ECONOMIC CONTROVERSIES

CONFRONTING MANAGERIALISM

HOW THE BUSINESS ELITE AND THEIR SCHOOLS THREW OUR LIVES OUT OF BALANCE

ROBERT R. LOCKE & J.-C. SPENDER

Zed Books is an independent progressive publisher with a reputation for cutting-edge international publishing. Innovative and thought-provoking, the **Economic Controversies** series strips back the often impenetrable façade of economic jargon to present bold new ways of looking at pressing issues, while explaining the hidden mechanics behind them. Concise and accessible, the books bring a fresh, unorthodox approach to a variety of controversial subjects.

Series editor Edward Fullbrook is the founder and editor of the *Real World Economics Review* (formerly the *Post-Autistic Economics Review*), which has over 11,500 subscribers. He has edited a number of books on economics, including *Pluralist Economics* (2008) and *A Guide to What's Wrong with Economics* (2004), and his essays on economics and philosophy have appeared in numerous anthologies and journals.

Already published in the Economic Controversies series:

Yanis Varoufakis, *The Global Minotaur: America, the True Origins of the Financial Crisis and the Future of the World Economy*

About the authors

Robert R. Locke is Emeritus Professor at the University of Hawaii at Manoa. He is one of the leading international authorities on the contentious subject of management, and the author of numerous books and articles on comparative management and management education.

J.-C. Spender is Visiting Professor at Lund University's School of Economics and Management and at ESADE (Universitat Ramon Llull). Now retired after seven years as a business school dean, he works as a consultant, researcher, writer, lecturer, and generally itinerant academic.

Confronting Managerialism

How the Business Elite and Their Schools Threw Our Lives Out of Balance

Robert R. Locke and J.-C. Spender

Zed Books
London & New York

Confronting Managerialism: How the Business Elite and Their Schools Threw Our Lives Out of Balance was first published in 2011
by Zed Books Ltd, 7 Cynthia Street, London N1 9JF, UK and
Room 400, 175 Fifth Avenue, New York, NY 10010, USA

www.zedbooks.co.uk

Typeset in Bulmer MT
by Bookcraft Ltd, Stroud, Gloucestershire

Index by Rohan Bolton,
Rohan.Indexing@gmail.com

Cover designed by www.alice-marwick.co.uk

Distributed in the USA exclusively by Palgrave Macmillan, a division of St Martin's Press, LLC, 175 Fifth Avenue, New York, NY 10010, USA

A catalogue record for this book is available from the British Library
Library of Congress Cataloging in Publication Data available

ISBN 978 1 78032 073 1 eb

To the many victims of managerialism

"The owl of Minerva takes flight at dusk."
– *G. F. W. Hegel*

Contents

Tables and figure

Tables

Figure

Acknowledgments

We would like to thank Edward Fullbrook, general editor of the Zed Books series Economic Controversies, for rousing us from our dogmatic slumbers with a request to write this short book on managerialism and business schools. We acknowledge, too, our debt to the following colleagues for their splendid help in the preparation of the text and the manuscript: Kenneth A. Locke, Chair of the Department of Religious Studies, University of the West, for material about Christianity; David A. Carter, Associate Professor of Finance, Oklahoma State University, Stillwater, for information on finance; and Vanessa Karam, of University of the West, and Idus A. Newby, of Cochran, Georgia, for their prompt and skillful editing of the manuscript. The final result, of course, is solely our responsibility.

RRL
JCS

Preface

As historians, we are keenly aware that our focus is on the thoughts and actions of the three generations who lived through the period covered in this study – from the Great Depression of the 1930s to the present. But we also know that "dumb" facts do not speak for themselves, and that to give them a voice we need a narrative line. Ours can be identified from the components of our title, and it is simple. Today the people of the USA, indeed the world, live in difficult times, and to a significant extent American managerialism and US business schools have exacerbated these difficulties. Their ideas and actions shape the US and world economies and thus many lives.

Notice our title deals with managerialism, not management. Management is a big topic that cannot be properly treated here. Our focus is narrower, on managerialism. Although by the middle of the twentieth century the American idea of management had been more or less subsumed by managerialism, management and managerialism are not coextensive. While management can be defined as getting things done in organizations through people, managerialism means that in businesses, managers have come to view themselves as a professional caste.

The distinction between managing and managerialism allows us to criticize managerialism without denigrating the critically important function of management.

Managerialism is defined as follows:

> What occurs when a special group, called management, ensconces itself systemically in an organization and deprives owners and employees of their decision-making power (including the distribution of emoluments) – and justifies that takeover on the grounds of the managing group's education and exclusive possession of the codified bodies of knowledge and know-how necessary to the efficient running of the organization. (Locke, 2009, 28)

The managerialist caste arose in the mid-twentieth century as the post–World War Two economy boomed. Its public face was the reputation for commercial brilliance the boom implied. Yet the connection is far from obvious; many other causes can be cited. So, far from presuming the changes in management technique and attitude were beneficial, our book examines the damaging impacts this caste and its practices had in other ways, for instance, on people's ability to make sense of their existence in a globalized society and economy as the twentieth century drew to a close. Without wishing to evoke a previous "golden age," our narrative line moves from managing in a place where life was relatively in balance to one in which, in part because of the effect of managerialism, life spun progressively out of balance. The expression is taken from the Hopi word *Koyaanisquatsi*, which means "crazy life, life in turmoil, life out of balance, life disintegrating, a state of life that calls for another way of living." Or, for those with religious inclinations, an existence without God's grace; or, for humanists, one devoid of humanity in people's daily lives.

With the history of managerialism as one theme, our book's companion topic is business school education. Managers get

their education in a variety of ways today, usually on the job. Increasingly, however, the selection and training of managers has become the focus of business-school-based education. Thus we critique the US elite business schools whose growth in the twentieth century has been associated with the rise of managerialism (Locke 1984, 1989, 1996, 2000, 2009; Spender 2005, 2007, 2008a, 2008b, 2008c). The elite schools' influence over the lesser-ranked schools around the world is huge, especially when it comes to the content of their programs and the ethos their programs inculcate. The management education industry is now vast and global, but almost all of it marches to these elite schools' drummers. Harvard Business School, which opened in 1908, has just celebrated its centennial while the Wharton School, arguably the first modern US business school, dates to 1881 (Engwall and Zamagni, 1998; Sass, 1982). Many other business schools – Chicago, Dartmouth, Columbia, University of Texas, etc. – trace their origins to the first quarter of the twentieth century. However, business school growth really exploded after World War Two with the proliferation of Master of Business Administration (MBA) programs driven, in part, by the GI Bill's support for the broad expansion of higher education and in part by the needs of a dynamic economy. The schools' growth has continued, even as the US economy has faltered from time to time. Business studies now preoccupy one of every five US college students. Eventually US business education, along with US systems of corporate governance and finance, became major export items.

While concerned with the form and content of business school education, our book is not a further addition to the expanding literature charging business schools with failing to deliver against their original promise (Khurana, 2007). We are preoccupied, rather, with how that promise never meshed well with the US's – and the wider world's – management needs, and instead helped progressively to spin our lives out of balance. Management is a

practice; hence, business studies, like other practitioner disciplines, must stand on intimate acquaintance with the context of the practice it purports to teach. The subtleties of the interactions between theorists and experimenters in the natural sciences show that this intimacy does not necessarily mean that business theorists have to engage in business themselves. But they do need to remain attached to the world of business practice and resist the temptation – one that goes back to the ancient interplay of Platonic and Aristotelian approaches to the world – to invent an abstract world that they find more attractive, for reasons that are largely methodological, than the real one. Those who take up intellectual residence in such an invented abstract world precipitate multiple failures: in the business community, among students looking to enter that community, and by encouraging the moral failure of the community itself.

Our intent is to show how the methodologies introduced into business school education combined with managerialism to foster today's world out of balance. To expose this, our book explores two themes. First, how the balance was disturbed by the obsessive preoccupation with numbers that followed the development of the "new paradigm" in business school curricula after World War Two (Locke, 1989). For people in that immediate postwar generation, numbers implied objectivity and accuracy. They were led to think, erroneously, that decisions based on numbers would be independent of the observer or of mere opinion. They also thought management could decide rationally and aspire to omniscience. But for most practicing managers not all the variables that affect their decisions and outcomes can be modeled mathematically. At the point where outcomes cannot be modeled, where numbers no longer suffice and the managers' rationality is evidently bounded, there human agency or judgment enters in to counterbalance the messages the numbers convey.

The Enlightenment philosopher John Locke called the point where people could not rely on a numbers-driven logical conclusion the moment of subjective judgment; others speak of the use of imagination, meaning that point in the analysis and evaluation where the agent's mind, for lack of a determining relationship between cause and effect, intervenes to supply her/his "subjective" solution. Those obsessed with the primacy of numbers find it difficult to accept the proposition that nonquantifiable variables have to be considered. How many times have we heard repeated Lord Kelvin's quip "if you cannot measure it, you cannot improve it"? René Descartes so disliked nonquantifiable variables that he excluded them as illusionary, as did the postwar business school curriculum reformers in the Ford Foundation program (Khurana, 2007, 233–88). Winston S. Churchill, who fully appreciated the importance numbers have for policy makers, differed; he grasped the deep significance of "soft" variables when managing events in the sphere of human action and interaction. Which is why he, as one of the twentieth century's great rhetoricians, devoted around forty minutes of thought, preparation and rehearsal to every minute of his speeches, and why those speeches were so memorable and world shaping. Men of great historical importance from Pericles to Abraham Lincoln to Charles de Gaulle have always appreciated the power of rhetoric to reach beyond "numbers alone" to bring forth and shape the agency of others. Rhetoric, as a practice of analyzing and inducing social action, goes back at least to Isocrates (436–338 BC) who felt that the distinctive aspect of Man is that he can "both persuade and be persuaded." Since in this book we argue that much of management is about numbers failing, we also argue it is more about persuasion and the shaping of others' agency than business education currently admits – and is correspondingly less about the numbers that are so clearly considered determining by so many influential business educators.

The point is that human agency counterbalances the seeming objectivity of numbers or rather comes into play where numbers leave off or fail. Quantification is generally important but seldom all-important, and sometimes it is not important at all. This also means that agents/managers must understand the limits to their agency, know where and when the numbers are determining, as well as when they are not. The French general staff, for instance, made this miscalculation in 1914. They imbibed Colonel Grandmaison's doctrine that the general who loses the battle is "the one whose will cracks first." Engaging the German army's superior firepower made this doctrine disastrous; their guns mowed French troops down – even while generals who refused to consider stopping the carnage for fear of being seen to "crack" urged them on. The irony is that the real value of training in the use of numbers springs not from denying the relevance of management's judgment, but from those managers who, being responsible anyway, fully appreciate the limitations of numbers. Those who do not know them and use numbers blindly make huge mistakes – as we might have learned from linking wartime strategic decisions to "body counts."

Unlike mathematical modeling, which rests on ostensibly universal principles, the agency analytical synthesis is always specific to a unique situation, never generalized or stored as manager-independent heuristics or Standard Operating Procedures. Agency is also profoundly morally burdened since it is not just an idea. It leads on to actions that affect others and the world. Many business entrepreneurs understood this in the past because a different culture prevailed. Business literature of the nineteenth century, even after the advent of the "robber barons," often refers to the businessman's "social duty" and the need to seek a moral balance between social and private benefit. But today, along with fetishing quantification in the business school curricula, students are trained to forget "soft" issues in

the most self-destructive ideological switch that could be imagined: a switch to an ideology that has little to do with politics or religion but bears directly on how we think about management. Real business, as opposed to the models imagined and propagated by, say, University of Chicago economists, is about everything except what can be measured. Ultimately the value of measuring and modeling lies in how it helps the entrepreneurial manager focus her/his imagination on what remains: the area of uncertainty or "knowledge absence" into which entrepreneurial agency must be projected.

All significant, efficacious educational reform ultimately has significant effects on national leadership. All great reformers want their nation's elite schools to awaken a sense of national responsibility in their students. Napoleon radically reformed the École Polytechnique to enable it to train a knowledgeable and responsible elite to run his army and empire. In 1946, Charles de Gaulle set up the École Nationale d'Administration (ENA) because he believed the leadership cadres had signally failed the nation under the Third Republic. West Point, founded in 1802 and modeled on France's École Polytechnique, cultivated a culture of military and civil service; it was also the incubator of the engineer-managers who carried through many of the great civil engineering projects that served the US national interest so well during the nineteenth century.

