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THE MARGINAL REVOLUTION AFTER ONE HUNDRED YEARS

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## THE MARGINAL REVOLUTION AFTER ONE HUNDRED YEARS\*

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### 1. Introductory Remarks

As the calendar year 1971 drifts by, modern economics enters its second century. This may not mean much to a generation raised with so little reverence or even respect for things historical.<sup>1</sup> However, for those of us who are interested in the fact that our discipline has a past, this paper is written to point out that the year 1871 can be regarded as the watershed of what we call "modern" economics. In that year, William Stanley Jevons published his Theory of Political Economy and Carl Menger his Grundsätze. Three years later, Léon Walras published his Eléments, and three members of the subjective value trio were all in print. The new movement gained ground slowly; however, unlike previous attempts at a subjective theory of value, this flame was not snuffed out after a

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\*This paper was supposed to be presented at the 1971 meetings of the Canadian Economics Association in Saint John's, Newfoundland; however, a pesky kidney stone intervened, roughly five hours before flight time. The author is grateful to Professor Scott Gordon, his official discussant, for presenting a summary of his paper at the session and also for helpful comments on an earlier draft. While Professor Gordon deserves much of the credit (if any) for this paper, he is absolved from all errors of fact or analysis.

<sup>1</sup>Indeed, judging by the spate of magazine articles and popular books on the subject, one might suppose that the present generation invented not only laboratory sex research, but sex itself.

brief few moments of light but instead flickered and then grew into a steady flame. By 1890, the subjective theory of value and the approach of marginalism were well established; indeed, with the exception of the institutionalists and the remnants of the German and British Historical Schools, it was fast becoming the new orthodoxy of academic economics.

The principal purpose of this paper is commemorative, rather than a wish to put forth a brand new interpretation of intellectual history. However, in Section 5 below, I shall give a slightly different answer to the standard question, "Why was the Marginal Revolution so long in coming?" Nevertheless, I basically find myself in the position that the late Professor Viner complained of when reviewing Marshallian economics some thirty years ago, on the occasion of the fiftieth anniversary of Marshall's Principles: I'd like to say something new, but there doesn't seem too much new to be said.

One hundred years is a long time, and I dare say that there is no one in this room who was alive, let alone flourishing intellectually, at the time at which Jevons, Menger and Walras wrote their classic works. Since Walras and especially Menger enjoyed longevity, there are some members of our profession (they may not be with us in this room) who knew these two giants personally. The world has changed a great deal over the past century, and so has the discipline of economics. Nevertheless, both retain important if tenuous links with their pasts. Looking at changes in the world about us, every one would agree that not all change is progress

(though I suspect that most of the agreement would melt away when we came to specify a list of retrograde changes). Similarly, in the discipline of economics, not all movement is monotonically forward, and at times we discard old fads only to acquire new ones, or discard hard kernels of truth in an obviously imperfect theory. Nevertheless, I am one of those who believes that the discipline of economics progresses, slowly if imperfectly and at times with retrograde movements. (I am less sure about society as a whole.) If we progress, then, by building on the achievements of our forebears, then it seems suitable to pause, from time to time, to pay homage to them, and, on this occasion, to the genius of the founders of modern economics. This is precisely what I propose to do in this paper.

In outline, then, the remainder of this paper is as follows: After a short digression on the issue of the worth of a study of economic thought itself, we examine briefly the three seminal works themselves. In Section 4, I attempt to assess the significance of the Marginal Revolution, not only for the development of economic thought but also for current day theory. Finally, I can't help being lured into the issue of why the Marginal Revolution was so long incoming; this problem is examined in Section 5. Some concluding remarks, in Section 6, complete this paper.

## 2. Why Should One Study Economic Thought?

In the preceding section, I addressed myself to the issue of why one might wish to commemorate a centennial of an important event in our

discipline, like the advent of marginalism. In a sense, this issue is closely related to the value of studying the history of economic thought itself. For anniversaries of important events in our discipline would appear to be of interest only if one is interested in the history of economics itself. Conversely, an interest in the history of economic thought suggests historical perspective, calendar dates, and anniversaries. If we concede that, technically speaking, one can be a perfectly competent economist with virtually no knowledge of the origins of the discipline (indeed, for most issues the preceding ten or twenty-five years of the literature will more than suffice), why should one study the history of economic thought?

In answering this question, I'd like to dispose first of an argument based on an analogy with political history. It is often said that those who refuse to study history are often condemned to repeat its mistakes. Now this may well be true of political history, but I think that the argument has at most limited relevance for intellectual history in our discipline. As economics has evolved, both the problems and the tentative solutions have changed, and I see little chance of modern-day economists repeating the blunders of the past, even without a formal training in the history of our discipline. Wages fund, the sole productivity of agriculture, the irrelevance of "value in use" for explaining "value in exchange" -- these are formulations that are unlikely to occur to modern theorists, whether or not they have studied the history of economic

thought. On the other hand, perhaps this assertion should be qualified in the realm of policy. The view that prices should be "just," mercantilism, laissez faire and its shortcomings -- these issues will probably continue to be debated as long as economics is relevant in the conduct of a society. Perhaps I can save the assertion at the beginning of this paragraph by arguing that, if an economist ignorant of the history of thought does perchance fall into a blunder reminiscent of past faux pas in our discipline, hopefully there will always be a historian of thought around to point out to him the error of his ways. In any case, I think that we can agree that a study of the history of economic thought is not essential to produce a practicing economist who is perfectly competent to tackle the problems for which economists are expected to have some expertise.

One perfectly good reason for studying the history of economic thought is one which never occurred to me during my student days. After teaching the history of economic thought four times during the past decade, I have been surprised to find that a study of the history of economic thought often helps to cement a student's understanding of currently received theory. In part, this is probably due to my style of approaching this subject, namely from the vantage point of current theory, much like that of Mark Blaug in his book, Economic Theory in Retrospect.<sup>2</sup>

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<sup>2</sup>Mark Blaug, Economic Theory in Retrospect, Revised Edition (Homewood, Illinois: Richard D. Irwin, Inc., 1968).

In any case, I have experienced a surprising number of instances when students have come to me and said that they never really understood a particular fine point of economic theory, until they had studied it in its historical context. Perhaps at times it is useful for the individual student to repeat the experience of the profession, in order to gain a firmer foundation in his understanding of a particular theoretical issue.

The principal reason that I should give for studying the history of economic thought is that it is enjoyable. If one is a utilitarian, that should be the end of the matter. However, perhaps I may be permitted to be enough of a non-utilitarian to assert that the pleasure in studying the history of economic thought is analogous to that enjoyed in other non-practical intellectual pursuits, like watching a Shakespearean play performed or reading a poem. Such activities have value for their own sakes, rather than as instruments to some particular end. Moreover, the study of economic thought adds breadth and (dare I say it?) cultural dimensions to an economist, removing him from the category of a narrow technician. If economics is to have dimensions as an art (and, in my view, trying to make economics purely a science is likely to be self-defeating), surely a study of the past of our discipline would seem to satisfy cultural and artistic values. All this, and it's fun besides!

