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THE DEVELOPMENT of utility theory has experienced two definitive episodes: the “marginalist revolution” of the 1870s and the “Hicksian” or “ordinalist revolution” of the 1930s. While the first event established a central place for utility theory in economics, the second restricted the concept of utility acceptable to economics. The term “ordinalist revolution” refers to the rejection of cardinal notions of utility and to the general acceptance of the position that utility was not comparable across individuals. The purpose of this paper is to analyze the events comprising the ordinalist revolution with a view to determining whether they achieved the advances in economic science usually claimed for them.

The developments of the 1930s are often regarded as unambiguous progress in

economics.¹ The intuitive idea of scientific progress is that new theories are discovered that explain more than old theories. We shall contend that the ordinalist revolution was not scientific progress in this sense. For example, the older school was concerned with economic policies to bring about income redistribution and alleviate poverty, and the ordinalists did not offer a more general theory for solving these problems. Instead, the trick that carried the day for the ordinalists was to argue that the questions asked by the older school, and the answers which they gave,

¹ For example, Kenneth Arrow, referring to the earlier school, wrote:

. . . the proponents of measurable utility have been unable to produce any proposition of economic behavior which could be explained by their hypothesis and not by those of the indifference-curve theorists [1963, p, 9].

were meaningless.² We shall argue that ordinalists offered different questions, not better answers. Thus, the ordinalist revolution represented a change, not progress in economics.

In order to understand why the questions asked by the older school seemed meaningless to the ordinalists, it is necessary to understand the dramatic change in the *conceptual framework* of economics. Important elements of a conceptual framework are a definition of the subject matter to be studied, a method of investigation and proof, and some substantive empirical claims. The older framework defined economics as the science of "material welfare"³ and employed an empiricist methodology. In addition, its practitioners held that their conception of utility was comparable across people. The newer framework adopted a scarcity definition of economics, and employed a positivist methodology. The salient feature of utility was held to be its ordinal nature.

The elements of the newer framework—the scarcity definition, positivist methodology, and ordinal utility—are familiar to contemporary economists. In contrast, the elements of the older framework—the material welfare definition, empiricist methodology, and interpersonal utility—are now viewed through the distorting lens of the ordinalist framework.

² The following is a partial list of questions that material welfare economists claimed to answer and ordinalists claimed were unanswerable by economics: Is a dollar more valuable to the average poor person than to the average rich person? Should economists give different weight to additional income for the rich and poor when doing cost-benefit analysis? Does a hungry person need food more than a bored person needs theater tickets? If income is redistributed to the poor, with no change in total income, does national welfare go up or down? Is there an economic justification for progressive income tax schemes?

³ In his *Essays on the Nature and Significance of Economic Science* Lionel Robbins stated that this was "(t)he definition of Economics which would probably command most adherents, at any rate in Anglo-Saxon countries" (1937 [1932], p. 4).

This essay aims to help the reader to recover a clear view of the older framework and to understand why it was rejected by the ordinalists.

In order to avoid misunderstanding, we shall offer a brief explanation in contemporary economic language of the material welfare conception of interpersonal utility. Economists of the older school are often characterized as having relied extensively on the belief that utility is cardinally measurable (unique up to a positive affine transformation), a belief that cannot be validated by examination of consumer behavior, and one that is unnecessary for deriving results in the theory of consumer demand. We do not consider in detail whether economists at the turn of the century believed individual utility to be cardinally measurable, since this issue is tangential to the question of interpersonal comparisons. Instead, we concentrate on the special assumptions concerning utility that justified the interpersonal comparisons made by these economists.

The different roles of assumptions about measurability and comparability of utility can be elucidated by borrowing from the modern approach to social welfare theory (for example, Amartya Sen 1977). Let each individual $i = 1, 2$ be represented by a set, L_i , of utility functions. Each utility function is defined over the set of social states, and, for the present purpose, is best regarded simply as a list of numbers, one for each state. Measurability assumptions restrict L_i to particular classes of functions or, equivalently, particular lists of numbers. For example, if utility is cardinally (ordinally) measurable, then each L_i will contain functions or sets of numbers that are related to each other by positive linear (monotone) transformations.

In this framework, we may view the problem of making interpersonal comparisons of utility as that of selecting a utility function from each L_i . This determines the magnitude of the number that will

represent each person's utility in comparisons. For reasons explained below, we will call such a choice a "comparability convention." In general, there will be comparability conventions from which it will follow that person 1 derives more utility than 2 in a particular state, and conventions that entail the reverse.⁴ In particular, even if individual utility is cardinally measurable, it can be seen that the L_i have not been restricted sufficiently to make the outcome of a comparison independent of the comparability convention adopted. For example, one can find a pair of utility functions for which the state that yields 1 lowest utility has a higher number attached to it than 2's highest utility state, and a pair for which the reverse occurs. A fortiori, we are not prevented from employing conventions that yield these results when utility is ordinally measurable.

It is apparent from the above that the "arbitrariness" involved in making interpersonal comparisons arises from the difficulty of discriminating among comparability conventions. Restricting the L_i by appeal to the standard measurability conditions does not materially limit the number of possible comparability conventions.

As we shall see, the material welfare school did opt for a particular comparability convention, and evaluated social welfare on the basis of it. This choice could be defended in the context of the interpretation of utility employed by the material welfare school. Utility rankings were not seen as coextensive with preference orderings, nor were they derived from

them. Essentially, goods were seen as having utility if they contributed to a person's physical well-being, which was conceived as nearly equivalent to productive capacity. Physical well-being is objective, like the condition of a person's health, not subjective, like a person's enjoyment of a good meal. Furthermore, productive capacity of people is closely related to economic efficiency, which is also objective.

When ordinalist writers criticized this comparability convention, they attributed to the material welfare school their own conception of utility rankings, derived from individuals' preference orderings. If utility is related to preference in this way, then interpersonal comparisons inevitably seem arbitrary, as if the writer were imposing his or her preferences on society. However, the material welfare school did not equate utility with preference.

The body of this paper examines the conceptual frameworks of the two schools. The substantial difference between them is offered as evidence against the view that the ordinalist revolution may be explained as part of the progress of economic science. The first section summarizes general developments in utility theory up to the early twentieth century. The next section describes the conceptual framework of the material welfare school. Following this, a comparison is made with the ordinalist school, which reveals that the two schools were using the common elements in their vocabularies to refer to different things. The final sections of the paper summarize the argument, and suggest lines along which to explain the success of the ordinalist view.

The aim of this paper is to demonstrate that the arguments developed some fifty years ago to criticize the material welfare school do not in fact address the claims of that school, whose scientific integrity remains intact. This suggests that it may be fruitful to draw on the material welfare perspective in the analysis of present-day

⁴ This is so, even though, to be accurate, a comparability convention defines an equivalence class in L , the Cartesian product of L_1 L_2 , in the sense that elements of this class will return the same results for interpersonal comparisons of utility. The class will contain elements of L that are related by positive monotone transformations. By this it is meant that the *same* positive monotone transformation is applied to every individual's utility function in the element selected by the comparability convention. This invariance condition is called "ordinal level comparability" by Sen (1977, p. 1542).

welfare problems, and perhaps warrants a comparison of the older view with the achievements of modern welfare economics. However, we stress that these issues are not pursued in the current research, which limits itself to recounting the development of doctrine. Consequently, we have concentrated only on the welfare problems stressed by the material welfare school, and contrast its work only with early ordinalist welfare economics.

I. *Utility Before the 1920s: Thumbnail History*

Contemporary economics offers a separate account of consumer and producer theory, then combines them together in an analysis of markets. The classical economic theories of Adam Smith, David Ricardo, and John Stuart Mill lacked a systematic account of consumer theory. Mill wrote:

Political Economy . . . has nothing to do with the consumption of wealth, further than as the consideration of it is inseparable from that of production, or from that of distribution. We do not know of any laws of the consumption of wealth as the subject of a distinct science: they can be no other than the laws of human enjoyment [1844, p. 318].