Many people understood, moreover, that a culture of service could not be cultivated successfully in a West Point, or an École Polytechnique, or a business school merely through lectures on ethics and morality or by mindless repetition of slogans like "honor, service, and country." Knowledge about leadership is wrought at the operational business coalface or the platoon level in the military. Officer training begins with the development of interaction and trust between officer aspirants and fellow soldiers. The goal is to develop the realization that even if you do

not like these guys, they are the people without whose complete confidence and unconditional full support you will certainly fail and may die. People learning this in the everyday life of the unit also learn something fundamental about themselves and their limitations. They realize that people who know nothing of their limitations do not know anything useful. The experience of being a member of something beyond the self, a certain result of being together under fire, creates a special relationship with those who shared the experience that has no match in any other sphere of life. Business leadership requires similar self-knowledge, though its circumstances are very different. Tough projects, undertaken against considerable odds and under high pressure, lead people to surprise themselves about who they are, what they can do, and how much they depend on others with complementary attitudes and capabilities.

Fully committed interpersonal association cannot be learned by an isolated student in an elite institution; it is always realized in an operational collaborative context – sociological, political, technological, geographical, historical, and so on. The military theorist Carl von Clausewitz believed military education could and should deliver this kind of knowledge, and it was implemented well in the integrated training regimes of the German officer corps between the world wars (Lewis, 1985). In contrast, the American army's policy of slotting individuals into vacant skill positions as if they were replacement parts had negative effects on unit cohesion and combat effectiveness. In this book the process of workplace association is discussed in depth because of its contribution to good management in German and Japanese manufacturing organizational cultures. In contrast, US managerialism and business school education interrupted the natural processes of association and collaboration under pressure, thereby contributing to the poorer performance of American business after the 1970s.

In earlier years US business school educators engaged the moral dimensions of managing in their technological and social educational programs. But post-World War Two reforms in the structure and content of business schools refocused student attention more narrowly and almost exclusively on the numbers, in fact, effectively banishing both soft variables and ethics from the professors' purview. Just as significant – and there is irony here – was the determination of Hayek and his generation of neoliberal economists to fight fascism by denying the theoretical possibility of fully rational centralized government. By appealing to market forces and individualism instead, these economists set themselves adrift from the very concept of community. In doing so, they pushed the "market ideology" that invaded business schools just at the time when the gap between rich and poor in the US began to increase at an accelerating pace. They brushed aside the idea that government and business leadership had complementary rather than competitive roles to play in a society in which markets function successfully.

This was a moment of profound failure of academic leadership, for the objective market forces to which these neoliberal economists appealed were not of this world. No one leading a school of general medicine will stop students from learning the practice of surgery simply because cutting the human body cannot be reduced to rigorous theory. Practical education calls for a fruitful balance of theoretical instruction and carefully guided practical experience, just as German engineering studies successfully developed and implemented *Technik* – the blending of scientific theory with workshop knowhow that is the traditional German definition of useful engineering. That US business schools failed – in part through greed, in part through the genuine difficulty of it – to develop a satisfactory way to balance abstract theorizing with a practical sense of community service and engagement is a sign of this leadership collapse. The

US business schools have generally ignored the many years of experimentation in practical and professional education – in Germany, the UK, and elsewhere – even as the latter offer good evidence of the benefits of educational balance for the former to study and, perhaps, emulate. We live with the consequences.

At the same time managerialism has led to further leadership failures. As so often in a democracy, people get what they ask for. Business recruiters have been content to let Yale, Harvard, Stanford, and the other business schools select students for them, reducing the business schools' role to one of facilitating the ambitious student's self-selection and caste membership preparation, while diminishing and maybe abandoning their educational role. In particular, business schools have been able to get away with not doing precisely what West Point and the École Polytechnique were expected to do – cultivate a culture of professional and public service. Rather, they have become penetrated by business leaders' greed, which trickles down as the students' evident sense of entitlement, limitless hubris, and general disregard for social norms that might stand in the way of their personal success. The business schools' renunciation of their moral and political responsibilities to society as they train those entering the management caste, and that caste's disinclination to have the business schools assume those responsibilities, have contributed directly to sending our lives out of balance in these difficult times.

INTRODUCTION

Managerialism and business school education, 1920–1970

Management is an integral part of the post-Enlightenment democratic capitalism that spins around individualism and inter-individual relations, particularly those relations fundamental to economic activity. In the eighteenth-century Enlightenment, people began to see human progress and economic activity as related – perhaps ideally identical if we could ever get the dimensions and metrics right and see the world's uncertainty as the source of, or rather the source of the *possibility* of, human-induced growth. Growth and innovation can never be "determined" for that implies a closed system. Rather, growth is a consequence of our human ability to pull something from the realm of the unknown into the present.

Some possibilities are not present in Nature but are aspects of "things" we create, which reminds us of Giambattista Vico's notion that the "social sciences" may not be sciences at all in the sense we mean when we say "natural science" (Vico, 2000). Nature makes the things natural science theorizes. Human beings make the things social sciences theorize. The unknown

from which socio-economic "things" – especially economic growth – are pulled is not one that Nature has created but the locus of human imagination, energy and action. While one can imagine all growth being the result of a specific individual's activity, a James Watt or a Henry Ford, society as we know it is "man-made," the consequence of collaboration that produces what we see as growth, the result of harnessing others' capabilities to managers' purposes. Collaboration is a hallmark of human activity, so "managing" it is a fundamental human capability without which we would have no society. Management today presupposes the agentic capacity and energy of free people. This has always been at the core of democratic capitalism, the source of its still, at times, astonishing vitality – right up to the present in places like Silicon Valley (Locke and Schöne, 2004, 16–50).

Managerialism differs; it is a phenomenon associated with membership in a specific group of managers that share specific attributes – a caste. It does not reflect the culture of democratic capitalism with its commitment to collaboration; rather the caste desires to stand apart from society, to become less social and more predatory; to see both markets and businesses as opportunities to plunder, whatever the consequences; to take unforgiving advantage of the errors, misfortunes, and circumstances of others, no matter how they arose. Managerialism has done America great harm. No aspect of that harm is more pernicious than the role business schools have played in reinforcing the caste's sense of itself and the legitimacy of its predatory instincts done in the name of good management.

Managerialism first appeared during the transformation of American organizational culture in the late nineteenth century, partially from changes in workshop routine. Explaining this change, one observer noted that around 1900:

> The skill and knowledge of Europeans … was the equal and sometimes the superior of that of Americans. The difference was in how this technical knowledge and skill was used. The European manufacturer used it to make a product. The American manufacturer used it to make a process for making a product. A high-class machinist in Europe [made] the product his company produced, his American counterpart … set up a semiautomatic machine for less skilled labor to operate and to make this product, or he … engaged in making the semiautomatic machine … to make a product. The literature of the time frequently mentioned that American machines and tools were superior to the European. This, however, reflect(ed) not a difference in abilities as much as a difference in the thinking of European and American management. One appreciated the importance of and understood how to obtain the advantage from machinery, the other did not. (Litterer, 1961, 467)

To seize the advantage a new class of shopfloor managers came into existence between the worker and the owner in enterprise; these shopfloor managers developed a cluster of general factory management skills eventually codified as "scientific management," which appeared in the US soon after the turn of the twentieth century. Frederick Winslow Taylor, the most prominent person in the movement, described many of the techniques in important papers on *Shop Management* (1903) and *The Principles of Scientific Management* (1911). These techniques included time-and-motion studies that managers conducted to teach workers job efficiency, which meant among other things that managers not workers controlled skill acquisition and deployment. Taylor and other members of the scientific management community also developed a myriad of management accounting techniques (standard costing, marginal costing, budgeting, etc.) that firms implemented in the new costing departments established by managers in the pursuit of efficiency.

A second transformation led to new administrative structures, necessary to run the burgeoning corporations then changing the industrial and business landscape of the USA (Chandler and Redlich, 1961; John, 1997). Chandler and Redlich have observed the administrative problems associated with huge multifunctional firms that had fomented a managerial revolution in their administration by the early 1900s. With thousands of administrators and tens of thousands of employees, these firms threatened to become ungovernable as top managers became more and more distanced from workers and everyday operations. The resultant change separated managers involved in strategic decision-making from managers preoccupied with daily operations. Chandler and Redlich wrote

> The centralized coordination, evaluation, and planning for the diverse activities of a large number of sub-units which often carried out several different functions of production, distribution, and transportation within a single, purely private enterprise, was something new in economic history. Such needs brought the managerial enterprise into being. The new enterprise could not run efficiently without formal internal organizations. They required the generation of internal operating, financial and cost data. Only through a flow of internal impersonal statistics could control of these large enterprises be maintained. (Chandler and Redlich, 1961, 5)

In these new multidivisional (or M-form) corporations, the higher- and lower-level staffs, organized on functional bases, utilized standard cost and budgetary methods to run an increasingly complicated enterprise. The American managerial revolution, then, consisted of two interrelated aspects: it created (1) the organizational structure of the modern corporation and (2) the managerial instruments the organization used.

The resultant division of labor between top corporate management and sub-units also changed management goals.

Engineers on the shop floors and in the manufacturing divisions of M-form corporations made artifacts. Top management, in which controllers trained in accounting increasingly replaced the engineers, thought about money, that is, about constantly improving return-on-investment. Money is particularly susceptible to management thinking based on general principles. As John Quiggin remarked,

> The belief [is] that organizations have more similarities than differences, and thus the performance of all organizations can be optimized by the application of generic management skills and theory. To a practitioner of managerialism, there is little difference in the skills required to run a college, an advertising agency or an oil rig. (Quiggin, 2003, 1)

The controller (today the Chief Financial Officer) became the board of director's indispensable man. He was generally a vice president in the company, with direct access to the chief executive. His function made him a fount of information for policy decisions of a financial, technical, and/or commercial nature. He also had an instrumental role in policy implementation once decisions were taken. American corporations began to create controllers in large numbers in the 1920s. The position became significant enough by 1929 for controllers to organize their own professional institute. These developments and their consequences soon drew public attention. In 1932 Adolf Berle and Gardiner Means, in *The Modern Corporation and Private Property*, described the role of management as a functional caste in executive circles; Simone Weil about the same time (1933) recognized that the separation of ownership from control had created a new "oppressive" class, as opposed to the older idea, derived from Marx, of the bourgeoisie as an "exploitive" class (Grey, 1996, 597); James Burnham's *The Managerial Revolution* appeared in 1937. By World War Two the management caste

constituted, to use Heinz Hartmann's words, "a fourth production factor … a strategic variable for the development of the firm" (Hartmann, 1963, 113). It has remained the management mindset in firms ever since.

J. David Edwards summarized the US mystique of managerialism:

1. The primary value is economic efficiency, or the pursuit of maximum output with minimum inputs.
2. Second is faith in the tools and techniques of management science and the ability of managers to use those techniques to resolve problems. In the extreme this faith in managers' specialized skills and knowledge may get carried over from the organizations they run to society as a whole.
3. Third, class consciousness, which serves as a unifying force among managers and which is perpetuated through a common literature and training regimen. This common consciousness places responsibility for organizational well-being squarely on the shoulders of managers and justifies to some degree the reliance on hierarchy and control inherent in bureaucratic structures.
4. Managerialism views the manager as a moral agent working to achieve the greatest good not only for their organizations, but for society as a whole. (Edwards, 1998, 5)

Business school education

While managerialism had taken root in American consciousness by 1940, no parallel change had occurred in management education. People often expect educational innovations to flow from two somewhat incompatible sources – academia and management practice. Between 1880 and 1941, however, neither sanctioned the creation of a science of management

in business schools to accompany the new managerialism. In Great Britain, institutions of higher education ignored engineering and management education during the First Industrial Revolution (1750–1850), and almost ignored it in the Second (1870–1940). Since people in praxis and in academia rejected the idea that professors could teach management, no business schools appeared in the UK until the mid 1960s.

In Germany the story was somewhat different. While practicing managers expressed little faith in management as an academic subject, academics set up institutes of commerce (*Handelshochschulen*), and university faculties of business economics throughout the empire. They developed a science of business economics (*BWL, Betriebswirtschaftslehre*) before World War Two (Locke, 1984; 2008). The professors did not, however, pretend to research and teach management. They distinguished between a *Lehre für Führung*, a preparation for managing composed of various subjects that could be useful to practicing managers (accounting, finance, etc.), and a *Lehre von Führung*, the study of management itself. While the *BWL* professors developed a *Lehre für Führung,* they rejected the idea of management as a generic function suitable for academic study.

