PROFESSIONALIZING ECONOMICS:

The 'Marginalist Revolution' in Historical Context

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> Economic analysis, serving for two centuries to win an understanding of the Nature and Causes of the Wealth of Nations, has been fobbed off with another bride -- a Theory of Value. There were no doubt deep-seated political reasons for the substitution but there was also a purely technical, intellectual reason.
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> -- Joan Robinson [1956][i]

If the last years of the nineteenth century witnessed the first, genuine articulation of a professional self-consciousness among American economists, then they also demarcated the establishment of an altogether novel protocol for those experts. This new agenda, developed with increasing rigor and authority as the twentieth century beckoned, began a significant reorientation of the field's object of study while at the same time it reconfigured long-standing perceptions of the history of economic thought as a whole. Scientific sophistication necessarily involved a revision of practice, yet it also encouraged the articulation of new perceptions of its pedigree.[ii] Linking the object of study with particular and venerable authorities from the ages was of singular importance to the successful construction of a distinctly professional knowledge. Framing that understanding in a particular way was the result of both a social and an intellectual process.

With their most apparent and seemingly immediate intellectual roots in the moral philosophy of the eighteenth and nineteenth centuries, modern economists were (and are) eager to invoke validation by impressive forebears and traditions. Yet that disciplinary genealogy was not unproblematic and the tensions within it have punctuated the field's evolution ever since. It is precisely for this reason that the turn of the twentieth century is regarded by the vast majority of historians of economic thought as a decidedly revolutionary period in the discipline's past. By

positing individual decision-making and goal-oriented behavior as the necessary focus of investigation, modern economists succeeded in bringing centuries of analysis (and debate) to ostensible closure.

Engaging with the intellectual ingredients of the transformation in the object of economic analysis that began in the late nineteenth century is a necessary part of any effort to come to terms not only with the modern evolution of the field in the United States but also with the modern development of the social sciences as a whole. Becoming part of what they viewed as a scientific and objective research protocol, American economists sought to embrace an analytical rigor that could make sense of a deeply controversial field of inquiry and thereby lay a foundation for a professional expertise that could put such a polemical ancestry to rest. Understanding the lineage of a social process of professionalization in terms of its intellectual antecedents is thus of considerable expository value.[iii] It also provides, for sociologists and historians determined to understand professionalization processes overall, with a powerful case-study of the intersections between the intellectual and social contexts that frame the emergence of expert communities.

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On the one side, those who have celebrated professionalism as the functional expression of intellectual progress have, whether self-consciously or not, embraced the view of one of the twentieth century's most eminent sociologists who, over four decades ago, noted that the scientific knowledge on which expertise subsists rests upon four central principles: "universalism" -- accepting or rejecting truth claims independent of personal or political

considerations; "communism" -- taking scientific knowledge to be the common property of all; "disinterestedness" -- insisting upon neutrality in the evaluation of evidence and arguments; and "organized scepticism" -- testing and scrutinizing all analytic claims. On the other, social and cultural historians have tended to assess professionalism in a more critical way, noting that while "[s]cience as a source for professional authority transcend[s] the favortism of politics, the corruption of personality, and the exclusiveness of partisanship[,]" its mobilization in the hands of professionals often involves the explicit pursuit of class privilege and anti-democratic authority.[iv]

Whatever the relative virtues of a positivist or critical approach to an understanding of professional expertise, clearly both the institutional setting within which scientific authority is both nurtured and judged and the social contexts within which professionals organize and utilize their skills powerfully determine the actual impacts of expert knowledge in a particular time and place. Here too, of course, a conflict or consensus approach will yield dramatically different conclusions, but it is perhaps the focus on process that a socio-historical perspective necessitates which in this case rightfully takes center stage. Both the university and the professional society may be assessed as either domains of objectivity and rigor or venues of corruption within which "disinterested and dispassionate" learning are sacrificed to the goal of "'practical' efficiency" and "the needs of earning and spending."[v] Yet, either way, far too many investigations have rested upon the examination of final results, however construed, rather than a close perusal of the particular paths -- political, intellectual, social -- by which they were reached.[vi]

Decades of debate among historians and sociologists of science, concerning "internalist" and "externalist" notions of the evolution of learning, have served to place the points at issue in any study of professionalism and expert knowledge in sharp relief. Mid-twentieth century

notions of science, fashioned at the hands of mainstream social theorists, emphasized the functionalist attributes of expert practice and of the institutional forms within which it subsisted. Closely identified with the work of Robert Merton and Talcott Parsons, this literature focused on the behavioral norms by which scientists pursued their work. Early in the 1960s this approach came under powerful attack by Thomas Kuhn. Rather than invoking a set of general rules by which science and scientists pursued progress, Kuhn argued that the community of scientists actually constituted a plurality of groups each committed to contesting paradigms in particular disciplines. Discriminating among these approaches involved assessing the extent to which particular paradigms were more or less capable of solving particular problems or puzzles at issue. Transformations in prevailing wisdom, upheld by a majority of practitioners in a given field, represented themselves as a series of "revolutions" in science itself. For Kuhn and his followers, expert knowledge and communities of expertise were thus revealed to have foundations more in conflict and debate than functional consensus.[vii]

Situating scientific controversy within its social and historical contexts has become the preoccupation of scholars ever since Kuhn's intervention in the literature. During the 1970s, the elaboration of a new understanding of scientific progress focused on the circumstances -- social, cultural, and political -- which allowed for the rise and fall of competing "belief systems" in a given scholarly community. This new approach, some versions of which examined the rhetorical and analogical strategies used in the creation of scentific belief, others of which more resolutely emphasized the social practices and ideological interests of participants in scholarly debate, served to beckon investigators not simply to novel interpretations of "scientific revolutions" but also to undertake altogether innovative studies of research practice itself. Recognizing particular groups of scientists as "interest groups" competing as much for prestige and influence as over a

given set of ideas inspired several scholars, while others looked to ethnographic examinations of "laboratory life" as a means to understand more fully the modern evolution of science itself. Yet another sociological strategy utilized the insights of network theory to explicate the ways in which groups of scientists elicited the support of others by the judicious use of incentives (rhetorical, institutional, and material) offered in exchange. Overall, these more recent techniques in the study of scientific knowledge-creation privileged the social examination of epistemological conflicts over the textual appreciation of canonical outcomes.[viii]

Yet above and beyond the substantive content of expert knowledge, and the complicated processes by which it evolves, scholars have always appreciated the fact that expertise is most often deployed by credentialed elites. Professions and professionalization have thus necessarily commanded the attention of investigators as well. In their classic interwar period study of the history of some two dozen British professions, A.P. Carr-Saunders and P.A. Wilson firmly established a functionalist approach to the phenomenon of professionalization. With this positivistic outlook on professional authority and influence, one that emphasized the service provided by expertise to society as a whole, an emphasis on the rise of specialized techniques, formal training and licensing practices, and codes of ethics was a logical research protocol. At the same time, the very findings of the functionalist "school" offered both empirical support and conceptual inspiration to the arguments of others who saw, in professionalizing processes in modern life, a self-interested pursuit of monopoly power. Needless to say, drawing attention to the exclusionary nature of professions -- and its attendant denigration of amateurs, "cranks," and "quacks" -- emboldened the claims of both those who viewed its impacts as desirable and welcome and those who took a more critical, even condemnatory stance. As with studies of the sociology and the history of scientific doctrines, research on professions and professionalization

tended to yield an array of ambivalent conclusions.[ix]

To the system of professions as a whole, and to its complex patterns of both interlocking skills and competing jurisdictional claims to authority, more recent scholars have drawn attention. Not surprisingly, this more aggregate assessment of professionalization, one that consciously avoids a focus on the nature and history of one profession at a time, draws inspiration from and affords support to both functionalist and monopolistic notions of professionalism. An integral part of this systems approach is its close identification of work practices and skills with professional identity itself. In this regard, the practical impacts and problem-solving capabilities of experts become the essential foundation of any understanding of professional evolution and differentiation. At the same time, the "work" of professionals may also be analyzed in terms of the rhetoric and discursive strategies used to legitimate it; the "power" of an expert vernacular, in this case, "lies not in the language itself, but in the group which authorizes it and invests it with authority."[x]

Most historical examples of professionalization yield narratives consistent with a variety of social theories, the applicability of which usually depends on the time-frame of the investigation underway. The earliest stages of a profession's development often conform more with structuralist views than later evolutionary trends that often portray struggles for authority more consistent with conflict assessments. Moreover, to the extent historians focus on the attitudes of experts themselves, an understanding of professional ideology and rhetoric must grapple with the self-deception frequently characteristic of the group as a whole. In short, the inherently broad purchase of historical inquiry militates in favor of a multivalent view of professionalization as a social (and political) process.[xi]

Instinctively oriented toward the documentation of agency and contingency in the past,

historians find it only logical to assume that the construction of reason and "objectivity" is itself a socially grounded outcome. "[N]o abstract force pushing inexorably toward greater freedom[,]" expert knowledge, in both its formal manifestations and its applications, is understood by historians to be "determined by the narrower purposes of men and women; their interests and ideals shape even what counts as knowledge." It is in this way that the evolution of professional authority has "cast up a new world of power" that captivates the attention of historians and draws them to analyze, as well, "the vast institutions that have arisen to manage and finance the rationalized forms of human labor." Not only expert knowledge itself but also the institutional and social frameworks within which it is both cultivated and utilized necessarily capture the historical imagination.[xii]

Understanding the particular evolution of an expert discipline must no doubt utilize an array of methodologies and research techniques. In the case of American economics, the field's close connection with matters of public policy and governmental operations makes the task all the more difficult.[xiii] Separating the mechanisms, internal and external, responsible for the elaboration of a professional economic sensibility as well as the articulation of an expert community of economists themselves becomes, in this context, a particularly daunting task. Even so, the objectives of the enterprise have far less to do with the testing of specific propositions or the evaluation of certain cognitive and analytical models than it has to do with the making sense of a complicated and, at times, quite ambivalent historical record.

All this having been said, the professionalization of economics must first and foremost be appreciated with reference to the powerful intellectual currents that framed the emergence of the discipline from its earliest beginnings through the grand debates of the nineteenth and first decades of the twentieth centuries. It is the burden of much of the discussion that follows to

demonstrate the validity of this claim while at the same time striving to preserve an ideological and controversial quality within the history of economic thought that has been, in more recent decades, forgotten or repressed. By means of this excursion into intellectual narrative and analysis, a more thorough understanding of the history and sociology of professionalization in American social science may be fashioned.

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Of fundamental importance to the modern transformation of economic thought was the formulation of an initial idea that posed human needs in opposition to the availability of resources -- an "availability" that, given the apparent scarcity characteristic of the natural world, inherently limited the satisfaction of those needs. The archetypal individual could, therefore, be conceived of as a locus of needs and desires that would be the primary foundation upon which a theory of economic life could be built. Economy, in this context, appeared as a system of needs, taken as an aggregate of individual desires, confronted with the scarcity of the means (both animate and inanimate) with which to fulfill them.[xiv]

Insofar as any means-ends dichotomy formed the basis of a rational calculus of choice, the market, as a realm of calculated decision-making, became the primary concern of modern economic theorists. In the market the rational actions of the agents of the economic process served to determine the movement of the economy as a whole. Market behavior, therefore, grounded both the more complex aspects of economic life involving production and distribution, and the more elementary moments of consumption and exchange. It was in this context that a theory of price (directly linked with, as Joan Robinson once declared, the discipline's "new

bride," a theory of value) became the central research focus of an array of late nineteenth and early twentieth century theorists.[xv]

If prices were conceived to be indices of the relationship between the supply of and demand for goods and services, being directly proportional to demand and inversely proportional to supply, then for the emergent neoclassical tradition they became a social mapping of the means-ends framework that defined the market to begin with. Relative prices, stipulating the proportions at which goods and services could be exchanged one for another, could thus represent a relationship of relative scarcities, expressing the availability of commodities in terms of their respective demands. Within this conceptual framework, neoclassical theory grasped the rational behavior of consumers as a device to secure a distribution of goods and services that, given the relative scarcities of all these objects of desire, would yield the maximum possible satisfaction of needs.

For modern economic theory, this conception of the rational foundations of the economic process came to play a crucial role once production was explicitly introduced into the analysis. Production became an extension into future time of the practice of rational decision-making. Individuals could decide to defer present consumption if such an act would result in enough increased future consumption to validate the initial deprivation and assumption of risk. These intertemporal consumption decisions would become physically embodied, through the mechanism of investment, in the means of production and the quantities of labor necessary for the execution of chosen production tasks. The payments to the production inputs, in the forms of interest and wages, arguing by direct analogy, would thus express the relative scarcities of those inputs in terms of the demand for their final output. To the extent that the technique of production in use, as exemplified by the proportions in which capital and labor were combined in

the work-place, expressed the relative scarcities of equipment, tools, raw materials, and labor itself, the payments to these "factors of production," and thereby the distribution of income between property owners and laborers, would become a function of the technical conditions surrounding the production process that confronted the choices (or demands) made by consumers.[xvi]

The neoclassical economic theory that emerged at the turn of this century (and that has characterized the evolution of the discipline ever since) analyzed the process by which rational decision-makers, acting in the market, interacted with a price system for goods and services that specified the techniques of production to be used (and, in so doing, the distribution of income) to transform scarce inputs into final demanded outputs. This is a very broad and general outline of the neoclassical conception of economic life, an approach that specified economic action as the rational (that is to say, self-consciously calculated) allocation of scarce resources, over time, to the fulfillment of competing ends.[xvii]

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In its intellectual origins and trajectory, the turn-of-the-century work of neoclassical economists invoked a long and venerable tradition of inquiry among its classical ancestors and, in fact, their precursors. Clearly, by doing so, a strong and compelling case for its probity and efficacy could be made. At the same time, those aspects of the classical tradition that proved to be troublesome, seemingly contradictory, or politically rather than scientifically motivated could be jettisoned thereby allowing modern theorists to claim an objectivity and expertise inherent in (and essential to) their professional aspirations. This was especially but not solely the case with

respect to that restructuring of the classical paradigm conceived of by Karl Marx.

