Introduction

American Studies and American Science: an Analysis

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Science, medicine, technology. These activities conjure up various images today for the careful observer and student of American culture. In multiple ways these activities appear relevant, even crucial, to contemporary life. To many Americans in our own time they seem related to society and culture as problem and solution, as threats to the social fabric and therapy for it. Because members of the American Studies movement often do take a sharp interest in contemporary society and culture, it might be expected that scholars in American Studies would have investigated them in considerable depth.

Such has not been the case. It is odd but incontestable that science, medicine and technology in American culture, as objects of study, have been, at best, of marginal concern to American Studies scholars and students. There has been some interest in the field, to be sure, but almost always among historians, not American Studies scholars. *American Quarterly*, *American Studies* or other journals in the field of American Studies have occasionally carried articles on these subjects. Usually the authors of these single studies were budding specialists in the history of science, not in American Studies, who published their work and then returned to their home turf. Occasionally scholars bridged the gap between the study of science, technology and medicine in America and American

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culture with books, including such distinguished scholars as Merle Curti and Stow Persons.[1] Such work did not generate a school of American Studies scholars studying science, medicine and technology in American culture. Nor has there been much intellectual cross fertilization between historians of science and American Studies scholars on these topics. This seems a peculiar state of affairs. Why have these two great wings of American culture studies—science and literature—not taken much interest in one another?

Models for such study and cooperation do exist. Two schools of thought emerged by the mid-1960s. In his *The Structure of Scientific Revolutions* (1962) Thomas S. Kuhn, a philosopher and historian of science, outlined a program for cultural historical studies that revived both Neo-Kantian and Hegelian philosophical idealism in more respectable, or, at least, more up-to-date costume, and, in turn, amplified the post World War II idealist program led by Alexandre Koyre and others in philosophy and history of science.[2] Kuhn argued that the scientific community's investigatory and interpretive efforts were directly influenced by shared, often tacit, paradigms or models of nature. Through various means of socialization—commonly, education and apprenticeship—the established practitioners incorporated the younger generation of scientists into the community. In such ways was the communal paradigm passed on to succeeding generations. Most scientists spent their careers working out the puzzles of the paradigm, taking the discrete facts with which they worked and fitting them into the larger paradigm at the appropriate points.

Because science in past and present are never the same, Kuhn had to account for changes in science's history. He explained the dynamics of change from one "paradigm" to another as internal—thus change stemmed from actions within the community of investigators. Specifically there came a point at which the discovery of new facts as anomalies with the old shared paradigm created such a burden of conflict and stress that a revolution took place in the perceptions of the research community's investigators, and, in short order, the community created a new paradigm in which the new and old facts could be comfortably juxtaposed and reconciled with one another. Thus there was "progress" through scientific revolutions.

What Kuhn offered was a program in which the ideas of science remained crucial and important. And for those interested in the social history of ideas, or the sociology of knowledge, his work appeared fresh and exciting. He stressed the importance of the scientific community as the social medium in which the actions of scientists took place, and as the mechanism (or congeries of mechanisms) through which the "progress" of science took place. This seemed ample grist for the mills of historians, social scientists and even specialists in American Studies. Moreover Kuhn appeared to make the history of science more accessible to non-scientists,

specifically to those trained in the humanities and social sciences, by insisting that the internal dynamics of a social entity—the scientific community—was the locus of science's history.

The other school of thought was even more accessible to historians and American Studies specialists than that which Kuhn represented. It might be thought of as the moralistic or even metaphysical school of the history of technology, a congenial enough perspective for many humanists and social scientists. Its most articulate champion was if, anything, better known to American Studies scholars than Kuhn—Leo Marx. His *The Machine in the Garden. Technology and the Pastoral Ideal in America* (1964) offered a work that was far more accessible to American Studies scholars than science and its history. Marx's book rapidly became a classic in American Studies, one of several other such seminal works in his field, beginning with Henry Nash Smith's *Virgin Land* (1950), and including R.W.B. Lewis' *The American Adam* (1955), John William Ward's *Andrew Jackson. Symbol for an Age* (1955), and Marvin Meyers' *The Jacksonian Persuasion* (1957) that were known under the rubric of the "myth and symbol" school.