Even though they opted to make *BWL* a *Lehre für Führung*, the professors turned their backs on praxis. At first they struggled with the issue of whether business economics was a *Kunstlehre* (vocational subject) or a *Wissenschaft* (science); by the 1930s, however, they had opted for *Wissenschaft*, no doubt primarily in order for *BWL* to be accepted in universities (whose ethos was *Wissenschaft*). Practicing German managers thought that neither *Lehre für* nor *von Führung* in academia could train people for the job. Both sides compromised uneasily. Drawing a distinction between education that made people capable of doing a job (*berufsfähig*) and training that made them ready to

do a job (*berufsfertig*), the professors decided to focus on giving students a schooling of the mind (*Denkschulung*) that enhanced their ability (*Fähigkeit*) to become *berufsfertig*. They left the training to firms and nonacademic institutions (Locke, 2008).

Between 1880 and 1940 the US business schools took up the challenge of management teaching per se as a *Lehre von Führung*, something that could be theorized with the methods of the natural sciences. This move resulted in a rapid growth in business education and in the establishment of business schools during the period. By 1950, 617 US institutions of higher education offered courses in business, mostly at the undergraduate level, with 370,000 students, nearly double the number in engineering, and 72,187 business baccalaureates graduating (Locke, 1996, 28). Although business education could not be equated with management education in all these institutions, the best US business school educators embraced the idea that they were educating a management caste or profession (Khurana, 2007).

From a curriculum perspective this claim was a fiction. American business schools did not promote progressive curricula innovation during their initial half-century. In fact the US business school syllabus of the mid twentieth century was not materially different from that of commerce schools in 1850 or even earlier, which suggests that business school growth occurred for nonacademic reasons. Various explanations have been offered. As the colleges switched strategies from their early-nineteenth-century focus on ecclesiastical matters to more secular ones, they embraced business studies, arguing loudly that it would establish management as a science. But the reasons for doing this were more likely to have been (a) to engage and serve the local business community, and thereby attract students and donations, and (b) to steal away the significant paying business education that was already being done by the many nationwide nonacademic schools of commerce.

For a long time nobody had much of an idea about what business schools should research or teach – neither the businessmen who gave money and lent their names to the new establishments, nor the professors appointed to teach in them. The subject lacked academic antecedents, so business schools up to the mid twentieth century taught traditional university subjects (geography, history, foreign languages, chemistry, physics, economics, etc.), that is, general knowledge that had little in particular to do with management, plus a cluster of commercial techniques taken from business practice – bookkeeping, merchandizing, sales, and business correspondence. This was the case even at the more established business schools. At Wharton, Steven Sass noted,

> Pioneer business professors … found most of their curricular material in the business world, not in the universities. Despite their energy and enthusiasm, their "scholarship" essentially had been an extended form of business journalism. The heavy reliance on business for teaching material offended academic sensibilities. (Sass, 1982, 268)

Sass observed of the neoclassical-oriented economists at Wharton: "As a group the schools' economists [of the interwar period] had been cool to the practical descriptive thrust of Wharton's business programs and had had little interest in the managerial arts and sciences that were taught in those parts of the school" (Sass, 1982, 268).

In 1908, at Harvard's newly founded Graduate School of Business Administration, Dean Edwin Gay introduced the case method he was familiar with from Germany – with support from the Harvard Law School, where Langdell had adopted it some years before (Kimball, 2009). Business students read and discussed résumés of hundreds of actual cases designed to give them a taste for real business problems. The method was

historical and critical rather than scientific. Indeed, the scientific method cannot be taught particularly well with cases, nor are cases very useful to researchers. The Harvard Business School (HBS), the most prestigious and influential of the US schools, did not foster the teaching of management as a positivist science.

The disequilibrium between the state of management-caste consciousness and the state of business school curricula was an incongruity. Nor would it right itself through some feedback system that looped from the early business schools into executive suites and back to the curriculum. The changes that brought about the creation of management science in business schools after World War Two came from outside. They stemmed from the cataclysmic historical events – the Great Depression, World War Two, and the Cold War – that overtook everyone. Government, stepping to the fore at these times, was more the agent of change than either business schools or businessmen. The government also helped bring many immigrants to the US, and their impact was huge. An example is the Manhattan Project, which brought people from scientific communities all over Europe to work on the US government's atomic bomb.

These events similarly disrupted the lives of the generation involved in management knowledge-creation and its transfer into business schools. An equivalent gathering of talent led to the development of a new science of management. The Cowles Commission, founded in 1932 by the Chicago businessman Alfred Cowles, which effected important contributions to mathematical economics, consisted to a large extent of immigrants. Jacob Marshak and Tjalling Koopmans, who directed the commission, were respectively Russian and Dutch. Abraham Wald, the gifted statistician who had a strong influence on the commission's work, was Rumanian by birth and partly by education (he was also educated in Vienna). Other contributors to

management science also came from abroad. Trygve Maavelmo, who studied in Oslo and worked in New York during World War Two, was Norwegian. Both Oskar Morgenstern and John von Neumann, who devised game theory (published in 1944 by Princeton University Press), were Austrians. Von Neumann also contributed to the development of computers and worked with the Cowles Commission on mathematical statistics.

But the most important change agent was war itself. The team of British scientists and engineers that worked on the 'operational use of radar information' at the British Air Ministry (at Bawdsey Manor) could hardly have guessed that their efforts to solve their operational problems would have such consequences. Their success spawned operation research groups throughout the military on both sides of the Atlantic. C. H. Waddington, who was involved in anti-submarine operations along with two Nobel Prize winners and four other fellows of the Royal Society, wrote: "Never before has science been used by responsible executive authorities for such a thorough and such an unrestricted analysis of practical affairs as it was by the Royal Air Force from 1941 onward" (cited in Locke, 1989, 25).

The reference is to science, not to scientists, for it was not just a question of intelligent men and women helping out, but rather of their deploying science's methods to solve unprecedented strategic planning, logistics, and operational problems that could not be dealt with by the methods governments and military bureaucrats had hitherto employed. Operational Research (OR) projects drew on statistical and mathematically informed techniques, such as queuing and transportation theories, that were particularly suited to maximizing efficiency in large-scale military operations (Fortun and Schweben, 1993). OR's success impressed a whole generation. It impressed Winston Churchill, in particular, who noted the "clear cut, logical, mass production style of thought" that he encountered in Americans.

After a brief respite the use of science in government-affiliated agencies expanded considerably during the Cold War (Waring, 1995; Hughes, 2002; Little, 2002). In 1946, the US Army Air Corps funded a new think tank, the Rand Corporation, to help solve operations problems. In 1947, George B. Dantzig and his Rand associates developed the simplex linear programming algorithms for decision making. The procedure utilized modern mathematics (vector algebra, matrix theory, symbolic logic) and statistical techniques in an effort to take the guesswork out of decision making. The US Air Force, for instance, used it logistically in the Berlin Airlift and during the Korean War.

British and American OR and educational traditions

The question of interest here is how this OR mathematical-modeling toolkit affected business school education. Although British Operational Research during World War Two set the example for the Americans, and British OR teams were especially active in the new nationalized industries postwar, English educational tradition hobbled the development of OR studies in higher education because of a missing utilitarianism. The first university-based course, inspired by Sir Charles Goodeve of the Operational Research Club and Professor Egon Pearson, the eminent statistician, came only in 1949, and then in typical English academic fashion as a one-time, three-month evening course, not as a regular university program. A British university did not offer another short-term OR course for five years. Nor could business schools have perked up an interest in OR studies in Britain for the simple reason that, until the late 1960s, Britain had no business schools with MBA and PhD research programs, where such a transformation could have occurred.

On the other hand, US academic institutions, always interested in utilitarian education, got involved. The Case Institute

of Technology in Cleveland started the first operations research (OR) unit at the urging of industry (with financial support from the Chesapeake and Ohio Railroad Co.) and the US Air Force (which funded research on airplane design). The institute organized a national conference in November 1951 on OR in business and industry attended by 150 people from all over the country (Page, 1952). Several other leading American universities established OR programs (Carnegie, University of California, Los Angeles (UCLA), Ohio State, Chicago, Johns Hopkins, Cornell, University of Pennsylvania, etc.). Among these, Ohio State and Case engaged actively in industrial consultancy from the mid 1950s on. These universities also worked with private consulting firms, some of which were large. Booz, Allen, and Hamilton, for instance, had fifty-two offices, which counseled clients on OR. Arthur D. Little got into OR early on. Generally, if private industry and consultants evinced any interest in OR, the Department of Defense readily provided funds to push the new techniques (Bonder, 2002).

Not surprisingly, since mathematics and scientific method prevailed in them, departments of industrial administration, especially in engineering institutions, pioneered the work. The OR teams at Case and the Massachusetts Institute of Technology (MIT) were good examples. Another was the Graduate School of Industrial Administration (GSIA) established at the Carnegie Institute of Technology in 1949. GSIA promoted the new paradigm and "had an impact out of all proportion to its seniority" (Locke 1989, 160). It required entering students to demonstrate a mathematical prerequisite in calculus and it employed "the analytic, normative, mathematical, and scientific mode of instruction" (Jeuck, 1973, 287). Researchers in these places, thinking the methods could and should be applied in marketing, finance, and other business disciplines, expanded beyond industrial administration. The new name given at MIT to the

Sloan School of Industrial Administration (The Sloan School of Business Administration) indicates the broadening interest. Thus mathematicians, engineers, and natural scientists, though based in technological venues, were the first to apply this new scientific method to management problems. The mathematically challenged denizens of business school faculties, generally acknowledged throughout the 1950s to be intellectually mediocre, could not have done this work.

Nor, despite their denigration of business schools, could the economists and their students in universities have pulled it off. Decades after Léon Walras turned neoclassical economics into a "mathematical science," Erich Schneider, a great admirer of his achievement, had to admit that it had not been of much help to practical problem-solving by economic policy makers (Vogt, 1979). In 1944 John von Neumann and Oskar Morgenstern had already drawn the same conclusion. In the foreword to *Theory of Games and Economic Behavior*, they wrote: "The concepts of economics are fuzzy but even in those parts of economics where the descriptive problem has been handled more satisfactorily, mathematical tools have seldom been used appropriately. Mathematical economics has not achieved very much" (von Neumann and Morgenstern, 1944, Introduction).

Game theory drew a straight line from modern mathematics (because von Neumann used algebra, matrix theory, and probability theory in his calculations) to George Dantzig's linear programming algorithms of 1947. Postwar military planners and the economists who worked with them at Rand believed the new toolkit would transform neoclassical economics into a prescriptive science. At Rand in 1948, the economist Kenneth Arrow used the toolkit in his work on Rational Choice Theory. His book *Social Choice and Individual Value* (1951) was the "first real classic" on what "is now taken as a given in economics and has spread out into many neighboring disciplines" (Bellah, 2000, 7).

The neoclassical economists Joseph Dorfman, Paul Samuelson, and Robert Solow applied linear programming to their subject as well (in *Linear Programming and Economic Analysis* [1958]). In 1954, Kenneth Arrow and Gerard Debreu announced that they had achieved a mathematical solution of general equilibrium, "the theoretical core of neo-classical economics," which Edward Fullbrook states "has become the central showpiece of academic economics ever since" (Fullbrook, 2003, 5; Arrow and Debreu, 1954).

These were heady days for Pentagon innovators. A new management technique, PPBS (Planning, Programming, and Budgeting System), was installed first in the Department of Defense by Rand economists after Robert McNamara left the Ford Motor Company to head the DOD in 1961 (Rosenzweig, 2010). After 1965 PPBS was extended to other government agencies (Locke, 1989, 33). In their enthusiasm to enhance the prescriptive value of economics, these economists set about upgrading their students' methodological skills. The Rand Corporation funded a generous fellowship program for graduate students in economics at the Universities of California, Harvard, Stanford, Yale, Chicago, Columbia, and Princeton, and provided postdoctoral grants to young faculty anxious to use the new methodology in their research (Fullbrook, 2006). Russell Ackoff left Case Western Institute of Technology to create the OR program at Wharton. Economists took their upgraded mathematical-scientific knowhow into the business schools, and the transformation of US business school education began.