Moreover, in closing this digression, I should like to make one final observation. Nearly all of the great economists of the past, and most of the leading current-day scholars as well, had (or have) an active

interest in the history of our discipline.<sup>3</sup> I cannot explain, in a completely satisfactory manner, why this should be; indeed, this association, derived from a study of the literature and casual observation, is much stronger than I should have naively expected. Perhaps part of the explanation is that a study of the history of economic thought gives both perspective and humility, thus providing a fine balance. If one is depressed about the current state of economics, a study of its past is reassuring on the matter of how far we have come. On the other hand, if one is tempted to claim too much for one's achievements, a study of how little of the systems of most of the finest minds in economics of preceding centuries is still in vogue is a tremendously sobering experience. In turn, such a fine balance is at least an element in the making of an outstanding economist.

### 3. The Seminal Works of Jevons, Menger and Walras

In this section, a brief review of the seminal works of the subjective value trio will be presented. Obviously, the limitations of space preclude an extensive review of any of these works. In any case, I shall focus as much on revisions, translations, and later editions, as on the content of the works themselves. The importance of all three

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<sup>3</sup>Unfortunately, the converse of this proposition is not true: having an active or even consuming interest in the history of economic thought does not necessarily mean (or even raise the probability to over 0.7 or 0.8) that one is a leading member of the profession. C'est la vie!



seminal works is attested to by the fact that, within the last quarter century, translations or new editions of the principal works of all three of these pioneers have appeared.

William Stanley Jevons published the first edition of The Theory of Political Economy in 1871. Briefly, this book develops the subjective theory of value that Jevons enunciated in his 1862 paper;<sup>4</sup> after considerable attention to the concept of a utility schedule, Jevons develops a subjective theory of exchange value, under conditions of a purely competitive market in the very short run (the Marshallian market period, during which no production takes place and trade is from existing stocks). A long chapter on the theory of labour develops the notion of disutility of effort in some detail, and is best regarded, in my view, as a contribution to the theory of labour supply. I agree with Professor Black that this chapter is definitely not a theory of wage determination.<sup>5</sup> Finally, the methodological aspects of The Theory of Political Economy deserve comment. Jevons is very strong on the mathematical approach to economics, an approach that has not lost adherents in the last hundred years. Also, he concludes his text by railing against "the noxious

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<sup>4</sup>"Brief Account of a General Mathematical Theory of Political Economy," a paper read before Section F of the British Association at Cambridge in 1862, printed in summary in Journal of the Statistical Society of London, Vol. XXIX (1866), p. 283, and reprinted as Appendix III of the fifth edition of The Theory of Political Economy.

<sup>5</sup>R. D. Collison Black, "Introduction" (to the 1970 Pelican edition of The Theory of Political Economy), especially pp. 25-27.

influence of authority"; the discussion singles out the tendency to make immutable creeds out of the doctrines of earlier scholars, such as Smith, Ricardo, and John Stuart Mill. I shall return to this point in Section 5, because I think that it is central to the explanation of the relatively delayed date of marginalism and the subjective theory of value.

Later editions of The Theory of Political Economy total five (hence there are six including the first), as far as I am aware. The second edition, published in Jevons's lifetime in 1879, made some minor revisions in the text and added a long preface in which Jevons conceded that Hermann Heinrich Gossen, in his (Gossen's) 1854 book, had anticipated his (Jevons's) work by seventeen years but that he had not heard of Gossen until 1878, his own work being independent of Gossen's. A long appendix on mathematico-economic writings, showing the spread of this approach, was also added. The third edition, edited by Jevons's widow Harriet (with the assistance of his friend, Professor Foxwell) in 1888, contains an augmented and updated bibliography of writings in the field of mathematical economics. The fourth edition, edited by Herbert Stanley Jevons (William Stanley's son, himself an economist), appeared in 1911; aside from some editorial changes, young Jevons's preface to this edition gave the choice bit of information that the first edition would probably have appeared somewhat later had W. Stanley Jevons not felt pushed by the appearance of two articles on a graphical exposition of the theory of value by Professor Fleeming Jenkin. In this fourth edition, young Jevons

rashly prophesied that this would be the final edition of this classic work. The fifth edition, edited also by H. Stanley Jevons and published by Kelley & Millman, Inc., of New York, appeared in 1957; in this edition, H. Stanley Jevons, now grown older and wiser, refused to hazard a guess as to whether this edition would be the final one. The latest edition (notice that I didn't say the last) of this classic appeared last year, edited by Professor R. D. Collison Black. Black provides an insightful introduction and some additional notes on the text; he seems, however, to be unaware of the existence of the fifth edition of this classic.<sup>6</sup>

Exactly one hundred years ago as well, a keen young Austrian economist published the first edition of Grundsätze der Volkswirtschaftslehre. At 31 years of age, Carl Menger had written a classic. With this seminal work, the Austrian School was founded, the subjective theory of value was firmly implanted on the continent, and an interest in theory (as well as a focus on the individual as the appropriate unit of study -- methodological individualism) was again revived in the German-speaking world.<sup>7</sup> As for the work itself, it commences with several conceptual

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<sup>6</sup>In Professor Black's "Note on Text and Bibliography," p. 272 of the 1970 Pelican edition, there is no mention of the 1957 Kelley & Millman edition.

<sup>7</sup>Since I am no authority on Austria or Germany in the late nineteenth or early twentieth centuries (I don't even speak German), I must admit honestly that I am simply retailing the fascinating account that Friedrich A. von Hayek has provided in his "Introduction" to the 1934 edition of Menger's

chapters, discussing the concept of a "good," "first order versus higher order goods," the role of time and uncertainty, and the concept of scarcity. After criticising the labour theory of value, it becomes clear that Menger's own concept of value is a subjective one. He suggests that "value" can be identified with the importance of the least important unit of a (scarce) good that the individual possesses (in other words, marginal utility) and illustrates the principle of diminishing marginal utility by means of a very intriguing table.<sup>8</sup> The discussion of this table also illustrates the equi-marginal conditions for consumer

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Grundsätze, reprinted in H. W. Spiegel, ed., The Development of Economic Thought: Great Economists in Prospective, Abridged Edition, (New York: John Wiley & Sons, Inc., 1964), pp. 342-368.

<sup>8</sup> This table is intriguing for two reasons. First, it appears to have been the limit of Menger's mathematics (or at least the mathematics that he was willing to use in economics). This in itself is the subject of some wonder, as both his brother Anton and his son Karl were able mathematicians. Professor Hayek hints that, unlike the other two founders of marginalism, Menger was probably sceptical of the worth of a mathematical treatment of our subject.

