

The Religion of Forestry: Scientific Management

Journal of Forestry, November 1999

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The founder of the USDA Forest Service, Gifford Pinchot, was more than a student of the growth rates of trees and other technical aspects of forestry. Pinchot was a leading member of the progressive movement of his time that sought elemental reforms in American political and economic institutions. He was a close adviser to President Theodore Roosevelt and would go on to become governor of Pennsylvania. His view of the role of the Forest Service in American life was shaped by broader progressive attitudes and assumptions. The Forest Service was to be an instrument within the overall project of the scientific management of American society. (The term “scientific management” is sometimes used narrowly to refer to the ideas of Frederick Taylor for improving production processes in American business. As employed in this article, following many other writings, scientific management refers to the application of scientific methods to guide management and other policy decisions throughout American society (Waldo 1984)).

The creation of a profession of forestry in the Progressive Era was part of a widespread movement toward professionalism, yielding not only the Society of American Foresters in 1900, but also the American Economic Association in 1885, the American Sociological Association in 1905, and the American Planning Association in 1909—indeed, new professional groups for almost every area of expertise that would be required for the future expert management of American society.

At the end of the 20th century, the Forest Service lacks a clear sense of direction and mission. The American public no longer accepts the main tenets of scientific management, whether applied to forests or other areas of American life. The level of public trust of professionals—from doctors to lawyers to economists to foresters—has been declining for a quarter century. Signs of this trend are seen in the willingness of members of Congress, the judiciary, and the executive branch to intervene in the management of the national forests. The trend was symbolized most recently by the appointment of Mike Dombeck as chief of the Forest Service, an overtly political appointment from outside the ranks of existing Forest Service professionals.

If the 20th century history of the Forest Service has been closely tied to the fate of scientific management, its future in the 21st century will closely reflect ideas that replace scientific management. The Forest Service is currently confused about its mission in part because American society is no longer

sure about the future of professional expertise. The agency needs a new paradigm, but it cannot develop such a vision on its own. Today it confronts a range of views that extends from libertarians who wish to abolish most of government to active proponents of powerful new government controls as the only way to avert environmental disaster.

Thinking about the future requires first an understanding of the past. What were the basic ideas of scientific management? Why have these ideas come to be widely rejected at the end of this century?

Engine of Progress

A 1995 article in *Public Administration Review* surveys the interaction of “Political science, public administration, and the rise of the American administrative state” (Lee 1995). The leading political scientists of the early 20th century, including Francis Lieber, John Burgess, Woodrow Wilson, Frank Goodnow, and W.W. Willoughby, articulated a “specific ideology of science and progress” (Lee 1995). It was based on the core idea that “science was regarded as the method of understanding and controlling changes.” Great faith was “invested in science and technology as the engine of progress.” From this beginning point the progressive theorists “provided the ideological and institutional apparatus for the rise of the administrative state” (Lee 1995) in the United States in the 20th century, which included the Forest Service as a leading example.

Scientific management was a theory not only about the capabilities of scientific knowledge to transform the physical world but also of the political institutions by which this knowledge would be put to use. The theory of “scientific management redefines what had hitherto been political problems as management problems, the solution of which is governed by the logic of science” (Lee 1995). That is to say, scientific management sought “the establishment of science as the institution of governance and the centralization of power in the hands of scientists.” This was possible in progressive thinking because the very processes of government administration were regarded as “objective, universal, natural, altogether devoid of historical and cultural contexts, and dictated only by scientific laws” (Lee 1995).

An inevitable tension was created with a traditional precept of American democracy—how could “government by the people” be replaced by government by a new professional elite? Progressives saw their efforts as a corrective to the failures of American democracy in the late 19th century, when government—if not outright corrupt—had become the captive of big business and other special interests. In the early 20th century there was a further general “disillusionment about the rational capacity of the people” (Lee 1995) in matters of governance. It was thus imperative that objective knowledge, as discovered by physical and social scientists, be applied more directly to the processes of government.

Progressive theorists such as Pinchot saw themselves engaged in a project in which the stakes were nothing less than “the survival of American democracy [which] rested on the use of scientific knowledge as a technology of governance” (Lee 1995).

