

The Dynamics of *Old-Economy* Industrial
Research and Development and the
Entrepreneurial Economy:
History, Strategy, and Policy

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Focus of My Presentation

- **Review** briefly the history of the first major US research center on entrepreneurship & the context in which it arose
- **Lay out the inherent problem** posed by the founders of this research center, which is the fundamental problem I want to address today
- **Explore a remarkable constellation** of three fundamental studies that appeared within a three-year period in the United States that together encapsulate this problem
- **Elaborate on the history, economics, and public policies** that surround this problem both in the past and today
- **Conclude**

Harvard University's *Research Center in Entrepreneurial History*

- 1946-1958
- Funding by the Social Science Research Council
- Founders:
 - Joseph Schumpeter, Arthur H. Cole, others within the Economic History Association
 - Believed that the entrepreneur was “the central figure in economics”
- Ultimately, the center failed in its mission to study the entrepreneur and entrepreneurship.
- Failures “were caused not by its internal organization but by the intrinsic difficulties of the subject matter” (Aitken)

Context & Mission of the Harvard Center

- **Context A:** Fundamental changes in modern industrial economies, specifically the rise of industrial capitalism (“trustified capitalism”)
- **Context B:** Fundamental changes in global politics, specifically the post-WWII situation of an emerging Cold War and the decline of colonial empires
- **Mission:** To ensure that the central role played by the entrepreneur in the rise of capitalism (once the “essence” of the entrepreneur was understood fundamentally) would endure in this brave new world

The Great Constellation & the Central “Problematique”

- Joseph Schumpeter, *Capitalism, Socialism, and Democracy* (1943)
- Vannevar Bush, *Science, the Endless Frontier* (1945)
- Peter Drucker, *The Concept of the Corporation* (1946)
- The central problematique of the time emerges from a triangulation of these works

Schumpeter

- What in is his 1911 book, *The Theory of Capitalist Development*, had been a major concern (the creation of the entrepreneur who possessed “the dream and will to found a private kingdom” and the “will to conquer” through innovation) had been alleviated by the time of his 1943 book by the “perfectly bureaucratized giant industrial unit” which had mastered the management of innovation through the institution of R&D laboratories that had “come to be the most powerful engine of progress”)
- “Manager” v. “Entrepreneur”--now subsumed in one institution

Drucker

- *The Concept of the Corporation*, 1946, an “insider” study of the organization and operating principles of General Motors Corporation, then the largest and most widely admired corporation in the United States
- Focused especially on the organizational design and principles of the “M-form” corporation--i.e., the diversified, multidivisional corporation
- A kind of casebook for American-style corporate capitalism: inspired major reorganizations in U.S.A. and abroad in order to emulate GM
- Championed “the manager”

Bush

- Perhaps less well known, but certainly as important from a policy perspective, as Schumpeter and Drucker
- *Science, the Endless Frontier* (1945): A report to the President of the USA from Vannevar Bush, the wartime science and technology “tsar” for Franklin D. Roosevelt, about postwar science and technology policy. Bush presided over the US developments of radar, large-scale production of penicillin, the proximity fuse, ENIAC, and the atomic bomb, among other innovations
- Principal arguments and recommendations:
 - All radical technological innovation derives from basic research (“*the linear model*”)
 - In the postwar environment, the US govt. had an inescapable duty to fund basic research, the wellspring of new technologies
 - US govt. had to scale up education of scientists and engineers for national security and economic progress

The Post-World War II Paradigm in the US “Innovation System”

- Schumpeter + Bush + Drucker = the paradigm
- Large, diversified corporations operating under a system of antitrust regulation
- Corporations supported both large, central research organizations that conducted academic-style basic research and more applied R&D in semiautonomous business units
- Increasing role of the federal government in funding basic research (principally in universities)
- Major federal Cold War-related defense R&D that reached high percentages of GNP

Breakdown of the Paradigm

- From within the corporation:
 - by the late 1950s & early 1960s
 - postwar corporate growth rates not sustained
 - large R&D spillovers from corporate research
 - some firms respond by creating internal new venture programs to try to capture or contain spillovers
 - some firms also establish venture capital programs that provided capital for start-up firms that might eventually be the “next Xerox” or whatever
 - some firms cut back on basic research programs and try to impose commercial “relevance” to corporate research programs (i.e., end of the “ivory tower”)

Breakdown of the Paradigm, II

- From outside the corporation:
 - In the face of emergent global competition and macroeconomic forces that resulted in federal science and technology policy changes
 - In the face of radical scientific breakthroughs, principally in university laboratories that presented econ/tech opportunities (classic case: recombinant DNA and protein chemistry)
 - In the face of breakdowns of Mertonian scientific norms that had emerged with Enlightenment science and had reached their peak in the immediate post-WWII environment in the US
 - In the face of the rise of new institutions (e.g., the venture capital industry)

The New Paradigm

- Inherently unstable, just like the old paradigm
- Much of what led to the shift from the old paradigm to the new paradigm depended on one of the dominant institutions of the old paradigm, the corporate research laboratory.
 - This institution is a dying breed (the “host” is dying to use a biological metaphor)
 - Those corporate labs that survive have gotten much smarter about IP management and containing spillovers
- Much of the new paradigm has depended on excessive public funding of innovative activity (i.e., funding that goes well beyond the basic criterion of “market failure”)

The New Paradigm, II

- In the face of globalization, technology-based firms (both Old Economy and New Economy types) are seeking both new and old ways of organizing innovative activity (the “division of innovative activity” as per Arora), and for numerous system-dynamic reasons, no equilibrium point is in sight
- The re-emergence of the inventor/entrepreneur as cultural icon is subject to rapid changes in social tastes. Just as the saint became passe, as did the mid-20th-century’s man in the grey-flannel suit and the corporate scientist in the lab coat, so too will the entrepreneur II, if the past is any indication of the future.

The New Paradigm, III

- Finally, the central problem that concerned Schumpeter, Drucker, and V. Bush--innovation in the context of institutions that are both difficult to create and, once established, difficult to change--remains with us. The fact that corporations still invest internally in R&D programs in the face of rapidly developing markets for technology seems to me to be an indication that the paradigmatic shifts about which I have spoken are perhaps not as clean and as neat as we commonly assume.