Secondly, this table is intriguing because Menger appears to claim that the increments in utility shown there possess an ordinal, not a cardinal, character. In view of the fact that the table deals with variations in utility with varying consumption (not absolute levels of utility), it seems difficult to agree with the assertion that Menger's implicit utility function is really ordinal, not cardinal, in character. Still, pioneers must be allowed some latitude, and at the very least Menger saw the problem, if not the neat solutions that we presently possess. Indeed, it is intriguing to weigh the possibility that the worth of an ordinal formulation of the utility function may date back to the onset of the marginal revolution, rather than coming from Pareto's work later in his career in economics.

equilibrium.<sup>9</sup> The subjective theory of value is then applied to price formation in various types of markets (isolated exchange, monopoly, and pure competition). Menger goes on to develop the imputation theorem, stating that the value of higher order goods is entirely dependent on the (prospective) value of the lower order goods that they produce. Finally, he developed an embryonic theory of distribution, an early and somewhat idiosyncratic version of the marginal productivity theory of rewards to the productive factors.

Later editions of Menger's Grundsätze had to await the master's passing from the scene. As we know from Professor Hayek, Menger's book was soon out of print and he was unwilling to reissue it in substantially its 1871 form.<sup>10</sup> Instead, he intended to rewrite and expand it, making it a treatise on economics and even social science in general. To this end, he began serious work on his magnum opus in 1892 and retired from teaching at the University of Vienna in 1903, at the comparatively early

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<sup>9</sup> Namely, the condition that the marginal utility of the last penny spent in every use (the ratios of marginal utility to price) should be equal, for all commodities actually entering into the household's consumption.

<sup>10</sup> We know, from Professor Hayek's "Introduction," that Menger almost reissued the Grundsätze in 1889 and even went so far as to write a new preface. But he became involved in Austrian currency reform problems, and the long awaited volume (delayed by Menger's controversy with Schmoller over methodology -- the methodenstreit) was again postponed.

Nevertheless, during Menger's lifetime, an Italian edition of the Grundsätze appeared in 1909, with an introduction by Maffeo Pantaleoni.

age of 63. It was all in vain; when death overtook him in 1921, Menger's major work was still incomplete.<sup>11</sup> Menger's son Karl published, as editor, a second edition of the Grundsätze in 1923 (although much of the material that Carl Menger worked on in his post-retirement years is still unpublished and probably never will be). As mentioned above, the London School of Economics issued a reprint of this classic in 1934, to which Professor Hayek wrote a most informative and interesting introduction. In 1950, an English-language version of the book appeared under the title, Principles of Economics.

The third member of the subjective value trio, Léon Walras, published his seminal work, Éléments d'Economie Politique Pure, somewhat later, in two installments in 1874 and in 1877. The second edition appeared in 1889; as the title page of this edition indicated, Walras took advantage of the intervening years to add some additional material. The third and fourth editions appeared in 1896 and 1900 respectively; while the definitive edition appeared posthumously, some sixteen years after the author's death, in 1926. As is well known, we have the meticulous scholar of Walras's life and economics, William Jaffé, to thank for an English translation of Walras's 1926 edition.<sup>12</sup> Jaffé has not only translated

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<sup>11</sup>In my History of Thought class, I always try to point out that the case of Carl Menger illustrates the principle that it is important to finish one's major work before one reaches age 70, or at least by age 75. The usual reaction that I get from a class of 21 and 22 year olds is laughter.

<sup>12</sup>Léon Walras, Elements of Pure Economics or the Theory of Social Wealth,

Walras's text and written a short introduction, but has also provided some sixty pages of translator's notes and some fifty pages of collation of material from the various editions of the Eléments.

Summarizing the economics of this book very briefly, one can say that Walras's major contributions were twofold: an independent derivation of the subjective theory of value and the formulation of the model of general equilibrium for a competitive economy. It is interesting to note that Walras regarded the former as his principal achievement; today, we should merely give him some marks as one of the co-rediscoverers of the marginal utility doctrine, while his general equilibrium model would rate the major attention.<sup>13</sup> Now a mathematical economist would probably argue that this is unfortunate, for Walras's formulation of the subjective theory of value is somewhat closer to what one finds in present-day mathematical treatments (say R. G. D. Allen's Mathematical Economics) than either the treatment of Menger (which is understandable) or of Jevons (which is less so). Indeed, Walras shared Jevons's enthusiasm for a mathematical approach to our discipline. In particular, Walras's discussion of utility maximization (in the context of the two commodity model)

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translated by William Jaffé (Homewood, Illinois, U.S.A.: Richard D. Irwin, Inc. [for the American Economic Association and the Royal Economic Society], 1954).

<sup>13</sup> Thus, for example, Blaug in his text, Economic Theory in Retrospect, devotes half a chapter to the Walrasian system but gives only passing mention to Walras's role in the development of marginal utility theory. The late Joseph A. Schumpeter, in his erudite encyclopedia-text (The History

is one that a modern reader, with some training in the calculus, will readily recognize as a variant of the standard treatment of the problem. Perhaps Walras is not given the marks that he should be given on this subject because Jevons and Menger anticipated him by three years, not to mention the fact that his own father anticipated him by a generation. Indeed it appears that Léon Walras learned his theory of rareté literally at his father's knee.<sup>14</sup>

But it is Walras's general equilibrium theory that today commands the greatest interest and respect of the economics profession. Much of the outline is familiar even today: the  $m$  (or  $n$ ) commodity markets, the  $n$  (or  $m$ ) factor markets, the equation-counting, the elimination of an unknown by the numeraire device, the elimination of a mathematically dependent equation by what has come to be called Walras's Law, and the elementary discussion of stability theory by means of the trial solutions or tâtonnements, shouted out by the hypothetical auctioneer or crieur. While the exposition has been polished by a number of later writers

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of Economic Analysis [New York: Oxford University Press, 1954]) has a similar emphasis.

<sup>14</sup> Indeed, Auguste Walras is one of large number of anticipators who almost --but not quite--discovered marginal utility theory some years before the 1870's. Auguste Walras, along with James Mill and John Neville Keynes, enjoys the distinction (or suffers from it, depending on your point of view) of being a reasonably competent economist who was greatly outshone by the accomplishments of a son who was outstanding in his father's discipline. In other words, the major contributions of the elder Mill, Walras, and Keynes must, in retrospect, be judged to be their reproductive contributions.