Those who worked in this vein used literary and historical materials (with emphasis on the literary) to "explain" various aspects of the essence of the American experience or of the national character, which was the result of that experience. Thus these scholars took an "essentialist" approach to American culture: the essence of America, past and present, was this or that main theme or issue or that, such as the economic or frontier interpretations of American history as offered up by Charles A. Beard and Frederick Jackson Turner. For those of the myth and symbol school, the tension between nature and civilization spelled the essence of the American experience. As for their approaches and interpretations, the school's guru, Henry Nash Smith, explained that myth and symbol stood for larger or smaller units of the "same kind of thing, namely an intellectual construction that fused concept and emotion into an image"; thus myths and symbols were collective representations, "not the work of a single mind."[3]

Marx focused on what he dubbed the pastoral ideal in America, and its concomitant dichotomy of nature versus civilization, as the essence or central meaning of America, past and present—a Hegelian dialectic if there ever was one. The "pastoral ideal" had been used from the age of discovery to the present century to define the meaning of America. Europeans were dazzled by the possibilities of a fresh, new, virgin world that the New World offered—including those of withdrawal from the troubled and problematic Old World.

Marx interpreted the pastoral ideal as the central cultural symbol of American culture past and present as it changed from Shakespeare's *Tempest* to F. Scott Fitzgerald's *The Great Gatsby*. Its chief manifestation was what he called the machine in the garden. The machine stood for indus-

trialization; the garden represented bucolic or pastoral America. The machine in the garden signified the invasion of technology and industrialism into pastoral America. "When the Republic was founded, nine of ten Americans were husbandmen," Marx argued, whereas "today not one in ten lives on a farm. Ours is an intricately organized, urban, industrial, nuclear-armed society." The essence of the American experience was the pastoral ideal. Marx devoted considerable space to the years 1800 to 1860 when, he insisted, many Americans were torn over the intrusion of the machine into the garden, and when many seemed to believe that, despite this potential contradiction, all would be well, for the upshot would be what Marx labelled a "middle landscape," in which the pastoral fused with industrialism in new and presumably beneficial ways, what one of his students had called "workshops in the wilderness."[4] Hence the early American linking of good land and honest labor could now include virtuous manufacturing and commerce as well. Yet Marx insisted that this soon changed. After 1860 the "middle landscape" idea became increasingly unrealistic. The dream of "a rural nation exhibiting a happy balance of art and nature" became chimerical, a mere rhetorical bromide rather than a social blueprint, "an increasingly transparent and jejune expression of the national preference for having it both ways," thus enabling the nation to continue to define its purpose "as the pursuit of rural happiness while devoting itself to productivity, wealth, and power."[5]

Marx wrote about technology in society and culture in a new fashion. At least since the 1920s scholars, writers and commentators in America had viewed technology (and, by implication, medicine and science) as a positive social force that influenced society and culture profoundly. This was part of perceiving technology—and science and medicine too—as solutions to social problems. What Marx injected into American Studies discourse was the post-1950s notion of technology as morally good or bad (in his own determination as bad), or technology as social problem as well as social solution.[6] In this way did he champion the labelling of technology as autonomous force from a moralistic—as well as a metaphysical or essentialist—perspective.

Initially Kuhn and Marx attracted much attention, and in certain ways they still do. Yet perhaps ironically, relatively little scholarly or monographic work has flowed or derived from theirs, so that these are schools without disciples, at least in a direct sense. For many in the history of science and cultural history in the 1960s, Kuhn's insistence that ideas could be linked with communities seemed to suggest a resolution to the "internal" versus "external" or ideas versus social experience debates that raged then. This was enormously stimulating as a general guide and stimulated discourse, but it remained only a suggestion. To paraphrase Kuhn, he did not create a paradigm which others could use as the basis for further practice. The problems were multiple and nettlesome. What was a para-

digm? Was it a micro-statement, a statement organizing material at some middle level of consciousness (or a variety thereof) or was it the model of the world? Were there important paradigms that were not statements about nature? And there seemed to be a pre-paradigmatic phase in the history of science, before there were universal paradigms. Could it really be established that there was something called "pre-science," and then after a certain point in history, "science"? Clearly that was a scientist's perspective, but how could a historian or social scientist legitimately shape it into a useful research agenda? And, for that matter, how could such a perspective be used in other areas of cultural history studies? Thus how could it be applied to politics and political theory, literature and drama, social thought and public policy or other non-scientific activities? Were there pre-paradigmatic periods of literature and politics, for example? Or was this just another form of presentist whiggery, modernization theory or other simple-minded linear explanations? And what did this say about Kuhn's notions of science?