Most commentators trace the radical content change in business school curricula to the impact of two reports on business education published in 1959 and the resulting efforts the Ford Foundation made to promote management education reform (Gordon and Howell, 1959; Pierson and Finberg, 1959; Khurana,

2007), even as it was clear this built on a trend begun many years before (Bottom, 2009). An explosive growth of graduate business schools and MBAs began. In 1960, some 4,814 of these qualifications were granted, 23,400 in 1970, 49,000 in 1980, 70,000 in 1990, with more than 200,000 plus per year at the century's end. The Ford Foundation programs provided funds for upgrading graduate business school faculties, in order to get rid of "unimaginative, non-theoretical teaching from descriptive practice-oriented texts to classes of second-rate vocationally-minded students" (Locke, 1989, 161).

These were also glory days for neoclassical economists. The Rand Corporation's scholarships and postdoctoral funding helped raise mathematical competence and added to the prestige of the discipline within the social sciences. That prestige grew even more when the Bank of Sweden created a Nobel Prize in economics in 1969. Most of the resulting Nobels were handed out to the creators of this new scientific-mathematical paradigm (Arrow, Samuelson, Solow, etc.). They, their students, and disciples took over teaching and research in most American university economics departments and in the best business schools, from which their influence spread overseas through the Department of Defense into NATO, through government programs such as the Marshall Plan, and through private agencies like the Ford Foundation.

In 2003 Fullbrook wrote of these neoclassical economists:

> They control the three most prestigious economics journals in which papers by their staff and PhDs predominate. Of the over 800 economists employed by the World Bank, a majority have been trained at one of the Big Eight (California-Berkeley, Harvard, Stanford, Yale, Chicago, Columbia, Princeton, and MIT). The International Monetary Fund is similarly provided, as are the other highly ranked economics departments in the US and in some cases in other countries. The 2003 edition of

> Penguin's *Dictionary of Economics* … has entries for 29 living economists. Of these, 26 … are from the US or have had all of the most important part of their careers there. Of the 26, 100 percent have either taught at or received their PhD from one of the Big Eight. (Fullbrook 2003, 6)

What a remarkable climb to academic heights! What triumph! Yet one must be careful to clarify what this triumph means. Democratic capitalism in America turns on individualism. This is a heroic vision, part of US folklore – sustained with Horatio Alger-like stories about John D. Rockefeller, Andrew Carnegie, J. P. Morgan, and Bill Gates. When these hero-managers make "strategic" decisions in an uncertain world, they rely on intuition as much as on knowledge, for, as Maurice Merleau-Ponty says,

> Every historical undertaking has something of an adventure about it, as it is never guaranteed by any *absolutely* rational structure of things. It always involves a utilization of chance; one must always be cunning with things (and with people), since we must bring forth an order not inherent in them. (quoted in Sartre, 1948, 163–64)

From this perspective the Harvard case method makes more pedagogical sense than OR and the science of management introduced in the new paradigm; this is because the former lets students vicariously experience the difficulties of strategic decision-making in a world of bounded rationality. Professors in top business schools, who have spent so much effort since World War Two equipping themselves with the research tools of the new paradigm, see no science in historical cases and frown on them. In committing themselves to omniscient rationality, however, the neoclassical economists and other hard management science advocates produce a science divorced from reality.

After World War Two the new paradigm thrived both in the business school curricula and in the rising managerialism to be

found among management practitioners, especially in the larger corporations. To the first postwar generation managerialism was not mean-spirited. It promised to provide stockholders with greater profits but also to keep the average man free from want through "managed" productivity. The rhetoric was the American response to the phony promises of Communism.

But it was rhetoric, nonetheless; managerialism in this regard was more akin to militarism than to entrepreneurship or management proper. Over sixty years ago Alfred Vagts juxtaposed the terms "militarism" and "the military way." The military way meant setting a military goal and developing the most efficient organizational means to see to its accomplishment. It required unpredictable and at times unfathomable genius. Management, as applied to commercial and industrial organization, meant the same. "Militarism," on the other hand, had a much different connotation. As Vagts wrote:

> [It] presents a vast array of customs, interests, prestige, actions and thought associated with armies and wars and yet transcending true military purposes. Indeed, militarism is so constituted that it may hamper and defeat the purposes of the military way. Its influence is unlimited in scope. It may permeate all society and become dominant over all industry and arts ... Militarism displays the qualities of caste and cult, authority, and belief. (Vagts, 1937, 11)

Managerialism as opposed to management means "a vast array of customs, interests, prestige, actions, and thought" associated with but nonetheless transcending the need for the efficient running of commercial and industrial organizations. In this book we argue its influence and power in enterprises is now almost unlimited in scope, having expanded into almost every kind of organization in the USA, profit and nonprofit, commercial and educational, governmental and military. As it grew up

in America in the second half of the twentieth century, managerialism came to exhibit the features of a caste – cult, authority, and belief – that Vagts noted. American managerialism – given the mystique it generates in elite business schools and the ethos being taught there, so evident in the media's championing of the wisdom, capability, and invincibility of our CEOs, and in the laws and customs that empower them – developed into a system that has, most paradoxically, often denied organizations the very means needed to formulate and effectively reach their goals.

Few, other than leftist ideologues, would have expressed such dark thoughts before 1970. Now, after the economic crisis of 2008, these views are commonplace. How can this be? The postwar generation that developed managerialism and business school education presided over an unprecedented US-led expansion of wealth and power. Its participants attributed that growth to their own knowledge and skills, eschewing any sense of propriety or respect for the others who also made contributions. Now some chickens are coming home to roost – but whose are they? How are we to understand that American plenty began to disappear after 1980, evident in the growing gap between rich and poor, and in the US's diminished global power? Do America's managers carry responsibility for this too?

Our argument is that they do – in part – and just how much is our central topic. There can be no proof, of course, for there is no real nonmanagerialist model against which we might compare what happened. The way of historians is to gather various items of evidence and deploy them as rhetorical support for conclusions that seek to be no more than reasonable and illuminating of our current situation. To justify our conclusions, we begin by arguing that the vision and optimism that propelled managerialism were not systemically based but historical, arising in a window of time and space. That is, rather than being based in a

powerful science of managing or even on a securer grasp of an enterprise's problems and challenges, managerialism was little more than a fad, a tale we told ourselves, but one that became leveraged into America's culture. From that position managerialism had a huge impact on enterprises in the US and elsewhere, and on nations themselves and how they began to be managed. We argue business schools contributed significantly to this impact. As corporate managers in the 1980s began to place their own interests above those of the nation or of the other stakeholders, they found such questionable personal inclinations supported by the culture-wide adoption of the language of free markets and antiwelfarism.

In Chapter 1 we look at how this cultural shift accelerated, even as one aspect of Edwards's definition of managerialism waned quite early on: "faith in the tools and technique of management science and the ability of managers to use those techniques to resolve problems." We help explain what went wrong with what Edwards called "the primary value of managerialism – its economic efficiency." The gathering evidence of managerialism's ineffectiveness as an approach to everyday practice, as manifest in the formal modeling of managerial decisions and organizational processes, was no impediment to its spread, as "Groupthink took hold" (Janis, 1972).

In Chapter 2 we explore how managerialism failed to develop an ethical core or commitment, what Edwards called the second component of managerialism, presenting "managers as … moral agents working to achieve the greatest good not only for their organization, but for society as a whole." In Chapter 3, moving from the macro to the micro level, we discuss the failure of managerialism to meet the organizational challenges of the US automobile industry. Chapter 4 describes how the management caste's conscious preoccupation with money (and the ideology of greed) disrupted the financial system and brought it

to the edge of ruin in the early twenty-first century. Clearly the trust initially placed in managerialism, and in the transformative power of business school education, too frequently resulted in inefficiency and impotence.

The Conclusion focuses on prescription – on guidelines for restoring the life presently out of balance. Given the extent of the current crisis of governance, many commentators presume society must change. There is a clear divide between improvement and correction, and radical change. Those looking for remedies within managerialism and the business school establishment forget Albert Einstein's admonition that one cannot solve problems at the same level of thinking that created them.

CHAPTER 1

The failure of management science and the US business school model

In this first chapter, as throughout the book, we are not concerned with establishing the truth value of management as "science" in our critiques of managerialism and the new paradigm in US business school education. That discussion we leave to management theoreticians and philosophers of science. Nor are we particularly concerned with the interpretations of historians, politicians, journalists, and social scientists, with various axes to grind, of recent US management events. Instead, we let the historian's old rule of thumb serve as a guide in our presentation, namely that informed contemporaries who witness events and often participate in them, usually, unless misinformed about or unaware of facts, get the story right the first time around as they live it. Since contemporaries close to events deftly wield Occam's razor, they best tell the story about the failures of management science and the US business school model, failures which, particularly in the past forty-plus years, surprised and puzzled most Americans in and outside of management, and still do those who are unwilling to suspend disbelief.

The first event of contemporary assessment covered in this chapter is the usefulness of war-spawned operational research techniques in the solving of complex postwar management problems. The chapter then turns to an assessment of a different order. It discusses the inability of Americans equipped with the toolkit of the new paradigm to cope with the greatest challenge US manufacturing faced in the second half of the twentieth century, that coming from Japan. This story is not told in ruined companies and unemployed people (Locke, 1996, 158-75) but in a critique of the epistemology of the new paradigm in management disciplines introduced postwar in the business schools. The seismic shift in consciousness that the epistemological arguments entailed infiltrated discussions about Japanese manufacturing culture. The debates affected the thoughts and lives of many people. The life of one prominent business school professor, H. Thomas Johnson, is used as a reference point to illustrate the change and the resistance to change that occurred, as managerialism and the business schools struggled to preserve their newly established orthodoxy.

The chapter's last section looks at business schools' relations with praxis after 1980 when, with the scientific standing of the faculties improved, top business schools had turned into research institutions, with multiplying subdisciplines and proliferating peer-reviewed scientific periodicals. The concluding section weighs contemporary views about how well graduates educated in the reformed business schools performed in the two major events that shaped the US economy in the mid-1980s – the Japanese manufacturing challenge and the industrial revolution in information technology (IT).

The OR experience: the new paradigm in postwar business schools

There were critics right from the beginning of what Locke called "the New Paradigm" (Locke, 1989, Chapter 2) and Schlossman, Sedlak and Wechsler (1987) the "New Look" in business school education. Among them were members of the old descriptive school in economics and business studies who distrusted the mathematicians. Fearful that their models poorly mirrored reality, sure, in any event, that mathematics would make business studies incomprehensible to businessmen, and hence separate them even more from academia, they often put up a spirited resistance (Larsfeld, 1959; Marschal, 1940; Koch, 1960; Mattessich, 1960; Piettre, 1961; Howson, 1978; Hudson, 2010). But it was difficult to defend the point of view of the old pre-mathematics paradigm, since the victory of the new men would make non-mathematically schooled business economists' views seem academically passé, and their protests self-serving. Besides, the powerful technical arguments of the self-confident purveyors of mathematical omniscience had to have their day. Until more numerate as well as nonnumerate people had experience with the new techniques, a telling body of criticism could not appear. When they did, the doubters began to assemble.

It is easy, therefore, to find maverick critics cavorting outside the citadel of a new discipline while the victory bells are still ringing inside. Doubts, however, crept up within the ranks of operations research scientists themselves. Since the OR experience in the two pioneering OR countries (Britain and America), as noted in the Introduction, somewhat differed because of academic traditions, OR appraisals varied somewhat within OR societies in each country.

There was more of a conflict in Britain between academia and working OR people and, because of the lateness and

sluggishness of OR's academicization, a greater imbalance between the two. It was as if the academic version of OR did not take root in the UK as it did in the United States. That version was dominated by abstract, complex, highly theoretical mathematical models which, because of academic career conventions – publish or perish – captured the scientific OR journals; the American academic version was carried into British OR academia belatedly through contact with Americans. K. B. Haley notes that Russell Ackoff's arrival at the University of Birmingham, as Joseph Lucas Visiting Professor, in 1961 was the signal event. "His presence had a major impact on the whole of the UK educational scene, inspired a number of initiatives in the way the subject was viewed in industry, and was one of the prime movers in the establishment of the Institute for Operational Research" (Haley, 2002, 85). The University of Birmingham, which had invited Ackoff, had instituted a master's in OR in 1958; his presence there seemed to stimulate the development of academic OR in the UK, with master's degrees in OR initiated at Imperial College London and at Cranfield in 1961; while a master's course in the subject started at the University of Hull in 1962.

