The Agricultural Experiment Station and Professionalization: Scientists' Goals for Agriculture

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In the last decade American historians have focused a good deal of attention on professionalism and professionalization as significant social forces in the late-nineteenth and early-twentieth centuries. Writing in 1976, Barton Bledstein delineated a late-nineteenth-century "culture of professionalism," characterized by the rise of new professions and the transformation of traditional occupations into professions. Bledstein argued that professionalism became attractive in part because it allowed some members of an egalitarian society to set themselves apart from the rest. Because they needed special training, which was often largely intellectual in nature, held knowledge not readily available to or understood by laypeople, and imparted the benefits of their expertise to selected clients, professionals gained an elite status in a nation in which equality remained a publicly celebrated value.[1]

Other historians have argued that professionalism did not rise solely from the human thirst for distinction. It also developed out of what Thomas Haskell has styled a "crisis of authority," in

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1. Barton Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York: Norton, 1976).

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which such traditional guides to action as republican and Christian values seemed insufficient for the challenges of the modern age. Because they commanded technical expertise, professionals both in the social and hard sciences seemed to offer especially appropriate means of addressing modern problems.[2] Despite their impressive rise to social importance, though, professionals did not sweep all before them. As Mary O. Furner has shown, obstreperous client groups and entrenched political interests often prevented professionals from using their knowledge freely to reshape the world. Not only was their own body of knowledge less sure and certain than the public perceived it to be, but they also faced opponents who frustrated their attempts to achieve their goals.[3]

This national trend toward professionalism did not pass agriculture by. One might even argue on the basis of the Morrill Land-Grant College Act of 1862 that agriculture stood in the vanguard of this movement. Another landmark on the road to professionalization in agriculture came with the creation of a national system of agricultural experiment stations by the Hatch Act of 1887. Much more than the agricultural colleges to which they were attached, these institutions were to be staffed by professionals who were to serve their rural clients and, indeed, to professionalize the farmers in turn. In this effort the early station personnel faced the problems of self-definition and acceptance by clients that confronted other professionals, and they had the further challenge of gaining rural acceptance for a standard of value which was essentially urban in nature.

Experiment stations are a curiosity in the history of science because, as Margaret Rossiter has pointed out in an earlier paper, they were created before there was an adequate base of knowledge for them. Agricultural chemistry and botany were the only mature disciplines included in the new stations, and the latter was undergoing revolutionary change. By encouraging agricul-

2. Thomas Haskell, *The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth-Century Crisis of Authority* (Urbana: University of Illinois, 1977).

3. Mary O. Furner, *Advocacy and Objectivity: A Crisis in the Professionalization of American Social Sciences, 1865–1905* (Lexington: University Press of Kentucky, 1975).

tural experiment stations, Congress in a sense created scientific disciplines. This reality, along with the problems occasioned by the hiring of many marginal employees in the early years of federal sponsorship, made professional self-definition a major priority among early scientists. The years between 1887 and 1910 thus witnessed the creation of new learned societies in the new disciplines, the definition and enforcement of professional standards, and the expansion of specialized graduate training, all of which were signs of professional maturation.[4]

Shaping disciplines and forming professional self-identity was only a part of the internal struggle in which the early scientists engaged. They also fought for professional control of the stations. Public sponsorship of the experiment stations placed agricultural scientists in an ambiguous position, and one similar to that held by most social scientists at the time. On the one hand, public support insured rapid growth and promised a relatively secure future. But on the other hand, it carried the threat of public control of, or interference in, matters that professionals considered to be their province exclusively. This problem quickly became apparent in two areas. The first of these was that of institutional governance.

The professionals who staffed the stations believed they should direct the new institutions in such a way as to serve the public or agriculture, variously defined. Unfortunately, local politicians often failed to look beyond the $15,000 annual federal appropriation, which they conceived as a source of patronage and preferment. Few stations were totally immune from the conflict between the professionals and the politicians. At the North Dakota station, for example, a governing board made up of "gang" politicians directed that purchases be made from cronies and even hired personnel without consulting the director. The latter complained, in the best professional fashion, that such actions were intolerable because "the work of the Institution is chiefly technical requiring expert knowledge on the part of its employees," but he was fired for his defense

4. Margaret Rossiter, "The Organization of the Agricultural Sciences," in Alexandra Oleson and John Voss, eds., *The Organization of Knowledge in Modern America, 1860–1920* (Baltimore: Johns Hopkins, 1979), 211–248.

of expertise.[5] The next two directors were politicians, rather than trained scientists.