Nor was this all. Kuhn gave great authority to the notion, not original with him or his work, that there were "internal" and "external" factors in the development of science, meaning, quite internal and external in relation to the scientific community itself. This also encouraged thinking of them as dichotomous, clearly not helpful if one wished to mediate these angles of vision as had seemed possible with Kuhn's work initially. Despite some overtures to the contrary, as when he discussed how "paradigm shifts" and "revolutions" occurred, at bottom he thought of science as progressive, additive and cumulative. Humans might be fallible, but the knowledge of science was somehow not, or, at least, less so. He did not take up the platonic argument that knowledge existed independently of human history, but on closer examination he might as well have insofar as his potential influence among those trained in the humanities and social sciences was concerned. Hence Kuhn's ultimate effect among American Studies scholars was not to encourage the study of medicine, science and technology, at least if by encourage one means direct inspiration and discipleship. It was true that some American Studies scholars did pick up on the notion of cultural paradigms, most notably the late Gene Wise, but its harvest in American Studies for any kind of scholarly investigations seemed slim pickings indeed. In addition, that was the result in the history of science as well.[7] This is not to say that Kuhn had no generalized influence among historians of science, or, for that matter, among a wide variety of scholars interested in cultural studies. He did and does. But, to paraphrase Kuhn, his work was non-paradigmatic: it could not be used as the basis of further practice.

The legacy of Marx's work has been complex in a different way. Among American Studies scholars, his approaches to historical and literary sources have remained popular, especially for undergraduate teaching. It is

perhaps revealing, however, that scholars in the field eschew the particular myth and symbol approach as method. In 1972, Bruce Kuklick published what became a famous methodological critique of the myth and symbol school in which he accused its members—including Marx—of a variety of serious errors that compromised their scholarship and interpretations, errors including what amounted to reading back into ancient sources the concerns of modern intellectuals through a confused Cartesian dualistic approach to the history of ideas, and to errors in assuming that one could read from popular culture to the motives and ideas of members of an entire society.[8] Kuklick did not criticize the larger aspects of Marx's work concerning technology and American culture; however, such would not have been his intention.

From a historian's point of view, Marx's work constituted a metaphysical and moralistic critique that closed off scholarly discussion. And in that specific sense Marx's legacy differed sharply from Kuhn's. And unlike Kuhn, the scientist-insider, Marx viewed technology from the outside, as a self-professed "humanist" and not too subtle metaphysician and moralist. Technology was simply this large force, monolithic, all-powerful and bad. Once it intruded into the garden that he claims America was, it was all over. To put Marx's argument negatively, as it were, technology was not a multifaceted human activity in which human beings were involved and participated.

Thus it was simply impossible to historicize Marx's argument. By insisting that the minute industrialism came, Americans could never have their rural past again, and that the unfolding future was both ineluctable and bad, Marx helped articulate a particular research agenda for the investigation of the relations between technology and society and culture. It would stress the depiction of the impact of technology upon society in an obviously presentist program. As Marx would have it, the intrusion of the machine into the garden was the beginning of our own time. This was not a useful perspective for someone interested in the past for its own sake. Eventually several writers noticed, in the words of Howard P. Segal, that there was more than one "middle landscape," so that there were more possibilities in America's past than Marx had conceded.[9]

Marx did not inspire derivative studies of technology and culture within the American Studies movement for various reasons. One consideration appears overriding: Marx's book simply closed off discussion. There was no way, outside of positing more "middle landscapes," that a scholar could follow up with more investigations if that person worked from within an American Studies perspective and with the kind of training commonly available in American Studies programs. The only avenue led to middle landscapes. But these seemed relatively limited in number and severely circumscribed in explanatory power. They were but brief stopping points on the ineluctable destination to the awful present. In the hands of Marx

and his devotees, they were static, ahistorical categories—caricatures of the past, really—and could not serve as a useful guide to scholarly investigation and interpretation.

By the middle to late 1970s the legacies of Kuhn and Marx seemed clear. In each case the imprint was a generalized one that helped set the tone for further speculation and conversation. By then a rising generation of historians interested in the history of science, medicine and technology in American culture was coming to the fore. In books and articles these scholars drew attention to the development of the scientific community in nineteenth-century America, or to the work of the medical and public health communities of the late-nineteenth and early-twentieth centuries, to the influence, in America, of the ideas of such "great men" as Lamarck, Pasteur, Koch, Darwin and Freud, to the importance of the social processes of professionalization and certification, to the social relations of such fields as physics, the development and institutionalization of Darwinian theory, the development of medical education, the successes of the campaigns to stamp out impure foods and drugs and to fight terrifying diseases, the involvement of the federal government in science, and the like, among historians of American science and medicine. Here the generalized imprint of Kuhn was strong in the emphases on the communities and the ideas of science and medicine. As for Marx's influence on historians of American technology, there were, not surprisingly, virtually no studies based on his specific approach. But as historians of American technology published books and articles on technological institutions, the engineering profession, the development of space flight and aeronautics, the so-called "American system" of manufactures and the role of technology in warfare, industry and social life, the humanist perspective that Marx championed, in which technology was good or bad, often dominated the agenda of research and discussion, sometimes openly, as with David F. Noble's *America by Design* (1977), in other instances not quite so obviously, as with Merritt Roe Smith's *Harpers Ferry Armory and the New Technology. The Challenge of Change* (1978).[10]