The British *Journal of the Operational Research Society (JORS)* began, under the influence of US OR, to reflect the greater formal scientific attributes of US OR, for, increasingly, the scientific articles in it came from academics employed in American educational institutions. Patrick Rivett's analysis of the articles published during one twelve-month period observed that "of 103 papers, 81 were by academics of whom only 31 were British. The *Journal* had over half of the papers in the form of theoretical materials from overseas academics" (Rivett, 1981, 1057). Considering the large size of British OR society membership (Table 1.1), the vast majority of working OR people, that is, the vast majority since the academic operational research

group was so small in the UK, did not publish. Rivett claimed that "80% of OR people go through life without publishing anything" (Rivett, 1981, 1057).

Perhaps UK executives could themselves better appreciate nonacademic compared to academic OR people because of UK businessmen's disregard of academic qualifications. Board-level executives in the top 100 UK corporations had significantly lower levels of education compared to, say, their French counterparts, even after the big push to upgrade levels of education for UK businessmen in the late twentieth century. Whereas in 1998 in France, 44.5 percent of board members of the 100 largest corporations had diplomas from the top ten ranked schools and 90.5 percent of them at the graduate degree level, only 16.4 percent of board members in the largest 100 UK corporation had diplomas from the top ten schools, and of them only 38.1 percent were graduate degrees (McClean, Harvey, and Press, 2007, 542).

There was hardly any complaint in the *JORS* about the absence of OR studies in British universities. On the contrary, articles primarily criticized the OR that was taught in them. Practical OR people even denied the relevance of the mathematical models proffered by academics, arguing that they were a poor yardstick with which to judge the health of OR in Britain. N. R Tobin, K. Ripley, and W. Teather, in "The Changing Role of OR," observed:

> In the Third International Research Conference on OR and Management Science at Bowness in April 1979, more than one attendee was left with an impression of a widening gap between the university-based OR man and the in-house OR man, the former full of gloom and despondency because OR is not being used in any important areas, the latter ... often carrying out useful OR in quite important areas. (Tobin, Ripley, and Teather, 1980, 279)

The implication is that a dichotomy existed in British OR between the academics following the Americans and the practical men who still gave useful advice to British management because they ignored the abstraction of the academics. Apparently, large numbers of OR scientists in Britain, like businessmen, shared the traditional and deep-seated English suspicion of academics. Both the OR Society and its journal, like all British professional associations, were started by practitioners, not academics. "The low proportion of academic members in the [Operational Research Society] reflects the growth of the UK Society as a body to encourage the exchange of practical experiences" (Haley, 2002, 85).

Practical OR people in the UK and the US believed that their work benefited clients, and there were successes in this regard. The petroleum industry's decisions on product mixes were never the same after the publication in 1952 of "Blending Aviation Gasolines: A Study in Programming Interdependent Activities in an Integrated Oil Company" (Cooper, 2002; Bixby, 2002). Given that in this case a demonstratively better decision process provided an optimum solution to a financially important decision problem in a competitive market, the better decision procedure, mathematical programming, was widely adopted for an entire class of tractable problems. If such particular successes could have been generalized, the expectation would have been that, with more experience in dealing with problems and perfecting their methods, the proportion of successes to failures would significantly increase through time. Actually, the opposite happened.

In 1981, Dando and Bennett evaluated the evolution of the mood of UK operational researchers as reflected in the pages of the *Journal of the Operational Research Society* (*JORS*), by looking at the issues published in 1963, 1968, 1973, and 1978. The credo affixed to the masthead of the journal when it started had read:

> Operational Research is the application of the methods of science to complex problems arising in the direction and management of large systems of men, machines, materials and money, in industry, business and defence. The distinctive approach is to develop a scientific model of the system, incorporating measurements of the factors such as choice and risk, with which to predict and compare the outcomes of alternative decision strategies or controls. The purpose is to help management determine its policy and actions scientifically.

Up to 1968 when "optimism about the future of OR" reigned, there was "almost a total lack of criticism and debate in the journal." In 1973, papers began to enounce considerable doubt about the practical effectiveness of OR, a doubt which by 1978 was being voiced in about one quarter of the major papers appearing in the journal. The essays of the late 1970s were, therefore, a culmination of a decade of ever-increasing and deepening concern about the usefulness of OR at the very center of the new paradigm.

The pessimism deepened when the subject of long-term prediction came up. The comments of Roger Collcutt on planning studies for a third London airport illustrate this concern. He observed that "alternative sites [for the airport] cannot be reliably distinguished by OR or any other method other than political. [About all that OR studies could do] was suggest the feasibility of various futures which in certain circumstances may look desirable" (Collcutt, 1981, 368). With all the "mays" and "mights," a defense of OR obviously conceded much to its critics.

A stagnation if not decline in Operational Research Society memberships also indicates that all was not well. Whereas membership grew between 1964 and 1974 at an annual rate of 20 percent, subsequently growth rates fell dramatically (Rivett, 1974). Table 1.1 furnishes comparative data on OR professional society participation in France, Germany, the United Kingdom,

and the United States. OR groups in these four countries were, in terms of numbers of qualified members, the four largest in the world. Among these four groups, two, the British and American, were by far the largest, judged both in terms of members per million inhabitants, and members in absolute numbers. Of the two leading countries, the British were slightly ahead of the Americans in membership per million inhabitants. These two nations dominated the operations research movement; indeed, whereas in 1980 OR societies in the UK and the US had 13,371 members together, those in all of Europe had only 4,720. The doubts that had cropped up had occurred in the countries where OR had the greatest experience and following.

Table 1.1
Membership in operations research societies in Europe and the USA

Country	*Year OR society founded*	*Qualified members 1974/76*	*Members per million population 1974/1976*	*Qualified members 1980*	*Members per million population 1980*
France	1956	570	11	555	10
Germany	1957/1961	701	11	749	12
UK	1953	2,808	51	3,371	60
US	1952	11,000	51	10,000	47

Source: H.-J. Zimmerman, "Trends and New Approaches in European Operational Research." *Journal of the Operational Research Society* 33 (1982), 597–603, 598.

Since operations research and management science are generic terms, misgivings about their efficacy actually covered a variety of managerial activities. They pertained to OR work in firms and in local and regional governments. Wilbert A. Steger pointed out that during the 1960s "a virtual avalanche of

urban/regional models about new planning, program analysis, budgeting and other 'futuristic' decision-making and policy related decision-making [appeared]" (Steger, 1979, 548). But he noted how unsuccessful the OR techniques were: "When reviewing this era, it is difficult not to wonder at the relative lack of sophistication … [T]he assessment techniques … proved not to be very useful and often caused more damage than good in dozens of overly literal applications." In the US, criticisms extended to the management techniques adopted in the national bureaucracy, the most famous being the Planning, Programming, and Budgeting System (PPBS) installed in the Pentagon in 1962 and in 1965 extended to other government agencies. Although designed to make decisions scientifically, that is, to optimize the means by which tasks are decided and realized, PPBS, Waddington observed, "has failed everywhere and at all times. Nowhere has [it] been established and influenced governmental decisions according to its own principles. The program structures did not make sense to anyone. They are not, in fact, used to make decisions of any importance" (Hofstede, 1978, 460). In 1972 the PPBS system was terminated (Gruening, 1998, 8).

No group so fundamentally misread reality as those who implemented and used PPBS in the Pentagon during the Vietnam War. The complaint, moreover, is more than political. It is also technical, for PPBS did not fail just because the Americans who implemented it were discredited by the Vietnam venture. They lost the war because they also did not understand the limitations of rational management methods such as PPBS, limitations prescient people knew at the time (Rosenzweig, 2010).

Other government scientific management techniques produced similar outcomes – in President Carter's attempt to implement a sibling of PPBS, the Zero Based Budgeting

Procedure in the federal administration (abandoned because of its "inadequacies"), in the introduction in French administration after 1963 of a scientific management process similar to PPBS (RCB, *Rationalisation des Choix Budgétaires*), which suffered, people later discovered, from "excessive hope" (Lequéret, 1982, 16). The reasons for meager results of optimization techniques in governmental affairs and operations are complicated. An important one is that the complexity of the decision problems in real government organizations makes optimization impossible; the irreducible characteristics of the problems grossly violate the assumptions required by the various optimization techniques. Another reason – one which is not always acknowledged – is that governmental problems amenable to optimization sometimes have great difficulty attracting the political attention and funding required to optimize.

"OR problems can never be a perfect representation of a problem," the OR guru Russell Ackoff concluded, in a startling volte-face at the end of the 1970s (Ackoff, 1979, 102). "They leave out the human dimension, the motivational one;" indeed, he affirmed that the successful treatment of managerial problems deserves "the application not only of science with a capital S but, also, all the arts and humanities we can command." Arts and humanities take mythopoetic dimensions of decision problems into consideration that express tacit-bonding skills and even sensory modes of communication essential to collaborative work.

For people managing nationally important operational events, imaginative management thinking should have started where the numbers left off. With managers captive to numbers-determinant thinking, too often excessive violence, environmental destruction, social disruption, waste of public resources, and national disgrace resulted.

Crumbling epistemologies: a critique of the new paradigm

While contemporaries questioned OR, at a more profound level they also in the 1980s scrutinized the epistemological foundations of management sciences – indeed of traditional science itself – in a powerful dissent from the postwar consensus about managerialism and the value of the toolkit that neoclassical economists had introduced into business school education between 1960 and 1980. The debate had a practical dimension because it encompassed the organizational challenge that Japanese manufacturing now posed to American managerialism, and it had serious consequences because as people changed their minds, this disrupted careers.

The transformed life of one management expert, H. Thomas Johnson, illustrates the practical consequences of this intellectual revolution. In the 1980s Johnson was a professor of management accounting at a respectable university (Johnson, 1978); a decade later, at a less prestigious but nevertheless respectable institution, he had become a Professor of Quality Management. This change – no quick jump onto some faddist bandwagon – amounted to a considerable pilgrimage during which Johnson came to question the value and usefulness of what he had been doing – at great personal cost because the business school where he worked in the early 1980s denied him tenure for challenging the new paradigm his academic peers had assumed he would use to frame his courses on management accounting. Johnson's focus on historical field research was denounced by his academic accounting colleagues who were trained to see the world exclusively through the lens of finance, efficient markets, and agency theory.

Along the way, Johnson spent several years studying the Toyota Production System, took a seminar with W. Edwards

Deming, and investigated new developments in physics. In a letter (Locke, 1996, 176) he mentioned three books in particular that influenced his outlook during his metamorphosis: Peter M. Senge's *The Fifth Discipline: the Art and Practice of the Learning Organization* (1990), Robert W. Hall's *The Soul of Enterprise* (1993), and Fritjof Capra's *The Turning Point: Science, Society, and the Rising Culture* (1982). Two of the three books are about management, but the other, Capra's, is not a management book at all; it deals with the reevaluation of the foundations of science.

On the assumption that much can be learned about a person's (or a generation's) behavior from reading the books he/she absorbed, the books Johnson cited can be used to shed light on his transformation and that of like-minded contemporaries. The following reconstruction of Johnson's intellectual migration is not, it must be cautioned, necessarily about the specific intellectual and psychological steps in the transformation Professor Johnson underwent. He never explained precisely how and when the books affected his thinking; he only wrote that they did. However, if the books do not catalogue the exact process of transformation of anyone, including Johnson, they do offer one representative insight into the thought process of Everyman who changed his/her view about American managerialism during the 1980s. Taken together, the three books permit the reader to construct a fantasy about the epistemological collapse of American managerialism.

The story begins with Capra's *The Turning Point*. Here, he planted an intellectual and psychological seedbed in which dissent from American managerialism could thrive and grow. Capra's analysis permitted people to map a very important intellectual revolution onto a significant historical event – the industrial challenge of Japan to America (for self-confident Americans, a troubling thing). The University of California physicist asserted

that a systemic crisis in Western science not only questioned its intellectual foundations but raised doubts about the ability of traditional science to solve pressing human problems.

Capra begins with a statement about how people in "think tanks" and "brain trusts," expressing "mainstream academic views," have been unable by their own admission "to solve the nation's most urgent policy problems." Capra traces this impotence to what Alfred North Whitehead called "the century of genius," the seventeenth, when Isaac Newton worked out the mathematical basis of physics, René Descartes its dualist philosophy, and Francis Bacon the experimental method that subsequently led science from triumph to triumph. Descartes proclaimed that "all science is certain, evident knowledge; we reject all knowledge which is merely probable and judge that only those things should be believed which are perfectly known and about which there can be no doubt" (Capra, 1982, 47).