The public nature of the institutions also rendered them vulnerable to pressure from client groups. The system was ostensibly set up to serve farmers, but few of them had requested help. Consequently, the stations attempted to identify farmers' needs and specifically tailor research to meet these. The "research entrepreneurs" of whom Charles Rosenberg writes were able thereby to stimulate rural interest in and even enthusiasm for the work of the stations, and to create committed client groups that helped insulate the researchers from predatory politicians.[6] The problem was that the client groups themselves sometimes usurped the professionals' role of directing research, and that they favored "applied" rather than "basic" research. The debate over which type of research should be emphasized raged for years. Generally, the more professionally oriented station people, who valued the good opinion of scientists in the mature disciplines, favored basic research.[7] This conflict was never really resolved, and much station work remains of the applied variety. This fact explains part of the contempt the scientific elite continues to hold for the station people, but it is an inevitable consequence of public support rather than a conscious choice.

Experiment station scientists were not unique in seeking a full measure of professional status for themselves. However, unlike doctors, lawyers, accountants, historians, or economists, they also sought to professionalize their clients, the farmers. Professionalization of farmers and the collateral elevation of their status was an early goal of the experiment stations and their champions. Indeed, one of Justin Morrill's eulogists at the convention of

5. Sworn Statement by H. E. Stockbridge, 11 May 1893, State Archives of North Dakota, North Dakota State Historical Society, "Governor: Investigations" Record Group, Subgroup 188, "Special Investigations, 1893–1925," Box 1, File 1, p. 9.

6. Charles Rosenberg, "Science, Technology, and Economic Growth: The Case of the Agricultural Experiment Station Scientist, 1875–1914," *Agricultural History* 45 (January 1971): 1–20.

7. For the debate in the system over "applied" and "basic" research see, for example, Charles E. Rosenberg, "The Adams Act: Politics and the Cause of Scientific Research," *Agricultural History* 38 (January 1964): 3–12, and Ronald L. Nye, "Federal vs. State Agricultural Research Policy: The Case of California's Tulare Experiment Station, 1888–1909," *Agricultural History* 57 (October 1983): 436–49.

the Association of American Agricultural Colleges and Experiment Stations claimed that his "central and controlling thought" was "to bring the light of learning and the aid of science to bear upon those pursuits and callings which, hitherto regarded as illiberal and a badge of inferiority, would thus be lifted to the plane of the other professions and confer equal respectability upon their members."[8] W. O. Atwater, a pioneer at the pre-Hatch Act station in Connecticut and the first director of the USDA's Office of Experiment Stations, claimed that the science produced by the stations "elevates farming as a profession . . . in which brains can be used with profit."[9]

With impressive regularity, commentators pointed to science as the means of uplifting the farmer and elevating his calling to a profession. In a 1900 history of the experiment station movement, for example, A. C. True and V. A. Clark claimed that "with the aid of science agriculture may be so lifted out of the ruts of a dead past that it will be able to hold its own amid the . . . complexities of our modern civilization."[10] One observer believed that science would make farming "among the most attractive and noble of pursuits," and another expressed satisfaction that "a once-despised calling is being lifted to its rightful place" by experiment stations.[11] Clarence Poe, editor of *The Progressive Farmer,* was pleased to see agriculture becoming a "scientific industry." He added that "its change from an industry requiring only physical strength to one requiring skill and trained intelligence means that it has now acquired a dignity which it has never had before."[12]

As Charles Rosenberg has pointed out, there was idealism in the effort to uplift farmers, to make their calling a profession

8. Remarks of M. H. Buckham, *Proceedings of the Thirteenth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, Held at San Francisco, California, July 5–6, 1899,* USDA Office of Experiment Stations *Bulletin No. 76* (Washington: GPO, 1900), 34.

9. V. O. Atwater, "The What and Why of Agricultural Experiment Stations," *Science* 14 (August 9, 1889): 97.

10. W. O. Atwater, *The Agricultural Experiment Stations in the United States,* USDA Office of Experiment Stations *Bulletin No. 80* (Washington: Government Printing Office, 1900): 77.

11. B. F. W. Thorpe, "The Price of Progress in Agriculture," *Scientific American* 87 (August 2, 1902): 86, and W. S. Harwood, "The Mastery of the Earth," *American Illustrated Magazine* 61 (December 1905): 123.