Mill did not develop "laws of human enjoyment" to explain how consumers allocate expenditures among different commodities. He was a utilitarian who did not make utility maximization by consumers into an important element of economic theory.

One reason why utility theory was not of great significance to economics in the first three-quarters of the nineteenth century is explained by the "paradox of value." Since water had a high use-value but a low price, and the reverse held for diamonds, utility apparently was not the cause of price. With this dismissal, English economists concentrated on cost of production as the explanation of price.⁵

⁵ Standard references are Mark Blaug (1978) and Joseph Schumpeter (1954).

In England this situation persisted until W. Stanley Jevons (1871) demonstrated that the paradox of value could be resolved by associating price with the "final degree of utility," or marginal utility, rather than total utility. Using techniques of calculus, Jevons showed that equilibrium in exchange requires everyone to consume commodities in quantities such that the ratio of marginal utilities equals the price ratio for each pair of commodities.

This demonstration that mathematics could be used to fuse the theory of markets and the theory of utility convinced Jevons that it was wrong to separate them. He spoke out boldly on this matter: "Utility is plainly the subject-matter of economics from beginning to end" because "the object of Economics is to maximize happiness by purchasing pleasure, as it were, at the lowest cost of pain" (1905, p. 6 and 1911 [1871], p. 23). Jevons' contemporaries did not share his opinion of the significance of his discoveries, and although he did not die in obscurity, he did not receive the recognition that later generations have accorded him.⁶ Nevertheless, research did continue in the same vein as Jevons', and by the turn of the century much progress had been made in the theory of price by economists of a mathematical bent, although few of them were in England.⁷

Vilfredo Pareto (1896, 1906) articulated a theory of markets based upon constrained optimization, and successfully integrated production into the marginal framework. This approach gave consumer demand equal standing relative to producer costs in determining prices, which conflicted with the older tradition of economic thinking. For example, the margin-

⁶ Jevons' disappointment at his lack of acclaim is displayed in a paper entitled "The Noxious Influence of Authority" (1871), and in Hutchison (1953, Ch. 2).

⁷ Some details of the works of continental writers are given in Emil Kauder (1965).

alist theory denies that prices are proportional to the labor time needed for production, except in very restrictive circumstances. The cost-of-production theory of value was replaced by a theory of simultaneous determination of prices by consumers and producers.

The marginalists accomplished more than injecting consumer theory into the core of economics. From the standpoint of the history of ideas, they brought Newton's mathematics and Bentham's utilitarianism into intimate association with economic theory. The assimilation of Newtonian mechanics, which began in the 1870s and was completed in the 1940s, was decisive in establishing the mathematical character of economics. The assimilation of utilitarianism was decisive in policy science, because utilitarianism suggests ways to evaluate economic policies according to how efficiently they satisfy the wants and needs of individuals.

Measurability and Comparability of Utility

A question faced by the marginalists was whether their conception of utility was really the same as the concept that Jeremy Bentham (1948 [1776]) had made prominent in political philosophy and ethics. According to Bentham, under ideal conditions, utility can be treated as an observable quantity of pleasure with the same measurable properties as weight.⁸ The utility of one person could be observed and added to another's if it were necessary to arrive at the total utility for society.

Among nineteenth century economists, opinion varied on the measurability of utility. Francis Y. Edgeworth proposed to measure utility in terms of the "just-no-

ticeable differences" in pleasure experienced by an individual confronted with a series of choices (1961 [1881], p. 7–9, 60). By equating the just-noticeable difference in utility across people, Edgeworth proposed to carry out the utilitarian calculus.⁹ In contrast, Jevons wondered whether it was possible to observe and compare individual utilities:

The reader will find, again, that there is never in any single instance, an attempt made to compare the amount of feeling in one mind with that in another. I see no means by which such comparison can be accomplished. The susceptibility of one mind may, for what we know, be a thousand times greater than that of another. But, provided that the susceptibility was different in a like ratio in all directions, we should never be able to discover the difference. Every mind is thus inscrutable to every other mind, and no common denominator of feelings seem to be possible [1911 (1871) p. 14].¹⁰

When Jevons derived the conditions for equilibrium in exchange, he recognized that it was not necessary to add together the utilities of different people. Pareto and Fisher (1892) developed Jevons' observation mathematically by analyzing how much must be known about utility functions in order to compute a market equilibrium. Fisher summed up this information:

Thus if we seek only the causation of the *objective facts of prices and commodity distribution* four attributes of utility as a quantity are entirely unessential, (1) that one man's utility can be compared to another's, (2) that for the same individual the marginal utilities at one consumption-combination can be compared with

⁹ For a discussion of Edgeworth's work, see Menahem Yaari (1981).

⁸ When Bentham takes up the issue of measurement (1948 [1776], Ch. IV) he describes the addition of the utilities of different people, which assumes that the utilities have the same properties as weight. However, he stresses that this exact process can be followed in ideal cases, but not in every case.

¹⁰ Elsewhere, Jevons appears to have expressed a different opinion, indicating that records of transactions kept by commercial enterprises would afford the necessary data for measuring "pleasures and pains" (1911 [1871], pp. 10–11). Irving Fisher (1927, p. 158) offers this passage as evidence in favor of the view that Jevons considered utility to be measurable. It has also been pointed out by George J. Stigler (1950, p. 320) that Jevons implicitly employed interpersonal comparisons of utility in his reference to "trading bodies."

those at another, or at one time with another, (3) even if they could, total utility and gain might not be integratable, (4) even if they were there would be no need of determining the constants of integration [1965 (1892), p. 89].

By 1900, therefore, there was no reason for anybody who was numerate to suppose that anything more than ordinal utility was required for price theory.¹¹

Insights such as Fisher's are cited as reasons why concepts such as marginal utility were expelled from scientific economics. However, the ordinalist revolution occurred some forty years after publication of Fisher's book in 1892. Fisher and other pioneers of utility theory persisted in using utility concepts that went beyond ordinality in their published work. In the late 1920s Fisher was still trying to measure marginal utility.¹²

Why was the ordinalist revolution delayed so long after all the necessary discoveries were made? The answer lies in recognizing that price theory was not so central to economics until after the ordinalist revolution. Although concepts such as measurability and comparability of individuals' utility functions were known to be superfluous to price theory, they were not at the time superfluous to economics.¹³ Economists retained a keen interest in the problems of producing and distributing necessities to alleviate want, which was principally the condition of physical deficiency that arose from poverty. For these

purposes, it was desirable to have a conception of utility that was comparable among people.

II. *The Material Welfare School*

There were several schools of thought among economists, but by the 1920s the material welfare approach was followed by prominent academics constituting the mainstream of English economics.¹⁴ This section will document this claim and at the same time extract from the classic texts the characteristics which define the material welfare school.

The conceptual framework offered by the material welfare school can be contrasted with contemporary ordinalism in terms of three central elements: the definition of economics, the conception of economic method, and substantive empirical claims about utility. The older definition of the subject focused upon material welfare, whereas the contemporary approach emphasizes scarcity. The older conception of method was called empiricism, whereas the contemporary method is positivism. Finally, the two approaches differ on the nature of the utility concept

¹¹ A reading of the appendices of Arthur C. Pigou (1920) and Alfred Marshall (1920 [1890]) will convince the reader that these economists' use of cardinal concepts did not result from limited mathematical vision.

¹² Cf. Fisher (1927). Ragnar Frisch's *New Methods of Measuring Marginal Utility* (1932) is dedicated: "To Irving Fisher, the pioneer of utility measurements."

¹³ In his inaugural lecture at Cambridge, Marshall noted that a "task [that] most properly belongs to the economic organon" was the computation of benefits of industrial or social change, "taking account of the fact that the same sum of money measures a greater pleasure for the poor than for the rich" (1885, p. 31).