Here we must recognize the popularity of the new social history, which has reordered research and teaching agendas in both history and American Studies. What began in the late 1950s and early 1960s as a call for a more quantitative (and, therefore, representative) approach to historical research in both research methods and conceptualizations of the relative "importance" or "relevance" of historical phenomena in the past—most commonly in political and economic history—became transformed by the late 1960s, aided doubtless by contemporary political crises, into the new social history, an interesting and new agenda for scholarship and for contemporary issues. The new social history had political as well as scholarly agendas and goals.[11]

What may not be so readily apparent is that the new social history of science and the new social history of America's groups (and thus the new American Studies scholarship) constituted parallel schools of thought. In turn they shared their origins in a chorus of concerns that were current in the 1950s: the belief in ineluctable social forces as well as the notion that the whole of American civilization had a distinct moral essence that could be judged. There appeared in the 1950s a language of protest against conformity and belonging and togetherness, as in the hip and beat movements, that mushroomed into a full blown discourse of victimization in the 1960s and 1970s, as in the popular moral movements for civil rights, feminism and against the Viet Nam War. In the new, post-1950s age, increasingly Americans from many walks of life acted and thought as if there was an infinity of dimensions, proportions, relations or, more simply, that life was individuated, that there was no larger whole, only an endless number of parts. Ours is an age in which we think of society as an aggregate of individuals—individual persons, single issues, an infinity of perspectives—and we cannot, try as we wish, regain that holistic sense of society that existed between the 1920s and the 1950s.[12] The kind of thinking about the order of things in the world that began with William H. Whyte Jr.'s famous study of organization men in the 1950s, with its witty, savage attacks on conformity and also David Riesman's *The Lonely Crowd: A Study of the Changing American Character* (New Haven, 1950) and even that quintessential 1950s motion picture, *The Man in the Grey Flannel Suit*, which first appeared as a bestselling novel by Wilson (New York, 1955), yielded first to forthright (and often highly moving) narratives of white racist oppression of nonwhites, then to such calls as that of E.F. Schumacher for smaller-is-better, and onto the individualism of the 1970s and 1980s, as in Tom Wolfe's designation of the "me-decade" for the former and "plutography" for the latter—among other representations.[13]

For historians, this agenda has devolved into the social history of science, technology and medicine, which has chiefly meant institutional, social and political history. Historians of American science, however, were also sensitive to the issues of race, gender and social oppression, so that there have been works on women and members of minority groups as their lives have been touched by science, medicine and technology, ranging from discrimination against women scientists to the eugenics movement or other manifestations of "scientific racism." For American Studies scholars the categories of race, gender and class have been crucial, as for the historians, but unlike the historians there seems to be relatively little interest in the history of scientific institutions or the politics of science. The connecting thread is the assumption that the social matrix (or social matrices) order and control all human behavior and thought—all of society and culture.[14]

Given the assumption that the social matrix determines thought and action, then presumably investigations into the social history of science—and medicine and technology as well—would not appear to be "relevant" or "important" to American Studies scholars who were looking into the workings of a different part of the social matrix (or a different social matrix) pertaining to gender, or minority group status and history. This has indeed been the fate of American intellectual history, which used to be a broad field in which one attempted to understand important issues in the culture as a whole.[15] From this point of view the field has become merely the social history of the intellectuals insofar as most specialists in it are concerned. And more is the pity.

Ultimately the social history interpretation assumes different loci for different groups in the social matrix of the past, because of their differing "importance." Given the plebiscitary or "democratic" mentality about historical "importance" rampant in many quarters in history and American Studies in our own time, a consequence of our individualistic way of understanding the world, of course such as science, medicine and technology—those human activities which are done by elites and involve elaborate and esoteric intellectual life—might appear marginal save in their social history, however defined. And it would be not so daunting for a scholar trained in the humanities or social sciences to take up such discussions from a social history *cum* moralistic point of view. The technical or professional discourse of science, medicine or technology would be, for most, too forbidding. From this point of view, it would not make sense to regard science, medicine or technology as windows onto the past, no more or no less "important" than any other kind of coherent human activity in the past, even though that perspective might suggest how a historian or specialist in American Studies might penetrate the mysteries of scientific, medical and technological activities in American (or any) culture and society in the past.