The Forest Service was the product of the application of these progressive ideas to the problems of forest management. It was to be an organization run by professionals kept well separated from politics. This separation would allow foresters to put science to use in the national forests in the service of the public interest. Social values, as dictated by the Congress and other parts of the political process, might enter in setting broad goals for the use of the national forests. But political influences must not enter into the details of forest management by which these goals were realized. The chief of the Forest Service must be a forestry professional, insulated from politics, who would supervise the overall application of scientific forestry knowledge to achieve forest outcomes in the most efficient manner possible.

Progressivism and Efficiency

In progressive thinking, the idea of progress was conceived in material terms. If progressivism was the “gospel of efficiency,” as Samuel Hays would famously describe it (Hays 1959), the importance of efficiency lay in the fact that it put American society on the path of maximum economic growth. An efficient economy was effectively solving the material problems that had preoccupied most people for most of human history. Life had always been a struggle to find adequate food, shelter, and protection from disease and the elements. If this struggle could now be resolved, progressives were convinced it would mean a whole new era in human affairs.

As Pinchot often emphasized, the preeminent role of the national forests was to supply wood to meet the home building needs of the nation—to resolve at long last the shelter problem. The Forest Service in this way would be doing its part in the grand progressive project of opening the way to a virtual heaven on earth (for a full treatment of the tenets of the progressive gospel, see Nelson 1991). Indeed, Pinchot would declare in *The Fight for Conservation* that his efforts for conservation had been designed “to help in bringing the Kingdom of God on earth” (Pinchot 1967, p. 95).

Progressivism thus was not only concerned with material matters but was a grand undertaking of spiritual renewal as well. If the details of achieving economic progress might differ among them, American progressivism shared with Marxism, European socialism, Herbert Spencer’s social Darwinism, and a host of “religions of progress” the conviction that the end of material scarcity would mean an end to the historic conflicts among people over resources and a broad solution to longstanding problems of the human condition.

This set of convictions was never itself subject to scientific analysis. American foresters never applied the scientific method to ask whether the high hopes for science and progress were objectively true. Rather, in the Progressive Era (if no longer today), it seemed impossible to many people to believe otherwise. The progressive vision was simply an article of faith. Scientific management was the secular religion, not only of the Forest Service and professional forestry, but for the American welfare and regulatory state during much of the 20th century.

Failure of Progressivism

The problem today is that most of the progressive articles of faith have not stood up well to the test of history. There has been enormous progress in the material conditions of life in the most developed parts of the world, for practical purposes supplying most essential needs. Yet the ending of material scarcity does not seem to have yielded a whole new degree of happiness and emotional well-being in human affairs, as progressives had so confidently expected would be the case. Indeed, even as a nation such as Germany made great strides economically and scientifically in the first half of the century, it simultaneously plunged the world into the horrors of world wars and genocide. The great rise of material wealth in the United States over the course of the 20th century has not abolished crime; the prisons of the United States today house the unprecedented number of more than 1.5 million Americans.

The high expectations of progressives for the development of science also have not been realized. All too often, social and administrative scientists have affirmed scientific truth only to find later that they were in error. For decades, the message of the need to control forest fires was proclaimed as a sound management principle of professional forestry, but in the 1990s new expert thinking has rejected all this. Keynesian economics proved unable to cure the economic problems of stagflation of the 1970s. Partly because social and managerial science has been unable to uphold its end, but also partly because there was a basic tension with democratic theory, the high progressive hopes for a clear separation of politics and government administration have been another victim of the history of the 20th century. Today, the Forest Service is being run by political appointees, rather than forestry experts. The Clinton administration in this regard has merely accelerated a longstanding trend.

Indeed, leading political scientists were making their reputations in the 1950s by writing about the failure of the progressive plan for scientific management of American government. Contrary to the progressive vision, interest groups were involved in determining government actions at every step of the way. American pluralist politics, not scientific management, was the reality of American government, even in many of its own administrative details. Perhaps there was no other possibility in a democratic

system. In the late 1960s Theodore Lowi characterized this emerging consensus within political science as “interest-group liberalism.”