¹⁴ The term "material welfare school" is our own, although, as we have mentioned above, Robbins (1937 [1932]) stated that material welfare was the subject matter of economics at the time. He ascribed the material welfare view to Edwin Cannan, Marshall, Pigou and John Bates Clark (1937 [1932], p. 11). Other writers use different categories. Schumpeter, for example, talks of a Marshallian school of thought, "the membership of which thought in terms of a well-defined scientific organon," but fails to elucidate its defining characteristics (1954, p. 833). Tibor Scitovsky (1951) talks of the "Cambridge School," and characterizes this as a group of practical men, with little patience for the gathering storm of theoretical problems attending their inferences, which finally swept them away with the publication of Robbins', *Essay* in 1932. Hla Myint identifies the "neoclassical school" of which Marshall, Cannan and Pigou are members (1948, p. 124). He also includes Joseph S. Nicholson, Henry Sidgwick, Frank W. Taussig and Allyn Young. This school is seen as straddling the classical "man against nature" and modern "subjective" views of economics. Myint is unclear as to the relationship of his neoclassical school with the scarcity school, as well as to the origins of the latter.

relevant for the analysis of economic behavior. We shall analyze each of these elements in turn.

Material Welfare Definition of Economics

The exposition of the conceptual framework of the material welfare school will refer mainly to Marshall, Cannan, and Pigou. In the 1920s Pigou's *Economics of Welfare* was used in teaching at Cambridge and Cannan's *Wealth* was the principal text for the "Elements of Economics" course taught at the London School of Economics (cf. London School of Economics, 1920–1940). Marshall's *Principles of Economics* had entered the intellectual culture as a classic and was still widely read.

As represented in these texts, economics confined itself to a part of the well-being of the community, to which Cannan referred as "material welfare" (1928 [1914], Ch. I), and Pigou as "economic welfare" (1932 [1920], Ch. I). The material welfare school made a distinction among the *types* of satisfactions that could be derived from goods. Indeed, goods, the motives for acquiring them and the satisfactions yielded by their consumption were arranged in a hierarchy that proceeded from the "purely economic" or "material" at one end to the purely noneconomic or nonmaterial at the other. It was stressed that there was no hard-and-fast line separating the economic part of the scale from the noneconomic, although the extremes were clearly distinguishable.¹⁵ The material end of the hierarchy was concerned with survival and health. The goods that fell most securely within the purview of

material welfare economics were food, "clothing, house-room and firing," followed by rest. These were dubbed "necessaries" by Marshall. As one proceeded further along the hierarchy, one came to "comforts" and "luxuries," whose material content was less certain (Marshall, 1920 [1890], p. 6).

According to Pigou, a reason for confining attention to the material or economic end of the scale was that it permitted exploitation of the form of measurement that was available to economists, the "measuring rod of money." Given the information that a person's income was a certain money value, under certain conditions, it could be inferred that they would enjoy material welfare of a level that could be purchased by that income.¹⁶ However, it was far more difficult to establish a connection between increases in income and the other parts of welfare. Pigou cited several authors who testified to the deleterious spiritual effects of advances that had brought greater productivity and material wealth (1932 [1920], pp. 12–14). After considering these arguments, Pigou concluded it was likely that material and total welfare would be positively related (p. 20).

To make statements about the effects of policies on material welfare, at the aggregate level, a measure was required. Pigou proposed a partial ordering based upon the size and distribution of the "national dividend" or national product.¹⁷ On the assumption that the rich spend so as to satisfy all their material wants, a redistribution in favor of the poor would permit more material wants to be satisfied. Thus, material welfare was said to increase if the distribution of the dividend shifted in favor of the poor, without decreasing

¹⁵ Thus, Cannan maintained that, "Although everyone is agreed that the satisfaction of hunger is economic and the satisfaction that a Tibetan fanatic feels when he has himself immured for life in the dark is non-economic," it is possible to "proceed from the undoubtedly economic at one end of the scale to the undoubtedly non-economic at the other end without finding anywhere a fence to climb or a ditch to cross" (1928 [1914], p. 4).

¹⁶ These conditions relate to the concept of rationality in the work of the material welfare school. See below, p. 516.

¹⁷ This was the way in which Pigou planned to employ the "measuring rod of money" in the analysis of welfare (1932 [1920], p. 31).

its total (1932 [1920], p. 89). In addition, an increase in the dividend increased material welfare if the absolute share accruing to the poor did not fall. This measure is only partial because nothing can be inferred from an increase in the dividend accompanied by a decrease in the poor's share, or from a decrease in the dividend accompanied by an increase in the poor's share.

Evidently, increases in material welfare brought about by redistribution would occur at the expense of the nonmaterial welfare or of less urgent elements of the material welfare of the expropriated. However, consideration of long-term effects somewhat mitigated this difficulty; it was held that many types of redistribution would actually increase the dividend in the long run. This result followed from the direct relationship between the extent to which an individual's material needs had been satisfied, and his or her productive efficiency. Thus, in modern terminology, there were redistribution measures for which there was no "equity-efficiency trade-off;" instead, the two were viewed as complementary. Pigou argued that the poverty of a significant proportion of the population, especially children, indicated an untapped resource, investment in which would pay more in terms of increases in the dividend than further investment in machines. The investments expected to yield the highest return were those in school meals, health care, and industrial training (1932 [1920], Pt. IV, Ch. XII). Substantive predictions of this kind constituted the central policy conclusions of the material welfare school.

Discussion of policies was carried out by considering the effects on incentives, as it was possible that, if the work effort of rich or poor were impaired, the eventual effect on the dividend would be negative. Material welfare economists were thus most confident when defending egalitarian policies on grounds of effi-

ciency. A more tentative approach was required when policies involved an equity-efficiency tradeoff. Pigou rejected rationing and wage subsidies as impairing incentives to work. Payments in kind showed much more promise, as they were considered less likely to have an adverse effect on effort than money transfers. As far as revenue is concerned, death duties were favored by Pigou over income taxes, in order to avoid adverse effects upon savings (Pt. IV, Ch. IX).

While the proximate reason for relieving poverty was its detrimental effect on industrial efficiency, the recommendations of the material welfare school were reinforced by a more grandiose master plan. The goal was to liberate the race from the wants of "the brute and the savage,"¹⁸ in order to permit people to develop their "higher faculties."¹⁹ These were of a more spiritual nature than material wants. Marshall argued firmly against religious views that insisted these virtues could be cultivated even in the presence of material privation (1920 [1890], p. 2).

In summary, this school of thought was concerned with deriving economic conditions that would bring about improve-

¹⁸ Pigou gave careful consideration to the findings of eugenicists. In a chapter entitled "The National Dividend and the Quality of the People" (Part I, Ch. X) he faced the argument that economic policies would be devoid of long-run effect, since the problem they were designed to cure was hereditary. He proposed that improvements in the quality of education and sanitation would cause improvements in environment, particularly in the area of child-rearing, that would be transmitted to future generations.

¹⁹ Marshall was quite explicit in his discussion of the role of economics in the development of the human race. Thus, while the proximate reason for the development of policies to alleviate poverty came from its deleterious effects on industrial efficiency, a more profound reason was that it stultified the development of man's "higher nature." This aspect of Marshall's thought is discussed in detail by Talcott Parsons (1931), who lists the facets of higher nature envisaged by Marshall as: energy, initiative, enterprise, rationality, frugality, industry and honorable dealing (1931, p. 107).

ments in material welfare. Economists could discuss necessities with assurance but encountered increasing difficulties in the consideration of comforts and luxuries. The difficulties did not arise in the explanation of prices—for the material welfare school, the price of bread had the same explanation as the price of opera tickets. The problems arose in the attempt to establish firm conclusions about the practical effects of policy. It was more defensible to argue that free school lunches and industrial training would increase the dividend significantly than to argue that subsidized opera would have that effect.