The experimental method that brought "certain" results in physics is called reductionism. Reductionism assumes that matter is "the basis of all existence" and that the material world is composed of "a multitude of separate objects assembled into a huge machine." Consequently, complex phenomena can best be "understood by reducing them to their basic building blocks and by looking for the mechanisms through which these interact." Although physics led the way, the reductionist methodology eventually permeated all the sciences.

Capra contends that the Western view of scientific method has crashed and that the first discipline to crash has been physics itself, where the Cartesian philosophical foundation and the reductionist methodology had seemed most secure. Capra's chain of doubt begins with Heisenberg's statement that "every word or concept, clear as it may seem to be, has only a limited range of applicability," a statement that plays havoc with Descartes's "certainty" principle. Capra claims that two

discoveries of modern physics fundamentally discredited the Newtonian world. First, quantum theory proclaimed not only that subatomic particles – electrons, protons, neutrons – are not the solid objects of classical physics, but that they are very abstract entities which have a dual aspect.

> Depending on how we look at them, they appear sometimes as particles, sometimes as waves, and this dual nature is also exhibited by light, which can take the form of electromagnetic waves or of particles … The more we emphasize one aspect in our descriptions, the more the other aspect becomes uncertain, and the precise relationship between the two is given by the uncertainty principle. (Capra, 1982, 47)

The second discovery Capra noted pertains to the nonlocal connections of individual events. We can never predict the jump of an electron from one atomic orbit to another; we can instead only predict its probability because the behavior of the electron is affected by the nonlocal and unknowable connection to the whole. Nonlocality stops us from being able to determine cause and effect precisely – we have to fall back on statistical probabilities. The concepts of nonlocality and statistical causality, Capra affirms, "imply quite clearly that the structure of matter is not mechanical … [but that] the universe [is] more a great thought than a great machine" (86).

The new physics Capra describes abolished Descartes's separation of mind from matter. The result, Capra observed, is manifest in scientific investigation itself.

> Human consciousness (in quantum physics) plays a crucial role in the process of observation … My conscious decision about how to observe, say, an electron will determine the electron's properties to some extent. If I ask a particle question it will give me a particle answer. The electron does not have objective properties independent of my mind. (87)

This discovery overthrew Newtonian epistemology; it meant that the patterns scientists find in nature connect intimately with the patterns of their minds, with their "concepts, thoughts, and values." Consequently, the universe is perceived as a dynamic "web of interrelated events." Since none of the properties of any part of the web is independent, reductionism is devalued. Since all the parts follow the properties of the other parts, "the overall consistency of their interrelations determines the structure of the entire web" (93).

In subsequent chapters Capra observes that all of modern science realizes that "scientific theories are approximations to the true nature of reality, and that each theory is limited to a certain range of phenomena." Moreover, researchers have questioned the reductionist method over and over again in other sciences. Biology, which Capra discusses in detail, where life, under the reductionist theory, "had to be understood in terms of cells," now increasingly studies "the organism as a whole. [B]iological functions [are] seen as the result of the interaction between the cellular building blocks" (103). The contention, then, is that the really interesting questions are about how the cells interconnect, how the cells must be understood in terms of a whole organism, not the individual cell itself. If the cell alone is examined, the observer might come up with a view of cell processes that fails to fit those of the whole organism. Capra extends the same antireductionist theme to the psychological and social sciences, of which he singles out behaviorism and economics for special criticism.

Throughout, Capra adopts a systems view of knowledge, wherein systems are defined as "integrated wholes whose properties cannot be reduced to those of small units" (21). Within systems "the behavior of the individual part can be so unique and irregular that it bears no sign of relevance to the order of the whole system" (238). For our purpose Capra's choice of

an organic metaphor to illustrate the social aspect of systems theory is heuristically valuable:

> Bees and ants are unable to survive in isolation, but in great numbers they are almost like the cells of a complex organism with a collective intelligence and capabilities for adaptation far superior to those of its individual members. This phenomenon of animals joining up to form larger organismic systems is not limited to insects but can also be observed in several other species, including, of course, the human. (277)

Capra's systems approach undermines nineteenth-century social Darwinist ideas about individual competition. The individual is not only imbedded within a system but is directly involved in that system's self-organization. The tendency of living systems to form multilevel structures, "whose levels differ in their complexity is all-pervasive in nature and has to be seen as a basic principle of self-organization" (280).

The application of systems ideas to human organizations makes them fundamentally different in their patterns from the consecutive "stacking of building blocks," or the hierarchy of command–power relations so familiar to the Newtonian outlook and to Chandler's view of the modern US corporation. Borrowing Arthur Koestler's concept of the "holon," something that is simultaneously a whole and a part, Capra points out that "every subsystem is a relatively autonomous organism while being a component of a larger organism." And he extends the idea of dual identity – of a relatively "autonomous organism … being a component of a larger organism" – to the mind. "In the systems concept of mind, mentation is characteristic not only of individual organisms but also of social systems. As Bateson emphasized, mind is immanent in the body and also in the pathways and messages outside the body. There are larger manifestations of mind of which our individual minds are only subsystems" (280).

This statement has radical implications for an understanding of group mental activity and the individual's place in it. It also alters our view of social order. Capra's comments on this subject deserve to be quoted *in extenso* because they describe a fundamental shift in views about organizational behavior:

> The multileveled structure of living organisms, like any other biological structure, is a visible manifestation of the underlying processes of self-organization. At each level there is a dynamic balance between self-assertive and integrative tendencies, and all holons act as interfaces and relay stations between systems levels. Systems theorists sometimes call this pattern of organization hierarchical, but that word may be rather misleading for the stratified order observed in nature. The word "hierarchy" referred originally to the government of the Church. Like all human hierarchies, this ruling body was organized into a number of ranks according to levels of power, each rank being subordinate to one at the level above it. In the past the stratified order of nature has often been misinterpreted to justify authoritarian social and political structures … To avoid confusion we may reserve the term "hierarchy" for those fairly rigid systems of administration and control in which orders are transmitted from the top down … By contrast, most living systems exhibit multileveled patterns of organization characterized by many intricate and nonlinear pathways along which signals of information and transaction propagate between all levels, ascending as well as descending. That is why I have transformed [hierarchy] into a tree, a more appropriate symbol for the ecological nature of stratification in living systems. As a real tree takes its nourishment through both its roots and its leaves, so the power in a systems tree flows in both directions, with neither end dominating the other and all levels interacting in interdependent harmony to support the functioning of the whole. (Capra, 1982, 281–82)

These were the ideas Professor Johnson encountered in one of the three seminal books he read. The management books by Hall and Senge that also influenced Johnson's "migration"

incorporate the transformed outlook that Capra identified: from the Newtonian, mechanistic, reductionist view of science to an organic, systemic view. Robert Hall in *The Soul of Enterprise* (1993) called for a new, holistic form of manufacturing in which companies do not preach teamwork between customer, employees, and suppliers, while management makes decisions. He presents a scheme which contrasts the old hierarchical spirit with the new, in which all elements in a thriving system are integral to the entire system's well-being and are interconnected. The systems metaphor for Hall's new management dynamic is not the machine, the power hierarchy of classical American management, but Capra's tree, with the roots and leaves, all parts, sustaining the life of the system (Hall, 1993, 84).

Peter Senge's book, in which the author combines systems theory with processes of continuous improvement, concurs:

> Systems thinking leads to experiencing more and more of the interconnectedness of life and to seeing wholes rather than parts. Whenever there are problems, in a family or in an organization, a master of systems thinking automatically sees them as arising from underlying structures rather than from individual mistakes or ill will. (Senge, 1990, 375)

Senge recognizes different goals in the learning process. He writes about them in terms of personal mastery (connectedness), systems thinking (interconnectedness), shared visions (commonality of purpose), and team learning (alignment). He writes too about the differences being increasingly subtle.

Just as Capra notes of the physicist, "ask a particle question, you get a particle answer," Senge notes of the manager, if you ask a systems question you get a systems answer. And the opposite is implied – ask a managerialist question you get a managerialist answer. The phrases and reasonings Senge uses echo Capra's views – the metaphor of the tree, the values

and thought patterns of the observer coloring reality, the web of interconnectedness of the single unit with the whole, the extracorporeal extension of the mind to group "thinking." The connections between both Hall's and Senge's system modes of perception and Capra's are obvious just as they are multiple.

So are the connections between Capra's work and the Japanese productions systems that people, including Johnson, began to study intensively in the 1980s. Capra does not mention Japanese management, but people found certain beliefs dwelt upon in his book central to it. Moreover, if Capra did not write specifically about Japanese management, those who did, if without reference to him, often did so in Capra's terms. In some cases the terms are identical. The Research Team for Japanese Systems, sponsored by the Masuda Foundation, spoke of Japanese management as "An Alternative Civilization," using Arthur Koestler's "holon" concept to clarify its position: "The Japanese organization is constructed from a system base of sub-whole and sub-individuum, and it may be most appropriate to view the Japanese organization as a holon made up of contextuals" (Masuda Research Project Team for Japanese Systems, 1985, 15).

Three well-known contemporary works (Fruin, 1992; Kenney and Florida, 1993; Nonaka and Takeuchi, 1995) and two from Johnson (Johnson, 1992; Johnson and Bröms, 2000) made similar connections. Johnson's work will be discussed in Chapter 3, but the others can be used here to show how Capra-like concepts can be found in the literature about Japan. Kenney and Florida wrote in *Beyond Mass Production* (1993, 8) that the "underlying conceptual premise of the book is that Japan is at the cusp of a new model of production organization that mobilizes workers' intelligence as well as physical skill." They stress how the Japanese enterprise uses teams and

other organizational techniques that explicitly harness workers' knowledge at the point of production, thereby transforming the ordinary employee's knowledge and intelligence into a source of value. They insist on the integrative, organic nature of the Japanese work process. They are, as in the following passage, not talking about hierarchy or Taylorism, but about reciprocal action, interconnection:

> We refer to this organization as the new shop floor [where] innovation becomes more continuous and the factory itself becomes a laboratory-like setting. The underlying organizational feature is the self-managing work team that enhances the functional integration of tasks. The new shop floor thus integrates formerly distinct types of work – for example R&D and factory production, thus making the production process very social. In doing so the organizational forms of the new shop floor mobilize … the collective intelligence of workers as a source of continuous improvement in products and processes, of increased productivity, and of value creation. (Kenny and Florida, 1993, 6)

Correspondingly, Mark Fruin writes of the Japanese corporation building:

> A stair-step process of give-and-take, of interaction, and integration between various production functions, and the welding of this interactive, feedback process into a product-development system … Variability results in learning and learning is the basis of a strategy based on functional integration, innovation, and continual improvement in manufacturing … Factories as architectures of innovation [appeared imbued with] the conviction that institutions can think, learn, and act for the purposes of self-improvement and self-renewal. (Fruin, 1992, 214)

Institutions that "think, learn, and act" – such words clearly conjure up Capra's biological references to nonlocal connections of individual events to the whole, of the universe as a great

"thought," instead of a machine, of the "web of interconnectedness" where the properties of parts map with the properties of other parts.

Nonaka and Takeuchi (1995) built their case about knowledge-creating companies on their ability to harness both tacit and explicit knowledge. Kenichi Yasumuro observed how sensitive Japanese engineers understood the necessity to learn tacitly as well as explicitly when importing Western technology at the end of the nineteenth century (Yasumuro, 1993). Nonaka and Takeuchi related that the interaction between these two knowledge sources, one with its locus in the skilled labor force, the other in the upper levels of management, is the dynamic of knowledge creation found typically in Japanese but rarely in Western corporations. In the West an

> intellectual tradition can be traced back to Cartesian dualism … A is pitted against B, resulting in the 'A vs. B' model … The debates over subjective vs. objective, mind vs. body, rationalism vs. empiricism, and scientific management vs. human relations reflect this intellectual tradition. The danger … is to create the building blocks of organizational knowledge creation in the same light. In our view, tacit knowledge and explicit knowledge … are not opposing ends of a dichotomy, but mutually complementary entities. They interact and interchange into each other to create something new. (Nonaka and Takeuchi, 1995, 236)

Nonaka and Takeuchi acknowledged Peter Senge's attempt to overcome "the Cartesian dualism" by integrating "reason and intuition," but they also felt that Senge himself was too much caught up in the mind/body duality characteristic of Cartesian thinking. This prevented him from appreciating the importance of "the body-learning aspect of tacit knowledge" and hence stopped him from fully appreciating the source of knowledge creation at play within the Japanese company.