Some of the earliest conceptions of economic life located their primary analytical categories in the natural realm -- in the sphere of subsistence. For the Physiocrats of the seventeenth century (and certain of their contemporaries), it was clear that a science of society had to "consider the common weal in terms of its essence, and humanity as a whole in terms of its root, subsistence." Economy was thus viewed as an expression of the relationship between the size of the human population and the availability of the means with which to maintain that population. What framed this relationship was the physical interaction of human needs (involving food, shelter, and reproduction) and the powers of nature. Social life was natural life comprising a dynamic of necessity wherein "the inhabitants of any country [could] increase in numbers until the ground refuse[d] farther nourishment."[xviii]

It was the analysis of this demographic relationship that lay at the heart of the emergent classical tradition in economic thought. As the primary grasp of social life emerged from the examination of the mechanisms of subsistence, the law-bound character of society was founded upon the naturally specified conditions of the land. The scarcity or abundance of the fruits of the soil determined the material conditions of the social system as a whole. Given this notion, the Physiocrats conceived of social wealth as the natural product of the earth. Social progress was thus dependent upon the ability to win greater surpluses, over the subsistence needs of the population, from cultivation. The production of wealth was understood, in this sense, as a "law of motion" of the social system; the science of society became necessarily an investigation of the implications of that law.[xix]

The striking specificity of this early conception of economics was inherent in the character of the posited object of the science itself. To the extent that the determinant of social

welfare was a natural force (comprising, essentially, the fertility of the soil), this approach to social inquiry located its object in a non-social realm. Indeed, the progress of society, understood to be a function of the productivity of nature, could not be assessed in a truly profound way; it could only be reckoned as a fortuitous circumstance arising out of natural conditions. For the Physiocrats, "the land [was] a grateful mother, who return[ed] with interest what [was] lent to her." The production of wealth was thus conceived of as a natural outcome. Insofar as nature was opaque to the analysis of a social science, there was ultimately nothing that could be said about social progress beyond the domain of the natural sciences.[xx]

Early modern economic thought, exemplified by the writings of the French Economists and their intellectual companions in England and Scotland, analyzed a social framework the characteristics of which were posed in an abstract fashion. It was precisely the significance of this effort that has earned the "precursors" of the classical tradition an undisputed and honored place in the history of economic thought. But the specificity of their investigations lay in their reduction of a social condition to the status of a natural one. The very essence of society was located, by these thinkers, in a natural struggle for the maintenance of the species. Representations of that struggle were to be found in the dynamics of productive development, such an evolution being powerfully limited by the natural context in which it moved. This understanding of social life as a derivative of the natural life of the species posed the context for the subsequent development of the classical tradition. Indeed, the history of economic thought through the nineteenth century may be viewed, on one level, as the record of attempts to incorporate this early view into a more general social theory.[xxi]

It was of course Adam Smith who provided the first systematic attempt to develop a unified theory of economy and society in his Inquiry into the Nature and Causes of the Wealth of

Nations [1776]. In that treatise, Smith endeavored to ground the production of wealth, and thereby social progress, in a social framework -- the division of labor. "The greatest improvement in the productive powers of labour," he declared in the famous opening of his text, "and the greater part of the skill, dexterity, and judgment with which it is any where directed, or applied, seem to have been the effects of the division of labour." Indeed, Smith's investigation was linked with an awareness of the differences between what he called "barbarism" and "civilized society," disparities uniquely related to the nature and extent of the social laboring process. In this, Smith resolutely built upon the insights of Physiocracy; as Quesnay had declared: "The whole magic of well-ordered society is that each man works for others, while believing that he is working for himself."[xxii]

Throughout the Wealth of Nations Smith moved between two concepts of the division of labor -- a conceptual antinomy that had profound implications for the subsequent articulation of the classical tradition in economics. One such idea was of a simple differentiation of the laboring process among independent producers. This division of labor was premised upon what Smith took to be certain natural aspects of human behavior. It was one's self-interest that encouraged that individual to produce that which he/she had the resources to so fashion, and to exchange the surplus of it "which [was] over and above his own consumption for such parts of the produce of other men's labour as he ha[d] occasion for." Exchange thus rested upon the freely determined opposition of individual wills in the market. Self-interest addressed self-interest, and all this was expressive of "a certain propensity in human nature . . . the propensity to truck, barter and exchange one thing for another."[xxiii]

A parallel notion of the division of labor, for Smith, was that of the intensive form that arises in manufacturing. Interestingly enough, this form of the laboring process was introduced

in the Wealth of Nations prior to the simple example noted above. By emphasizing the positive impact of the division of labor upon the productivity of labor, the division of operations in a manufactory was posited by Smith as a compelling example. Thus the first chapter of his Wealth of Nations compared the efforts of an individual producer of pins with those in a pin factory where: "One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on, is a peculiar business, to whiten the pins is another; it is even a trade by itself to put them into the paper; and the important business of making a pin is, in this manner, divided into about eighteen distinct operations."[xxiv]

So soon as Smith turned to the analysis of exchange, the difficulties associated with his conflation of two conceptions of the division of labor emerged in a more problematic form. Given a social division of labor, it was clear to Smith that it became necessary to consider the process of exchange. Initially this is precisely what Smith did and he determined the value of a commodity to be measured by the amount of labor it could purchase (or "command") in the market. Yet at the same time, indeed on the same page of his treatise, Smith averred that value was equal to the labor expended (or "embodied") in the production of a product itself. "Labour, therefore, [was] the real measure of the exchangeable value of all commodities."[xxv]

On the one hand, Smith conceived of an individual who owned a surplus of certain commodities that could be exchanged for other commodities desired. As a result, the value of the goods owned was "equal to the quantity of labour which [they] enable[d] him to purchase or command." Thus the value of a particular commodity to its owner was equal to the purchasing-power it enjoyed in the marketplace. On the other hand, Smith argued that value existed outside the peculiar conditions of commodity ownership. The labor required to produce a commodity

was an index of the true value of that good. If two shirts were exchanged for one coat, this could only mean for Smith that the labor embodied in the shirts was equal, in some quantitative sense, to the labor embodied in the coat. Labor was thus the intrinsic substance that posited the commensurability of goods in exchange.

Upon closer examination it is clear that there was a relationship between Smith's confusion with regard to a theory of value and his theoretical treatment of the division of labor. In a world of individual producers, exchange could not be abstracted from the particularity of the labor process involved. Each partner in an exchange would bring into the relation a specific product-expression of their labor. The value of that labor, to its owner, would be realized in the marketplace in the amount of the products of another labor that could be appropriated. Value, in this sense, would comprise many facets that Smith nevertheless did not specify in his argument. As two producers offered their goods to one another in the market, they would seek to equate the concrete and useful effort represented by their respective products. In addition, the individual skills and circumstances of production would be compared. Yet to elevate these conditions of the exchange into abstract categories (such as some measure of the "labor embodied" in the work performed) would be to deny the specificity of the exchange itself. Insofar as a labor-embodied notion of value implied an abstraction of labor, from the concrete and useful representation of its application, to the status of being a universal element of <u>any</u> exchange, an exchange among individual producers (i.e., barter) was, in Smith's mind, transformed.[xxvi]

Even more problematic for Smith was the change in his understanding of the exchange process necessitated by conceiving of the division of labor in detail. As in the celebrated case of the pin factory, exchange was no longer an interaction of individual producers; indeed, how could the painter of the pin and the person who packaged it participate in an exchange? To say

that such an exchange could occur through the use of money would be to beg the question posed. For if money stood as universal equivalent, then Smith faced the need to explain what that universal element was with which money corresponded. The character of the production process, epitomized in Smith's factory example, denied the specificity of producers and universalized labor as an abstract entity. Exchange, in this framework, expressed a universal quality of labor precisely because it could not do otherwise.

With the introduction of what was, in essence, the problem of prices and distribution in "civilized society," the abstract discussion of exchange value receded from view in The Wealth of Nations. In fact, the historical and political reality of the ownership of the means of production by a particular class of individuals in the eighteenth century world of which he theorized pushed Smith to argue that laborers were normally compelled to "share" the value they produced with the providers of tools, raw materials, and work sites -- in short, with the owners of capital itself.[xxvii] In this retreat from a theoretical cul-de-sac, Smith set the terms within which classical economic theory would continue to evolve throughout the nineteenth century. Within that later trajectory, as well, were shaped the analytical boundaries and methods of the neoclassical "revolution." No figure was more central to that intellectual evolution than the brilliant English theorist (and remarkably influential Member of Parliament) David Ricardo.

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Uniquely framed by the controversy over the Corn Laws that punctuated his career in public life, Ricardo's research on economic matters not surprisingly deployed the insights of both the Physiocrats and Adam Smith. Struggling to understand the influence of labor costs upon

profits, Ricardo held to the fundamental proposition that "it [was] the profits of the farmer which regulate[d] the profits of all other trades, -- and as the profits of the farmer . . . necessarily decrease[d] with every augmentation of Capital employed on the land, provided no improvements [were] at the same time made in husbandry, all other profits [had to] diminish." This central idea was to find its fullest expression in a remarkable 1815 "Essay on the Influence of a Low Price of Corn on the Profits of Stock."[xxviii]

Formally, Ricardo posited an economy in which the production of a consumption good was achieved by the interaction of labor with that good. This good produced both laborers, in its capacity as a consumption item, and itself, in its role as a capital good. As a straight-forward example, Ricardo thought of corn (or, for that matter, any other agricultural foodstuff) as this universal consumption-capital good. The production of corn (assuming no rent being paid for the land) involved labor, L, and its wage, w -- payment being made simply in amounts of corn. If output was Y, the rate of profit, r, would vary as:

$$r = (Y-wL)/wL$$
$$= (Y/wL) - 1$$
$$= y/w - 1 \; ; \; y = Y/L$$

For Ricardo, the profit on capital (capital being wL -- that is, the corn required to maintain the labor force) was a function of the extent to which the productivity of labor (in terms of output per head, y) exceeded the productivity of corn in the "production" of the working population. In other words, the deviation of y/w from unity expressed the net-productivity of nature. Insofar as production could exceed the subsistence requirements of the economy, a

positive rate of profit would prevail. Otherwise, with subsistence just being met, the economy would be in a steady-state with a profit-rate of zero. If y/w was less than 1, the economy would descend into famine.[xxix]

That this "corn model" of economic life bears striking and profound affinities with the arguments of the Physiocrats is revealed so soon as we note its explicit reduction of the economy to a natural condition. It is the "net productivity of nature" that determines the movement of the system. To what extent, if at all, output per capita exceeds the subsistence requirements of the labor force is a function of nature, of the biological character of both the corn plant and the working population? It cannot be understood by social parameters. This is hardly surprising given the fact that in this "model" there is only one commodity -- corn. So soon as Ricardo posited a world of exchange in his investigations, a world of heterogeneous commodities, a world in which inputs and outputs were qualitatively dissimilar, he forced himself back upon the vexing puzzle of exchange that had bedeviled Smith -- the problem of price-formation. Like Smith, arguably like all of the classical economic theorists of the nineteenth century, Ricardo had to confront the need to specify a "rule" by which goods could be exchanged in the marketplace. It is this theoretical task that informs the core of his landmark work <u>On the Principles of Political Economy and Taxation</u> [1817].[xxx]

The crucial aspect for the development of classical economic theory -- involving the need to theorize about a world of heterogeneous commodities -- is also part of an important distinction between the earlier work of the Physiocrats and the later work of the classical tradition. Clearly "the Physiocrats did not need a theory of value at all in order to give expression to the idea of . . . a surplus. In early agricultural production, as distinct from manufacture, the commodities comprising the input [were] likely to be qualitatively similar to those comprising the output, so

the creation of the surplus [could] be plausibly described in real terms without the intervention of a value theory." Hence the impressive and evocative simplicity of the corn model was shown by the fact that "it [made] possible an understanding of how the rate of profit [was] determined without the need of a method for reducing to a common standard a heterogeneous collection of commodities." This method for "reducing heterogeneous commodities" precisely involved the articulation of a value rule.[xxxi]

In Ricardo's sustained struggle to overcome the limitations and contradictions of the classical theory of economic value are to be found the very controversies and confusions that would characterize the evolution of economic thought through to the twentieth century. By attempting to develop his theory of value on the basis of Adam Smith's investigations, Ricardo immediately confronted the confusion between the labor-commanded and labor-embodied value rules. If, for example, the labor required to produce a given wage-bundle were to double, then it was clear to Ricardo that the value of the output, as measured by the amount of labor embodied in it, would have increased one hundred percent. Yet it did not follow, Ricardo soon realized, that the labor-commanded value of the output would have also risen by the same amount. That calculation would depend on other relative prices in the marketplace -- in other words, the labor-commanded value of output would always depend on the purchasing power it represented. If wages, measured in amounts of corn, increased, while the amount of other goods that could be purchased with that corn fell (due to changes in relative prices), the contradiction was obvious. On the one side, it appeared that labor had risen in value (if measurement was made with reference to the labor embodied in corn); on the other, it appeared that labor had decreased in value (if measurement was made with reference to the labor commanded by the corn in exchange). It was this puzzle that then preoccupied Ricardo for the remainder of his life.