The Material Welfare Conception of Utility

(a) *Utility and Ophelimity*

Economists of the material welfare school tended to use the concept of material welfare for analysis at the aggregate or “national” level. The term “utility” was reserved for discussion at the level of the individual. If one substitutes “utility” for “welfare” in the above discussion, it appears that an interpersonal comparison is present in one of Pigou’s criteria for the establishment of increases in material welfare. This is the condition that material welfare can increase if there is a shift in the distribution of the national dividend, but no decrease in its size. The grounds for this comparison seem arbitrary, and this would lead one to believe that the work of the material welfare school was normative. Indeed, it is in this manner that they have been represented by modern historians of thought and ordinalist writers. However, this view comes from thinking in terms of the subjective notion of utility that is current today. In fact, at the turn of the century the definition of utility was not so clear-cut, and there coexisted two distinct ideas. This was recognized implicitly by many ordinalist pio-

neers, and was explicitly treated by Pareto.²⁰

In his *Cours d’Economie Politique* (1896), Pareto noted that economists had traditionally understood “utility” in the everyday sense of “usefulness.” Thus, to economists, something had utility if it was “conducive to the development and prosperity of an individual, a people, or the human race” (Pareto, 1896, p. 3). In his discussion of equilibrium, Jevons had employed the term in a different sense, which Pareto understood as the capacity to satisfy the desires of an individual, “whether legitimate or not,” (1896, p. 3). Pareto coined the term “ophelimity” to refer to this type of utility, which he regarded as “subjective” (1896; 1971 [1906], *passim*). *The difference between utility and ophelimity is thus the difference between “socially useful” and “desired.”* At the level of the individual “socially useful” is construed as being conducive to physical health. To illustrate the contrast, Pareto suggested that bad-tasting medicine has utility for sick children, but not ophelimity.²¹

In Pareto’s view, the science of ophelimity had proceeded to an advanced state. In contrast, the study of utility was problematic. The usefulness of things was a sticky issue: Pareto listed air, water, light and wheat as among the things that were undoubtedly useful, but he was ambiva-

²⁰ The distinction to be discussed is merely to be regarded as a useful terminological device. It is not intended to suggest that Pareto is to be counted among the ranks of material welfare economists, or to imply that material welfare views were prominent on the continent. (A hierarchy of wants is discussed in Carl Menger, 1976 [1871], Ch. 3, however.)

²¹ The idea that interpersonal comparisons might have an objective rather than a subjective basis is a theme of current philosophical inquiry. For example, in the *Theory of Justice*, John Rawls compares the material well-being of different people by an index of “primary social goods,” rather than subjective satisfactions. Rawls’ approach can be viewed as extending the idea of material well-being into a setting of moderate scarcity, where everyone’s basic needs are satisfied.

lent about potatoes, as excessive reliance on them had caused great problems in Ireland. Difficult as these questions were, Pareto believed that the progress of the social sciences depended on their resolution. Furthermore, unequivocal answers to questions of usefulness could be given if a criterion for "economic utility" were adopted, and Pareto proposed to take this as "material well-being."²²

When economists of the material school thought about interpersonal comparisons of utility, they thought in terms of comparing the material well-being of people. Physical objects were considered useful in so far as they could satisfy material needs, and the power of commodities to satisfy material needs was called utility. They believed that the *needs* of individuals, and, therefore, the power of given quantities of useful objects to satisfy them, could be compared. The comparison of needs, not the comparison of subjective desires, was what they usually meant by comparing utilities of different people. Thus their conception of utility was similar to the old idea of use-value and dissimilar to ophelimity.²³

It is worthwhile to dwell on the difference between focusing on needs and focusing on desires, since this underlines the crucial differences, for our purposes, between utility and ophelimity. The noun "need" is synonymous with "deficiency," as measured against a norm of "completeness." For the material welfare school, this norm was the condition of the physically fit individual. The significance of such a norm is that the important deviations from it (those relating to "industrial effi-

ciency") are physical in nature, and hence *observable*. One can thus dispute meaningfully with someone as to whether they or others have a need: Departures from industrial efficiency may be documented by pointing to inadequacy of diets, frequency of illness, high mortality rates and so on.²⁴ Thus, an important implication of confining utility to the material end of the hierarchy of goods or satisfactions, is that it made the production of utility observable and verifiable. On the other hand, the generation of ophelimity for a particular individual is not answerable to any standard of verification external to that individual because each person is the best judge of his or her own preferences.

(b) *Maximization of utility vs. maximization of ophelimity*

For the material welfare school, the coincidence or divergence of the pursuits of ophelimity and utility assumed great importance for policymaking.²⁵ The issue arose in the debate about whether money transfers would yield the same results as payments in kind. If the poor desire what is useful, then they will spend extra money to increase utility, i.e., transfers will be spent on food, clothing, industrial training and the like. If the poor do not desire what is useful, then instead of being spent so as to maximize utility, money transfers would be squandered, i.e., spent to maximize ophelimity.

²⁴ There are some difficulties with this approach, in particular that the norm may not be easy to establish, and may vary considerably among tasks, cultures and even individuals of different physical size or construction. However, these do not vitiate the claim that deviations from the norm are measureable *in principle*. For a discussion of these matters, see Sen (1981, pp. 11–14).

²⁵ The greatest divergence between calculations of ophelimity and utility was believed to be present where the planning of expenditures for the future was involved. This was held to have a deleterious effect on material welfare, as a result of the lower rate of capital formation it engendered (Pigou 1932 [1920], pp. 24–30).

²² "*Le bien-être matériel.*" He did not attempt to justify this choice explicitly, but seems to have had in mind some Spencerian ideas of evolutionary fitness. Evolution is seen here as improvement rather than adaptation.

²³ Pareto asserted that a rational person would view the two as identical. Thus, in contemporary usage, rationality was viewed as "doing what is good for you."

This problem caused some consternation for the material welfare school. On the one hand, Pigou maintained that "to charge the whole body of the poorer classes with ignorance and lack of capacity for management would, indeed, be to utter a gross libel" (1932 [1920], p. 754). On the other hand, he bemoaned the limitations of the wisdom of the typical household in its purchases and use of goods, likening it to technologically primitive cottage production of textiles (1932 [1920], p. 754).²⁶ Considerable care had to be exercised in the practice of doling out subsidies to people who had been at or below the margin of subsistence:

For, if anybody accustomed to a given standard of living suddenly finds his income enlarged, he is apt to dissipate the extra income in forms of exciting pleasure, which, when their indirect, as well as their direct, effects are taken into account, may even lead to a positive loss of satisfaction [1932 (1920), p. 91].

In view of this, Pigou advocated that any redistribution of income be carried out gradually and imperceptibly.

Despite such caveats, Pigou and Marshall believed that the poor would tend to use additional money in the most useful ways. This outcome could be expected be-

cause the desire to spend on necessities is prompted by the want of them:

For we may fairly expect that most material commodities, and especially those of wide consumption, that are required, as articles of food and clothing are, for direct personal use, will be wanted as means to pleasure, and will consequently be desired with varying intensity in proportion to the pleasure they are expected to yield [Pigou 1903, p. 68].

It could therefore be assumed, in discussions of the disparities of material welfare, that the effect of transfers of money would be quite similar to the effect of transfers in kind.