(Pareto, Cassel, and a host of others in our generation), the substance has remained surprinsingly intact. We now know that the equality of equations and unknowns is neither a necessary nor a sufficient condition for the existence of an economically meaningful solution; still, such an equality is not without interest. Discussions of mathematicians and mathematically oriented economists have focussed on exact conditions for the existence and uniqueness of an economically meaningful solution to the Walrasian model; and the current generation, commencing with Professor Hicks, has added to Walras's elementary discussion of stability analysis. Nevertheless, as time goes on, Walras's intellectual achievement in the construction of such a model appears only to gain lustre. For, in the context of present day economics, Walras's abstract models appear to have anticipated not only a host of theoretical developments (especially in the field of welfare theory, an area studied by his successor at Lausanne, Vilfredo Pareto) but also a number of applications such as the linear programming analysis of the firm, input-output models for a region or an entire economy, and macro-economic econometric models.<sup>15</sup> When one looks at a modern econometric model of an entire economy, in which the model-builder attempts to compress the salient features of a modern economy into

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<sup>15</sup>This judgement is shared by a number of commentators (Hicks, in Spiegel, ed., The Development of Economic Thought, pp. 381-392; Schumpeter, op. cit.; Blaug, op. cit.. An exception is Milton Friedman, who, in a lukewarm review of Jaffe's translation ("Léon Walras and his System," American Economic Review, Vol. VI, No. 5 (December, 1955), pp. 900-909, reprinted

some 25 to 200 behaviorial equations, identities, or some other types of relationships, one thought which comes to mind is that this is the model of wise old Léon Walras, made operational by a suitable amount of aggregation. It used to be said that the Walrasian model could never be implemented statistically, because no computer could handle millions and millions of equations. That is still true, at least at the present state of computer technology, although it is frightening how rapidly the capacity of the computer has been growing. But a Walrasian model, suitably aggregated, can be quite useful in applied economic analysis -- as the above examples illustrate.

#### 4. The Significance of the Marginal Revolution

Much of this section is implicit in our discussion of the three seminal writers, in the preceding section. I wish to argue that there were essentially two contributions in this movement: the subjective theory of value, based on marginal utility theory, and marginalism itself. Ultimately, in my view, it was the technique, not the substantive

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in Readings in the History of Economic Theory, ed. Ingrid H. Rima [New York: Holt, Rinehart, and Winston, Inc., 1970], pp. 145-153), argues that Walrasian economics gives one a language or a means of formulating an hypothesis without actually providing much in the way of substantive hypotheses. Such a criticism seems rather harsh to me, in light of the discussion in the text. However, even if valid, such a line of argument would appear to be strange coming from an economist who regards himself as the disciple of another great economist (Marshall), who stressed that economics is principally "an engine of analysis," rather than a body of substantive conclusions.

results, that was of greater importance.

On the development of value theory, the marginal revolution definitely placed the final consumer and the demand side in the picture so that never again could they be ignored. Thus it was a revolution on the side of value theory (and, especially, in the theory of consumer behaviour) initially. Application of marginalism to the factor markets, thus producing a marginal productivity theory of factor pricing, did not come to the fore until some twenty to twenty-five years later, in work of Wicksteed, J. B. Clark, and Marshall.<sup>16</sup> For a time, as in most revolutions, the emphasis on the new was overstressed, in the perspective of present views on the subject. All three pioneers argued that exchanged value emanated from subjective, not objective, determinants; marginal utility, not cost of production, was held to be the main determinant of exchange value or relative price.<sup>17</sup> This marked quite a

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<sup>16</sup> Von Thünen's pioneering work on this subject had to be rediscovered, although one must concede that his early statement of marginal productivity theory was relatively complete. As noted above, Menger had an embryonic version of marginal productivity theory (in terms of imputed marginal utility) in his *Grundsätze*; von Wieser and Böhm-Bawerk worked mainly with fixed coefficients of production and so their versions of the imputation theorem did not take the form of marginal productivity theory.

<sup>17</sup> One interesting paradox in intellectual history is the fact that economists adopted hedonism as a theory of human behaviour roughly at the time that it was coming into bad repute with the psychologists. Thus, for years, economists suffered a bad press for operating with a false or at least a dubious theory of human motivation; in my view, not all of this criticism was unjustified. Even today, economists don't always do

change from the English Classical School, where value in use was either thrown out by Smith's water-diamonds paradigm or made at best a precondition for exchange value.

To develop this line of thinking somewhat further, the subjective value theorists argued the unimportance of the phenomenon that the English Classical School had placed at the center of their theory of exchange value, namely cost of production. Jevons was willing, in his famous concatenata, to concede an indirect influence to cost of production on price.<sup>18</sup> The Austrians and Walras would not concede even this much,

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as good a job as they might in explaining the postulate of a utility function. When one works with a utility function, one is not denying that there can be many types of motivations affecting human behaviour nor is one asserting that human beings have built into them fine, sensitive pleasure-pain registers to which they respond with unfailing accuracy. What one is asserting is that households are able, consciously or subconsciously, to rank alternatives and that they act on the basis of these rankings. In other words, what is ruled out is the inability or unwillingness to make choices (as would occur if the alternatives were totally incommensurate); equally ruled out by the postulate of a utility function is a wild, chaotic, and unsystematic fluctuation in choices with no predictability attached to them (although in some analyses we do allow for changes in tastes!).

<sup>18</sup> Thus, on p. 165 of the Fifth Edition, Jevons states:

"Cost of production determines supply;  
supply determines final degree of utility;  
final degree of utility determines value."

As Marshall pointed out many years ago, this concedes too much because, if the world were as simple as this little chain suggests, the two earlier elements in the chain could equally be said to be a "cause" of value.

arguing that cost of production was a determinate, not a determinant, and that the classicists had the lines of causation running in the wrong direction, costs of production being a pale reflection of the demand for the final product, which in turn depended on utility determinants.<sup>19</sup> In turn, it was argued that the price of the services of the factors of production reflected the prices of the final outputs (the Imputation Principle). It is worth pointing out that this argument is strongest when the supplies of the productive factors' services are considered fixed.<sup>20</sup> It is also worth mentioning that, roughly twenty years later, Alfred Marshall attempted a synthesis of the subjective and objective theories of value, emphasizing fundamental determinants on both sides of product and factor markets, as in his famous scissors analogy. Needless to say, in doing this, Marshall found it convenient to reintroduce variable factor supply schedules, by such devices as disutility or discommodity in the case of labour and "waiting" (a castrated form of Senior's "abstinence") in the case of capital. In Marshall's case, the lines of

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<sup>19</sup>Thus Walras states, "It is not the cost of the productive services that determines the selling price of the product, but rather the other way round." (p. 400, Jaffé translation.)

<sup>20</sup>There is a very interesting illustration of Austrian imputation theory in the mathematical technique of linear programming, as applied to a competitive firm or to an economy as a whole. Here the objective is to maximize the firm's quasi-rents or gross profits (or the economy's social product), at fixed prices of the final outputs, subject to linear technological constraints on the use of the resources available to the firm or the economy, and the amount of these resources is fixed (though it is permitted

causation become blurred, and simultaneous determination is the safest (if not the most exciting) way of putting the matter.<sup>21</sup>

On marginalism itself, we may content ourselves with a few brief observations. As Hutchison has said, "what was important in marginal utility was the adjective rather than the noun."<sup>22</sup> After all, we have,

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to use less than the maximum). The mathematical conjugate or dual problem has an interesting interpretation: it attaches shadow prices to each of the scarce resources of the first (or primal) problem. Thus, in this context (which is definitely one of fixed productive factors), the Imputation Principle has a rigorous, technically accurate meaning. For the details of the results summarized in this footnote, see Robert Dorfman, Paul A. Samuelson, and Robert A. Solow, Linear Programming and Economic Analysis (New York, Toronto, London: McGraw-Hill Book Company, Inc., 1958), especially Chapters 2, 3, 6, and 7.