After long consideration of the value problem, Ricardo concluded that the labor-embodied principle was "under many circumstances an invariable standard" of the value of commodities overall. He noted that the labor-embodied standard would allow for the determination of commodity values not simply in terms of the immediate labor involved in production, but also in terms of the labor wrought up in the tools, machinery, plant, and raw materials that were included in the process. This combination of direct and indirect labor constituted the central concern of Ricardo's theory of value. Any changes in the productivity of labor, throughout the "pipeline" of production, would necessarily be reflected in changes in the total value of final output. Thus, if variations in the monetary standard of measurement were ignored, the wages of direct and indirect labor could be taken as the specified value of a good -- further assuming that skill differences and varying work intensities were also taken into account.[xxxii]

The difficulty of Ricardo's formulation of the value problem quickly became apparent so soon as he moved on to consider the role of fixed capital in production (thereby moving his analysis beyond the simplicity of the "corn model"). The problem may be simply posed if we imagine three sectors of production in which, faithful to Ricardo's idea of value, all evaluation is done in units of labor embodied. Consider the following data:

	Sector 1	Sector 2	Sector 3
Value of means of production	20	40	40
Value of labor inputs	40	30	30
Value of total capital advanced	60	70	70
Profit in units of labor	40	30	30
Total value of output	100	100	100

Now, in the economy as a whole, the total profit is 100; the total capital advanced is 200. Therefore, the economy-wide rate of profit (simply dividing total profit by total capital advanced) is 0.5. Yet the prices of the outputs of each sector must resolve themselves into the following:

$$Pi = Ki(1 + r) \; ; (i = 1, 2, 3)$$

where Pi is the price of the commodity produced by the ith sector, Ki the total capital advanced

to its production, and r the "equilibrium" (or, economy-wide) rate of profit. Thus we obtain the following results:

$$P1 = (40 + 20)(1 + 0.5) = 90$$

$$P2 = (40 + 30)(1 + 0.5) = 105$$

$$P3 = (40 + 30)(1 + 0.5) = 105$$

If however we reckon in values, all three commodities must exchange as equivalents. In that case, the profit-rate in each sector must vary as:

$$ri = (Vi - Ki)/Ki \; ; (i = 1, 2, 3)$$

where ri is the sectoral profit-rate and Vi the total value of the output in that sector. We thus have:

$$r1 = 0.66$$

$$r2 = 0.43$$

$$r3 = 0.43$$

In order for equal profit-rates to prevail in each sector, an "equilibrium" condition premised upon the idea of competitive markets (where capital would always seek out sectors where a specific profit-rate was higher than the average, thereby ultimately driving all sectoral rates to a common level), we see that prices must necessarily diverge from values. For prices to be consistent with the labor-embodied value rule, the notion of equilibrium economy-wide

profit-rates must be abandoned. There is the further problem that if the return to capital is (more realistically) a function of the time of production, r will have to be computed as part of the price of output in each, successive production period.[xxxiii]

For Ricardo the puzzles attendant upon his effort to formulate a consistent theory of economic value moved his analysis to a focus on a theory of prices alone. By locating the value problem in the sphere of price-formation, his work presented a striking contrast to the position taken by Adam Smith with regard to those exceptions to the value criterion arising from the use of fixed capital in production. Whereas Smith specified the problem as an historical and social one in which the laborer had to share the value produced with both the capitalist and the rentier, Ricardo believed the difficulty to be linked with the conditions of the production process. There was, he argued, an opposition between the general category of value and the apparently technical specificity of the commodities being produced in an economy. The "difficulty . . . in finding a measure of value applicable to all commodities," he declared, "proceed[ed] from the variety of circumstances under which commodities [were] actually produced." This stumbling block was the theoretical motivation behind Ricardo's enduring concern to find an invariable standard of measure of value. It was an analytical quest in which he never succeeded.[xxxiv]

The intractable difficulty of finding an invariable value standard derived from the fact that isolating such a measuring-rod required the discovery of a commodity the conditions of production of which never changed. Any variation in the value of another commodity, in terms of the standard, could be unambiguously related to changes in that commodity's conditions of production and not to those of the standard itself -- if only such a "standard commodity" existed. Even if, Ricardo soon realized, gold or some other monetary medium were taken to be that standard, if the conditions of its production changed -- in other words, if the labor embodied in

its manufacture or extraction rose or fell due to productivity changes -- straight-forward (and invariant) value measurement would again be impossible.[xxxv]

For all these reasons, and in a theoretical move that dramatically restructured the subsequent development of modern economic theory, Ricardo ultimately abandoned his investigation of the absolute value of commodities and turned instead to a focus on relative value relationships. In a famous letter to the Reverend Thomas Malthus, he summarized his reasoning as follows:

> Political Economy you think is an enquiry into the nature and causes of wealth -- I think it should rather be called an enquiry into the laws which determine the division of the produce of industry among the classes who concur in its formulation. No law can be laid down respecting quantity, but a tolerably correct one can be laid down respecting proportions. Every day I am more satisfied that the former enquiry is vain and delusive, and the latter only the true objects of the science.[xxxvi]

Unable to resolve the contradictions of the classical theory of value, Ricardo thus pursued an investigation of relative values, that is of the prices of an economic system. Indeed, for this reason, the bulk of his core treatise on the subject was ultimately concerned with the movement of prices under varying conditions of accumulation, population growth, and taxation. Classical economic theory had, in the hands of one of its greatest contributors, encountered a conceptual predicament from which there was no escape short of radical alterations in both the object and the purpose of the science.

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Of the most immediate and influential efforts to move economics beyond the dilemmas that frustrated Ricardo there was none more significant than that of Karl Marx. Yet, ironically enough, while Marx succeeded in positing an altogether new conception of the purpose of economic analysis, he nevertheless failed in decisively changing the object of its investigation. In both his success and his failure, he set the stage for the transformation of the discipline that began at the end of the nineteenth century. For this reason it is arguably the case that, contrary to most popular and professional perceptions of the history of economic thought, Marx stands as perhaps the most important and consequential architect of the modern field as a whole.[xxxvii]

On the one hand, Marx's effort to move economics beyond the confines of Ricardo's contributions posed a galling and unavoidable challenge to those social investigators who found in the emergence of the liberal capitalist order that arose in the wake of the democratic and industrial revolutions of the eighteenth and nineteenth centuries much to admire. In this negative respect, his work molded the research and aspirations of generations of economists throughout Europe and the United States. Moreover, because of (if not in spite of) the role Marxian economic theory played in inspiring the two most important political revolutions of the twentieth century, Marx's extensive corpus remained (and has remained), like the striking image he invoked in one of his most famous publications, a spectre haunting the mainstream social sciences to the present day.[xxxviii]

On the other hand, Marx's economics, exemplified by his magnum opus Capital, refashioned yet at the same time reiterated the puzzles and weaknesses of the classical tradition. It did so, perhaps in part because of the impassioned political vocabulary in which it was constructed, in ways that encouraged and facilitated a pivotal transformation in the goals and objectives of economic inquiry as a whole. Yet it was not simply the normative content of the

Marxian approach that invited criticism and refutation; the positive claims Marx made for an economic science, to the extent they made even more vivid the illogical and contradictory approach of the classical school, paved the way for a compelling and strikingly persuasive reconstruction of economics itself.

Like his classical forebears, Marx argued that the background of the social practice of exchange, and thereby of the process of abstraction that posited a commodity as a general value in the market (and not simply as a specific use-value), was the social division of labor. To the extent that abstract labor was the foundation of the general character of a commodity, as a social use-value, then abstract labor itself, Marx concluded, was the basis of exchange value. It was thus necessary to locate the source of value in the general element of the system of exchange -- namely, abstract labor or what he called "labor power." In order to define that generalizing principle that made specific things assume the form of social values, it was necessary to locate that essence, underlying all commodities, that was "common to them all" -- human labor. Yet Marx's ultimate identification of the magnitude of value with labor-time posed fundamental problems for his analysis -- problems that arose for the same reasons that accounted for the theoretical failures of the classical theorists.[xxxix]

There was no substantial argument given by Marx, analogous in many ways to the silence on similar issues to be found in the work of Smith and Ricardo, to account for the measurement of value in labor-time. The entire issue was, in fact, discussed in Capital by means of what were, more or less, definitions. It was in the attempt to define the value of a commodity produced by labor and capital equipment that the difficulty with the labor-time criterion was most clearly posed. For in order to evaluate fixed capital in terms of dated labor, it was necessary to invoke a physical parameter of depreciation. In other words, Marx (just like Ricardo) could determine the

value of a product only by conceiving of the bit-by-bit transference of the value of fixed capital to that of the final output. But in doing so, Marx severed the connection between the sphere of production and that of the market. It was exceedingly difficult to justify this position, wherein depreciation was grasped as a physical process independent of the market forces specifying rates of interest and profit. The determination of the value of a product, for Marx, was thus solely dependent upon the contributions of direct and indirect labor as well as the uncompensated extraction of value by the owners of capital (i.e., "exploitation"). In this conclusion, Marx simply recapitulated the confusion so characteristic of Ricardo's work -- how could commodity values be determined independent of and prior to relative prices?[xl]

Hardly surprising then is the fact that Marx came face to face with the same problem of price calculation that plagued Ricardo. He invested an enormous amount of energy trying to resolve it, and indeed devoted a large portion of the third volume of his treatise on Capital to its discussion. What has come to be known in the literature as "the transformation problem" in Marxian economics, a computational task intended to show how values measured in labor-time may be "transformed" into market prices, is nothing more nor less than the same conceptual contradiction epitomized by Ricardo's vain search for an "invariable standard of measure" of economic value. What formal advances have been made in solving it have nevertheless always failed to address the substantive fallacy, in both the classical and Marxian traditions, it represents. How can values determine prices if prices themselves affect the measurement of values? The circularity of the classical and Marxian arguments could never overcome this problem of simultaneity.[xli]

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Seeking a foundation upon which a more adequate understanding of economic issues could be built, several late nineteenth century thinkers pursued a research agenda that, in their minds, would overcome the pitfalls of classical and Marxian analysis, while at the same time it incorporated their most viable and enduring features. That this project, beyond its theoretical articulation, also entailed a sometimes unconscious but most often explicit rejection of prior claims regarding the social and political origins of poverty, inequality, and economic instability, only made more powerful its appeal to an emergent community of social science experts and professionals. Even so, it would be a mistake to conclude that the rise of a neoclassical economics represented simply a process of ideological reconstruction per se. On the contrary, modern economics -- perhaps most vividly in its American version -- owed its progress as much to new late nineteenth and early twentieth century intellectual fashions as it did to the pursuit of particular political and social goals.

Of those end-of-the-century vogues in social thought that had such a profound impact on what modern economists thought about, and how they thought about it, none was more important than the propositions advanced by the British empiricist tradition concerning the starting point of effective social analysis as a whole. The central analytical motif of empiricism was to pose the individual in nature as the necessary starting-point of any theory of social life. By reflecting upon the subjective apprehension of the individual, the empiricists believed that substantive insight could be gained regarding the forces and behaviors that molded society itself. In this conceptual framework, society could properly be viewed as the sum of its parts. "Read thy self," Thomas Hobbes had declared at the outset of his monumental study of Leviathan. "[W]hosoever looketh into himself," he wrote, "and considereth what he doth, when he does think, opine,

reason, hope, feare, & c, and upon what grounds; he shall thereby read and know, what are the thoughts, and Passions of all other men, upon the like occasions."[xlii]

In what was a deft, if not self-conscious, alteration in the particular approach of the Physiocrats and the early classical economists, the empiricists understood the problem of scarcity and the material limitations of the natural world to be primarily conditions of subjective experience. An individual, confronted with needs and desires of which they were absolutely conscious, was thus counterposed to nature itself. In the necessity of procuring food, shelter, and conveniences conducive to physical and psychic satisfaction, humanity, by virtue of this antagonism between self and nature, became a conquerer of the natural realm. This conclusion seemed irrefutable to the empiricists, and it seems so to this day, because if "we consider ourselves in the condition we are in the world, we cannot but observe that we are in an estate, the necessities whereof call for a constant supply of meat, drink, clothing, and defence from the weather, and our conveniences demand yet a great deal more. To provide these things, Nature furnishes us only with the material, for the most part rough, and unfitted to our use; it requires labour, art, and thought to suit them to our occasions."[xliii]

On the basis of need and desire, according to the empiricists, confronted with the necessity of winning satisfaction from nature, the individual became an activity -- a laboring entity. Spurred by need, the individual had to apply physical and mental powers to the natural world in order to procure those things conducive to happiness. This need, this uneasiness, in the face of nature, became "the chief, if not only spur to human industry and action." Labor thus opposed nature and conferred upon it a form that made it adequate to the satisfaction of human needs, desires, and hopes. In the act of appropriation in the natural world, the products of labor would thus become useful to particular individuals.[xliv]

Having grounded the ultimate determination of social behavior in the life of the individual, the empiricist tradition similarly located the right of property in the sphere of individuality. The fruits of labor were an extension of a person's will; the act of laboring served to remove a piece of nature from its given (and natural) condition. Work thus transformed objects into use-values. As an expression of an individual's action, work was the right, indeed the necessity, of an individual's existence. A product of work thus "ha[d] by this labour something annexed to it that exclude[d] the common right of other[s]." It was on this basis, a conceptual link between individual working activity and the right to property, that the empiricists created a general conception of the social life of the species.[xlv]

It would be difficult to overemphasize the significance and impact of the empiricist notion of property-right for the modern development of economic theory. Especially in the wake of the American and French Revolutions, it seemed appropriate to neoclassical economists later in the nineteenth and twentieth centuries to seize upon a subjective theory of economic value and exchange that privileged individuality as both a concept essential to the further development of a social science and as a virtuous ideal. Clearly, in the absence of the individual right to the products of one's labor, it would be impossible to begin a social analysis with reflection upon individual efforts to fulfill need. In a system devoid of property-right, the individual would have no reason to work, they would lack the incentive and drive to fashion objects of nature into objects of use. This argument, of course, had been most apparent to the empiricists themselves. Given no certainty as to the security of their labors, individuals would not strive to use "labour, art, and thought" in nature; social life would, by contrast, degenerate into an existence of fear, violence, deceit, and usurpation. Human life would thus be an expression of "that condition which is called Warre; and such a warre, as if of every man, against every man." In a disordered

world of struggle and domination,

> every man [would be] Enemy to every man; the same [would be] consequent to the time, wherein men live without other security, than what their own strength, and their own invention [would] furnish them with all. In such condition, there [would be] no place for Industry; because the fruit thereof [would be] uncertain: and consequently no Culture of the Earth; no Navigation, nor use of the commodities that [might] be imported by Sea; no commodious Building; no Instruments of moving, and removing such things as [might] require much force; no knowledge of the face of the Earth; no account of Time; no Arts; no Letters; no Society; and which [would be] worst of all, continual fear, and danger of violent death; And the life of man, solitary, poor, nasty, brutish, and short.[xlvi]

That a social science could be elaborated on the basis of these fundamental ideas seemed clear to the empiricists so soon as one considered the fact that there must arise some means by which labor and its fruits could be assured security. Such security would not only validate the efforts of individuals to meet their needs and desires through work, it would also provide the encouragement and incentive to extend laboring activity in the hopes of acquiring a greater and greater quantity (and quality) of use-values from nature. This notion of development and social progress (whereby human life would cease to be "nasty, brutish, and short") was linked, in the empiricist view, with the entire idea of property-right and the role of a state.

