own buildings. They have their own managements. They are responsible for their own design, marketing, communications and distribution. They are emotionally connected to their brands, not just to SHM as an entity.

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16 Since Weber, there has developed a good deal more skepticism about the efficacy of bureaucracy even to administer existing structures. For example, Coleman (1990) criticizes Weber for conflating the idea of bureaucracy as an impersonal hierarchy of positions with the idea that bureaucracy is always the most efficient structure for allocating resources. Drawing on the modern literature of agency theory, he points out that positions can often be used to attain personal goals rather than the functional goals of the organization. (Remember the case of Waltham Watch Company.)

17 Moreover, even as highly integrated a structure as SMH remains imbedded in the market. And some of the success of Swatch is arguably attributable to external capabilities in the region, notably injection-molding (for the plastic case) and automated assembly technology that was unique to Switzerland (Taylor 1993, p. 107). Indeed, the Jura remains a Marshallian industrial district today, one that has diversified beyond watchmaking into microtechnologies more generally (Maillat, *et al.* 1995).

> I want people at Rado to love Rado. And I want people at Longines to love their brand. (Taylor 1993, p. 110.)

In fact, much of the integration at SMH is what Chandler would call "defensive," that is, ownership integration[18] aimed at controlling portions of the production process in a world in which there are only two other producers of movements, Seiko and Citizen (Taylor 1993, p. 109).

But does this case prove that entrepreneurship must always arise from *outside* the firm, or that organizations cannot be sources of innovation? Surely no one case can be decisive. But this story reinforces what is arguably the theoretical conclusion both of organizational sociology and of management theory.

In a very insightful gloss on Weber, the late sociologist James Coleman (1990) suggested that charisma of the sort Nicolas Hayek wields may actually be thought of as a "rational" form of authority, one that is especially important in times of crisis and radical change.[19] In his well-known study of bureaucracy, Michel Crozier also stresses the importance of crisis for organizational change. For Crozier,

> change in a bureaucratic organization must come from the top down and must be universalistic, i.e., encompass the whole organization *en bloc*. Change will not come gradually on a piecemeal basis. It will wait until a serious question pertaining to

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[18] As distinct from genuine coordination integration. On this terminology see Langlois and Robertson (1995), chapters 2 and 7.

[19] Similarly, Peter Temin (1980) makes a tripartite distinction — among rational, traditional, and command behavior — that is similar to that of Weber. Temin argues that people will behave according to different modes in different times and places. My argument is that entrepreneurship is an instance of command behavior, which is effective in times of radical economic change or opportunity.

> an important dysfunction can be raised. Then it will be argued about and decided upon at the higher level and applied to the whole organization, even to the areas where dysfunctions are not seriously felt. ... Crises are important in another way. They exemplify other patterns of action, other types of group relationships — temporary, but of decisive importance. During crises, individual initiative prevails and people eventually come to depend on some strategic individual's arbitrary whim. (Crozier 1964, p. 196.)

In other words, bureaucracies always respond to crisis with what is in effect a temporary departure from the following of rules and a return to an arbitrary type of authority.[20] Thus, even to the extent that (more or less) radical change does take place within an articulated Weberian bureaucracy, it does so by emulating the cognitive and authority structure of Schumpeterian entrepreneurship.[21]

We find a similar story in the management literature. Consider, for example, the writings of Hamel and Prahalad (1994), who are not only among the more influential gurus of the times but also among the strongest proponents of an organizational-capabilities view of management. As students of management and corporate consultants, of course, they are primarily interested in the question of how to make firms innovative rather than the question of whether innovation does or should take place within the bounds of firms. So

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[20] Such authority is "personal" in the sense that it reflects the will of an individual at the top of the hierarchy, even if, in Crozier's account, it is not personal in the sense of being face-to-face or strictly charismatic in Weber's meaning.

[21] And, as Joseph Berliner (1976) points out in his study of Soviet industry, a bureaucracy that makes individual initiative impossible makes innovation impossible.

they are in quest of the innovative organization. And surely organizations can be innovative at some level. Even in Nelson and Winter (1982), for example, firms may be bound by routines, but some of those routines can be "higher level" ones that govern the search for new lower-level routines. Nonetheless, innovativeness requires more than mechanistically searching for new routines. In Hamel and Prahalad, it essentially involves forcing the firm to take on more of the characteristics of a market: it must develop the kind of genetic diversity Friedrich Hayek praised. "In nature," they write, "genetic variety comes from unexpected mutations. The corporate corollary is skunk works, intrapreneurship, spinoffs, and other forms of bottom-up innovation" (Hamel and Prahalad 1994, p. 61).

In the end, however, they, like Crozier, realize that the most radical kind of change must come from the top down: it requires a Schumpeterian entrepreneurial vision. "Top management cannot abdicate its responsibility for developing, articulating, and sharing a point of view about the future. What is needed are not just skunk works and intrapreneurs, but senior managers who can escape the orthodoxies of the corporation's current 'concept of self'" (Hamel and Prahalad 1994, p. 87). Example? Nicolas Hayek's "crazy" vision that the Swiss could manufacture cheap watches competitively with the Japanese (pp. 98-99).

Economist, of course, must take a slightly different perspective, as they must remain open to the possibility that change might take place not within an already-existing organization but rather in new firms, groups of firms, or "markets" broadly understood.[22] And there is no reason to think that all

[22] These various alternatives are what Langlois and Robertson (1995) refer to as business institutions.

innovation must come from "re-engineering" existing organizations, even if some surely does.

Indeed, one might argue that, the farther an innovation is from the ken of existing firms, the more likely it is that the innovation will be instantiated in new organizations. We can think about this in the imagery of the economics of rugged landscapes[23] (Levinthal 1992). If we think of innovative opportunities as "peaks" in some suitably defined space, then we might expect those who inhabit known peaks to be able perhaps to discover nearby opportunities through relatively myopic search. But "peaks" that are far away — radical innovations — are likely to be discovered and exploited by quite different individuals and organizations.

Whether Schumpeterian entrepreneurship operates from the top of an existing organization or in the creation of new ones, the same conclusion seems unavoidable. The charismatic authority and coherent vision of such entrepreneurship remains an inevitable part of capitalism, however modern. For reasons that have to do with the nature of cognition and with the structure of knowledge in organized society, some essential part of capitalism must always remain personal.

[23] I am indebted to Massimo Egidi for this idea.

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