Educational alternative

One further point needs to be made about Japanese organization culture and US business school education during this era. For people living in Japan, the latter was irrelevant. Most rich and powerful NGOs and businessmen that wish to call on society to fulfill a need, usually find a way to achieve their ends. This happened in the US when rich businessmen endowed business schools in famous universities to teach the managerial caste. After World War Two, Japanese employer associations repeatedly requested more and better higher education in Japan. They asked for scientists, engineers, computer specialists, for the creation of technical research facilities and for the establishment of closer cooperation between universities and industry. But the words "business school education" seldom appeared in these requests because the presence of a powerful outside class of managers schooled in general management principles in business schools made no sense in company cultures based on a "web of interconnectedness." Since business and industrial spokesmen presented no real and persistent demand for this education and there was no business school establishment in Japan to lobby for it, no American-style education of the MBA type materialized (Locke, 1996). In the 2007 *Business Week* survey of the top US and international MBA programs, 191 are located in North America, 22 are in England, 10 in France, 60 in the rest of Europe (but only 3 in Germany) and 1 in Japan.

This does not mean that the Japanese had no interest in management education outside business firms and professional organizations. But they did it in a way Americans would not recognize as management education, although it very much suited Japanese organizations. Educational specialists observe that, despite changes in education brought on after World War Two through Western emulation, the cultivation of group

consciousness retained its focus in Japan. William K. Cummings noted that Japanese teachers spend an inordinate amount of time at the beginning of the school year just establishing order in the classroom, so that learning subsequently can take place. "Classroom order is developed by having students cooperate in groups that prepare contributions for the rest of the class" (Cummings, 1990, 150).

Classes break into groups, with teachers sitting by rather unobtrusively. Bright students work with slow learners whose performance they help raise to the group pace. Teachers and administrators do not discipline individuals, by, say, sending a pupil to the office, but let the group to which the problem pupil belongs decide and administer "punishment." Assertive discipline is "antithetical" to the Japanese style of student management. Japanese teachers even at the preschool level defer discipline authority to pupils. Small work groups are held collectively responsible for homework assignments, so that if a group member does not do this work, the others receive demerits. Groups are assigned tasks, sometimes too difficult to do, just to see how well they can handle them – they are stretched (Adams, 1995, 69).

Process education stresses the procedure through which results are obtained, not the results themselves. W. Edwards Deming, after working in Japan, emphasized process as opposed to individual performance. He advocated making improvements in the process in which the individual works, not trying to eliminate individual "mistakes" (Deming, 1982, 1986). Kaoru Ishikawa's famous fishbone diagrams used in Japanese schoolrooms and in manufacturing illustrate process orientation; they show the people involved how the entire process in which they work produces the results, so that they can learn to think of their work in terms of process improvement. In other words, in a high-employee-dependent Japanese management

system, management education takes place differently than in America. It occurs cooperatively in the primary, intermediate, and secondary school system, not in business schools. If people wish to organize a work process in which the employees participate in managing it and are not "managed" by a group external to it, what happens in the Japanese classroom K through 12 *is* management education.

At the tertiary level, Japan's educational environment differs as well. Japanese firms want to hire educated people; since they do not intend to hire them into management slots like in big US corporations, they are much less interested in recruiting specialists in management subjects than people right out of college with arts and science degrees from elite universities. The subjects Japanese learn were and are not all that different from those studied in advanced and advancing countries all over the world – and where American education is judged to be deficient, despite the demands of the "new paradigm," namely in mainline disciplines such as mathematics, natural science, engineering, and, to a far lesser extent, social science. Serious students who want to get jobs, like students everywhere, usually avoid majoring in the humanities; they do study commerce, but not management in graduate schools (unless they are seconded by a big firm to Harvard or some other US or European business school, not to learn the techniques, but to learn about Western business culture and to make contacts). In Japanese corporations, core employees, as distinguished from temporary employees, are not recruited by skills but as people whose chief qualification must be a capacity to assimilate quickly the corporate work culture and production systems. Recruited students have no company-and-job-specific skills. Companies spend much time and money on in-house training, job rotation and multiskilling that impart tacit and explicit learning tailored to the firm's environment.

Business school response to major economic events

Since the introduction of the new paradigm into US business schools occurred *after* the onset of managerialism, it played no role in its triumph. The corporate hierarchies Chandler describes already existed in 1960. The recruitment of the first MBAs equipped with the "New Look" toolkit began in the early 1970s; their rise to positions of importance in corporate hierarchies came in the mid 1980s. The question to pose, then, is what role did the schools and graduates from the "New Look" reformed business schools play in the innovative economic events of the mid 1980s? Two problems in particular were significant: meeting the Japanese manufacturing challenge, and promoting the revolution in information technology (IT).

Business schools: not meeting the Japanese manufacturing challenge

Americans conscious in the 1980s of the new epistemology and the need to reform US manufacturing to meet the Japanese challenge cursed the "New Look" in US business school curricula. Johnson complained about it in *Relevance Regained* (1992, 175–96), and in an article he wrote with Anders Bröms in 1995 (Locke, 1996, 287), and he returned to the theme in the book he wrote with Bröms in 2000. He observed:

> Successful [US] managers believed they could make decisions without knowing the company's products, technologies, or customers. They had only to understand the intricacies of financial reporting … [B]y the 1970s managers came primarily from the ranks of accountants and controllers, rather than from the ranks of engineers, designers, and marketers. [This new managerial class] moved frequently among companies without regard to the industry or markets they served … A synergistic relationship developed between the management accounting taught in MBA

> programs and the practices emanating from corporate controllers' offices, imparting to management accounting a life of its own and shaping the way managers ran businesses. (Johnson and Bröms, 2000, 57)

He despised these lifeless pyramidal structures imposed on work processes and managed by computer-oriented production control experts:

> At first the abstract information compiled and transmitted by these computer systems merely supplemented the perspectives of managers who were already familiar with concrete details of the operations they managed, no matter how complicated and confused those operations became. Such individuals, prevalent in top management ranks before 1970, had a clear sense of the difference between "the map" created by abstract computer calculations and "the territory" that people inhabited in the workplace. Increasingly after 1970, however, managers lacking in shop floor experience or in engineering training, often trained in graduate business schools, came to dominate American and European manufacturing establishments. In their hands the "map was the territory." In other words, they considered reality to be the abstract quantitative models, the management accounting reports, and the computer scheduling algorithms. (Johnson and Bröms, 2000, 23)

People studying the transfer of Japanese manufacturing to America also objected to the US management caste's work culture. Japanese transplant managers criticized the American managers they encountered for their lack of "commitment" and their abuse of power. They complained about the US managers' caste mentality, about their weak loyalty to their companies, about their high salary claims, and about their inability to forget Taylorist modes of command management – all mother's milk in managerialism and taught in the core curriculum of US business schools. Martin Kenney and Richard Florida in their study

of Japanese transplants emphasized this point: "In nearly every plant we visited [in the US], Japanese managers voiced concern about the manner by which American managers operate. An executive at Honda of America told us that his greatest problem was teaching American managers the Honda way" (Kenney and Florida, 1993, 287).

Like-minded people thought US manufacturing and the business schools that funneled MBAs to them were ripe for reform. The management problem in manufacturing came to public attention. In 1979, after the NBC television program "If Japan Can … Why Can't We?" three to four hundred alarmed managers trooped into each of W. Edwards Deming's four-day seminars on Total Quality Management (TQM), which heretofore had been empty. Concern became a movement with institutional dimensions. The Greater Philadelphia Chamber of Commerce sponsored PACE, the Philadelphia Area Council for Excellence, which brought together businessmen, union leaders, and civic dignitaries grappling with regional deindustrialization attributed to Japanese competition. A Growth Opportunity Alliances of Greater Lawrence (GOAL), composed of the same sort of people as PACE, met for the same reason during the same period. Deming Societies sprang up in every region of the country, more than fifty of them by the late 1980s, eagerly resolved to propagate the master's ideas about statistical quality control and process management, the mainstays of Japanese production systems.

In the Rust Belt, concerned people broke away from the American Production and Inventory Control Society, with its quantification-oriented Material Resource Planning (MRP), a computer-focused control system for shop floors created at IBM in the 1960s, and founded the Association for Manufacturing Excellence (AME), headquartered in Wheeling, Illinois. Formally chartered in 1985, AME concentrated initially

on manufacturing improvement. They investigated Japanese production methods, employee participation schemes on shop floors, and team-based work. AME grew into a national association with 5,000 members, organized regionally, with branches in the Northeast, the Mid-Atlantic, the Southeast, the Midwest, the West, the Southwest, and Canada.

Congress in the 1988 Trade Act authorized the US Department of Education to found sixteen (later expanded to twenty) Centers for International Business Education and Research (CIBER). Business school deans, seizing on the opportunity, organized new CIBER units in their precincts, which emphasized foreign languages and business cultures. They organized foreign business internships, and study exchange programs. Some of the new institutes blossomed, such as Hawaii's Pacific-Asian Management Institute (PAMI). Business schools offered joint MBA-Asian Studies degrees, at Cornell, the University of California at Berkeley, Michigan, and Wharton.

But these developments, which took place on the periphery of business school education, did not disturb the core "New Look" study program in elite MBA institutions. Considering the magnitude of the threat, the failure of the business schools to throw themselves into the fight to save manufacturing is astonishing and constitutes a leadership failure of major importance. Robert S. Kaplan, former dean of Carnegie Mellon Business School and a Harvard Business School professor (co-author with H. Thomas Johnson of a critical book on management accounting, *Relevance Lost*, 1987), underscored the failure. After reviewing articles published in leading operations management journals and examining research and teaching in top business schools, Kaplan found that only 1 to 2 percent of the schools had "truly been affected, as of early 1991, by the Total Quality Management revolution that had been creating radical change in many US and worldwide businesses" (Kaplan, 1991, 1). He

concluded that American business school research and teaching contributed almost nothing to the most significant development in the business world over the past half century – the quality revolution.

The information technology revolution and business schools

While manufacturing declined in what became the Rust Belt, the nation experienced a remarkable industrial revolution in information technology that for most allayed doubts about the prowess of US entrepreneurship, except for those mired in the old decaying industrial regions. Could it be that business schools made up for their neglect of TQM by making a major educational contribution to the management needed to develop the new IT firms?

In order to clarify the relationship between business schools and the IT revolution, our discussion is divided into two time frames: 1950–1975, the pre-commercial phase of development, and 1975 onward, the stage of interactivity in IT technology that exploded on the internet in the 1990s in commercial applications that fundamentally changed almost every aspect of people's lives throughout the world. To have made a major contribution to the management of the IT revolution would have made the business schools' neglect of TQM forgivable.

Before 1975

"According to modern theory," Erkko Autio and Riikka-Lenna Leskela wrote, "economic growth is ultimately driven by the search for new ideas by profit-seeking innovators" (see Reynolds et al., 2001, 28). This thinking belongs to the triumphant school of neoclassical market economists. The historical

economist Werner Sombart offered a better explanation for the rise of Silicon Valley before it happened. He claimed that "the growth of large-scale nationalistic warfare" was the root cause of economic development, since the demand for more effective weapons, offensive and defensive, stimulated technology and invention (quoted in Castells and Hall, 1994, 17). The industries that developed IT before 1975 operated "outside the restrictions of [commercial] market criteria." They were an accidental product of the exigencies of the Cold War. Not greed, not free-market demand, but fear, especially after the Soviet Union exploded atomic bombs and possessed the intercontinental missiles to deliver them, prompted Americans decades-long to pay the enormous costs of superpower rivalry. Most of that money went into conventional weaponry, but billions also went for scientific research in IT. Consequently, one group of scholars observed: "From the explosion of the first Soviet atomic bomb in 1949 until the mid-1960s, the driving force for science policy remained the military-technological competition with the Soviet Union" (Alic et al., 1992, 97).

Most of the interactive IT exploited commercially after 1975 started in government-sponsored research. Without a long and expensive gestation period, IT could never have been used commercially, for it would not have existed. Examples are legion, but one, because it is now ubiquitous, suffices to illustrate the noncommercial origins of IT. The government lavishly funded a new organization, the Advanced Research Projects Agency (ARPA) in a crash program to regain the initiative in science and technology (which in fact the US had never lost). In 1964 a team of ARPA funders visited Douglas Englebart, whom the National Aeronautics and Space Administration (NASA) had supported with computer equipment and one million dollars a year to establish an Augmentation Research Center at

the Stanford Research Institute, to "create the mind amplifying computer" he had been writing about (Rheingold, 1991, 81).