If the seeking of self-interest was a natural, human trait, then so was the reason of individuals that would encourage them to agree to various "Articles of Peace" that would secure the products of labor to each person. By agreeing to recognize the right of individual property (i.e., <u>private</u> property), the "state of Warre" among people would cease and the <u>common-wealth</u> begin. Such an agreement was, for the empiricists, the genesis of the state proper -- of law, government, and civil right. Insofar as the foundation of the system was self-seeking labor, the

expression of which was individual property-right, it appeared then that "[t]he great and chief end therefore, of Men uniting into Commonwealths, and putting themselves under Government, [was] the Preservation of their Property." All of these social theoretic convictions were born of a subjective introspection that had informed the empiricist project from the start. Indeed, it seemed obvious that "[t]he Passions that encline men to Peace, are Fear of Death; Desire of such things as are necessary to commodious living; and a Hope by their Industry to obtain them." Private property-right, law and government, and the subjective individualism necessary to an understanding of social life all seemed obvious outgrowths of human nature itself.[xlvii]

Upon the immensely persuasive and seemingly rigorous intellectual foundations of empiricism, economic theorists of the turn of the century built a wholly new science, one that could move decisively beyond the puzzles and difficulties encountered by the classical theorists. To be sure, the notion of the free and independent individual that formed the basis of neoclassical analysis was in fact, by the late nineteenth century, an historically palpable reality that commanded the attention of an array of thinkers. It is hardly surprising that in the wake of a series of bourgeois revolutions, many social thinkers would be drawn to the conviction that the individual was coterminous with social life as a whole.[xlviii]

Yet far from an unself-conscious theoretical turn, the neoclassical focus upon individual behavior and decision-making, as the necessary object of a reformulated economic science, was the product of a careful reflection upon the traditional concerns of theorists with understanding the relationship between human desire and the apparent scarcity of the natural world. Wealth, for this new breed of economist, was obviously a collection of all things, material and immaterial, that were useful but scarce; "useful" in the sense that they satisfied a human need or desire, "scarce" insofar as their available quantity was not sufficient to meet the constellation of

needs in their entirety. Thoroughly examining this nexus between human goals and natural limits was thus the task of a modern economics, a task that could be linked to what had been literally centuries of tradition in the field.[xlix]

Subjective reflection allowed neoclassical thinkers to begin analysis with a series of virtually axiomatic claims. Given a liberal democratic order, useful things in limited quantity were appropriable. To the extent that unlimited abundance obviated the need for appropriation, and given that no rational individual would seek to acquire useless things, the world of goods and services (i.e., "commodities") would either be appropriated for an individual's consumption or their excess over and above their need would be exchanged for other needed or desired entities. Useful things, limited in quantity, were thus valuable and exchangeable. They could also be increased in quantity by industry. In these specific generalizations, neoclassical theory could build upon the plausible findings of classical analysis and move the discipline beyond their weaknesses.

By starting with the subjective valuation of the material world by a hypothetical individual, modern economic theory then necessarily confronted the problem of the exchange of goods and services among individuals. Once again, economists found their analytical energies devoted to the understanding of value and its expression, price. The outward manifestation of a commodity's value was thus defined by the relative quantification of its worth in terms of other goods and services. Assuming free and uncoerced bargaining in the marketplace (which is to say that exchange would take place within a legal framework epitomized by Hobbes' "Articles of Peace"), the consummation of a transaction was taken to express an agreed-upon equivalence of those objects brought into the exchange in the first instance. Moreover, given the scarcity characteristic of humanity's estate in the material world, it was claimed that buyers would

attempt to outbid, and sellers to underbid one another. Prices, or ratios of value of exchange, would thus be equal to the inverse ratios of the quantities exchanged. In other words, modern economists theorized that a market transaction brought about "equilibrium," when in its wake there was no "excess" supply of or demand for a particular good. If there were such excesses, prices would change to "clear" the market. An excess supply of one good, given its demand, would result in a falling price and an increase in the amount demanded; an excess demand for one good, given its supply, would eventuate in a rising price and a decrease in the amount demanded.

In rigorously articulating a theory of market price, neoclassical theorists had taken, however, only one step toward resolving the conceptual difficulties that so frustrated their classical forebears. For the key issue remained as to how individuals determined the prices at which they would offer or demand particular goods in the market. Given the failures of the labor theory of economic value, in its various classical manifestations, the neoclassical theorists turned resolutely to an exploration of subjective valuation as the means by which to resolve this core problem in the development of their science. It was in this context that they developed the notion of "utility" as a means by which to construct a theory of demand.

Reflecting upon the attitudes and perceptions of a model individual in a market, it quickly became apparent to neoclassical investigators that the central issue for understanding demand behavior had to with the relationship between sacrifice and satisfaction. In other words, for each unit of a desired good, an individual had to sacrifice (i.e., pay) something. Since useful things were not available in infinite supply, this seemed an obvious and inarguable conclusion. How might some determinacy be lent to this insight? The answer lay in considering what operative links might exist between consumption and satisfaction. By exposing those connections, a

behavioral argument could be made concerning the attainment of satisfaction relative to the sacrifices (i.e., the payments in exchange) necessary to its realization.[l]

For the individual, argued the neoclassical theorists, the consumption of a desired good or service would yield a diminishing utility as more and more of the commodity was used. In other words, each successive unit of consumption would yield less and less enjoyment as the individual moved from the consumption of the first -- which would have filled the most immediate and urgent desire -- to the last, after which satiation would set in. As one of the most eminent of the neoclassical theorists, Léon Walras, argued, the intensity (or as he called it, the rareté) of the last want satisfied by any given good was an inverse function of the quantity of the good consumed. Put another way, the rareté of a commodity would increase as the quantity possessed (or that is to say, consumed) decreased.[li]

Given two commodities in the marketplace, each partner to an exchange would, under the neoclassical rubric, strive to attain a maximum possible satisfaction of their wants. They would do so by seeking to maximize the utility (or, if you will, rareté) gained from a particular market transaction. The limiting condition would be reached when any alteration in a completed bargain would yield less satisfaction to its participants. Put formally, the criterion of optimality in this case would be realized when the ratio of the intensities of the last wants satisfied by each of the two goods in this hypothetical market (i.e., the ratio of their raretés) was equal to that first good's price.[lii]

That this identity constitutes a threshold of "equilibrium" exchange is clear so soon as we consider that a party to this exchange would find it to their advantage to sell the commodity the rareté of which was lower than its price in order to gain another unit of the other commodity the rareté of which exceeded its price -- all this in order to maximize one's total utility or satisfaction

from exchange. Until and unless market arbitrage yields no further improvements in satisfaction, rational economic agents will adjust their offers and demands in pursuit of a final state of repose or "equilibrium." Relative equilibrium prices, in competitive and freely constituted markets, would thus be equal to the ratio of commodities' raretés. Values in exchange would be proportional to these raretés, and these raretés would only be defined with reference to a given individual. Their subjective existence would be derivative of the objective circumstance that utility is inversely related to the quantity of something consumed. Value in exchange, represented by price, thus stood for a subjective realm of experience having to do with individual needs and desires. It was this distinction between value in exchange -- as relative and objective -- and rareté -- as subjective -- that was, for the new neoclassical theorists, a rigorous expression of the puzzling classical distinction between exchange-value and use-value.[liii]

Of unique importance in appreciating the impact and distinctiveness of the neoclassical transformation in economic theory was not its emphasis on rational human action. Quite the contrary. In focusing on rational responses to the natural environment and the human world of need and desire, the neoclassicals had, in many ways, actually recapitulated some of the most compelling and intriguing concerns of the classical and pre-classical theorists. The special significance of the neoclassical approach was its determined emphasis upon the choices and decisions economic actors would make regarding the last (or "marginal") unit in a transaction. It was not therefore the pursuit of rational objectives per se that set neoclassical arguments apart from their classical antecedents, but rather the ways in which that rationality could be described, explained, and measured that was crucial to the success of an intellectual project that sought to overcome the failures of its forerunners.[liv] In the presumption of declining raretés, or of diminishing utility in the consumption of each successive unit of a good or service, neoclassical

economic theory found its true voice. Not inappropriately, therefore, do historians of economic theory speak of this period in the history of the discipline as the era of the "marginalist revolution."[lv]

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In their emphasis on decision-making in exchange relationships, and in particular on choices made "at the margin," neoclassical theorists succeeded both in solving (or defining away) certain, central dilemmas of classical theory and in articulating a new, focused, and enduring object of investigation for their field. No longer an "inquiry into the nature and causes of the wealth of nations," economics had become the study of the implications and applications of a subjective theory of value for an understanding of the social world. Prices could be understood as the exchange-ratios on the basis of which rational actors sought to maximize their utility given the principle of diminishing marginal satisfaction. Understanding the exchange and valuation of <u>any</u> useful thing or service could be framed within the context of this approach -- the choices of a consumer in a grocery store, the decision by a worker about trading income (or work time) for leisure, the assessment by an investor of the relative merits of assuming a given risk (trading present consumption against future returns), the operational strategy selected by an entrepreneur in production (comparing the prices and "utility" -- which is to say, the marginal productivity -- of an extra unit of labor, tools, machinery, and raw materials). In both its simplicity and its pervasive applicability, neoclassical value theory proved its worth. What challenges emerged to its intellectual hegemony were linked either directly with the enduring critiques associated with Marxian analysis or with historical circumstances, best exemplified by the Great Depression of the twentieth century, that evoked powerful counterattacks from within

the discipline itself.[lvi]

Yet neoclassical theory endured and has continued to hold sway in economics ever since its initial formulation. If anything, its appeal is greater now, in the early twenty-first century, than in the years of its founding. This would suggest that the success of the marginalist revolution had as much intellectual as it had social and political (and even bureaucratic) components. In fact, one of the leading historians of the modern economics profession has perceptively argued that the marginalist revolution is most profitably viewed in four ways: as an autonomous intellectual development, as the product of philosophical changes, as the result of economic and institutional changes in the western world in the late nineteenth century, and as part of a powerful counterattack against Marxism and socialist politics at the time.[lvii]

There is, to be sure, no shred of historical evidence to support the idea that the marginalist revolution was a conscious conspiracy to overthrow the tenets of Marxism -- at least among its "founding fathers," Jevons, Menger, and Walras. Indeed, some intellectuals sought to utilize the work of Jevons and Menger as a justification for socialism. By contrast, Walras himself believed his theory to prove the "beneficence" of capitalist competition. Certain followers of the marginalist tradition, including one of its leading practitioners in the United States, held the approach to be an explicit and entirely persuasive critique of the Marxian theory of exploitation -- to the extent marginalist analytics were applied to the problem of income distribution. Yet, in the final analysis, it was not the specific findings of marginalist theory that gave a simple blueprint for political action (of whatever stripe), but rather the approach itself that was so consequential.[lviii]

Just as the new, marginalist approach in economics did not subsist in an historical vacuum, so too was it not separated from peculiar social forces linked with the continued rise of

professions (especially in the academic disciplines) at the turn of this century. Whatever the philosophical and scientific foundations of marginalism might have been, its success owed a great deal to the process of professionalization that emerged in the economics field in the last two decades of the nineteenth century. Independent of the specific political or ideological objectives to which the findings of marginalist analysis could, by particular individuals, be applied, the intellectual agenda it constructed went hand-in-hand with emergent efforts to make social science the domain of experts rather than of activists and amateurs.[lix]

By the 1880s, concern with the status and legitimacy of economics was a decidedly Anglo-American affair. On the eve of his 1884 move from Balliol College, Oxford to Cambridge University, the eminent Alfred Marshall was determined that economists be trained in theory "inaccessible to laymen" so that they would, as group, enjoy "a specialist voice in the art of policy-making." In no small measure, Marshall's goals were those of garnering respect and status within the academy and among political leaders; realizing them would depend upon the ability of economists to "enhance the[ir] scientific authority . . . by keeping it clear of political partisanship." The pressing need to do so was made obvious by the chaotic circumstances surrounding British economics scholarship at the time and the disdain and attendant embarrassment the field had suffered at the hands of other specialists.[lx]

Similar pressures made themselves felt in the United States. Although, as early as 1860, "political economy" was a separate instructional field at several American colleges and universities, "it remained closely linked to its parent [moral philosophy]." Throughout the balance of the nineteenth century, the investigation and discussion of economic issues among American "political economists" had proceeded along a strikingly moral plane focused on reform. While this brought a great deal of vigor and passion to the discipline, it did not

necessarily strengthen or sustain economists' ability to capture public attention and mold opinion accordingly. Part of a larger movement among social science investigators to expand the domain and role of their various disciplines in American higher education and American politics, late nineteenth century economists confronted a constellation of challenges, intellectual and professional.[lxi]

Perhaps primary among the intellectual crosscurrents with which "professionalizing" American economists had to deal, by the 1880s, was the influence of the "German Historical School." Unabashedly inductive in its approach, German historicism held all economic generalizations to be relative judgments and, correspondingly, argued that "each economic problem must be approached de novo." A most problematic methodological lesson was this for it directly contravened the notion that experts, armed with an array of analytical weapons based on deductive principles, could speak with singular authority on matters of economic interest. As the turn of the century beckoned, academic economists in America increasingly came to the conviction that only an "elaborate economic theory [could] embod[y] their claim to professional skill and knowledge."[lxii]

With respect to the professional tests that faced this new generation of American economists, there was first and foremost the need to secure academic institutional visibility and acceptance. In large measure this project involved securing the liberation of 'political economy" from the theological frameworks, drawn from moral philosophy, that had in the United States delimited its mid-nineteenth century emergence as a classroom subject. With that substantive topical freedom, the discipline could also enjoy an independent faculty existence in the modern college and university. Disciplinary independence would as well sustain the development of professional venues for the sharing of research findings.[lxiii]

Yet in every respect success in the achievement of both intellectual and professional authority depended upon the informed acceptance of an agreed-upon standard of analytical probity -- a set of doctrines and theories that would represent the very expertise that a new profession could deploy. In the marginalist analytics of the neoclassical corpus, late nineteenth century American economists were convinced they had that standard. The rapid acceptance of marginalism, not simply among economists in their work but especially as part of the field's teaching agenda, demonstrates that fact.