It would appear, to invoke William James, that like religious experiences, there have been a variety of social history approaches in the history of American science, medicine and technology. One has been to write, in fairly straightforward fashion, about the history of scientific or medical or technological institutions or professionals in these fields. When this has been connected to the ideas of the *dramatis personae*, and even to the larger culture, the results have often been gratifying. Yet this is not a lead that has been followed much, especially in recent years. More common has been discussion of the social impact of science, technology or medicine—how these phenomena "impact upon" society, as with Stephen J. Gould's *Mismeasure of a Man* (1981), which insists that the inegalitarian ideas of scientists have led to the horrors of racism and sexism.[16] Another variation has been to discuss social context as formative: what a scientist (or doctor or engineer) thinks is a reflection of who he or she is in society.[17]

The difficulty with such social history agendas—especially the latter two—is the problematic assumptions undergirding them. Thus it is simply not a self-evident truth that science (or medicine or technology) can be thought of as autonomous social forces beyond human control, after the fashion of Marx, or as ultimately "true" platonic statements as Kuhn would have it. Nor is it clear that one's social background is a predictable guide to their attitudes and behavior. It might be—and it often is not.

In sum, a social history approach to cultural studies cannot provide the interpretive unity that is called for with increasing frequency in many scholarly circles. In a finely differentiated social matrix there can be no concept of unity save the social matrix itself, which in the hands of most scholars has been reified into a metaphysical unity, such as "industrialism" or "modernization" or the like. One cannot follow Marx if one's goal is true scholarship, for he has closed off discussion. In a curious kind of way, the result is the same with Kuhn. It is possible to have incessant discussion (as indeed has occurred in many academic circles) about Kuhn and his approach, but it is impossible to resolve any such discussions. In sum, Marx has closed off discussion before it can begin, and Kuhn has provided no guidance for participants to end discussion.

There is another way of approaching the phenomena of science, medicine and technology in American culture that might prove helpful for American Studies scholars—and, indeed, for any scholarly constituency. Those who have written from this point of view have stood the social history formulation on its head. They have asked what is the influence of American society and culture upon science, medicine and technology in America? How have common, widespread notions in culture and society in a given age influenced such complex and multifaceted phenomena as science, medicine and technology in the American past and present?

There are several distinguished examples from the extant literature to point the way. In his classic *The Pursuit of Science in Revolutionary America* (1956), Brooke Hindle covers a wide canvass of scientific activity in eighteenth-century America, and discussed men of science of widely differing backgrounds and interests. But he also demonstrates the intellectual unity of the age, the essentially mercantile character of the scientific enterprise, a notion entirely congruent with those organizing the larger society and culture, and how that manifested itself in the scientific institutions of the age. He also convincingly narrates the establishment of the first home-grown scientific institutions in the Western Hemisphere during and after the Revolutionary War. Daniel J. Boorstin, in *The Lost World of Thomas Jefferson* (1948), and George H. Daniels, in *American Science in the Age of Jackson* (1967), well from this perspective cover their topics for the early to middle nineteenth century. Unfortunately the most noted works for the mid-nineteenth-century do not follow this promising lead, but for the late-nineteenth and early-twentieth centuries there are other books in

this genre, including Henry D. Shapiro's *Appalachia on our Mind* (1978) which may be considered a landmark in both history and American Studies. Shapiro locates the causes and support for successive scientific ideas about Appalachia and its denizens in contemporary cultural notions about America and Americans. Thus ideas of scientists—in this case social scientists—were the products of cultural notions.[18]

Such an approach offers certain advantages to the American Studies scholar. It makes the study of science, medicine, and technology in American culture accessible to scholars trained in the humanities and social sciences. Naturally the American Studies scholar must learn the technical discourse of the science to be investigated. The principle of scholarship remains the same for all fields: one must understand the activity under scrutiny. Those who have studied literature, whether poetry or prose, or art, or drama or cultural communities, will find that the study of, say, Darwinian concepts, is inherently no more difficult than any other subject that they have mastered in its technical aspects. Also this approach enables the scholar to avoid the dangers of presentism, of placing human action and belief in the wrong era or historical period. It will, in short, facilitate historicization, which will in turn permit work that is truly scholarly.