12. Clarence Poe, "The Government and the New Farmer," *The World's Work* 9 (March 1905): 5951.

requiring special knowledge and skill rather than simply a job that even the dullest person could do. It was also a laudable goal to counter the contempt in which society held farmers, whom it viewed increasingly as hicks, yokels, and ignorant bumpkins. Urban people honored professionals, so the professionalization of farmers would raise their status. "The successful infusion of 'scientific' procedures and ideas . . ." Rosenberg notes, "would make the ordinary farmer a man of learning, no longer an object of casual scorn, but a professional like those lawyers and physicians who so frequently regarded themselves as superior."[13]

Although there was much that was praiseworthy in the goal of professionalizing the farmer, there were other aspects of it that were less clearly positive. Implicit in this effort from the beginning was the sense that the status of the station scientist was inextricably bound to the status of his clients. No matter how specialized his knowledge might be, the professional's status would always be limited if he was perceived mainly as the servant of hicks and bumpkins. Conversely, a scientist who served professionals could anticipate greater public respect, regardless of the intrinsic quality of the service he offered. In this way altruism and self-service came to be mixed together in the professionalizing effort.

The goal of professionalizing farmers also imparted to the stations characteristics that remain subjects of controversy today. As Rosenberg implies, it tended to embed them in a single-minded productivity orientation that continues to draw criticism.[14] The clearest objective and quantifiable measure of a farmer's professional expertise was his ability to grow crops and raise animals. The more he produced and the more efficiently he produced became the standard of the farmer's professional performance. Thus, helping the farmer produce more and better crops, regardless of the effect of that activity on the agricultural community as a whole, became the primary area of station concentration.

The professional ethic also had political implications, for it car-

13. Charles Rosenberg, "Rationalization and Reality in the Shaping of American Agricultural Research, 1875–1914," *Social Studies of Science* 7 (1977): 403.

14. Charles Rosenberg, *No Other Gods: On Science and American Social Thought* (Baltimore: Johns Hopkins, 1976): 141–44.

ried with it the very conservative and very American attitude that most problems can be solved by the individual, if only he will alter his way of doing things. Secretary of Agriculture Norman Colman took the notion of individual responsibility so far in 1887 as to claim that "it is the crop of the poor cultivator that is burned with drought, eaten by insects, or caught by the frost."[15] Few station scientists publicly held farmers responsible for natural calamities, but they shared Colman's general view regarding the main source of failure and the importance of self-improvement in agriculture. Certainly, they had little sympathy for farmers who engaged in political action to solve agriculture's problems. Michigan's P. M. Harwood expressed the attitude prevalent at the stations when he complained in 1892 of the "calamity howler" who filled rural minds with "rubbish . . . that needs removing."[16] Their assumption that political action was inappropriate for problems which were basically individual put the station scientists at odds with many farmers in the late-nineteenth and early-twentieth centuries.

While the professional ethic and its underlying assumptions repelled some in agriculture, it attracted others. Director Eugene Davenport of the Illinois station noted in 1913 that "the uneducated and uncritical farmers . . . do not count one way or the other in [station] policy, nor do they constitute or even characterize its constituency."[17] From the beginning the stations were warmly supported by the railroads, bankers, and businessmen who shared their faith in self-improvement. Within the agricultural community they attempted to attract, and were attractive to, highly commercial farmers oriented toward the production of one or two commodities. These farmers tended to have the sorts of production problems that the stations could effectively address, and they often shared the scientists' self-improvement orientation. The "research entrepreneurs" who allied the stations to

15. *Report of the Commissioner of Agriculture, 1887* (Washington: Government Printing Office, 1888): 7.

16. P. M. Harwood "What Shall the Professor of Agriculture Teach?," *Proceedings of the Sixth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, Held at New Orleans, Louisiana, November 15–19, 1892,* USDA Office of Experiment Stations *Bulletin No. 16* (Washington: GPO, 1893), 141.

17. Eugene Davenport, "The Constituency of the Experiment Station," *Science* 37 (June 13, 1913): 908.

commodity groups and business interests strengthened the new scientific establishment. At the same time, they roused the suspicion of many farmers and furthered an existing division within the agricultural community.