If people typically desire what they need, and if needs are more urgent when people are poor, it follows that additional income is more useful to the poor than the rich. The marginal utility of income declines because additional income is devoted to needs whose urgency diminishes as a person's income increases. For example, Pigou wrote:

It is evident that any transference of income from a relatively rich man to a relatively poor man of similar temperament, since it enables more intense wants to be satisfied at the expense of less intense wants, must increase the aggregate sum of satisfaction. The old "law of diminishing utility" thus leads securely to the proposition: Any cause which increases the absolute share of real income in the hands of the poor, provided that it does not lead to a contraction in the size of the national dividend from any point of view, will in general, increase economic welfare [1932 (1920), p. 89].²⁷

Given the material welfare conception of utility, it is possible to understand Pigou's welfare criterion in terms of the condition that money be allocated so that its marginal utility is equal between people. This scheme will produce the greatest ma-

²⁶ It was the argument of John A. Hobson and the "humanist school" that even if someone desired possession of an object that was capable of satisfying their wants it did not follow at all that these wants would be satisfied by endowing the person with the good in question: "the amount of utility or welfare to be got out of any goods depends upon the character, the natural or acquired capacity of the particular consumers or classes of consumers into whose hands they fall" (Hobson 1914, p. 37). Extracting utility from goods was a skill which had to be learned in the same way as one learned productive skills. William Robson (1925, Ch. 2) presented a more detailed study in this vein, in which he demonstrated that variations in family income around a low level were uncorrelated with occurrence of rickets in the children concerned. He took these and other findings on the lack of relationship between health and income as evidence that the principal needs of the time were for education in the best use of income to satisfy wants and that increases in income or payments in kind alone would not help.

²⁷ This quote is characteristic of the language of the material welfare school. The term "want" is often used to mean the objective fulfillment of a need and the corresponding subjective pleasure. In retrospect the material welfare school could have avoided confusion by observing Pareto's distinction more rigorously; however, their mode of expression is not inconsistent with ordinary speech.

terial welfare (and the greatest improvement in productive efficiency), given the available resources. It will lead to an equal distribution of wealth only if the relationship between individual wealth and the production of utility is the same for each individual. The fact that utility was confined to the material end of the hierarchy of wants thus suggests the possibility of an egalitarian bias.²⁸ However, this was tempered in Pigou's writing by consideration of the deleterious effects on incentive and thus ultimately on the dividend, that an egalitarian policy might create (1932 [1920], Pt. IV, Chs. VIII-X, XII).²⁹

(c) *The Use of Interpersonal Averages*

Material welfare economists were most comfortable in making comparisons of utility, not between specific persons, but between broad classes of people who differ widely in their unmet needs—e.g., the rich and the poor. The terms “the rich” and “the poor” were used to describe averages, not individuals, much as modern economists talk about “the consumer.”

²⁸ Sen (1973, p. 16) observes that utilitarianism is, in general, “supremely unconcerned with the interpersonal distribution” of total utility, and points out that maximizing the sum of total utility will lead to an egalitarian outcome only in the special case in which everybody has the same utility function. The assumption of identical utility functions was attacked by Robbins and others, which “gave utilitarianism a reputation for being equality-conscious.” From the above, it is clear that the “special case” arises from the particular conception of utility held by the material welfare school, and, indeed, any assignment of utility indices that varied dramatically among persons would be considered inadmissible. Only when “utility” is interpreted in terms of ophelimity does the egalitarian version of utilitarianism become a special case, placed on an equal footing with all other possible assignments of utility functions to individuals.

²⁹ This particular solution to the allocation problem is reminiscent of Edgeworth's formulation of the problem of the “Utilitarian Calculus” (1961 [1881], p. 56). The difference between two approaches is that Edgeworth believed that the pleasures derived by all people from all commodities may be compared, whereas the material welfare school confined itself to a more modest list of commodities. Edgeworth's approach is discussed in Yaari (1981).

Comparisons between two *named* individuals were declared impossible or infeasible. However, this was not considered to be of particular importance for policy. Thus, Marshall argued:

It would therefore not be safe to say that any two men with the same income derive equal benefit from its use; or that they would suffer equal pain from the same diminution of it . . . Nevertheless, if we take averages sufficiently broad to cause the personal peculiarities of individuals to counterbalance one another, the money which people of equal incomes will give to obtain a benefit or avoid an injury is a good measure of the benefit or injury. If there are a thousand persons living in Sheffield, and another thousand in Leeds, each with about £100 a-year, and a tax of £1 is levied on all of them, we may be sure that the loss of pleasure or other injury which the tax will cause in Sheffield is of about equal importance with that which it will cause in Leeds [1920 (1890), pp. 18–19].

Indeed, it was scarcely to be expected that one would be able to make any sense of individual comparisons. In his attempts to measure the marginal utility of money, Fisher resorted to the device of the average family. His justification in modern usage, was that individual data contains “too much noise” (1927, p. 181). The claim that poor people have more urgent needs than rich people was thus made with similar caveats as the claim that the consumer allocates a smaller share of his or her budget to housing as income rises. Both propositions smooth out the statistical outliers.

That material welfare economists, as we have described them above, had no difficulty with this use of averaging is scarcely surprising.³⁰ Their view that utility sprang from conditions associated with physical survival and development led them natu-

³⁰ What is remarkable is that the process of averaging was advocated by economists who have gained a reputation for being the forerunners of the more modern sort of economics, in which “interpersonal comparisons” are vigorously eschewed: Phillip H. Wicksteed, whom Blaug (1978 [1962], p. 514) cites as a precursor of Robbins' conception of the scope of economics, argued that there could be no doubt that the pain experienced by torturing one hundred

rally to believe that people were fundamentally alike except for an insignificant personal component, rather than that the personal component swamped the shared one.

The ability to make interpersonal comparisons of utility is already implicit in the hierarchical conception of human needs. The significance of the hierarchy is that it arranges needs in the order in which they unfold as income increases. This order is the same for different people, in particular it is shared by the average rich person and the average poor person. In order to compare the welfare of two different people it is necessary to locate their positions on the hierarchy. The person higher on the hierarchy enjoys a greater level of welfare. For example, a person deprived of food has a more urgent need than a person deprived of entertainment. Giving food to the hungry increases material welfare more than giving theater tickets to the bored. However, material welfare economists did not claim any jurisdiction over the "higher faculties," as Marshall called them. They did not pretend to know whether one person was more capable of enjoying the theater than another. All they said about these commodities was that, in comparison to food, their contribution to material welfare was less significant.

The "Scope and Method" of Material Welfare Economics

Material welfare economists held that social reform is an important motive for

studying economics.³¹ However, they were particularly conscious of the distinction between positive and normative economics, and of the necessity of abstaining from prescription based on normative judgments. Thus, Pigou contended that economics "will not . . . be an art, or directly enunciate precepts of government. It is a positive science of what is and what tends to be, not a normative science of what ought to be" (1932 [1920], p. 5). According to Schumpeter and Denis H. Robertson, the methodological bible of the time was John Neville Keynes' *Scope and Method of Political Economy*.³² Here, three aspects of political economy were distinguished: The studies of "economic uniformities, economic ideals and economic precepts." The first were seen as the subject of positive inquiry, the second as the concern of a "normative science" and the last as the province of an "art," "a system of rules for the attainment of a given end" (p. 35). Keynes insisted that it was both possible and desirable to restrict economics to the positive study of economic uniformities (1917 [1890], Ch. 2, p. iii). Similar views are advanced in Marshall's Inaugural Lecture at Cambridge (1885, p. 38). The pronouncements of the material welfare school on the scope of economics are thus in keeping with

³¹ Pigou saw this motivation as emanating not from the desire for "knowledge for its own sake," but from "the social enthusiasm which results from the sordidness of mean streets and the joylessness of withered lives" (1932 [1920], p. 5). Marshall believed that the possibility of banishing poverty depended on the outcome of economic investigations, and imparted to them "their chief and their highest interest" (1920 [1890], p. 4).