Interest-Group Liberalism

Professional foresters were slow to appreciate the new thinking about American government but in fact interest-group liberalism represented a decisive rejection of the very foundational scheme on which the Forest Service had been built and on which its social legitimacy continued to rest. For Pinchot, the “special interests” were not to be incorporated into the basic processes of governance but were unfortunate and unwelcome influences and every effort must be made to exclude them from objective, “scientific” government.

The Forest Service often tried to resist the application of interest-group liberalism in its domain but could not stand against the tide. Laws such as the National Environmental Policy Act of 1970 and National Forest Management Act of 1976 required extensive public participation in planning and other decisionmaking processes. The courts no longer deferred to the claims of the Forest Service to apply objective scientific knowledge to the management of the national forests. The power of progressive ideology to hold the fort against congressional, White House, and other direct political interventions in the details of national forest management was being steadily eroded. By the late 1980s, groups outside professional forestry, often within the environmental movement, were setting the agenda and driving the principal decisions in national forest management.

The stage for all this had in essence been set much earlier in the world of ideas, when leading American intellectuals had concluded that progressive hopes for scientific management of American society were not going to be realized. However, the Forest Service and the forestry profession, unlike in Pinchot’s day, were no longer on the cutting edge of American political thought. Thus, they would often be blindsided by the developments of the 1970s and 1980s, reacting by feeling a sense of betrayal of their old progressive ideals.

Outside the forestry profession, critics from an economic perspective argued that the failure of professional forestry had been intellectual as well. In order for forestry to provide a basis for scientific management of the national forests, foresters had to do more than establish the correct rate of growth of trees under certain physical assumptions. If forestry was to be a land management science as well as a physical science, there had to be a way of applying technical expertise to make decisions about the best use of the forests. It was apparent that the “principle” of multiple-use, traditionally offered by the Forest

Service as the basis for allocating the resources of the forests among competing uses, could not fill this role.

Seeking a New Foundation

At Resources for the Future, an old progressive, Marion Clawson, saw the Forest Service itself as having betrayed its early ideals. Clawson expressed this view in a series of scathing commentaries on agency management in the 1970s and 1980s, at one point declaring in *Science* magazine that the overall record of the Forest Service could only be regarded as “disastrous” (Clawson 1976). The Forest Service had in practice abandoned the progressive commitment to efficiency and was instead basing its decisions on crass politics. His Resources for the Future colleague, another old progressive, John Krutilla, offered much the same diagnosis but put the emphasis in his writings on the steps necessary to revive scientific management. As Krutilla saw matters, professional foresters would have to learn economics. The only possible objective criterion for deciding among the many possible uses of the national forests was to choose that combination of uses that acted to maximize the total value of all forest uses combined. It would be possible in this way to replace the “high motives and sincere exhortations” of traditional forestry with more practical “operation criteria” that could finally provide a true scientific basis for forest management (Krutilla 1979).

Krutilla’s and Clawson’s attempts to articulate a new intellectual foundation for scientific management of the national forests—to revive the progressive project through economics—was a failure as well. Economic science had not reached the degree of objectivity promised by Krutilla. Moreover, both took the progressive value system for granted. Like most forestry professionals, they saw no need to defend the values of maximum use of the forests to advance human material well-being in the world, values that had in fact been at the core of Pinchot’s original founding vision. Many members of the environmental movement, however, had a different idea. For theorists of “deep ecology,” such as Bill Devall and George Sessions, the fundamental problem was “the ultimate value judgment on which technological society rests—progress conceived as the further development and expansion of the artificial environment at the expense of the natural world” (Devall and Sessions 1985, p. 48)

This was an idea in basic conflict with the progressive value system. For American progressives, for example, a dam had been a great symbol of progress, representing the wonderful application of engineering expertise to conquer a raging river to provide food and electricity for the world.

Environmentalist David Brower’s view, however, was, “I hate all dams, large and small,” whatever the benefit-cost ratio might be (McPhee 1971, p. 159). Economics had nothing to do with the undesirability

of building a dam because a dam was, simply put, a desecration of nature. To argue for building a dam would be like arguing for the institution of slavery because it was economically efficient. Instead of the progressive symbol of a dam, the leading symbol for modern environmentalism has been a wilderness area, defined by the very absence of human presence and impact. Rather than control nature for human benefit, mankind must set nature free.