In 1969, the Englebart research team presented their findings at a computer conference.

> Sitting on stage with a keyboard, screen, mouse, and the kind of earphone/microphone setup pilots and switchboard operators wear, Englebart navigat[ed] through information space … He called up documents from the computer's memory and displayed them on the big screen at the front of the auditorium, collapsed the documents to a series of descriptive one-line headings, clicked a button on his mouse and expanded a heading to reveal a document, typed in a command and summoned a video image and a computer graphic to the screen. He typed in words and deleted them, cut and pasted paragraphs and documents from one place to another … The assembled engineers, programmers, and computer scientists had never seen anything like it. (Rheingold, 1991, 84)

Englebart's ARPA-supported center introduced the interactive features of the personal computer that Apple purloined and brought to market in the 1980s and which is now omnipresent.

The networks that link computers, moreover, began as government projects, starting with SAGE (Semi-Automatic Ground Environment System), a computer-activated, real-time continental air-defense system developed at the Massachusetts Institute of Technology's Lincoln Laboratory under US Air Force contract, continuing through ARPANET, a computer network that ARPA researchers created and exploited themselves in their research liaison and then gave to the commercial world (Locke, 2000, 70). None of the technology originated with commercial application in mind but instead as tools needed to solve military information problems. The United States' massive commercial IT lead after the 1970s arose from the government-sponsored head start, not from superior free-market enterprise (Lerner, 1992). To conclude with Rheingold,

> If necessity is the mother of invention, it must be added that the Defense Department is the father of technology: from the Army's first electronic digital computer in the 1940s to the Air Force research on head-mounted displays in the 1980s, the U.S. military has always been the prime contractor for the most significant innovations in computer technology. (Rheingold, 1991, 80)

The hardware industry thrived before 1975; semiconductor firms evolved from small producers of made-to-order military products to mass producers of standard chips. The industry expanded capacity, became capital intensive and vertically integrated. By 1980 only a few American semiconductor producers (Fairchild, Intel, National Semiconductors, Advanced Micro Devices) counted in an industry that employed 200,000 people in Silicon Valley alone. Management in the semiconductor industry adopted the budgeting, the accounting-based financial reporting systems, and the cost-control instruments typically found in large managerial corporations. Consequently there was a useful place for MBAs in them just as there was for business school graduates in financial accounting in US automobile firms during the era of mass production.

But then, just as in automobiles and at about the same time, the "technology jelly bean" producers suffered grievous losses through Japanese competition. Between 1983 and 1990, US firms' share of worldwide semiconductor revenues fell from 80 percent to 33 percent (Locke, 2000, 74). The industry looked as if it too would succumb to the Japanese challenge. But the explosive growth in interactivity technology and software manufacturing unexpectedly transformed the region and the American IT industry, resulting in a remarkable US high-tech manufacturing turnabout.

The US IT industry moved away from a semiconductor, commodity-driven business to one of high-value-added specialized chip making, and high-tech, customized semiconductor

production. More important, IT bred a prodigious software industry in the 1980s. By the early 1990s, over 5,000 software firms operated in the United States.

Did managerialism make Silicon Valley commercially successful after 1975?

How a dynamic habitat like Silicon Valley really worked in the high-growth commercial phase of information technology is not easily deciphered. For explanations, scholars turned away from big firm hierarchies to habitat analysis, since start-up firms drove the development. No social scientist could actually build a high-tech habitat based on habitat theory and then watch it blossom commercially before his or her eyes. The life-giving variables were not sufficiently knowable to do it. But it can be said upfront that the management ideas MBAs learned in the reformed business schools did not drive habitat development in these high-tech regions.

In the start-up enterprises mushrooming in the Silicon Valley habitat after 1975, scientists and engineers, not MBAs, were the heroes. Those from Stanford's Computer Science Department illustrate the point. Andy Bechtolsheim, a founder of Sun Microsystems, John Hennessy, a founder of MIPS Technologies, Inc., Jim Clark, a founder of Silicon Graphics and Netscape, Jerry Kaplan, a founder of Techknowledge, Go, and Onsale, Forrest Basket, technical officer at MIPs, Len Bosack, a founder at Cisco Systems, and David Cheriton, a founder of Graniote Market Value all came out of there. In 2004 the combined worth of their companies amounted to about $90 billion. The scientists and engineers possessed the indispensable mathematical and scientific knowhow for the great product ideas essential to start-up firms.

Business schools object to such a formulation, on the grounds that entrepreneurialism requires more than a technical idea; to

succeed, a high-tech start-up needs a sense about the commercialization of a product, plus capital, public relations, marketing, and good administration, which are not technical ideas. There is no evidence, however, that those trained in mainline MBA business schools with skills suited to management in pyramidal corporate structures spurred entrepreneurship in a high-tech cluster such as Silicon Valley. Most studies about it and similar habitats stress entrepreneurial networking. The Swedish economist Gunnar Eliasson, who was often in Silicon Valley, noted that the new Experimentally Oriented Economy there, which operated in a climate of "uncertainty," depended on the existence of "competency blocs" (Eliasson, 1998); Michael Best talked about success depending on an "open system dynamic" in a regional network into which start-up firms integrated and from which they profited (Best, 2001).

Eliasson observed that "the bulk of subjects on the teaching agenda of business schools, like investment calculation and financial economics, rest on the assumption of [a formal knowledge] model" (Eliasson, 1998, 6). And the angel investors that funded IT start-ups had to know the "territory" for their investments to do well. AnnaLee Saxenian pointed out that the informal networks of moneyed angels brought technical skills, operating experience, and a myriad of industry contacts – as well as cash – to the ventures they funded (Saxenian, 1994, 184). The closeness to local technology networks was the key. She quoted a former Wall Street executive on their importance: "In New York, the money is generally managed by professional or financial promoter types. Out here [Silicon Valley] the venture capitalists tend to be entrepreneurs who created and built a company and then sold out. When problems occur with any of their investments, they can step into the business and help." Tacit knowledge about IT learned in Silicon Valley made up more of venture capital competence than formal knowledge of

financial and investment techniques learned in business school finance courses.

The people who developed Silicon Valley in the post-1975 commercial phase were a motley crew. Many of them were immigrants from Asia who had come to study mathematics, science, and/or technology in American universities and then stayed on to work in firms, start their own companies, or both. Saxenian told their story based on the 1990 census (Saxenian, 2000). At the century's end, Asian immigrant entrepreneurs had founded 17 percent of Silicon Valley high-tech start-ups. Almost simultaneously, IT centers developed in their homelands – in Taiwan, in Singapore, in Bangalore – incited through the Silicon Valley connection.

The extent to which Europeans participated is less clear (Locke and Schöne, 2004). They began to take part in what Frenchmen called the gold rush, the *ruée d'or,* in the mid 1980s. Jean-Louis Gassée, who arrived at Apple then, was one of the pioneers. The great influx came in the 1990s. Numbers are not easy to derive, but those provided by the French consulate in San Francisco estimated that from 10,000 to 40,000 Frenchmen were in Silicon Valley and San Francisco circa 2000, which, even if the lower number is used, is a lot of French scientific and engineering talent living in northern California. Most of them came from the *grandes écoles* of engineering. Rumors about German visitors put their numbers even higher – twice that of the French. They were scientifically knowledgeable and numerate, but there were few MBAs among them because MBA programs in Germany were rare. The British arrived in great numbers too, although they are less easy to identify because they blended more easily with the Americans. Every European country had a presence.

Orthodox American managers in the late 1970s expected their management views to be just as useful to firms in maturing

IT companies as in low-tech enterprises. John Sculley, the Wharton MBA, thought so when he decided to leave Pepsi-Cola for Apple in 1983. He told Steve Jobs,

> Just as Northern California is the "technology center" for innovation in computers … the Northeast corridor [is] the "management center" for innovation in business. There are a lot of exciting concepts and tools being developed by business schools and consulting firms in the East … Make sure you are exposed to their leaders and their ideas. (Sculley, 1987, 135)

The top-down style of management, with its top-down management control methods, that he had known at Pepsi-Cola and learned at Wharton and naïvely thought would be the East's contribution to management at Apple did not work. These methods were useless for habitat networking. They did not even succeed at Apple. Sculley found this out after his management team ousted Jobs. A new, Sculley-led board managed the firm rapidly towards bankruptcy. Desperate stockholders forced the board to bring back Jobs, a product man, to save the firm; Sculley was history, Jobs the future.

The burgeoning software industry depended on a tacit-knowledge work environment that could not easily accommodate MBA managerialism. Tacit skill and innate ability are more pertinent components of the software programmer's competence than they are that of engineers working on hardware. The largest software firm (Microsoft) hired "people with no professional programming experience or formal training." Neither of its two founders (Paul Allen and Bill Gates) had obtained college degrees. The legend of Silicon Valley hacker/entrepreneurs is not a myth; they learned about programming on the job, when they had a gift for it. Software firms, in their maturity, moreover, never assumed the organizational dimension of large manufactories. Even Microsoft employed only 700 people

in its new facilities at Redmond, Washington. In the late 1980s the core workers there, the programmers, required "a work environment," as Ichbiah and Knepper remarked, "with as few restraints as possible. At Microsoft, the company chooses the best, hardest-working people and turns them loose to prove themselves" (Ichbiah and Knepper, 1992, 225).

Much the same conditions prevailed within the specialist chipmakers, whose business by the late 1980s outpaced that of the commodity-driven, mass-production microchip makers. The specialist chipmakers discarded the control mechanism learned in business schools for network organizations "where people teams, and sometimes whole organizations," as AnnaLee Saxenian wrote, "act as independent nodes, form multiple links across boundaries, support one another, share common values, and report to a matrix of leaders who act as coaches and mentors more than line managers" (Saxenian, 1994, 90).

Business schools under the influence of the new paradigm did not teach this kind of management. People learned it from the entrepreneurial environment. Once the schools awoke to the nature of the IT habitat's entrepreneurial demands, they began belatedly to develop centers of entrepreneurship out of sheer opportunism. Professors and students in the add-on business school centers participated in the activities of habitat entrepreneurial start-up networking. But the faculties in the top research business schools resisted, in the name of management science, efforts to make entrepreneurship an academic discipline. Indeed, Stanford's business school faculty is notorious for having refused to accept the endowment of a chair in entrepreneurship from a rich benefactor because they considered the subject scientifically unworthy. There were no Nobel prizes in economics to be won in the subject.

By 2000 the "New Look" that had been ushered into business school education had clearly prepared people inadequately to

meet the Japanese challenge or fully participate in the entrepreneurial opportunities of Silicon Valley. Students in economics departments and business schools started to revolt against their neoclassically trained economics professors. In June 2000, a group in Paris openly protested about the "knowledge censorship" they experienced in their studies. They proclaimed in a public manifesto:

> Most of us have chosen to study economics so as to acquire a deep understanding of the economic phenomena with which the citizens of today are confronted. But the teaching that is offered, that is to say for the most part neoclassical theory or approaches derived from it, does not generally answer this expectation. Indeed, even when the theory legitimately detaches itself from contingencies in the first instance, it rarely carries out the necessary return to the facts. The empirical side (historical facts, functioning of institutions, and study of the behavior and strategies of the agents …) is almost nonexistent. Furthermore, this gap in the teaching, this disregard for concrete realities, poses an enormous problem for those who would like to render themselves useful to economic and social actors. (Fullbrook, 2003, 6)

The French rebels called the neoclassical economics they were learning "autistic," meaning that it was cut off from the real world. They named their movement, Post-Autistic Economics (PAE). The manifesto of protest, published in *Le Monde*, gained the attention of the French government, which promised "investigations." The rebellion initiated a broad if thin and unevenly spread international movement that involved mainly professional economists, who founded their own review (originally called the *Post-Autistic Economics Review*, now the *Real-World Economics Review*), currently with almost 12,000 subscribers. But these doubts about the effectiveness of the "New Look" in business school education grew mostly outside the United States, on the fringes of core MBA programs within business

schools, and in less famous institutions. The professorial establishment in prestigious US economics departments and business schools skillfully deflected the attack by the most effective way of doing such things – ignoring it. They insisted on living in an academic cocoon, doing research that produced theories without real-world substance, publishing it in peer-reviewed journals, to be read by academic audiences, while training their best graduate students to follow in their footsteps by making careers depend on mastering the toolkit and lingo of the new paradigm.