³² From what one can judge, this book was, for many years, the main source of information on methodology, to the extent that such information was sought. Schumpeter refers to the "excellent performance of J. N. Keynes that settled most . . . methodological issues . . . to the satisfaction of the profession. For two decades this book held a well-deserved position of authority" (1954, p. 824). D. H. Robertson affirms its importance, but is more reserved about the interest it excited (1952, p. 14).

men was greater than that experienced by another hundred men each subject to a gnat bite. "There might in one odd case be extraordinary sensitivity, and in another extraordinary anaesthesia, but they would not be typical" (1932, p. 149). Similarly, Pareto, whom John R. Hicks and Roy G. D. Allen (1934, pp. 52-54) name as the father of ordinal utility theory, argued that comparison of utilities (as opposed to ophelimities) of two people was legitimate as long as they did not depart too much from the average (Pareto 1896, Vol. II, pp. 48-49).

those at the base of modern economics.

The material welfare economists saw themselves in a long tradition of empiricism. British empiricism was characterized in theory by the claim that knowledge comes from experience, rather than reason and, in practice, by meticulous attention to detail and the collection of facts. The material welfare economists, like other empiricists, took pride in being sober scientists whose theories were grounded in facts: They took pains to collect and analyze data on wealth and welfare,³³ and they were pioneers in mathematical economics and statistics. They aspired to the same high standards of proof as present-day economists, but had a different idea of what to do when that standard was hard to reach.

If quantitative evidence was insufficient to decide an issue then the material welfare school accepted common sense and introspection as legitimate evidence. Thus, Marshall observed that "as human nature is constituted, man rapidly degenerates unless he has some hard work to do" (1920 [1890], p. 136). Similarly, Frank Taussig, in his discussion of the law of diminishing marginal utility, appealed to the fact that "all human enjoyments tend to pall rapidly when repeated" (1946 [1911], Ch. 9). Such passages are relics of the prose style of 19th century British classics, which modern economists can find embarrassing, like a photograph from adolescence.

In fact the appeal to common sense was part of a carefully considered method formulated by J. S. Mill (1844). According to Mill, all knowledge is obtained inductively from experience, and the scientific ideal involves performing an exact experiment whose outcome is decisive among rival theories. However, in economics it is rarely possible to perform the *experimen-*

tum crucis, e.g., the Bank of England will not alter its policies merely to test economic theories. The absence of experimental data can be overcome in part by statistical methods, but in the end Mill thought it was necessary to draw upon ordinary experience and common sense. According to Mill, abstract economic theory proceeded by deduction from common sense generalizations.

From our argument in Part II it is clear that the elements of the conceptual framework of the material welfare school were closely bound together. The material welfare definition of economics committed the subject to the analysis of economic needs. The arrangement of needs in a hierarchy was motivated by common sense, as well as by scientific evidence. The methodology of empiricism admitted common sense into social science. These foundations supported the conception of utility as an objective, public phenomenon, comparable across individuals. Critics of this conceptual framework were more likely to succeed if they could offer a complete alternative, which is exactly what Lionel Robbins did.

III. *The Critique of the Material Welfare School*

The tradition exemplified by Cannan, Pigou, and Marshall was attacked by Robbins in his *Essay on the Nature and Significance of Economic Science*, first published in 1932. The parts of this critique that generated the most controversy were the first and last chapters, which dealt with "The Subject Matter of Economics" and "The Significance of Economic Science," respectively. Our development of the arguments of these chapters will correspond to the discussion above of the material welfare school, dealing with Robbins' definition of economics, and his conceptions of method and utility.

³³ The findings of the Royal Commission on the Poor Law are cited frequently by Pigou and Marshall.

Scarcity Definition

In the first chapter Robbins criticized the material welfare definition of economics on the grounds that it did not comprehend the full range of topics that economists study. For example, wheat is more material than opera, but the demand for opera tickets is as fit for study by economists as the demand for wheat. He proposed an alternative definition:

Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses [1937 (1932), p. 16].

Only this definition possessed the "capacity to describe exactly the ultimate subject-matter of the main generalizations of the science," (pp. 4–5) according to Robbins. He called this definition "analytical," rather than merely "classificatory," because it "focuses attention on a particular aspect of behavior, the form imposed by the influence of scarcity" (p. 17).³⁴

The crucial feature of Robbins' definition is that it expands the list of goods that are equally legitimate concerns of the economist. Under the material welfare definition, economics was particularly but not exclusively concerned with goods that people need for the sake of physical and mental well-being. Under Robbins' definition, one good is as appropriate for study by economists as another so long as someone does not have as much of it as he or she desires. Bread and opera are on an equal footing in scarcity economics,

³⁴ Much of Robbins' argument was anticipated by Frederic Benham (1930), who condemned "economic welfare" as a loose concept, vulnerable to misinterpretation, and the "law of diminishing marginal utility" as the result of "an amateur incursion into the domain of psychology" (p. 184). However, Benham was more skeptical about the scarcity conception of economics that Robbins was to introduce. The scarcity definition was not unknown to the earlier generation of economists. J. N. Keynes explicitly rejected the notion that political economy is concerned with scarcity or the "specially reasonable adaptation of means to ends" (1917 [1890], p. 35).

whereas they occupy different positions in the hierarchy of needs.

Robbins stated that "what is rejected is but a definition," and not "the body of knowledge which it was intended to describe" (p. 22). However, it is important to realize that change of definition was instrumental in uprooting the existing body of knowledge. For, if the "unity of the subject of Economic Science" were to come from "the forms assumed by human behavior in disposing of scarce means" (1937 [1932], p. 15), then the natural primitive concept for studying economic welfare would be *ophelimity* rather than *utility*. Robbins did not make this distinction, and continued to use the term "utility" in his analysis of the work of the material welfare school.

As we have noted, *ophelimity* cannot be observed, and there is no way to know that it will be the same for two "average" individuals confronted with the same objective circumstances. Therefore, Robbins would find that his conception of utility offered no scientific support for statements about the effects on welfare of redistributive measures. This argument was couched in terms of Robbins' conception of science, as we shall now explain.

Positivism

During the 1930s, economists at the London School of Economics, where Robbins taught, were exposed to the philosophy of logical positivism,³⁵ which was imported into England from Vienna (William H. Beveridge 1960, Ch. 4). Positivism had a dramatic impact upon Anglo-American philosophy and social science.

Positivism shared many of the predilections of empiricism, e.g., both held that knowledge comes from experience rather than reason, both advocated testing theo-

³⁵ There were two positivisms in the history of philosophy, logical positivism being the twentieth century version (Paul Edwards 1967: "Positivism" and "Logical Positivism").

ries by quantitative methods, and both held that prescriptions and policy judgments are outside of science. However, these traditional tenets of empiricism were given a much narrower interpretation by the positivists. This change in tone had a large effect upon the practice of social science.

At this stage, we can focus upon one aspect of positivism, namely its strictures against mental and moral concepts. A basic claim of positivism is that science can be demarcated from nonscience according to whether or not the propositions in question predict observable events.³⁶ Positivists tended to interpret "observable events" in a very restrictive sense. Concepts with an ethical tinge (duties, obligations, values, norms, etc.) were deemed "unobservable." For example, it is said that the existence of a duty to tell the truth cannot be confirmed by observation and is therefore regarded as metaphysical, and outside the pale of science. Those concepts with a subjective tinge (intentions, wishes, purposes, pleasures, happiness, etc.) were suspect. For example, another person's pleasure cannot be observed so directly as chairs or horses. Some positivists went so far as declaring all subjective and mentalistic concepts to be unobservable, and became behaviorists in their approach to science.

Robbins went a long way in the positivist direction of excluding ethical and mental concepts from science. The material welfare school had long recognized that neither cardinal utility, nor interpersonal comparability of utility is necessary to explain *market* behavior. Robbins claimed that no *observable* behavior could be explained by placing such structure on utility. Since observability is the demarcation criterion for science, he concluded that

interpersonal comparisons of utility are outside science. In order to understand this claim we must appreciate Robbins' conception of utility.