From 1893 to 1907, leading American economics textbooks increasingly utilized marginalist analysis in the presentation of core ideas in the field. The main emphasis in these works was to introduce students to the concept of marginal utility as a means to understand market demand. By 1908, and carrying on for the next two and a half decades, authors extended their use of marginalist ideas to embrace explanations of the distribution of income between capital and labor -- this by means of the notion of marginal productivity. Toward the end of the interwar period, "[b]oth marginal utility and marginal productivity had been accepted" as essential parts of the introductory training of economics students -- as exemplified by their utilization in the best known and most often used texts. These developments taken together constituted a trend in the teaching of economics that continued well through the latter half of the century.[lxiv]

Hand in hand with the articulation and dissemination of a new intellectual agenda went the institutional (and professional) progress of the economics discipline. With the establishment, in the course of the 1890s, of highly visible and highly regarded economics departments at the University of Chicago, Columbia University, Harvard University, Johns Hopkins University, and the University of Wisconsin, a crucial step in this professional self-realization had been taken.

The founding of the American Economic Association in 1885 had, to be sure, presaged this development. Part of a wider historical current, one that facilitated the emergence of a variety of social scientific professional societies and faculties, the turn of the century (re)birth of American economics was relatively swift and strikingly tenacious.[lxv] By the first decade of the twentieth century, therefore, American economists were poised to pursue a project of professional fulfillment that stood at the end of centuries of intellectual evolution in their discipline. Set in intellectual and historical perspective, the role of the "marginalist revolution" in the construction of their authoritative community of experts is made vivid and coherent.

Endnotes

[i] The Accumulation of Capital (London: Macmillan, [1956] (1971), v.

[ii] Reckoning with the connections between the intellectual evolution of a discipline and changes in the understanding of a field's doctrinal evolution has been a core theme in the work of historians, philosophers, and sociologists of science. Particularly informative in this regard is, of course, Thomas S. Kuhn, The Structure of Scientific Revolutions (Chicago: University of Chicago Press, 1970) ch.1. Economic theorists and historians of economic thought have also had much to say about the relationship between the evolution of the discipline and retrospective evaluations of its intellectual past. For example, see Terence W. Hutchison, On Revolutions and Progress in Economic Knowledge (Cambridge: Cambridge University Press, 1978); D.F. Gordon, "The Role of the History of Economic Thought in the Understanding of Modern Economic Theory," American Economic Review 55 (1965), 119-27; A.F. Chalk, "Relativist and Absolutist Approaches to the History of Economic Theory," South Western Social Sciences Quarterly 48 (1967), 5-12; and G.J. Stigler, "Does Economics Have a Useful Past?," History of Political Economy 1 (1969), 217-30;

[iii] An appreciation of a variety of factors that formed the context within which modern American economic thought evolved may be won from Joseph J. Spengler, "Exogenous and Endogenous Influences in the Formation of Post-1870 Economic Thought," in Events, Ideology and Economic Theory (Robert V. Eagly, ed.), (Detroit: Wayne State University Press, 1968), 159-205; O.H. Taylor, "Economic Theory and Certain Non-Economic Elements in Social Life," in Explorations in Economics: Notes and Essays in Honor of F.W. Taussig (no ed.), (New York: Kelley, [1936] (1967), 380-90; Lawrence Birken, "From Macroeconomics to Microeconomics: The Marginalist Revolution in Socio-Cultural Perspective," History of Political Economy 20 (1988), 251-74; G.L.S. Shackle, The Years of High Theory: Invention and Tradition in Economic Theory (Cambridge: Cambridge University Press, 1967); Paul R. Bernard, The Making of the Marginal Mind: Academic Economic Thought in the United States, 1860-1910 (unpublished Ph.D. dissertation, University of Michigan, 1990); and, of course, Robert L. Heilbroner, The Worldly Philosophers: The Lives, Times and Ideas of the Great Economic Thinkers (New York: Simon and Schuster, 1972).

[iv] The quotation is from the core work of one of the best known historians of this type, Burton J. Bledstein, The Culture of Professionalism: The Middle Class and the Development of Higher Education in America (New York: Norton, 1976), 90. Of clear inspiration to Bledstein's particular outlook are David Riesman, The Lonely Crowd: A Study of the Changing American Character (New Haven: Yale University Press, 1950) and C. Wright Mills, White Collar: The American Middle Classes (New York: Oxford University Press, 1951). The sociological taxonomy of scientific characteristics is, of course, Robert K. Merton's from essays republished in his The Sociology of Science: Theoretical and Empirical Investigations (Chicago: University of Chicago Press, 1973), 267-78.

[v] From Thorstein Veblen, The Higher Learning in America: A Memorandum on the Conduct of Universities by Business Men (New York: Augustus M. Kelley, [1918] 1965), 42. Michael A. Dennis has specifically noted the complications, for Merton's model of scientific norms, posed by the institutional contexts within which research is performed. See his "Accounting for Research: New Histories of Corporate Laboratories and the Social History of American Science," Social Studies of Science 17 (1987), 479-518 at 492. David F. Noble has provided a

striking assessment of the importance of the corporate framework for an appreciation of the evolution of professional expertise and scientific knowledge. See his America By Design: Science, Technology, and the Rise of Corporate Capitalism (New York: Knopf, 1977).

[vi] In part, this is precisely the burden of an argument made by Martin J.S. Rudwick in his "A Year in the Life of Adam Sedgwick and Company, Geologists," Archives of Natural History 15 (1988), 243-68. Rudwick explains in his introduction: "The commercial allusion in the title has a . . . meaning. Companies produce goods and services by means of processes operated by personnel. It would be useless to try to understand the work of an industrial firm merely by analysing its finished and packaged products. Yet until recently, much of what passed for history of science was just such an analysis of polished publications, with little attention to the processes by which they were produced or to the practice of the scientists themselves."

[vii] See Thomas S. Kuhn, The Structure of Scientific Revolutions (Chicago: University of Chicago Press, [1962] 1966) as well as his The Essential Tension: Selected Studies in Scientific Tradition and Change (Chicago: University of Chicago Press, 1977). Parsons' links with the "Mertonian" conception of the scientific enterprise are made clear in "The Present Position and Prospects of Systematic Theory in Sociology," in his Essays in Sociological Theory (New York: Free Press, [1945] 1954), 212-37. The philosophical foundations of Merton's and Parsons' views of science are clearly articulated in the epistemological work of Karl Popper. See his The Poverty of Historicism (New York: Harper and Row, 1961); Conjectures and Refutations: The Growth of Scientific Knowledge (New York: Basic, 1962); and Objective Knowledge: An Evolutionary Approach (Oxford: Clarendon Press, 1972). In this regard, Parsons' determination to make sociology a "science" is significant. See, for example, C. Camic, "The Making of a Method: A Historical Reinterpretation of the Early Parsons," American Sociological Review 52 (1987), 421-39. Roger E. Backhouse has more recently situated debates in economics itself within controversies in the theoretical literature in the sociological and philosophy of science. See, for example, his Explorations in Economic Methodology: From Lakatos to Empirical Philosophy of Science (New York: Routledge, 1998), a study clearly inspired by a very well known essay by Mark Blaug on "Kuhn versus Lakatos, or Paradigms versus Research Programmes in the History of Economics," History of Political Economy 7 (1975), 399-433. Also see, in this regard, Martin Bronfenbrenner, "The 'Structure of Scientific Revolutions' in Economic Thought," History of Political Economy 3 (1971), 136-51.

[viii] Some well-known examples of the network theory approach are Bruno Latour, The Pasteurization of France (Cambridge: Harvard University Press, 1988); Michel Callon, John Law, "On Interests and Their Transformation: Enrolment and Counter-Enrolment," Social Studies of Science 12 (1982), 615-25; and Steve Woolgar, "Interests and Explanation in the Social Study of Science," Social Studies of Science 11 (1981), 365-94. Studies of "laboratory life" were inspired by the path-breaking work of Latour and Woolgar. See their Laboratory Life: The Construction of Scientific Facts (Princeton: Princeton University Press, 1988). The efflorescence of work on conflict among communities of scientific "interests" founds it roots, to some extent (and interestingly enough), in the earlier work of Karl Mannheim. See his Ideology and Utopia: An Introduction to the Sociology of Knowledge (Louis Wirth, Edward Shils; trans.) (New York: Harcourt Brace Jovanovich, [1929] 1936). Leading contributions in this genre are David Bloor, Knowledge and Social Imagery (Chicago: University of Chicago Press, 1976); Steven Shapin, "Pump and Circumstance: Robert Boyle's Literary Technology," Social Studies of Science 14 (1984), 481-520; his (co-authored with Simon Schaffer) Leviathan and the Air-

Pump: Hobbes, Boyle, and the Experimental Life (Princeton: Princeton University Press, 1985); as well as his A Social History of Truth: Civility and Science in Seventeenth-Century England (Chicago: University of Chicago Press, 1992); and Barry Barnes, Donald MacKenzie, "On the Role of Interests in Scientific Change," in (R. Wallis, ed.), On the Margins of Science: The Social Construction of Rejected Knowledge (Keele: University of Keele Press), 1979, 49-66. Yet another striking and quite influential example of the new "social" approach to the study of science is Michael Lynch, Scientific Practice and Ordinary Action: Ethnomethodology and Social Studies of Science (Cambridge: Cambridge University Press, 1993).

[ix] An appreciation of the dichotomous quality of research on the exclusionary character of professions may be garnered from Thomas Haskell, The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth-Century Crisis of Authority (Urbana: University of Illinois Press, 1977); Burton J. Bledstein, The Culture of Professionalism; J. L. Berlant, Profession and Monopoly (Berkeley: University of California Press, 1975); and Magali Larson, The Rise of Professionalism (Berkeley: University of California Press, 1977). Also see Jeffrey Berlant, Professions and Monopoly (Berkeley: University of California Press, 1975); and Eliot Freidson, Professional Dominance (Chicago: Aldine, 1970). Some of this literature emphasizes a class-based approach not simply to the rise of professions but of an intellectual elite as a whole. See, for example, Alvin W. Gouldner, The Future of Intellectuals and the Rise of the New Class (New York: Oxford University Press, 1981); Russell Jacoby, The Last Intellectuals: American Culture in the Age of Academe (New York: Basic Books, 1987); J. Ben-David, "Professions in the Class system of Present Day Societies," Current Sociology 12 (1963), 247-98; and Charles Derber et al., Power in the Highest Degree: Professionals and the Rise of a New Mandarin Order (New York: Oxford University Press, 1990). There are, interestingly enough, novel departures from common attitudes towards "amateurs" in certain professional fields. In astronomy, for example, the role of non-professional observers, in helping to chart and identify objects in space, is both accepted and celebrated -- even to the extent of naming comets, for example, after amateurs who first observed them. Also see, in this regard, N.K. Denzin, "Incomplete Professionalization: The Case of Pharmacy," Social Forces 46 (1968), 375-81 and Amitai Etzioni, The Semi-Professions and Their Organization (New York: Free Press, 1969). The classic work by Carr-Saunders and Wilson on the functionalist approach to professionalization is their The Professions (Oxford: Oxford University Press, [1933] 1964). Their contribution is, of course, closely identified with the investigations of Parsons as well as with those of Harold Wilensky, "The Professionalization of Everyone?," American Journal of Sociology 70 (1964), 137-58 and Everett Hughes, "Professions," Daedalus 92 (1963), 655-68.

[x] From Pierre Bourdieu, Outline of a Theory of Practice (Richard Nice, trans.) (New York: Cambridge University Press, 1977), 22. Also see, in this regard, Michel Foucault, "The Discourse on Language," an appendix to his The Archaeology of Knowledge (A.M. Sheridan Smith, trans.) (New York: Harper and Row, 1972), 215-37. Consideration of the significance of professional discourse for an understanding of the authority of experts is provocatively explored, in the case of economics, by Diedre McCloskey in her "The Rhetoric of Economics," Journal of Economic Literature 31 (1983), 434-61; "The Literary Character of Economics," Daedalus (1984), 97-119; "The Standard Error of Regressions," Journal of Economic Literature 34 (1996), 97-114; and "The Loss Function Has Been Mislaid: The Rhetoric of Significance Tests," American Economic Review 75 (1985), 201-5. The contributions of literary critics have also

been uniquely influential as in the case of Stanley Fish, Is There a Text in This Class?: The Authority of Interpretive Communities (Cambridge: Harvard University Press, 1980); and Jane Tompkins, Sensational Designs: The Cultural Work of American Fiction, 1790-1860 (New York: Oxford University Press, 1985). Also of interest, in this regard, is T.F. Gieryn, "Boundary Work and the Demarcation of Science From Non-Science," American Sociological Review 48 (1983), 781-95 and W.J. Goode, "Encroachment, Charlatanism, and the Emerging Profession," American Sociological Review 25 (1960), 902-14. It is in the work of Andrew Abbott that one finds the foundations of the systems approach to professionalization. See his The System of Professions: An Essay on the Division of Expert Labor (Chicago: University of Chicago Press, 1988); and his "The Sociology of Work and Occupations," Annual Review of Sociology 19 (1993), 187-209. Also see J.B. Cullen, The Structure of Professionalism (New York: Petrocelli, 1978); and R. Collins, The Credential Society (New York: Academic Press, 1979). A remarkable challenge to the idea that social science affords a rigorous set of techniques for the resolution of social problems is Charles E. Lindblom, David K. Cohen, Usable Knowledge: Social Science and Social Problem Solving (New Haven: Yale University Press, 1979).