The essays in this special issue do exemplify the method—the impact of culture and society upon science approach—outlined above that appears so promising and illuminating. Thus the first two papers clearly underline and exemplify dominant cultural notions of the early nineteenth century. According to Robert E. Schofield, Charles Willson Peale's museum was first and foremost a commercial enterprise. And indeed from the outset this focus was crucial to the institution's operations and development. Yet parallel to that was the concern for what Schofield calls Peale's commitment to Enlightened Republicanism, another recognizable cultural construct of the era. Peale organized his museum according to the dictates of contemporary science, which in turn was informed by his commitment to republicanism. And he believed that science should be for everyone—a truly democratic notion. When Peale's son, Reubens, succeeded his father, he attempted to make it into popular entertainment, thus to make it commercially successful, in the absence of aristocratic or mercantile patronage, but Charles returned in the early 1820s and it survived until the 1840s when it collapsed, literally an anachronism, an institution not suited for the new age in which it found itself. Schofield also argues that Peale's notion of science for everyone, or his commitment to individualism—Enlightened Republicanism to the core—became increasingly irrelevant in the 1830s, and American society and culture shifted from individualistic republicanism to mass democracy. Schofield also insists that Peale's contribution was nevertheless the foundation of different scientific accomplishments in new ages to come.

In the only essay in the history of technology, Gail Fowler Mohanty discusses the relationships of technology on the one hand, and society and culture on the other. She probes a new labor system—outwork—in the early nineteenth century by looking at certain aspects of the textile industry in Rhode Island. The early nineteenth century did not, she insists, create the generalized social practice of outwork. That social institution, as a generalized and ahistorical construct, could be traced back to fourteenth-century England. But it is entirely clear from Mohanty's account that a social construct such as outwork, or putting out, meant one thing in one age, and something completely different in another. By 1810 many rural communities in Rhode Island were threatened with economic stagnation or worse, saddled as they were with barter economies, population increases, and dysfunctional inheritance patterns. Outwork became attractive to many women as a source of cash, which offered families opportunities for the accumulation of property and for greater consumption of goods. Traditional expectations about women's roles in society shaped the system of outwork, save that two notions generic to the age—cash, not goods, as remuneration, and individualism as a modest dilution of traditional notions of female social roles—helped alter work practices. Technological innovation led to male artisans operating highly complex machinery to manufacture more elaborate fabrics while outwork made it possible for women to make the simpler fabrics. Outwork attracted women because it was congruent with societal expectations about women. Women realized that they could do outwork and support themselves when they had children at home; the kind of weaving done was neither dangerous nor particularly strenuous; and there was a relatively low level of skill necessary to be successful. Thus, Mohanty concludes, once women did outwork or piecework, "putting out might be viewed as one of the first efforts to incorporate women into the general labor force."

The next group of papers treat, in varying ways, the later nineteenth century. By then the "Republican" emphasis on the individual had faded. Now notions of the national population assumed a hierarchy of groups, each distinct from the other. It was hardly surprising that Americans thought of themselves as members of and participants in particular groups in society and culture, whether white or nonwhite, Protestant or not, native or foreign born, rich or poor, male or female and the like. Ultimately the hierarchical notions of the later nineteenth century constituted statements of the quality of each group's ability to fit into a white, Anglo-Saxon Protestant culture—each group's "American-ness", as it were.

In her discussion of puerperal insanity, Nancy Theriot shows how a multifacted and interdisciplinary interpretation of a phenomenon such as this "disease" is a study of relationships involving, from different points of view, group identity—for the woman so afflicted, the constraints of womanhood in the larger society; for the doctor, the illness a manifestation

of a category of patients and categories of professional expertise for the doctors; and for the woman's family, the identity of patient, physician and medical establishment, and family itself. As Theriot puts it, puerperal insanity can be regarded as a socially and culturally constructed disease, reflecting both the gender constraints and the professional battles accompanying medical specialization. She notes that discussions of the affliction in the last half of the nineteenth century shifted from a relative "soft" attitudinal phenomenon to a "hard," seemingly biologically-caused behaviorial malady after the 1870s, and that after 1900 discussions of the disease evaporated from the medical literature, reflecting, perhaps, new notions and patterns of behavior concerning the possibilities for enhanced freedom for American women. Also twentieth-century medicine was less tolerant of such categories as puerperal insanity. Hence the disease was the product of certain cultural notions in a particular time or age.

Group identity and hierarchical relationships were also fundamental cultural constructs for two other authors in this issue, Alan I Marcus and Zane L. Miller. As Marcus points out, hookworm was a disease that seems to have had an existence out of time as well as within distinct time periods. But central to its identification and definition for late nineteenth- and early twentieth-century Americans, including American doctors and physicians, was the concept of American nationality. Marcus follows through the often tortured debates among American doctors as to the causes and character of the disease among American Southerners from the 1890s to the formation of the Rockefeller Sanitary Commission in 1909, which was inaugurated to "stamp out" the problem. Marcus insists that little changed in any fundamental way in these notions concerning hookworm. Specific ideas changed, to be sure, but the overall substance remained the same, for to those interests that were concerned with the phenomenon, the disease of hookworm and its Southern victims retained their essentially alien, non-American character and thus persisted as a problem in the extension of American nationality. Before 1900 doctors blamed hookworm on immigrants from southern and eastern Europe. In the early 1900s they linked the disease to other groups, such as inhabitants of the Tropics, then to Indians and Blacks. Finally urban doctors pinpointed defective Southern country life as either the cause or the effect of hookworm. "This mode of living . . . seemed as foreign to and out of concert with the American nation as any of the other determinations," Marcus concludes, thus evoking tremendous concern and leading to such efforts as the Rockefeller Sanitary Commission to make the South more "American" and less "alien." Here Marcus finds important linkages between so-called progressivism in public health and the group thinking that was so characteristic of the age.