Ordinal Utility

The claim that interpersonal comparisons of utility are outside of science may seem bizarre in light of the careful research by the material welfare school into the consequences of material deprivation. Hunger is plainly observable, open sewers assault the senses, the relationship between infant mortality and prenatal care is documented, etc. For the material welfare school, "utility" referred to the extent to which material needs were satisfied, which is observable. What did Robbins mean by claiming that utility is unobservable?

We noted that the material welfare school adopted an objective definition of utility (socially useful), whereas the ordinalists adopted a subjective definition (satisfaction of desire). As noted, Jevons used the subjective definition and remarked that there is no compelling way to compare the pleasures of different people. Robbins merely embedded this familiar claim in positivist philosophy. Specifically, he regarded utility as relating to preferences (i.e., ophelimity) and he stressed that alleged comparisons of utility among persons cannot meet the criterion of observability which demarcates science from nonscience (Robbins 1937 [1932], pp. 136-42).

Robbins' commitment to the positivist line is exemplified by his treatment of the law of diminishing marginal utility in the last chapter of his *Essay*. Here he offered a discussion of the assumptions underlying the "theory of public finance," especially progressive income taxation. The defense of progressive taxation by Robbins' opponents proceeds from the assumption that the marginal utility of income declines to

³⁶ This claim takes a somewhat different form in different writing: Karl Popper (1972 [1934]); the collection of writings in Alfred Ayer (1959).

the conclusion that total utility will be increased by the transfer of a pound of income from the rich to the poor.

Robbins condemned this argument as “merely specious,” representing “an extension of the conception of diminishing marginal utility into a field in which it is entirely illegitimate.” The unextended, legitimate law refers only to the income and utility of one individual; to extend it “begs the great metaphysical question of the scientific comparability of different individual experiences” (1937 [1932], p. 137; also, Benham 1930).

Two sources of evidence are recognized in Robbins’ *Essay*: introspection and observation. He reported that he could find no introspective evidence in favor of the extended law of diminishing marginal utility of income. He also asserted that observation had no bearing on this extension, because no one can observe the satisfaction enjoyed by other people. We may, by chance, agree on which satisfaction is greater, but if we disagree, then there would be no way to resolve the dispute. He concluded that the extended law of diminishing marginal utility

... cannot be justified by appeal to any kind of positive science. It involves an element of conventional valuation. Hence it is essentially normative [1937 (1932), p. 139].

Economists were thus presented with a dilemma: either they adopted a convention that made interpersonal comparisons possible, or they abandoned comparisons altogether. If they took the former course, then, according to Robbins, they would have to eschew the pursuit of positive science. On the other hand, were they to dedicate themselves to positive science, there would need to be a “substantial curtailment of much of what [now] assumes the status of scientific generalization in [current] discussions of applied economics” (1937 [1932], p. 141).

As noted, the material welfare school

thought that propositions about needs and their satisfaction concern observable facts, not ethical judgments. Of course, “needs” has an ethical tinge and “satisfaction” sounds mental, which arouses the suspicion of positivists. Robbins proposed to purge utility of its ethical tinge, but he did not propose to eliminate its subjective tinge. In his day there was a tendency to describe utility as a psychological impulse or mental spring to action. He did not object to such descriptions, but he insisted that subjective impulses were not measurable or comparable among persons. The possibility of a strictly behaviorist interpretation of utility was not part of the vision of his *Essay*.

In 1934, John Hicks and R. G. D. Allen offered “A Reconsideration of the Theory of Value,” which supplied the technical basis for a behaviorist account of consumer theory. Their article reconstructed consumer theory by isolating and developing those parts that did not rely on cardinality. Two notable casualties were the concepts of the marginal utility of a good, and complementarity between two goods, which were replaced respectively with the concepts of the marginal rate of substitution between two goods, and a revised conception of complementarity that required the presence of three goods. These changes did not alter any of the standard results about consumer equilibrium, but the implications for the meaning of utility were substantial: A concept that described mental impulses (marginal utility) was replaced by a behaviorist concept (marginal rate of substitution).

In conclusion, we note that Robbins assembled the elements of a new conceptual framework by joining together the scarcity definition of economics, the positivist conception of method, and the ordinalist view of utility. The only piece missing from the modern view was a behaviorist interpretation of ordinal utility, and that was supplied by others.

IV. *Debate Between the Schools*

We have described two internally consistent but mutually incompatible conceptual frameworks. The ordinalist framework eventually came to dominate the exposition of economic theory, but tracing this movement is difficult.³⁷ The ordinalists did not convert the members of the material welfare school, but students were won over. The material welfare school died out gradually as it failed to reproduce itself. In this section of the paper we recount these developments as reflected in the leading journals and books.

Replies to Robbins

The initial responses to Robbins' *Essay* were unfavorable, although muted. In the same year as it was published, the *Economic Journal* offered two critical reviews. The first, by Cannan, was directed primarily at Robbins' definition, the apparent virtues of which failed to attract him. It appeared to Cannan that Robbins had broadened the definition of economics to the point where it encompassed most of life. For example, Robbins saw the tradeoff between pursuit of pleasure and fulfillment of duty as an economic decision, whereas Cannan viewed it as "one of the problems of life" (cf., George M. Janes 1933).

In a second review, entitled "How Do We Want Economists to Behave?," Lindley Fraser (1932) pointed out that the scarcity definition had not been distilled from the actual practice of economists. Economists had long concerned themselves with comparing the well-being of different seg-

ments of the population, yet Robbins defined this practice out of economics. Robbins had proceeded by laying down a definition of economics and deducing the activities which economists could legitimately pursue.

Later (1937), Fraser characterized two methods of definition as themselves either "positive" or "normative." He reasoned that the material welfare definition is positive because it describes the actual practice of economics, whereas the scarcity definition is normative because it prescribes the appropriate practice for economics. Robbins was portrayed by Fraser as defining economics normatively while advocating the exclusion of norms from economics.

Fraser also criticized Robbins' application of scientific method.³⁸ He claimed that it was not the rigor of scientific method that Robbins had imposed on the practice of making interpersonal comparisons of utility, but rather a variant of the skeptical method. According to Fraser, people agreed that there was "no ground for supposing that poor men are *in general* less capable of enjoying a given amount of wealth than rich men" (p. 562). From this, it followed that egalitarian policies were *likely* to increase welfare, even though "the metaphysical doubt remains." Thus, while one could never rule out the possibility that redistributive policies would decrease welfare there was no reason for acting on the basis of this unlikely state of affairs, instead of the one that people considered more likely.

³⁷ Fraser (1938), in a review of Barbara Wootton's *Lament for Economics* (1938), indicated that the views of "Robbins and his colleagues are utterly unrepresentative of economists as a whole" (p. 196). By contrast, Roy Harrod (1938, p. 388), in the article referred to below, remarked that in recent years the history of thought had been discussed far more from the standpoint of the theory of exchange than from the standpoint of improving material welfare.

³⁸ Fraser's identification of ordinal utility theory with the skeptical method, rather than the scientific method, anticipated seminal criticisms made years later by C. West Churchman (1966). A full account of Fraser's concept of economic method is found in *Economic Thought and Language* (1937). This admirable and much-neglected work discussed economic theory from the viewpoint of the philosophy of language. The philosophy of language has had profound influence on the other social sciences; Fraser is unique in trying to work out some of its implications for economics.

Little more was written about these issues until Harrod raised them again in his essay entitled "Scope and Method of Economics" (1938). He, too, was critical of the practice of writers who stipulated methods and definitions instead of discussing those actually employed by economists. The suggestion that economists limit themselves to developing causal laws, and leave it up to policymakers to decide which course of action would be pursued, was illegitimate as it was "in manifest contradiction with the actual practice of economists" (p. 388). Robbins' proscriptions were seen to entail the principle that economists offer no advice whatsoever, as a result of which the interest in their causal laws would diminish markedly.