[xi] What has become a virtually classic treatment of the eclectic approach to professionalization characteristic of historical scholarship is R.W. Gordon, "Legal Thought and Legal Practice in the Age of American Enterprise: 1870-1920," in Gerald L. Geison (ed.), Professions and Professional Ideology in America (Chapel Hill: University of North Carolina Press, 1983), 4-82. Also see, in this regard, a more recent study by Laura Kalman undertaken from the perspective of legal scholarship itself: The Strange Career of Legal Liberalism (New Haven: Yale University Press, 1996). In his massive treatment of intellectual and cultural history, Peter Gay notes the increasing centrality of analyses of professionalism for an historical understanding of the modern world. See his The Cultivation of Hatred (vol. 3 of The Bourgeois Experience: Victoria to Freud (New York: Norton, 1993), 484-91.

[xii] The quotations are from the highly regarded study by Paul Starr of The Transformation of American Medicine (New York: Basic Books, 1982), 3. Historians have, of course, turned the critical lens of social history on the evolution of their own profession as best exemplified by Peter Novick, That Noble Dream: The "Objectivity Question" and the American Historical Profession (New York: Cambridge University Press, 1988). An excellent example of the perspective on professionalization afforded by attention to institutional contexts, unique for its focus on philanthropy, is E. Richard Brown, Rockefeller Medicine Men: Medicine and Capitalism in America (Berkeley: University of California Press, 1979). A more tendentious assessment of the social and political foundations of expertise is offered by Edward T. Silva, Sheila A. Slaughter, Serving Power: The Making of the Academic Social Science Expert (Westport: Greenwood Press, 1984). Chandra Mukerji provides a fascinating argument about government institutions creating a "reserve army" of scientific labor to be utilized in moments of emergency and mass mobilization. See her study of A Fragile Power: Scientists and the State (Princeton: Princeton University Press, 1989). A consideration of the celebration of quantification as an index of a field's rigor and objectivity is undertaken in my "Numerable Knowledge and Its Discontents," Reviews in American History 18 (1990), 151-64. Also see Theodore M. Porter, Trust in Numbers: The Pursuit of Objectivity in Science and Public Life (Princeton: Princeton University Press, 1995).

[xiii] For a thought-provoking consideration of the ways in which economics has, throughout the twentieth century, become a ever-more prominent facet in both the intellectual evolution of other

disciplines and the practices of public and private institutions, see Jack Hirshleifer, "The Expanding Domain of Economics," American Economic Review 75 (1985), 53-68.

[xiv] Not pretending to give an exhaustive list of the literature, it is nevertheless important to draw attention to the core contributions to this early development of modern (or, as most historians of economic thought label it, "neoclassical") economic theory. Thus see Léon Walras, Elements of Pure Economics: or The Theory of Social Wealth, (trans., W. Jaffé), (Chicago: Irwin, [1900] 1954); Carl Menger, Principles of Economics, (trans. and ed., J. Dingwall and B.F. Hoselitz), (New York: Free Press, [1871] 1950); and William S. Jevons, The Theory of Political Economy, (New York: Macmillan, [1888] 1957). Other significant "founding" contributors to the neoclassical school are Vilfredo Pareto, Manual of Political Economy (New York: Kelley, [1898] 1971); Francis Y. Edgeworth, Mathematical Psychics (London: Routledge, 1881) as well as his Papers Relating to Political Economy (London: Macmillan, 1925), vol. I; and J.S. Mill, Principles of Political Economy (W.J. Ashley, ed.), (London: Longmans Green, [1848] (1909). Also see Claude Ménard, "The Lausanne Tradition: Walras and Pareto," in Neoclassical Economic Theory, 1870 to 1930 (Klaus Hennings, Warren J. Samuels; eds.), (Boston: Kluwer Academic Publishers, 1990), 95-137; Carl Menger and the Austrian School of Economics (J.R. Hicks, W. Weber; eds.), (Oxford: Oxford University Press, 1973); and The Correspondence of Léon Walras and Related Papers (W. Jaffé, ed.), (Amsterdam: North-Holland, 1965). No doubt the best known English-language survey of the history of economic thought, one that examines the rise of neoclassical theory within a "mainstream" framework yet which is nevertheless intellectually open and generous, is Mark Blaug, Economic Theory in Retrospect (Cambridge: Cambridge University Press, 1985). An alternative perspective, inspired by the classical and Marxian traditions, is offered by Maurice H. Dobb, Theories of Value and Distribution Since Adam Smith (Cambridge: Cambridge University Press, 1973). Some of the English-language classics in the history of economic thought are Charles Gidé and Charles Rist, A History of Economic Doctrines (Boston: D.C. Heath, [1913] (n.d.)); George J. Sitgler, Essays in the History of Economics (Chicago: University of Chicago Press, 1965); and Joseph A. Schumpeter, History of Economic Analysis (Oxford: Oxford University Press, 1954) as well as his Economic Doctrine and Method: An Historical Sketch (R. Aris, trans.), (New York: Oxford University Press, [1912] (1967). Some more recent publications that give an excellent contemporary grasp of the earliest ideas in the neoclassical reformulation of economics are Charles Ferguson, The Neoclassical Theory of Production and Distribution (London: Cambridge University Press, 1969); Terence W. Hutchison, The Significance and Basic Postulates of Economics (New York: Kelley, [1938] (1960); Phyllis Deane, The Evolution of Economic Ideas (Cambridge: Cambridge University Press, 1978); Harry Gram and Vivian Walsh, Classical and Neoclassical Theories of General Equilibrium (New York: Oxford University Press, 1980); and Frank H. Hahn, On the Notion of Equilibrium in Economics (Cambridge: Cambridge University Press, 1973).

[xv] I embrace here the widely accepted convention of referring to the immediate forebears of modern economics -- most prominently Adam Smith, David Ricardo, and Karl Marx (and their followers) -- as "classical" investigators. Those whose research reoriented the field of economics at the turn of this century, such as Walras, Menger, and Jevons, are thus said to have initiated the "neoclassical" approach.

[xvi] See R.M. Solow, "A Contribution to the Theory of Economic Growth," Quarterly Journal of Economics 70 (1956), 65-94; and his Capital Theory and the Rate of Return (New York: Rand

McNally, 1965). Also see Irving Fisher, The Theory of Interest (New York: Kelley, [1930] (1965), chs. I-VII as well as his Mathematical Investigations in the Theory of Value and Price (New York: Kelley, [1892] 1961); F.P. Ramsey, "A Mathematical Theory of Saving," Economic Journal 38, 543-59; John R. Hicks, Value and Capital (Oxford: Oxford University Press, 1939); and P.A. Samuelson, "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money," Journal of Political Economy 66 (1958), 467-82.

[xvii] See Tjalling C. Koopmans, "Allocation of Resources and the Price System," in his Three Essays on the State of Economic Science (New York: McGraw-Hill, 1957). Also see George J. Stigler, Production and Distribution Theories: The Formative Period (New York: Macmillan, 1946); Ralph W. Souter, "'The Nature and Significance of Economic Science'in Recent Discussion," Quarterly Journal of Economics 47 (1933), 377-413; Frank H. Knight, "The Nature of Economic Science in Some Recent Discussion," American Economic Review 24 (1934), 225-38; Lionel Robbins, An Essay on the Nature and Significance of Economic Science (London: Macmillan, [1936] 1952); Talcott Parsons, "Some Reflections on 'The Nature and Significance of Economics,'" Quarterly Journal of Economics 48 (1934), 511-45; and Fritz Machlup, "Marginal Analysis and Empirical Research," American Economic Review 36 (1946), 519-54.

[xviii] Sir James Steuart, "An Inquiry into the Principles of Political Oëconomy," [1767] quoted in Ronald L. Meek, Precursors of Adam Smith (London: Dent, 1973), 154 and Marquis de Mirabeau, Francois Quesnay, "Rural Philosophy," [1763] also quoted in Meek, Precursors, 104. Also see Ronald L. Meek, The Economics of Physiocracy (Cambridge: Harvard University Press, 1963), 370-71.

[xix] Not surprisingly, therefore, the Physiocrats claimed that agriculture alone was the productive sector of any economy. See Meek, Economics of Physiocracy, 381 and A.R.J. Turgot, "Reflections on the Formation and the Distribution of Wealth," [1766] in Ronald L. Meek (ed. and trans.), Turgot on Progress, Sociology and Economics (Cambridge: Cambridge University Press, 1973), 128.

[xx] See David P. Levine, Economic Studies: Contributions to the Critique of Economic Theory (London: Routledge, 1977), ch.1; and the Marquis de Mirabeau, "The Tableau Economique and its Explanation," quoted in Meek, Precursors, 126.

[xxi] See Sir James Steuart, "An Inquiry into the Principles of Political Oeconomy," in Meek, Precursors, 167-68.

[xxii] See Meek, The Economics of Physiocracy, 371, emphasis added. Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations (New York: Random House, [1776] 1937), 3. Smith was also clearly building upon traditions of western thought that stretched back to the ancients. As Aristotle had argued in the first part of his Politica, "[T]he individual, when isolated, is not self-sufficing . . . . he who is unable to live in society, or who has no need because he is sufficient for himself, must be either a beast or a god." See The Works of Aristotle (W.D. Ross, ed.; B. Jowett, trans.), (Oxford: Clarendon Press, 1921), vol.X, 1253a-18. Interestingly enough, this aspect of Smith's investigations apparently had a profound impact on the later inquiries on the subject undertaken by Hegel. See G.W.F. Hegel, Philosophy of Right (trans., T.M. Knox), (Oxford: Clarendon Press, 1942), 122-23 and 129 where Hegel writes: "The universal and objective element in work . . . lies in the abstracting process which effects the subdivision of needs and means and thereby eo ipso subdivides production and brings about the division of labour . . . this abstraction of one man's skill and means of production from another's completes and makes necessary everywhere the dependence of men on one another and their

reciprocal relation in the satisfaction of their . . . needs."

[xxiii] Smith also wrote: "Every man thus lives by exchanging or becomes in some measure a merchant." See Smith, The Wealth of Nations, 13, 17, 22. Again, the echoes of ancient Greek philosophy were clear in Smith's approach. See The Republic of Plato (F.M. Cornford, trans.), (Oxford: Clarendon Press, 1948), 54 where Socrates states: "[A] state comes into existence because no individual is self-sufficing; we all have many needs . . . . having all these needs, we call in one another's help to satisfy our various requirements; and when we have collected a number of helpers and associates to live together in one place, we call that settlement a state." Further, on pp. 55-6, Socrates argues "that more things will be produced and the work be more easily and better done, when every man is set free from all other occupations to do, at the right time, the one thing for which he is naturally fitted."

[xxiv] Smith, The Wealth of Nations, 4. The confusion regarding the division of labor, in Smith's work, is also immediately apparent on p.5 where he says: "The division of labour . . . so far as it can be introduced, occasions, in every art, a proportionable increase of the productive powers of labour . . . . what is the work of one man in a rude state of society, being generally that of several in an improved one." Yet this idea is compatible with both forms of the division of labor examined in The Wealth of Nations.

[xxv] Smith, The Wealth of Nations, 30. I am focusing here on Smith's notion of "real price." The problems associated, in his mind, with the divergence between "real" and "nominal" price are not posed in this context.

[xxvi] See Levine, Economic Studies, ch.2.

[xxvii] See Smith, The Wealth of Nations, 47-50.

[xxviii] See The Works and Correspondence of David Ricardo, (ed., P. Sraffa with M.H. Dobb), (Cambridge: Cambridge University Press, 1951), vol. IV, 9-41.

[xxix] The resonances of Ricardo's investigations in this regard with the explicitly demographic focus of the work of the Reverend Thomas Malthus are obvious. See Thomas R. Malthus, Principles of Political Economy Considered with a View to their Practical Application (London: J. Murray, 1820) and his An Essay on the Principle of Population (New York: Modern Library, [1798] 1960) as well as Ricardo's "Notes on Malthus's Principles of Political Economy," in Piero Sraffa (ed.), The Works and Correspondence of David Ricardo (Cambridge: Cambridge University Press, 1951-1973), vol.II.

[xxx] The fact that the problem of value and price was the result, rather than the initiation of Ricardo's investigations was brought out vividly by Piero Sraffa in his "Introduction" to The Works and Correspondence of David Ricardo, vol. I (On the Principles of Political Economy and Taxation).

[xxxi] From Piero Sraffa's "Introduction" to the first volume of The Works and Correspondence of David Ricardo, xxxii; also see Meek, Economics of Physiocracy, 353.

[xxxii] See The Works and Correspondence of David Ricardo, vol. I, 14-20.

[xxxiii] See The Works and Correspondence of David Ricardo, vol.I, 30-43. These matters are also discussed in some detail in my "Problems in the Theory of Production and Exchange: An Essay in Classical and Marxian Themes," Australian Economic Papers, (December, 1980), 248-63.

[xxxiv] See Ricardo's essay on "Absolute Value and Exchangeable Value," in The Works and Correspondence of David Ricardo, vol.IV, 368.

[xxxv] See The Works and Correspondence of David Ricardo, vol.IV, 361,364,386-87, 389-90 and vol.I, 43-47. Interestingly enough, a century after Ricardo, the brilliant theorist Piero Sraffa

succeeded in demonstrating the mathematical possibility of deriving an invariable standard of value, what he called a "standard commodity," within a general economic model of production and distribution. See his The Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory (Cambridge: Cambridge University Press, 1960), in particular ch.IV. Also see John Eatwell, "Mr. Sraffa's Standard Commodity and the Rate of Exploitation," Quarterly Journal of Economics 89 (1975), 543-55.

[xxxvi] Ricardo to Malthus, 9 October 1820, quoted in The Works and Correspondence of David Ricardo, vol.VIII, 278-79, emphasis added. In the opening chapter on value theory in his Principles of Political Economy and Taxation (see The Works and Correspondence of David Ricardo, vol.I, 21), Ricardo wrote: "[T]he inquiry to which I wish to draw the reader's attention, relates to the effect of the variations in the relative value of commodities, and not in their absolute value."