Much the same can be said about Zane L. Miller's essay on that most formidable intellectual opponent of racial bigotry, the social scientist W. E.

B. Du Bois, who, Miller argues, thought in group or racial categories just as his opponents in the racial conflicts of early twentieth-century America did. Du Bois thought of history as social process in which various races, each with their own distinctive geniuses, struggled for existence and prosperity in history. In what was perhaps the most arresting comparison Du Bois made, he argued that if American Blacks were given a fair chance, they would improve dramatically in the urban, industrial, capitalist present just as the ordinary whites had benefitted from the frontier experience of the nineteenth-century. For Du Bois as for other social scientists of the early 1900s, Miller argues, "culture stemmed from race," although place as physical and social environment was crucial in Du Bois' arguments. For Du Bois, race was an exciting concept. By it he meant biological as well as social inheritance—a common enough conception for that time.

In the issue's concluding essay, Patricia Spain Ward addresses the historical background to a timely issue, the cost and accessibility of health care. The historical phenomenon about which she writes was set in an age different than those about which Theriot, Marcus and Miller have written. It is a staple of New Deal historiography that President Franklin D. Roosevelt worked from a framework in which the federal government was a broker state, mediating among the various competing interests and entities in public life, each distinct yet interrelated to all others, in a whole that was greater than or different than the sum of the parts. What may not be so readily apprehended is that this tacit cultural notion that the whole was greater than or different from the sum of the parts was pervasive in American culture and society from the 1920s to the 1950s.[19]

Ward forcefully argues that on some ultimate moral level the conflict about which she writes concerned whether medical care should be distributed according to need or ability to pay. Her work also clearly underlines the conflict between the "reformers," who wished to redesign health care according to the organizational blueprint of their age, and organized medicine, many of whose champions insisted on the older individual doctor and fee-for-service tradition. In that sense it is squarely within the cultural notions school that is so promising in the field. In 1938, the United States Department of Justice filed an anti-trust suit against the American Medical Association and certain other medical organizations. In 1943, the Supreme Court found for the government, and levied as a fine the not too princely sum of $2500 against the American Medical Association for anti-trust activity.

As Ward's account makes clear, first officials of the Hoover Administration took up the issue, and then the New Deal carried it along—bipartisanship indeed. Her account also shows that in both administrations there was agreement on the fundamental arrangement or order of health care as an organized system or network, and further demonstrates that the new arrangement was congruent with the basic cultural notions of the age. It

would have alliances of doctors, nurses, dentists and other health care workers, groups in larger wholes in comprehensive community medical centers, organized regionally in hospitals and reimbursed by various kinds of group payments. Just as other New Deal programs were based on notions of interaction and multiple purposes, such as the Tennessee Valley Authority, so was this plan. As Ward stresses, the alignment of forces was not favorable for this particular proposal, and the end result of the anti-trust case was not to clear the way for a variety of "illuminating experiments," as Justice Department officials had intended, but to block the possibilities of national health planning. But then something so uniform, if not monochromatic, as national health planning—certainly much more so than the TVA or other New Deal nostrums—might simply have not made sense then in the way it appears to in our own time.

Notes

1. Stow Persons, ed., *Evolutionary Thought in America. Special Program in American Civilization at Princeton.* (New Haven, Connecticut, 1950); Persons, *American Minds; A History of Ideas* (New York, 1958); Merle Curti, *The Growth of American Thought*, (New York, 1943); Curti, *Human Nature in American History: A History* (Madison, Wisconsin, 1980).

2. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, second edition, enlarged (Chicago, 1970). Alexandre Koyre, *From the Closed World to the Infinite Universe*, (Baltimore, Maryland, 1957). A useful guide to historiographical trends in history of science, medicine, and technology is Paul T. Durbin, ed., *A Guide to the Culture of Science, Technology, and Medicine*, (New York, 1980).