“Ecosystem Management”

The Forest Service thus found itself torn between budget officers and economists arguing for a revival of the progressive project of Pinchot and leading environmentalists renouncing the very value system of progressivism. In the 1990s the agency sought to reconcile these tensions by a virtual sleight of hand. A new principle, “ecosystem management,” would put scientific management at the service of the new environmental values. But what if a basic hostility to scientific management lay at the core of much new environmental thinking? What if many environmental advocates found objectionable the very idea of manipulating nature through scientific knowledge for human benefit?

In seeking to reconcile the irreconcilable, many observers saw ecosystem management as devoid of content—as a public relations gesture more than actual scientific management. As the General Accounting Office put it, “ecosystem management has come to represent different things to different people” (GAO 1994). Or as the GAO found one person putting it cynically, “there is not enough agreement on the concept to hinder its popularity”—a comment often made earlier with respect to a predecessor Forest Service management “principle,” the principle of multiple use.

Despite such problems, the Forest Service does not feel able to abandon explicitly the ideas of scientific management. It would be almost like a Christian abandoning the authority of the Bible. Pinchot is the George Washington of American forestry. Moreover, scientific management resolves a very practical question—what does the Forest Service say when a forest user asks the following question: why have you favored another use over my desired use? The answer, as the Forest Service now responds, is the “scientific” dictates of ecosystem management. It may be mostly a bluff but the language of ecosystem management at least sounds good enough to buy the Forest Service some breathing space.

Future of the Forest Service

If there were no answer, if the Forest Service had to confess today that it has no principled basis for decisionmaking, the social legitimacy of the agency might be in doubt. Indeed, the very institutional survival of the Forest Service might be in danger. Randal

O'Toole stated in 1997 that the "Forest Service will be 100 years old in 2005—if it survives that long. There is a good chance that it won't" (O'Toole 1997). Still more recently, Roger Sedjo of Resources for the Future has similarly suggested that "perhaps it is time to 'think the unthinkable.' The Forest Service has been an unusually successful organization for much of its history. That is no longer so." Sedjo concluded that even if the agency should survive, "it is clearly time to rethink the role and mission" (Sedjo 1998).

The fundamental problem posed is the need to find a successor vision to the Forest Service's founding guiding vision—its religion—of scientific management. The Forest Service is still wedded to a set of progressive ideas that have not been widely accepted among leading American political and social thinkers for more than a quarter century. The difficulty for the Forest Service, to be sure, is that so much of its current institutional forms and public posture have been so closely tied for so long to scientific management themes. If these arguments are abandoned, the Forest Service might have no satisfactory intellectual defense against demands for radical changes in its organization and traditional ways of doing things. As O'Toole and Sedjo have speculated, the future of the agency could even be in doubt. It has been the claim to scientific objectivity above all that has justified the centralization of authority to manage the national forests at the federal level in Washington, DC.

It thus is difficult for the Forest Service to exercise a leadership role in the search for a successor vision to the ideas of scientific management—as Pinchot once was a leading American figure in formulating broader tenets of American progressive thought. The same need not be true, however, of the forestry profession. If scientific management is abandoned, there would probably be some significant changes in the practice of professional forestry. However, as long as there are forests, there will be a need for systematically organized inquiry into the management needs and policies for these forests.

It is time for the forestry profession to move back to the frontiers of American political and economic thought, rather than continue to operate within the stale bromides of scientific management theories dating all the way back to the Progressive Era.

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Long abstract

The guiding philosophy of the USDA Forest Service in the 20th century has been scientific management. Due in part to many failures of scientific management, and also to basic shifts in American values, this philosophy is no longer appropriate. The Forest Service is left without any clear role. Ecosystem management is an awkward compromise that is not likely to solve the problem. If the agency cannot define a clearer and more widely accepted mission to guide its efforts, its future existence will be in doubt.

short abstract:

The USDA Forest Service was established by progressive interests whose guiding philosophy was scientific management. This management strategy is no longer appropriate, requiring a basic rethinking of the place of the agency in American government.