<sup>21</sup>Actually, even in the Austrian (fixed productive factors) case, one can argue that the assertion of unidirectional causation is still overly simple. For, as the Walrasian model of a competitive model in general equilibrium makes clear, the exogenous elements in such an economy are utility functions (of the various households comprising the consumer sector of this economy), fixed technical coefficients (or input-output ratios), and fixed amounts of the productive factors. If one element from any one of these three sets of exogenous variables changes, then, in general, all of the determinates (endogenous variables) take on new values in the new general equilibrium resulting from such a change. Hence it would appear too simple to state that utility functions call the entire tune in such a world. Even in a model of pure exchange out of existing stocks, a parametric variation in stocks available for trade will still affect exchange values, so that even in this case, which is most favourable for demand determinants, utility functions are not everything.

<sup>22</sup>T. W. Hutchison, quoted by Blaug, Economic Theory in Retrospect, p. 299.

at present, less methodologically suspect ways of deriving individual demand curves with the properties that we believe characterize such curves in the "real world." On the other hand, if one thumbs through a modern text, such as Samuelson's Economics, one is struck by the predominance of the marginal concept -- marginal rates of transformation, marginal physical products, marginal rates of taxation, marginal propensities to consume (or save or invest), marginal efficiency of investment, marginal rates of substitution [which some, but not all, would regard as relative marginal utilities], marginal costs, marginal revenues, and marginal revenue products all appear, along with a polished version of the subjective value trio's marginal utility curves. Indeed, one cannot read any of the theoretical chapters of this text without becoming enmeshed with some marginal concepts, with the significant exception of the theoretical chapter on the pure theory of the gains from trade, which is cast in a manner much like the way David Ricardo formulated this problem some one hundred and fifty odd years ago. (However, in the appendix to this chapter of Samuelson's text, the constant cost case, implying an equality between marginal and average costs, is relaxed.) The Classical economists, one can argue, were not unaware of the existence of a margin applicable in certain cases. Indeed, the Ricardian theory of rent can be interpreted as marginal theory, in both the intensive and extensive [margin] cases, and certain passages in Ricardo can be cited to

bolster this contention.<sup>23</sup> But it is fair to say that the dominant measure of social abstraction from individual idiosyncrasy is an average concept in Classical economics, just as the marginal concept as a measure of social significance has first gained ascendancy and then predominated in the last hundred years.

On the matter of technique of approach, as contrasted with substantive results, an additional observation is that the marginal revolution was the beginning of economists' serious interest in mathematical tools as techniques of analysis and research.<sup>24</sup> The approach pioneered by Jevons and Walras has become widespread; restricted, indeed, are the areas of economics in which a purely literary economist can work without feeling at a disadvantage. In marginal analysis itself, economists discovered the calculus two centuries after the

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<sup>23</sup>See David Ricardo, The Principles of Political Economy and Taxation, Third Edition with an Introduction by Michael P. Fogarty (London, England: J. M. Dent & Sons, Ltd., 1957), especially p. 37 and p. 74. On the former page, Ricardo speaks of a "diminished return." On p. 74, there is a nice discussion of what we should call marginal supply price for an upward-sloping (aggregate) supply curve.

<sup>24</sup>One can cite, of course, economists working before the 1870's who used the mathematical method; Cournot and Von Thunen come to mind. Even in the eighteenth century, mathematically oriented writers on economic questions, like Isnard and Daniel Bernouilli (who worked on the formulation of a utility function in the context of uncertainty), can be cited. But these are isolated instances; the mathematical method was far from being in general use. After 1870 the picture was different, and these techniques became gradually diffused throughout the profession.



mathematicians did; marginal analysis, while capable of being presented in literary, graphical or tabular form, is most easily formulated as an exercise in calculus. In addition to the calculus (or, strictly speaking, most of the parts of the field that mathematicians call "analysis"), economists have also used, in recent years, a number of interesting and intricate mathematical techniques; linear algebra, mathematical programming, probability theory and mathematical statistics, difference and differential equations theory, topology, and the calculus of variations are some of the fields of mathematics that economists have brought to bear on their problems in recent years. In addition, the process of confronting theories with empirical observations, while it did not begin with the marginalists,<sup>25</sup> was nevertheless

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<sup>25</sup>The testing of economic hypotheses with the evidence of "real-world" data has a long history that goes back to Sir William Petty; in the nineteenth century, one might wish to cite Richard Jones and the German Historical School. But the procedure of a theoretical formulation followed by empirical testing does seem to be fairly well a twentieth century phenomenon and does appear to require (or at least to be greatly facilitated by) some rather sophisticated mathematical and statistical tools.

In an intriguing section entitled "Numerical Determination of the Laws of Utility" (pp. 146-148, The Theory of Political Economy, Fifth Edition), Jevons presents a discussion as to how the utility functions of particular individuals might be subjected to an estimation procedure from statistical data. As Lionel Robbins has pointed out ("The Place of Jevons in the History of Economic Thought," 1936 paper reprinted in Robbins, The Evolution of Modern Economic Theory, [Chicago, Ill.: Aldine Publishing Company, 1970], pp. 169-188, especially p. 185), this discussion legitimately allows an historian of thought to place Jevons among those who anticipated the econometric estimation of demand functions. Thus Jevons himself illustrates the text's assertion that a mathematical approach to theory facilitates statistical estimation of theoretical constructs.

facilitated by a mathematical approach to the subject. For this allowed economists to formulate hypotheses so that they were more readily subjectable to empirical tests. In addition, the development of statistical and later econometric techniques provided a set of "rules of the game" by which hypotheses might be accepted or rejected (or, in some cases, considered too close to the margin for a judgement). In this connection, Jevons hints on the statistical estimation of demand functions and his contributions to the theory of index numbers and to the measurement of business cycles (we shall quickly pass over his sunspot theory of the cycle) should be recalled. On both of these counts, then, the development of the approaches of modern economics may be said to have commenced, or at least accelerated, in the Marginal Revolution of a century ago.