3. Leo Marx, *The Machine in the Garden. Technology and the Pastoral Ideal in America* (New York, 1964). Henry Nash Smith, *Virgin Land: The American West as Symbol and Myth. Twentieth Anniversary Reissue* (Orig. 1950; Cambridge, Massachusettes, 1970), xi.

4. Marvin Fisher, *Workshops in the Wilderness: The European Response to American Industrialization, 1830-1860* (New York, 1967).

5. Marx, *The Machine in the Garden*, quotes at 354, 226.

6. A useful discussion of these attitudes toward technology in American culture is Alan I. Marcus and Howard P. Segal, *Technology in America. A Brief History* (San Diego, 1989), 257-310.

7. See, for example, Gene Wise, "'Paradigm Dramas' in American Studies: A Cultural and Institutional History of the Movement," *American Quarterly* 31 (Summer, 1979) 292-337; Wise, *American Historical Explanations: A Strategy for Grounded Inquiry* (Chicago, 1973).

8. Bruce Kuklick, "Myth and Symbol in American Studies," *American Quarterly* 24 (October, 1972), 435-450.

9. Howard P. Segal, "Leo Marx's 'Middle Landscape': A Critique, A Revision, And An Appreciation," *Reviews in American History* 5 (March, 1977), 137-150.

10. A good general guide to the literature of the history of science, medicine and technology in America is Sally G. Kohlstedt and Margaret W. Rossiter, eds., *Historical Writing on American Science. Perspectives and Prospects* (Baltimore, Maryland, 1986). David F. Noble, *America by Design. Science, Technology, and the Rise of Corporate Capitalism*, (New York, 1977); Merritt Roe Smith, *Harpers Ferry Army and the New Technology: The Challenge of Change* (Ithaca, New York, 1978).

11. Much of the *Journal of American History* 76 (September, 1989) contains accurate and revealing statements of this agenda.

12. See, for example, Peter Clecak, *America's Quest for the Ideal Self: Dissent and Fulfillment in the 60's and 70's* (New York, 1983); Alan I. Marcus, "The Wisdom of the Body Politic: The Changing Nature of Publicly Sponsored American Agricultural Research Since the 1930s," *Agricultural History* 62 (Spring, 1988), 4-26; Marcus and Segal, *Technol-*

ogy in America: A Brief History, 315-361; Hamilton Cravens, "History of the Social Sciences," *Osiris* second series I (1985), 184-307; Cravens, "Recent Controversy in Human Development: A Historical View," *Human Development* 30 (December, 1987), 325-335.

13. Willliam H. Whyte, Jr., *The Organization Man* (New York, 1956); Anne Moody, *Coming of Age in Mississippi* (orig. 1968; New York, 1976); E.F. Schumacher, *Small is Beautiful* (New York, 1973); George M. Sheehan, *Running and Being: The Total Experience* (New York, 1978) and George Gilder, *The Spirit of Enterprise* (New York, 1984).

14. For a recent example of this kind of thinking, see Thomas Bender, *New York Intellect. A History of Intellectual Life in New York City, from 1750 to the Beginnings of our own Time* (New York, 1987).

15. See, for example, Curti, *The Growth of American Thought*, Persons, *American Minds*, Richard Hofstadter, *The American Political Tradition* (New York, 1948); Ralph Henry Gabriel, *The Course of American Democratic Thought* (New York, 1940); Robert H. Bremner *From the Depths* (New York, 1957); Eric Goldman, *Rendezvous with Destiny* (New York, 1953).

16. Stephen J. Gould, *The Mismeasure of Man* (New York, 1981).

17. Among the best examples of this school would be Charles Rosenberg, *The Cholera Years. The United States in 1832, 1849, and 1866* (Chicago 1962). Rosenberg has been enormously influential among historians of science and medicine in America.

18. Brooke Hindle, *The Pursuit of Science in Revolutionary America* (Chapel Hill, North Carolina, 1956); Daniel J. Boorstin, *The Lost World of Thomas Jefferson* (New York, 1948); George H. Daniels, *American Science in the Age of Jackson* (New York, 1967); Henry D. Shapiro, *Appalachia on our Mind. The Southern Mountains and Mountaineers in the American Consciousness* (Chapel Hill, North Carolina, 1978).

19. Among the books that discuss that question are: Marcus and Segal, *Technology in America. Brief History*, 257-310; Hamilton Cravens, *The Triumph of Evolution. The Heredity-Environment Controversy, 1900-1941* (Baltimore, Maryland, 1988 [1978]); Cynthia Eagle Russett, *The Concept of Equilibrium in American Social Thought* (New Haven, Connecticut, 1966); Edward A. Purcell, Jr., *The Crisis of Democratic Theory. Scientific Naturalism and the Problem of Value* (Lexington, Kentucky, 1973).