[xxxvii] Marx himself argued that his work constituted a split in the development of economic thought. See Karl Marx, Capital (E. Aveling, S. Moore, trans.; F. Engels, ed.), 3 vols., (New York: International Publishers, [written 1863-1883, first published in English 1887] 1967), vol. I, 15. There is a vast literature that explores the intellectual, historical, and ideological foundations of the genesis and impact of classical, Marxian, and neoclassical ideas in the history of economic thought. Some prominent contributions are Ronald L. Meek, Economics and Ideology and Other Essays (London: Chapman and Hall, 1967) as well as his Studies in the Labour Theory of Value (London: Lawrence and Wishart, 1973); H. Katouzian, Ideology and Method in Economics (New York: New York University Press, 1980); R. Eagly (ed.), Events, Ideology and Economic Theory; and, of course, Gunnar Myrdal, The Political Element in the Development of Economic Theory (Paul Streeten, trans.) (London: Routledge, 1953). Of particular relevance for an understanding of the evolution of Marxian categories of economic analysis is Louis Dumont, From Mandeville to Marx: The Genesis and Triumph of Economic Ideology (Chicago: University of Chicago Press, 1977) and his Homo Hierarchicus: An Essay on the Caste System (Mark Sainsbury, trans.) (Chicago: University of Chicago Press, 1970).

[xxxviii] See the opening line of Karl Marx, Friedrich Engels, The Communist Manifesto (New York: Pathfinder Press, [1848] 1970).

[xxxix] See Karl Marx, Capital, vol.I, 38. Also see his Grundrisse: Foundations of the Critique of Political Economy (trans., M. Nicolaus), (New York: Vintage, [written 1857-1858, first published in German 1941] (1973), 141 where Marx writes: "As a value, every commodity is equally divisible; in its natural existence this is not the case . . . commodities are exchanged only because they are not the same and correspond to different . . . needs. As a value, the commodity is general; as a real commodity it is particular." Given his powerful intellectual affinities with the theoretical tradition of the classical theorists, it is no mere coincidence that Marx could say of David Ricardo's treatment of value theory that it was, at the time, "by far the best." See Capital, vol. I, 2 (footnote 1). Of course, Marx's approach to the value theory problem was uniquely influenced by the Hegelian philosophy in which he was trained. See, for example, G.W.F. Hegel, Philosophy of Right, 72: "Value, as the inner equality of things which in their outward existence are specifically different from one another in every way, is a category . . . by means of [which] our idea of a thing is raised above its immediate character to its universality."

[xl] See Marx's discussion in Capital, vol.I, part V in which the determination of the value of output is linked with the capital-intensity of production (what he called "the organic composition of capital") and the rate of capacity utilization (which Marx measured by "the length of the

working-day").

[xli] See Francis Seton, "The Transformation Problem," Review of Economic Studies 24 (1963), 149-60; Paul Sweezy, The Theory of Capitalist Development: Principles of Marxian Political Economy (New York: Monthly Review Press, 1968), ch.VII; L. von Bortkiewicz, "On the Correction of Marx's Fundamental Theoretical Construction in the Third Volume of Capital," (trans., P.M. Sweezy), published in Eugen von Bohm-Bawerk, Karl Marx and the Close of His System (New York: Merlin Press, 1975), 199-221; Pierangelo Garegnani, A Problem in the Theory of Distribution from Ricardo to Wicksell (unpublished Ph.D. dissertation, University of Cambridge, 1959), part I; I. Gerstein, "Production, Circulation and Value: The Significance of the 'Transformation Problem' in Marx's Critique of Political Economy," Economy and Society 5 (1976); B. Fine and L. Harris, "Controversial Issues in Marxist Economic Theory," Socialist Register 1976; and J. Eatwell, "Controversies in the Theory of Surplus Value: Old and New," Science and Society 1974. Also see Marx, Capital, vol.III, part I.

[xlii] From Thomas Hobbes, Leviathan, (C.B. Macpherson, ed.), (New York: Penguin, [1651] (1968), 82-83.

[xliii] From an entry in John Locke's journal, dated 8 February 1677, quoted in Lord King's The Life of John Locke (London: Colburn and Bentley, 1830), vol.I, 161.

[xliv] See John Locke, Of Civil Government Second Treatise (London: Regnery Company, [1696] (1971), 22.

[xlv] From Locke, Of Civil Government Second Treatise, 22.

[xlvi] This extract is arguably the most famous and clearly thematic portion of Hobbes' Leviathan, 186.

[xlvii] See John Locke, Two Treatises of Government, (P. Laslett, ed.), (Cambridge: Cambridge University Press, [1696] (1960), 368-69; and Hobbes, Leviathan, 188. Not surprisingly, Hobbes could, reflecting upon the conclusions of his argument, refer to the "Articles of Peace" surrounding the formation of a commonwealth as indeed "Lawes of Nature."

[xlviii] It was further characteristic of the formulations attempted by this new breed of economic theorist to argue that whereas history had produced the individual under analysis, it would nevertheless do so no further. In other words, with the advent of the individual freedom characteristic of liberal democracy, these theorists could also argue that history had in some fundamental sense come to an end. Even so, this theoretical conviction was the result of a sustained reflection upon the triumphs and failures of classical economic thought and its precursors.

[xlix] The discussion that follows utilizes Walras, Elements of Pure Economics, Lesson 3 -- parts II and III as its core focus. Walras is, in this sense, a very significant yet hardly exhaustive example of the theoretical transition under consideration. Indeed, his work is interchangeable, for these purposes, with that of a Jevons or a Menger. Moreover, the very fact that the principles here under review were simultaneously "discovered" by an Austrian (Menger), a Briton (Jevons), and a Swiss (Walras) is taken as a compelling argument for the profound intellectual (as distinct from political) origins of the birth of neoclassical theory. It also suggests that the historical reality of liberal property-right and individual civil-right had impressed an entire generation of western European intellectuals. See William Reddy, The Rise of Market Culture: The Textile Trade and French Society, 1750-1900 (New York: Cambridge University Press, 1984).

[l] Carl Menger declared that in this new formulation of economics the essential goal was "understanding the causal relation between goods and the satisfaction of human needs." See his

Principles of Economics, 58. Similarly, Jevons presented his theory as one that "presume[d] to investigate the condition of a mind, and base[d] upon this investigation the whole of Economics." See his The Theory of Political Economy, 15. Also see W.S. Jevons, "A General Mathematical Theory of Political Economy," Report of the British Academcy for the Advancement of Science (1863); and P.H. Wicksteed, The Common Sense of Political Economy (London: Routledge, [1933] 1957) as well as his "Political Economy in Light of Marginal Theory," Economic Journal 24 (1914); and Robert M. Fisher, The Logic of Economic Discovery (Brighton: Wheatsheaf, 1986).

[li] As Walras argued, "rareté [was] the cause of value in exchange." He went on to declare that "[t]he theory of exchange based on [an understanding of] the intensities of the last wants satisfied . . . constitutes the very foundation of the whole edifice of economics." See his Elements of Pure Economics, 145. The argument is made especially clear if we resort to a simple analogy -- a not uncommon rhetorical device in the work of the subjective value theorists in economics. Imagine an individual who has not eaten for some time. Offered a loaf of bread, they are willing (if one assumes rational behavior) to offer some positive price in order to consume it. Offered a second loaf, they are willing to offer a bit less in exchange, as their hunger is now less urgent -- and so on until some subsequent loaf is offered for which there is no positive price, in other words for which there is no further desire (or hunger) to be satisfied. In recent decades, economists and philosophers of science have begun a systematic investigation of the use of rhetorical tools in the furtherance of the neoclassical paradigm. See, for some of the most influential works in this area, Diedre M. McCloskey, The Rhetoric of Economics (Madison: University of Wisconsin Press, 1985) as well as her "The Rhetoric of Economics," Journal of Economic Literature 21 (1983); If You're So Smart: The Narrative of Economic Expertise (Chicago: University of Chicago Press, 1990), Knowledge and Persuasion in Economics (Cambridge: Cambridge Univeristy Press, 1994); The Spread of Economic Ideas (David Colander, A.W. Coats; eds.), (New York: Cambridge University Press, 1989); Mark Blaug, The Methodology of Economics; or, How Economists Explain (Cambridge: Cambridge University Press, 1980); Bruce Caldwell, Beyond Positivism: Economic Methodology in the Twentieth Century (Boston: Allen and Unwin, 1982); and The Rhetoric of the Human Sciences (John S. Nelson, Allan Megill, Donald N. Magee; eds.), (Madison: University of Wisconsin Press, 1987).

[lii] A particularly sensitive critic of neoclassical economics has argued more recently that "the rise of utility theory [was] a crucial step in freeing Man from the tyranny of Nature since such a theory show[ed] how Man [could] master Nature for his own purposes." See Jack L. Amariglio, "The Body, Economic Discourse, and Power: An Economist's Introduction to Foucault," History of Political Economy 20 (1988), 583-613, at 604. Also see O.H. Taylor, "Economics and the Idea of Natural Laws," in his Economics and Liberalism: Collected Papers (Cambridge: Harvard University Press, [1929] 1955), 37-69; and Frank H. Knight, "Economic Psychology and the Value Problem," in his The Ethics of Competition (New York: Harper, [1925] 1935), 76-104.

[liii] Indeed, it seemed also to resolve one of the most famous paradoxes in value theory -- the "water-diamond" paradox. How could the labor theory of value account for the fact that water, essential to human life as a use-value, had a virtually zero price and a diamond, irrelevant to fundamental human needs, was exceedingly expensive? Classical theorists tried to answer this question by resort to arguments concerning the labor costs of "producing" water and diamonds. Neoclassical theorists had, they believed, a more straight-forward answer, one that satisfied the principle of Ockham's Razor: water was cheap because of its abundant supply relative to human

wants; diamonds expensive because of their unique scarcity in the natural world.

[liv] To this day, most critics of neoclassical economic theory focus their attacks on the assumption of rationality that undergirds the analysis. See, for example, Maurice Godelier, Rationality and Irrationality in Economics (New York: Monthly Review Press, 1972). While it is true that the behavior of economic actors ultimately requires attention to a wide array of social, political, historical, and cultural forces that transcend a simple notion of innate rationality among human beings, nevertheless the "anti-rationality" position is an especially weak approach to the critique of modern economic theory. For one thing, neoclassical theorists have quite powerfully countered with the argument that the rationality axiom is just that, a starting point for a theory that may ultimately be "complicated" by more realistic approximations. See, for one of the finest statements of this position, Milton Friedman, "The Methodology of Positive Economics," in his Essays in Positive Economics (Chicago: University of Chicago Press, 1953), 3-43 as well as his "A Theoretical Framework for Monetary Analysis," in Milton Friedman's Monetary Framework (Robert J. Gordon, ed.), (Chicago: University of Chicago Press, 1974); and also see Frank H. Knight, "The Limitations of Scientific Method in Economics," in The Trend of Economics (Rexford G. Tuwell, ed.), (New York: Crofts, [1924] 1934), 229-67. For another, privileging rationality as the uniquely distinctive contribution of neoclassical theory misses the ways (mostly having to do with its emphasis on marginalism and declining marginal satisfaction) in which the neoclassical tradition truly redefined what economics was about.

[lv] Interestingly enough, Walras himself argued that the notion that rareté increased as the quantity consumed of a good decreased was the core "postulate" on which his theory of exchange rested. See his Elements of Pure Economics, part II. Walras was satisfied to leave it at that, invoking the subjective individualism that was so characteristic of his (and his contemporaries') scientific method. Some investigators did struggle to ground the "postulate" in physiology -- they sought to demonstrate experimentally that response to any stimulus, by an animate being, declined with its cumulative repetition. These efforts were never wholly successful. Many scholars use the term "marginal" rather than "marginalist" to describe the neoclassical reorientation of economic thought in the late nineteenth and early twentieth centuries. I have avoided that usage here because of the confusion it sometimes causes having to do with the connotation of the word "marginal." Evidently, it was John Hobson who first coined the words "marginalism" and "marginalist" to describe neoclassical theory. See his Work and Wealth, 174-75, 331 and his The Industrial System, 114 as noted in R.S. Howey, "The Origins of Marginalism," in The Marginal Revolution in Economics: Interpretation and Evaluation, (R.D. Collison Black, A.W. Coats, Craufurd D.W. Goodwin, eds.), (Durham: Duke University Press, 1973), 15-36.

[lvi] See John Bates Clark, The Distribution of Wealth: A Theory of Wages, Interest and Profits (London: Macmillan, [1899] (1927); T.N. Carver, "The Marginal Theory of Distribution," Journal of Political Economy 13 (1905), 257-66; Knut Wicksell, Lectures on Political Economy (London: Routledge, 1951-56); A.C. Pigou, The Economics of Welfare (London: Macmillan, 1932) as well as Irving Fisher, The Theory of Interest, C.E. Ferguson, The Neoclassical Theory of Production and Distribution, Eugen von Bohm-Bawerk, Capital and Interest (New York: Kelley, [1890] 1957); and Paul A. Samuelson, Foundations of Economic Analysis (Cambridge: Harvard University Press, 1947). Also of interest in this regard are recent biographies of two of the leading architects of the marginalist revolution: John F. Henry, John Bates Clark: The Making of a Neoclassical Economist (New York: St. Martin's Press, 1995) and Robert Loring Allen, Irving Fisher: A Biography (Cambridge: Blackwell, 1993). As Ronald L. Meek explained

(on p.235) in his "Marginalism and Marxism," in R.D. Collison Black, A.W. Coats, Craufurd D.W. Goodwin (eds.), The Marginal Revolution in Economics: Interpretation and Evaluation (Durham: Duke University Press, 1973), 233-45, with the advent of marginalist analysis, "[t]he new starting-point [for economics] became, not the socioeconomic relations between men as producers, but the psychological relation between men and finished goods. . . . the primary focus of attention in the theory of value was shifted from the relations between men as producers to the relations between men and goods." Also see R.D. Collison Black, "W.S. Jevons and the Foundation of Modern Economics," in The Marginal Revolution in Economics, 98-112.