As compared to Classical economics, was it all pure, unalloyed progress? Many are of the opinion that marginalist economics gave neater answers to more simple questions, that after 1870 economists stopped asking fundamental questions about the nature, causes and development of the wealth of nations and instead focussed on efficiency in the allocation of given scarce resources toward the satisfaction of given ends. As Blaug put it recently, "An unkind critic might say that neoclassical economics indeed achieved greater generality, but only by asking easier questions."<sup>26</sup> While in my opinion there is much truth in this view,

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<sup>26</sup> Blaug, Economic Theory in Retrospect, p. 304.

this is not the end of the story. In recent years, economics has returned to some of the grand classical issues -- problems of growth and underdevelopment, the economics of natural resources, the economics of education and what is called "human capital formation," the future of capitalism, and the determination of distribution shares. In addition, some new concerns have been studied, such as the economics of urban areas, regional economics, and the economics of the environment (though all of these have some antecedents in the writings of economists of previous centuries). In any case, one can argue that economists actually or potentially can make far better contributions to these issues as a result of possessing the tools of economic analysis, many of which were developed during the period of the rise of marginalism. In this sense, the contribution of marginalist economics may have been even greater than appeared to be the case at the time.<sup>27</sup> By laying a foundation for a more rigorous and hence more useful analysis of some difficult problems of economic policy, the developments during the period of the rise of marginalism may have contributed as much (or at least almost as much) as the direct discussion of many of these issues, in a literary and non-technical manner, during the Classical period.<sup>28</sup>

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<sup>27</sup>It will be recalled that Marshall never thought of Neo-Classical economics as being a finished system and indeed pointed the way to a number of unsolved problems, many of which were raised by the discussions of Classical economists.

<sup>28</sup>A radical economist would, of course, consider this evaluation one-sided.

## 5. The Delayed Appearance of the Marginal Revolution

Finally, we may turn to an issue that has intrigued historians of thought for some time. Elements of a subjective theory of value appear in Aristotle and the Schoolmen, and a number of eighteenth and even seventeenth century antecedents of a subjective theory of value might be cited. In the first half of the nineteenth century, two Classical economists who considered possible subjective elements in the determination of exchange value were Jean Baptiste Say, and Nassau Senior, while outside the Classical School one might wish to mention W. F. Lloyd, A. J. E. J. Dupuit, and (as briefly discussed above) Auguste

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To the radical economist, orthodox economics is obsessed with technique, at the expense of asking the larger questions; instead, the technique is directed toward trivial and/or inappropriate questions. For a literate exposition of this view, see John G. Gurley, "The State of Political Economics," American Economic Review, Vol. LXI, No. 2 (May, 1971), pp. 53-62. Hence, for a radical economist, 1871 would probably symbolize the date at which economics was shunted off on the wrong track. In reply, one can hardly do better than look at Robert M. Solow's comment on Gurley's paper (loc. cit., pp. 63-65); Solow argues that it is technique that distinguishes the economist from the informed citizen, and consequently a survey of current economics appropriately enough stresses technique. However, it is probably true that traditional (post 1871) economics is better suited to suggesting marginal improvements in the current economy, than to devising entire new systems. Consequently, those who regard the present state of society as intolerable (I am not one of them) are likely to be unimpressed with technical competence. On the other hand, if the radicals had their way and society were to be reconstructed according to their lights, analysis would again come into its own. One can criticize an existing order on the basis of philosophy (and philosophical issues are important in themselves), but running an economic system even reasonably satisfactorily requires technique.

Walras. In 1854, H. H. Gossen's brilliant statement of the subjective theory of value appeared, in nearly the full form that Jevons gave to it some seventeen years later. Still, the subjective theory of value did not gain adherents, even at this late date. What accounts for the retarded acceptance of a subjective theory of value?

In attempting to answer this fascinating question, we shall first look at three alternative answers. (Actually, the third alternative answer rests on a misinterpretation of the commentator, I shall argue.) The Marxian interpretation of the Marginal Revolution is interesting, but primarily (in my view) as an illustration of a Marxian interpretation of one form of the cultural superstructure or epiphenomena of a society, in this case a widely held economic theory. Nearly half a century ago, Nikolai Bukharin published a book<sup>29</sup> in which he attempted to explain the rise of marginal utility theory in terms of a rentier psychology characteristic of those elements of the bourgeoisie which had been divorced from an active concern with the process of production itself. It is an interesting hypothesis, but it appears to be of doubtful validity when confronted with even the most superficial facts from either economic history or the history of economics.<sup>30</sup> First, it should be

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<sup>29</sup> Nikolai Bukharin, The Economic Theory of the Leisure Class (New York: 1927).

<sup>30</sup> When I was a high school student, I had a teacher of English literature who would greet our intricate but erroneous interpretations of the material

observed that the subjective value trio, the developers of marginal utility theory as an explanation of exchange value, were all academics, and only the most unkind critics of the universities would refuse to recognize the distinction between rentiers and university professors.<sup>31</sup> Secondly,

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that he was teaching us with the comment, "Ingenious but wrong!" I can't help remarking that, in my view, Bukharin's explanation is of this character.

A more credible variant of the Marxian interpretation of the rise of marginalism is the view that the developments in the subjective theory of value helped reinforce the ideological defenses of capitalism, which (it is averred) were badly sagging as Classical economics came under increasing attack. Thus it has been asserted that marginalism and the subjective theory of value helped provide a more sophisticated defense of the private enterprise economy; the theory could be interpreted to assert that, under a private enterprise system, all participants in production received roughly what they were "worth." (This thesis is developed in C. B. MacPherson, "Post-Liberal Democracy?", The Canadian Journal of Economics and Political Science, Volume XXX, No. 4 (November, 1964), pp. 485-498, especially pp. 490-491.) In my view, there are at least two difficulties with this position. First, it can be argued that marginalist economics is largely ideologically neutral; models of a democratic, consumer-oriented socialist economy have been built in the spirit of marginalist economics by Barone and Lange. Secondly, in marginal utility theory itself, there are strong egalitarian presumptions if one permits interpersonal comparisons of utility and assumes that individuals are essentially similar. (This point is recognized by MacPherson, who, however, denies its importance.) However, it must be conceded that marginalist economics can be adapted to a defense of capitalism and laissez faire, as indeed it was in the hands of Menger's successors in the Austrian School.

<sup>31</sup> In addition, as Emil Cauder points out ("The Retarded Acceptance of Marginal Utility Theory"), the subjective theory of value has been utilized by economists of all shades of political persuasion, which suggests a certain absence of class bias, while, on the other hand, the presence of a class bias would appear to be an essential element of Bukharin's interpretation.

coupon-clipping did not begin in 1871 or shortly before; rentiers have existed from the outset of capitalism (or perhaps even earlier).

Another explanation of the delayed acceptance of marginal utility theory traces it to contemporaneous developments in philosophy. The acceptance of a marginal utility theory of exchange value required, it is averred, hedonism as a prerequisite<sup>32</sup> or, alternatively in the German context, a revival of Kantian philosophy.<sup>33</sup> Cauder's objections to both of these explanations seem to me very convincing; he is able to show that at least some of the pioneers were not adherents of the philosophy asserted to be playing a dominant role.<sup>34</sup>

This brings us to Emil Cauder's brilliant piece of analysis and interpretation, first published almost twenty years ago.<sup>35</sup> Cauder is represented in Blaug's text as asserting that Protestantism, with its

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<sup>32</sup>Gunnar Myrdal, The Political Element in Economic Thought (Berlin: 1932); C. Northrup, The Meeting of East and West (New York: 1946).