Implicit in Davenport's remarks above is a strong contempt for that portion of farmers which was disinterested in station activities or which disagreed with scientific prescriptions for agriculture's problems. Virtually all of the leading figures in the early stations showed disdain for farmers who did not accept the assumptions of professionalism or see it as the means to agriculture's salvation. Elaborating on a favorite scientists' theme, Davenport lampooned farmers guided by "tradition and superstition . . . who plant their seeds and kill their meat with reference to the phases of the moon, who treat 'hollow-horn' and 'wolf in the tail' by incantation, who put a red-hot horseshoe into a churn to drive the witches away, and who castrate only when the sign is right."[18] I. P. Roberts of Cornell was one of many who believed that the exodus of the unprofessional farmer from the land should be encouraged rather than lamented. "There are now many who occupy the land who must, of necessity, leave it," he told his colleagues at the AAACES convention in 1896, ". . . and the sooner trained and cultivated farmers own and till the land, the better it will be for all concerned."[19]

The contemptuous attitude of station spokesmen such as Davenport and Roberts toward unprofessional farmers was a clear measure of their elitism and conservatism. But it also indicates the degree to which professionalism reflected urban cultural hegemony in late-nineteenth- and early-twentieth-century America. Although they often had rural backgrounds and sympathized with agriculture—on their terms—the professionals in the early stations were applying an urban standard of value to farmers when they upheld the professional ideal.

18. Eugene Davenport, "Scientific Farming," *The Annals of the American Academy of Political and Social Science* 40 (March 1912): 48.

19. I. P. Roberts, "The Exodus From the Farm: What Are Its Causes and What Can the Colleges of Agriculture Do to Nourish a Hearty Sentiment for Rural Life?," *Proceedings of the Tenth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, Held at Washington D.C., November 10–12, 1896,* USDA Office of Experiment Stations *Bulletin No. 41* (Washington: Government Printing Office, 1897): 81.

Traditionally, agrarians had held that farmers were valuable to society simply because they were farmers. As Thomas Jefferson put it in his classic formulation, "those who labour in the earth are the chosen people of God, if ever he had a chosen people, whose breasts he has made his peculiar deposit for substantial and genuine virtue."[20] To Jefferson, it was sufficient that farmers *be,* it was not important that they do their jobs in a particular way. But the professional ideal carried the very modern, technical, and secular notion that intrinsic value was more-or-less irrelevant, if it existed at all. Urban society apportioned value mainly on the basis of technique, of *how* one did what he or she did. To the professional scientist in the experiment station, farmers were not valuable just because they were farmers. Progressive, productive, professional farmers were good, and those who could not achieve that status were worthy of contempt. In their emphasis on technique, the station scientists thus applied an urban standard of value to rural society. In a sense, they attempted to elevate a portion of the rural community to a position worthy of urban respect, while they denigrated the remainder in terms urban people traditionally applied to all farmers.

This is not to say that the professional ideal swept all before it, or that the agrarian ideal ceased utterly to exist or to be expressed, even among station scientists. Few of the many people who commented on agriculture around the turn of the century even appeared to sense the contradiction between the old and new ideals. Only after World War I did a few observers begin to point to the apparent incongruity of the agrarian and professional ideals.[21] Even today, of course, farmers speak of themselves alternatively as highly-trained professionals and embattled yeomen struggling to save the family farm. This is less an indication of intellectual dishonesty than it is an illustration of the human facility for holding onto antithetical ideas simultaneously and comfortably. Still, the development of the professional ideal in agricul-

20. Quoted from *Notes on the State of Virginia* (Chapel Hill: University of North Carolina, 1955): 164–65.

21. One of the most fruitful explorations of this problem remains Paul H. Johnstone's "Old Ideals Versus New Ideas in Farm Life," *Farmers in a Changing World: The Yearbook of Agriculture—1940* (Washington: GPO, 1940), 111–170.

ture was, and is, an indication of urban cultural and ideological hegemony in the United States.

Professionalization was an important social phenomenon in late-nineteenth-century America, and it affected agriculture in general and the experiment stations in particular. Like the professionals whose activities have been explored by Bledstein, Haskell, and Furner, the station scientists searched for status, engaged in self-definition, offered new answers to questions and means of solving problems, and skirmished with governing bodies and client groups which did not agree on all of the specifics of the professional ideal. In the process they shaped the character of their institutions and, to a lesser extent, agriculture as a whole. The major difference between these professionals and those in the larger society was that the station scientists were carrying an urban ideal into a rural community. This fact shaped their attitude toward much of their agricultural constituency and its attitude toward them, and limited their options and the degree of success they enjoyed. But their importance in being among the first carriers of the professional ideal to farmers cannot be denied.