[lvii] See A.W. Coats, "The Economic and Social Context of the Marginal Revolution of the 1870s," in The Marginal Revolution in Economics, 37-58. Coats also notes, interestingly enough, that Nikolai Bukharin argued, in his The Economic Theory of the Leisure Class (London: Lawrence, 1927), that the rise of a mature capitalism in the late nineteenth century served to facilitate the articulation of an ideology of individualism and, with it, of marginalist analysis in the social sciences. John Maurice Clark (son of John Bates Clark and a distinguished economic theorist in his own right) once argued that marginalism was formulated as a direct attack upon the challenges of Marxian theory. See Donald Harris, Capital Accumulation and Income Distribution (Stanford: Stanford University Press, 1978), 245, footnote 37.

[lviii] See Meek, "Marginalism and Marxism," 237-38. It was the distinguished Cambridge University economist A.C. Pigou who found in marginalist theory a set of egalitarian conclusions and no less than George Bernard Shaw who sought to develop a socialist strategy based on the works of Jevons and Menger. On marginal productivity theory as a refutation of the Marxian notion of exploitation, see John Bates Clark, The Distribution of Wealth: A Theory of Wages, Interest, and Profits (New York: Macmillan [1899] 1924).

[lix] It will be obvious to some of my readers that I am here reconfiguring an enduring controversy among historians, philosophers, and sociologists of science as to whether dramatic changes in scientific theories represent a gradual process of knowledge evolution or a dramatic and revolutionary break with past practice. Originally joined in dispute between the evolutionary views of Karl Popper and the discontinuity notion of Thomas Kuhn, this debate has continued to the present day. See Karl Popper, The Logic of Scientific Discovery (New York: Harper and Row, 1959), his Conjectures and Refutations: The Growth of Scientific Knowledge (London: Routledge and Kegan Paul, 1972) and his The Poverty of Historicism (New York: Harper and Row, 1964); and Thomas Kuhn, The Structure of Scientific Revolutions. Some more recent contributions, many of which are specifically focused on the history of economic theory, are I. Lakatos, A. Musgrave (eds.), Criticism and the Growth of Knowledge (Cambridge: Cambridge University Press, 1970); Martin Bronfenbrenner, "The 'Structure of Revolutions' in Economic Thought," History of Political Economy 3 (1971), 136-51; A.W. Coats, "Is There a 'Structure of Scientific Revolutions' in Economics?," Kyklos 22 (1969), 289-95 as well as his "Half a Century of Methodological Controversy in Economics," in Methodological Controversy in Economics (A.W. Coats, ed.), (Greenwich: JAI Press, 1983), 1-42; Neil De Marchi, The Popperian Legacy in Economics (Cambridge: Cambridge University Press, 1988); History and Methodology in Economics (Neil De Marchi, Christopher Gilbert; eds.), (Oxford: Clarendon Press, 1989); and Douglas W. Hands, "Second Thoughts on Lakatos," History of Political Economy 17 (1985), 1-16.

[lx] See Alfred Marshall, "The Old Generation of Economists and the New," in Memorials of Alfred Marshall, (A.C. Pigou, ed.) (New York: Kelley, [1925] 1956), 297. Also see John

Maloney, Marshall, Orthodoxy and the Professionalization of Economics (New York: Cambridge University Press, 1985), 2-3, 9, 47, 232. With regard to the unstable nature of professional authority in economics in the late 1880s, Maloney points out, on p.2, "[i]f one imagines hospital orderlies writing in The Lancet . . . that hardly conveys an exaggerated picture of the [flagship British serial] Economic Journal in its early days." The less than respectful regard in which economics was held by an array of British intellectuals, at the same time, was further reflected in an 1877 proposal to expel economists from the British Association for the Advancement of Science. That suggestion, made by Francis Galton (in his "Economic Science and the British Association," Journal of the Royal Statistical Society (September, 1877), was ultimately rejected -- but it had a humiliating impact on those, like Marshall, who aspired to high professional status as economists. Also see R.F. Hébert, "Marshall: A Professional Economist Guards the Purity of His Discipline," in R.V. Anderson (ed.), Critics of Henry George: A Centenary Appraisal of Their Strictures on "Progress and Poverty", (Cranbury, N.J.: Associated University Presses, 1979), 56-71.

[lxi] See W.P. Metzger, "The Academic Profession in the United States," in The Academic Profession: National, Disciplinary, and Institutional Settings, (B.R. Clark, ed.) (Berkeley: University of California Press, 1987), 123-208 at 128; A.W. Coats, "The Educational Revolution and the Professionalization of American Economics," in Breaking the Academic Mould: Economists and American Higher Learning in the Nineteenth Century, (W.J. Barber, ed.) (Middletown: Wesleyan University Press, 1988), 340-75 as well as his Reflections on the Professionalisation of Economics (Newcastle: 1980 Newcastle Lecture in Political Economy, 1980) and his The Sociology and Professionalization of Economics (new York: Routledge, 1993); R.L. Church, "Economists as Experts: The Rise of an Academic Profession in the United States, 1870-1920," in The University in Society, vol.II: Europe, Scotland, and the United States from the 16th to the 20th Century, (L. Stone, ed.) (Princeton: Princeton University Press, 1974), 571-509 at 573-74; Gladys Bryson, "The Emergence of the Social Sciences from Moral Philosophy," International Journal of Ethics 42 (1932), 304-23; and her "The Comparable Interests of the Old Moral Philosophy and the Modern Social Sciences," Social Forces 11 (1932), 19-27.

[lxii] See R.L. Church, "Economists as Experts," 593. On the German Historical School see Jürgen Herbst, The German Historical School in American Scholarship (Port Washington: Kennikat Press, 1972), ch.1; Joseph Dorfman, The Economic Mind in American Civilization (New York: Viking, 1946-59), vol. 3, chs. 1 and 3; as well as his "The Role of the German Historical School in American Economic Thought," American Economic Review, 45 (1955), 17-28; and Jack C. Myles, German Historicism and American Economics: A Study of the Influence of the German Historical School on American Economic Thought (unpublished Ph.D. dissertation, Princeton University, 1956). In his presidential address to the American Economic Association in 1904, the Harvard economist Frank W. Taussig singled out the Historical School for special criticism; see his "The Present Position of the Doctrine of Free Trade," Publications of the American Economic Association 6 (1905), 56-58. Interestingly enough, members of the German Historical School rejected both the traditions of classical economic theory and the newer fashions of marginalist analysis because in their view both approaches "abstracted timeless economic laws from specific historical settings and from the social and political context of economic activity." By the late 1880s, with the challenge of marginalism, the School became engulfed in a grand Methodenstreit from which neoclassical theory emerged victorious. See Fritz K. Ringer, "The

German Academic Community," in The Organization of Knowledge in Modern America, 1860-1920, (A. Oleson, J. Voss; eds.) (Baltimore: Johns Hopkins University Press, 1979), 409-29 at 23 as well as his The Decline of the German Mandarins: The German Academic Community, 1890-1933 (Cambridge: Harvard University Press, 1969).

[lxiii] See A.W. Coats, "Henry Carter Adams: A Case Study in the Emergence of the Social Sciences in the United States, 1850-1900," Journal of American Studies 2 (1968), 177-97. Needless to say, in their determination to secure both intellectual influence and professional independence, American economists in the last two decades of the nineteenth century were but part of a larger movement involving the social sciences more generally. With its establishment in 1868, Cornell University had created the first independent social science departments in the country; the founding of Johns Hopkins University in 1876 and the opening of a School of Political Science at Columbia in 1880 furthered the trend. The first professorships in political economy were established by Williams College (1854), Harvard University (1872), Yale University (1874), Columbia University (1876), and the University of Minnesota (1885). By 1886, as a corollary to these institutional changes, new journals in the social sciences appeared, publications that would dominate the academic landscape for a century and more -- some major examples of which were the Political Science Quarterly (founded in 1886 at Columbia), the Quarterly Journal of Economics (founded in 1886 at Harvard University), the Proceedings of the American Economic Association (founded in 1886), and the Annals of the American Academy of Political and Social Science (founded in 1890 at the University of Pennsylvania). See Robert L. Church, "Economists as Experts," 591; and his The Development of the Social Sciences as Academic Disciplines at Harvard University, 1869-1900 (unpublished Ph.D. dissertation, Harvard University, 1965); R. Gordon Hoxie et al. (eds.), A History of the Faculty of Political Science, Columbia University (New York: Columbia University Press, 1955); Hugh Hawkins, Pioneer: A History of the Johns Hopkins University, 1874-1889 (Ithaca: Cornell University Press, 1960); John B. Parrish, "The Rise of Economics as an Academic Discipline: The Formative Years to 1900," Southern Economic Journal 34 (1967), 1-15; and Joseph Persky, “The Neoclassical Advent: American Economics at the Dawn of the 20th Century,” Journal of Economic Literature 14 (2000), 95-108.

[lxiv] See R.S. Howey, "The Origins of Marginalism," 35-36. The major textbooks that, in the late nineteenth and early twentieth centuries, exhibited the acceptance of marginalism among American economists were Richard T. Ely's 1893 Outlines of Economics (New York: Macmillan); A.T. Hadley's 1896 Economics: An Account of the Relations Between Private Property and Public Welfare (New York: G.P. Putnam’s Sons); C.J. Bullock's 1897 Introduction to the Study of Economics (Boston: Silver, Burdette); H.J. Davenport's 1897 Outlines of Elementary Economics (New York: Macmillan); E.T. Devine's 1898 Economics (New York: Macmillan); F.W. Blackmar's 1900 Economics (New York: Macmillan); F.A. Fetter's 1904 Principles of Economics with Applications to Practical Problems (New York: Century); H.R. Seager's 1904 Introduction to Economics (New York: Holt); and E.R.A. Seligman's 1905 Principles of Economics, with Special Reference to American Conditions (New York: Longmans, Green). Those that demonstrated the continuation of this marginalist trend in teaching, and the use of marginalist concepts in the explanation of a broader array of economic issues, well into the interwar period were Alvin Johnson's 1909 Introduction to Economics (Boston: D.C. Heath); F.W. Taussig's 1911 Principles of Economics (New York: Macmillan); Irving Fisher's 1911 Elementary Principles of Economics (New York: Macmillan); F.M. Taylor's

1911 Principles of Economics (Ann Arbor: University of Michigan Press); J.R. Turner's 1919 Introduction to Economics (New York: Scribner's Sons); Henry Clay's 1919 Economics: An Introduction for the General Reader (London: Macmillan); T.N. Carver's 1919 Elementary Economics (Boston: Ginn); Lionel Edie's 1926 Principles of the New Economics (New York: Thomas Y. Crowell); L.A. Rufener's 1927 Principles of Economics (Boston: Houghton, Mifflin); F.B Garver's and A.H. Hansen's 1928 Principles of Economics (Boston: Ginn); P.F. Gemmill's 1930 Fundamentals of Economics: A Textbook for Introductory College Courses in Economic Principles (New York: Harper and Brothers); F.R. Fairchild's 1930 Elementary Economics (New York: Macmillan); Broadus Mitchell's 1932 A Preface to Economics (New York: Henry Holt); and F.S. Deibler's 1936 Principles of Economics (New York: McGraw, Hill). Also see, in this regard, Edward S. Mason, "The Harvard Department of Economics from the Beginnings to World War II," Quarterly Journal of Economics 97 (1082), 383-433; F.W. Taussig, "Economics, 1871-1929," in Samuel Elliot Morrison (ed.), The Development of Harvard University: Since the Inauguration of President Eliot, 1869-1929 (Cambridge: Harvard University Press, 1930), 187-201; E.R.A. Seligman, "The Early Teaching of Economics in the United States," in J.H. Hollander (ed.), Economic Essays in Honor of J.B. Clark (New York: Macmillan, 1927); Robert J. Lampman (ed.), Economists at Wisconsin: 1892-1992 (Madison: University of Wisconsin Press, 1993); and Lewis A. Froman, "Graduate Students in Economics, 1904-1940," American Economic Review 32 (1942), 817-26. The best example of the postwar triumph of marginalism in the teaching of American economists was the 1948 initial publication of Paul A. Samuelson's Economics: An Introductory Analysis (New York: McGraw Hill, 1948), arguably the most successful textbook in the field well through the 1970s. Also see George J. Stigler, "The Adoption of the Marginal Utility Theory," in The Marginal Revolution in Economics, 305-20.

[lxv] See the remarkable study by Mary O. Furner, Advocacy and Objectivity: A Crisis in the Professionalization of American Social Science, 1865-1905 (Lexington: University Press of Kentucky, 1975), 322. Peter Novick has written a similarly path-breaking analysis regarding the rise of a professional history discipline in the United States throughout this century; see his That Noble Dream: The 'Objectivity Question' and the American Historical Profession (New York: Cambridge University Press, 1988). Also see Dorothy Ross, The Origins of American Social Science (New York: Cambridge University Press, 1991) and her "The Liberal Tradition Revisited and the Republican Tradition Addressed," in John Higham, Paul K. Conkin (eds.), New Directions in American Intellectual History (Baltimore: Johns Hopkins University Press, 1979), 120. There is a growing literature on the struggles over the achievement of "objectivity" in the social sciences in early twentieth century America. See, for example, John M. Jordan, Machine-Age Ideology: Social Engineering and American Liberalism, 1911-1939 (Chapel Hill: University of North Carolina press, 1994); Mark C. Smith, Social Science in the Crucible: The American Debate Over Objectivity and Purpose, 1918-1941 (Durham: Duke University Press, 1994); Robert C. Bannister, Sociology and Scientism (Chapel Hill: University of North Carolina Press, 1987); and James Allen Smith, The Idea Brokers: Think Tanks and the Rise of the New Policy Elite (New York: Free Press, 1991) who traces these debates to the middle of the nineteenth century as exemplified by the 1865 creation of the American Association for the Promotion of Social Science.