<sup>33</sup>W. Stark, The History of Economics (New York: 1944).

<sup>34</sup>Cauder, "The Retarded Acceptance of Marginal Utility Theory," shows that Vienna was not touched by the Kantian revival and that, in general Austrian thinking was not sympathetic to the idealism of Kant and his followers. As for hedonism, while it was true that Gossen and later Jevons were strict hedonists, Menger and Walras were not. Hence this explanation is at best a partial one.

<sup>35</sup>Emil Cauder, "The Retarded Acceptance of Marginal Utility Theory," The Quarterly Journal of Economics, Vol. LXVII, No. 4 (November 1953), pp. 564-575, reprinted in Ingrid H. Rima, ed., Readings in the History of Economic Theory, pp. 136-144.

exaltation of hard work, was favourable to the development of a labour theory of value, which is what happened in England.<sup>36</sup> On the other hand, Catholicism, which encourages "Moderate pleasure-seeking and happiness," was said to be favourable to the development of a subjective theory of value, and this is asserted to be what happened on the Continent, particularly in France and Italy. Now it is true that this is the thesis developed by Cauder for the eighteenth and earlier centuries, but, as he himself says, "My theory has, however, an important limitation. The belated acceptance of marginal utility in the nineteenth century cannot be explained by the Aristotelian-Calvinistic [Catholic-Protestant] dichotomy."<sup>37</sup> In the nineteenth century, Cauder argues for an internal explanation of why it took so long for a subjective theory of value to take hold.<sup>38</sup> With this approach I find myself in complete agreement.

Cauder states, "First the classical theory of value and later the historical school delayed the acceptance of the subjective theory of value."<sup>39</sup> I find myself in general agreement with this proposition, but

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<sup>36</sup> Blaug, Economic Theory in Retrospect, states in a bibliographical note on p. 324, "E. Cauder, however, argues that the delayed acceptance of utility theory in England was due to its predominantly Protestant culture." In my view, this is an oversimplification of Cauder's position (see the text above).

<sup>37</sup> Cauder, "The Delayed Acceptance of Marginal Utility Theory," p. 140.

<sup>38</sup> On p. 141, Cauder states, "The reasons for the delayed acceptance of marginal utility theory in the nineteenth century can be found only in the history of economic science itself."

<sup>39</sup> Cauder, "The Delayed Acceptance of Marginal Utility Theory," p. 143.



I should stress even more heavily the importance of the English Classical School and its (predominantly, especially in the long run) cost of production theory of value. British economics, at least up to the middle of the nineteenth century, had a dominant position in the economic thought of the Western world; and it is worth recalling that the German Historical School, like its predecessors the Romantics and the economic nationalists, was a reaction to the thinking of the English Classical School.

Hence I should argue that, in the English-speaking world and to a lesser extent on the Continent, the delayed acceptance of a marginal utility theory of exchange value was due to the great influence of the English Classical School. Moreover, for three or four generations, the old theory of exchange value (cost of production theory or one specialization, the labour-content theory of value) was given new life through reformulations by great (or at least gifted) economists. In 1776, Adam Smith shunted the profession off the track with his water-diamonds paradigm, erroneously (in my view) implying that there was no connection between utility (value-in-use) and exchange value. In 1817, David Ricardo developed and gave new emphasis to Smithian doctrines, ending up with (almost) a pure labour-content theory of exchange value (in the long run). Nassau W. Senior, building on some hints of J. B. Say, attempted to introduce subjective elements into the determination of exchange value in his work in the first half of the nineteenth century.

These attempts, however, did not really take root, and one can cite John Stuart Mill's reformulation of Ricardian doctrine as the reason; while Mill moved some distance from a pure labour-content theory of exchange value (as indeed Ricardo appears to have been doing near the time of his death), he was, in general, quite staunch in supporting a cost of production theory of exchange value (for the overwhelming majority of commodities, in the long run). Mill, in addition, had a maddening confidence in his own theory; he asserted, "Happily, there is nothing in the laws of value which remains [1848] for the present or any future writer to clear up: the theory of the subject is now complete."<sup>40</sup> It was this sort of attitude of which Jevons complained; not only Mill but also the economics profession of the day appeared to take this assertion seriously, and in consequence the acceptance and development of a subjective theory of exchange value broke against the hard authority of the English Classical School. Indeed, it is noteworthy that the final formulation of the doctrines of the English Classical School appeared in 1874 (three years after Jevons's and Menger's books, and contemporaneously with the first portion of Walras's work). This was the book of John Elliott Cairnes, with the retrospectively ironic title, Some Leading Principles of Political Economy Newly Expounded. The fact that an eminent economist

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<sup>40</sup> John Stuart Mill, Principles of Political Economy, ed. W. J. Ashley (London: Longmans, Green, and Company, 1917), p. 436.

could still write in this manner, three-quarters of the way into the nineteenth century, testifies to the tenacity with which Classical doctrines were held.

Indeed, on this subject we have the comments of Jevons himself, both in his book and (more voluminously) in his letters and private papers. As noted above, the final section of Jevons's book rails against "the noxious influence of authority" (the phrase in quotes being the title of the section). It is worth quoting Jevons at some length, because this quote illustrates the argument I am attempting to develop:

"...There is ever a tendency of the most hurtful kind to allow opinions to crystallize into creeds. Especially does this tendency manifest itself when some eminent author, enjoying the power of clear and comprehensive exposition, becomes recognized as an authority. ....If, instead of welcoming inquiry and criticism, the admirers of a great author accept his writings as authoritative, both in their excellences and in their defects, the most serious injury is done to truth. In matters of philosophy and science authority has ever been the great opponent of truth. A despotic calm is usually the triumph of error."<sup>41</sup>

Jevons goes on to mention explicitly Adam Smith, Ricardo, and John Stuart Mill as instances of the type of authority about which he was complaining.<sup>42</sup> Thus we have the words of one of the pioneers in the

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<sup>41</sup>W. Stanley Jevons, The Theory of Political Economy, fifth edition, pp. 275-276.

<sup>42</sup>In fairness, I must report that Jevons mentions Cairnes as an example of a number of writers who are attempting to improve the discipline of economics. However, from the dates of the publications, we know that

marginal utility theory of value as an explanation for the delayed acceptance of this theory, at least for the English-speaking world.

In summary, then, I am arguing that the great authority of the English Classical School (and, for the final quarter century, the writings of John Stuart Mill in particular) delayed the introduction of a subjective theory of value in nineteenth century England (and, to a lesser extent, elsewhere).<sup>43</sup> The new ideas came up in several forms and in a number of different writers, in England, France, and Germany during the first seventy years of the nineteenth century, but they never gained a

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Jevons must have had in mind either Cairnes's work on methodology (1857) or his application of economics to a study of slavery in the U. S. (1862) and not his Leading Principles. In any case, as we know from Keynes's biographical sketch of Jevons's life, Cairnes did not reciprocate this enthusiasm and wrote a most uncomplimentary review of the first edition of The Theory of Political Economy.

<sup>43</sup> A similar point of view, for England in the 1850's and 1860's, has been expressed by S. G. Checkland, "Economic Opinion in England as Jevons Found It," Manchester School of Economic and Social Studies, Vol. XIX, No. 2 (May, 1951), pp. 143-169. In concluding, Checkland asserts, "English economics languished between Mill's Principles of 1848 and Jevons' Theory of 1871, largely because the academics had gained authority before they had developed competence." (p. 168.) While this condemnation is stronger than I'd be prepared to assert, it illustrates a similar view. The surrounding discussion makes it clear that the principal academicians holding back progress in British economics were Henry Fawcett (a disciple of J. S. Mill), Cairnes, and the Drummond Professors of Political Economy at Oxford, J. E. T. Rogers and Bonamy Price.

large number of adherents, as the authority of the English Classical School was too strong. Even after the subjective value trio had published their seminal works, the influence of their ideas spread slowly. This slowness in replacing an objective, cost of production theory of exchange value can also be regarded as reflecting the strength and influence of the older doctrine.<sup>44</sup> Still, the subjective value trio did far better than poor old Gossen. As Cauder points out, Gossen was a retired Prussian functionary without academic qualifications; in addition, the milieu in which he published was strongly against theoretical economics, reflecting the German Historical School's reaction against Classical doctrines. Thus, although the connection was indirect, the authority of the English Classical School played a role (reactively) in Gossen's failure to win an audience in his native Germany.

## 6. Concluding Remarks

In my papers on subjects outside the history of economic thought,

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<sup>44</sup> One can object to this explanation along the same lines as objections run to the "great man" theory of history; too much weight may be given to obvious personalities and not enough weight to hidden influences or conditions, which require a more diligent search. My view is that strong personalities may shape or influence particular developments or movements, although ultimately the conditions (intellectual, institutional, sociological, or economic) rather than personalities will predominate. The authority of the English Classical School in general and of John Stuart Mill in particular would appear to be an instance that could be cited in defense of this belief. The triumph of the subjective theory of value could not be avoided indefinitely, but its widespread acceptance and influence could be delayed, as indeed it appears to have been.

I like to make the concluding section a statement of major results and qualifications. I have some doubts regarding the suitability of such a format for a paper such as this, but I shall try it in any case.

First, the qualifications. Unlike a statistical paper, I cannot talk about measurement errors in the data, autocorrelated residuals, data mining, and so forth. Instead, the major qualifications on the above analysis are basically twofold: the limitations on my time for reading primary and secondary sources and possible weaknesses in my interpretations of the authors surveyed. The first qualification, a limitation on time, means that I have not read thoroughly and exhaustively all of the primary and especially secondary sources that I should have liked.<sup>45</sup> I feel that I have read enough, however, to be able to form a judgement on the topics in this area; ultimately, however, the reader will have to decide for himself. The second possible source of inaccuracies in my discussion, namely weaknesses in my judgement, is something that even unlimited time for reading and reflection could not overcome. Especially on this point, the reader will have to decide for himself.<sup>46</sup>

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<sup>45</sup> As I remarked to my discussant, Professor Scott Gordon, in a recent letter, now I can see why it takes so long to produce a paper in the history of economic thought.

<sup>46</sup> Another possible short-coming is one that I referred to in the introduction, namely the possibility that one has failed to say anything original. While I have attempted to synthesize matters in a slightly

My major conclusions are basically twofold, also. First the founders of marginalism built well, perhaps better than was appreciated twenty-five or thirty years ago. While the schedules of total and marginal utility have currently been reduced to the status of one particular method (and a doubtful one at that) of deriving demand curves with "realistic" properties, the methodology (in all its aspects) of the founders of marginalism has served us well and I should venture the guess that it will continue to do so, the criticisms of the radical economists notwithstanding. Secondly, it is my view that the delayed appearance of a subjective theory of value and the accompanying technique of marginalism was due in large part, especially in the English-speaking world, to the overwhelming authority of the English Classical School. (In the 1850's and 1860's, this meant primarily John Stuart Mill and secondarily John Elliott Cairnes.) It is interesting that, even today, commentators still stress the strength of the influence of Classical economics on aggregative employment theory, especially the formulation that came to be known as Say's Law of Markets. It has been pointed out that this approach probably prevented a more fruitful approach to aggregative employment theory, as Ricardo's views became the orthodoxy

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different perspective, it is difficult to be strikingly original in discussing a well-studied group of authors. In any case, I'd rather be right than original (although I give no guarantees that I've succeeded in this objective).

and Malthus's views the heresy. It is somewhat surprising that the role of Classical economics in inhibiting the advent of marginalism has not been stressed, although perhaps this is explicable in terms of Marshall's genius, which was directed in large measure toward synthesizing and reconciling the new and the old (as indeed is implied in the name that he gave to his economics, namely Neo-Classical). In any case, I agree with Caudez that there was indeed such an inhibiting and retarding influence which, however, fortunately could not hold the new movement back forever.

Finally, I'd like to say a word regarding commemorative celebrations of the anniversaries of important events in our discipline. As far as I can tell, this is strictly a twentieth century phenomenon; only in the current century has the discipline felt itself developed enough (or old enough) to celebrate its past in this manner. As you can tell by the fact that I've bothered to write this paper, I'm highly in favour of such commemorative celebrations. I think that it's very useful and at times soul-satisfying to take time out from our present problems (which, it must be admitted, are generally very pressing and at times appear insoluble) and look at our past, for whatever inspiration and possible guidance it may offer us. Indeed, I am looking forward to several such commemorative celebrations over the next two decades. In addition to the appearance of the first portion of Walras's work, the year 1874 was the birth year of Wesley Clair Mitchell, and so



enthusiasts of the National Bureau approach to business cycles might wish to mark the centenary, in 1974. The year 1976 is the bicentenary year of Adam Smith's The Wealth of Nations, and I shall be interested in the reappraisals of Smith after two centuries. The year 1983 should be a vintage year for reminiscing, being the centenary of the death of Karl Marx and the births of both Joseph Alois Schumpeter and John Maynard Keynes. Moreover, in 1986, Keynes's monumental work, The General Theory of Employment, Interest and Money will have been in print for fifty years. For Austrian School buffs, the year 1989 will mark the centenary of Eugen von Böhm-Bawerk's monumental work, The Positive Theory of Capital. Finally, 1990 will mark the centenary of the first edition of Alfred Marshall's Principles of Economics; it will be interesting to see how the profession regards Alfred Marshall in twenty years. There may be some centenaries and other commemorative occasions that I have overlooked, but in any case, a rich harvest should be in store for us in the future. Accordingly, I should like to leave you with the thought that this paper is but one link in a chain of papers aimed at celebrating the achievements of pioneers in our discipline.