The advisory role assumed by economists also formed the basis for Harrod's dissent on the matter of interpersonal comparisons of utility. Economists could not afford to reject the common sense view of such comparisons. The objection that they were unscientific

. . . would be very weighty if economics itself were a mature and exact science. Yet in fact its achievements outside a limited field are so beset on every side by matters which only admit of conjecture that it is possibly rather ridiculous for an economist to take such a high line . . . [p. 396].

While it was necessary to assume equality of ability for satisfaction in order to make comparisons, this assumption, when used with care, need not lead to problems.

Robbins' response to Harrod, which appeared in the *Economic Journal* a few months later, merely reiterated his earlier positions (1938b). In this and another article written at the same time, he insisted that the question of the scope of economics was dead (1938a, p. 344).

One cannot but come away from this discussion between Robbins and his critics with a sense of dissatisfaction. They argue past each other, instead of defining the issue clearly. Neither side seems to appre-

ciate that the other is using the same words to mean different things. Consider for example the fate of the term "utility." We mentioned that Pareto distinguished utility (usefulness) from *ophelimity* (satisfaction of desire). Robbins used one name, utility, to refer to both concepts. Pareto had shown that *ophelimity* was not comparable, but Robbins discussed the incomparability of *utility*. In Robbins' *Essay* the meaning of "utility" to the material welfare school is ignored.

Another source of confusion arose from the examples used to illuminate the debate about the interpersonal comparisons. The material welfare school compared the rich to the poor, speaking in terms of abstract individuals widely separated on the scale of material well-being. Robbins made comparisons in terms of named individuals who were not so far apart in terms of income. This shift in examples affects the plausibility of the assertions that levels of welfare can be compared.

Ordinalist Welfare Economics

It appears unlikely that the work of Robbins and Hicks and Allen could, in isolation, precipitate the dramatic changes in the practices of economists that occurred. However, the development of the literature on compensation criteria may offer a clue to the victory of Robbins' framework.

Harrod had noted that Robbins' scientific ideal would not have allowed economists to endorse repeal of the Corn Laws which almost all British economists had endorsed (1938, p. 388). Nicholas Kaldor (1939) suggested that the repeal of the tariff was justifiable because the increase in wealth brought about by this reform, if redistributed appropriately, was more than sufficient to put everybody at the same level of utility as previously. Thus, repeal of the Corn Laws made a Pareto improvement possible by appropriate wealth redistribution. This procedure

promised to rank a state of the world by comparing the *hypothetical* redistributions it permitted to other actual states of the world, using the Pareto criterion. According to Kaldor, using hypothetical rather than actual redistributions permitted economists to make policy recommendations without making value judgments (Kaldor 1939, p. 550). Use of the Pareto criterion made interpersonal comparisons of utility unnecessary. Thus, it appeared that some of the conclusions of the material welfare school might remain intact, even when Robbins' strictures were obeyed.

The recommendations that flow from Kaldor's principle are sometimes different from the recommendations of the material welfare school. Suppose we are considering the desirability of a redistribution policy that raises marginal tax rates at low incomes and lowers marginal tax rates at high incomes. This policy is expected to raise the national income, the increase accruing to the rich. Suppose further that their eventual gain in income exceeds the loss in the income of the poor. Using Kaldor's criterion, we would say that the policy results in an economic gain, even if the rich do not compensate the poor. However Pigou's criterion yields no definite result in this case. (Although it would agree with Kaldor's criterion if compensation were paid.) Alternatively, if the eventual money gain to the rich were exactly equal to the loss of the poor, Kaldor's criterion would evaluate the two situations equally, whereas the original situation would dominate under Pigou's rules. The difference in conclusions occurs because Kaldor's approach requires the economist to proceed as if a dollar were equally valuable to everyone, whereas Pigou's requires the economist to proceed as if a dollar were more valuable to the poor than to the rich. Thus, Kaldor made a *different* conventional judgment from Pigou, rather than no judgment. However

most subsequent discussion of compensation criteria did not consider this point.³⁹ This suggests that a generation of economists was trained to believe that science treats a dollar as equally valuable to everyone, whereas a nonscientific approach treats a dollar as more valuable to the poor than to the rich.

Nevertheless, compensation criteria did offer some degree of rapprochement between the two schools. In the Introduction to his textbook on the new welfare economics, Melvin Reder precedes his development of compensation criteria with this statement:

... if our welfare criterions were applicable only to the few policies that harm none, welfare economics would be quite sterile. Fortunately, this is not the case [1947, p. 18].

Subsequently, the technical difficulties with compensation criteria were exposed by Paul Samuelson (1950) and William M. Gorman (1955). One may wonder whether the new welfare economics would have been so readily adopted in the late 1930s had its "sterility" been evident at that time.

V. *Evaluating and Explaining the Ordinalist Revolution*

The body of this paper has reconstructed the conceptual frameworks of the two schools of thought involved in the debate on the possibility and relevance to economics of interpersonal comparisons of utility. A comparison of these frameworks leads to the conclusion that phrases such as "the comparability of utility across persons" meant different things to each school. The observation that the earlier conceptual framework was not generalized by the later motivates a reconsideration of the question of whether scientific progress occurred. To this we now turn.

³⁹ An exception is William Baumol (1965 [1952], pp. 161-70).

Received history of economic thought accounts for the difference between the two schools in terms of rival views of the scope and method of economics. Thus, material welfare economics is seen as normative and the banishment of interpersonal comparisons of utility as the consequence of the attempt to make economics a positive science (Blaug 1978 [1962], pp. 636–37). This view is in keeping with Robbins' recollections:

All that I had done was to assert, in regard to discussion of economic affairs, the distinction between propositions involving existence and obligation, well recognized elsewhere since Hume pointed out the distinction between "ought" and "is" [1971, p. 148].

Yet, as we have argued above, in our discussions of scope and method, material welfare economists were well aware of this distinction. They did not consider normative statements to be part of the economics they practiced. Further, they affirmed "Hume's guillotine" in much the same breath as they made statements that were later criticized for ignoring it.

In his discussion of the development of utility theory from 1790 to 1915, Stigler pointed to the method of empirical investigation by appeal to "casual knowledge" used by economists practicing during this period. He went on to suggest:

Had specific tests been made of the implications of theories, the unfruitfulness of the ruling utility theory as a source of hypotheses in demand would soon have become apparent . . . That such able economists were delayed and distracted by the lack of a criterion of refutable implications of theories should be a finding as useful to us as any of the fine theoretical advances they made [1950, p. 396].

It is true that the material welfare economists appealed to everyday experience for evidence, which resulted from their use of an empiricist rather than a positivist methodology. However, this does not explain why they retained their version of

utility theory.⁴⁰ Instead, the explanation resides in the fact that, cumbersome as their conception of utility was for price theory, it was well adapted to the examination of propositions about material welfare, which were the major preoccupation of the school.⁴¹ Moreover, their conception of admissible scientific evidence was congruent with their view of utility. The belief that a utility structure was common to people made introspection an appropriate empirical tool. The fact that the production of utility was linked to the material end of the hierarchy of needs made the incidence of utility readily observable, and so offered a place for observations based on everyday experience.

The theses that economics developed as it did in the early decades of this century because it confused normative and positive concepts, or because of inadequate scientific method, must be rejected. They attribute to apparent differences in scope and method the effects of differences in research agenda. An account of the doctrinal changes of the 1930s must concentrate on differences in research agenda which influenced the two rival schools' definitions of "economics," and the denotation they gave to the term "utility."

Each school was guided by a separate definition of economics, which mandated that they focus their attention on different phenomena. Considerations of scarcity directed economists to study the production and exchange of all commodities, for which the appropriate concept of human behavior is preference, or ordinal utility. Considerations of material welfare man-

⁴⁰ Stigler referred to the aspects of this theory that were later generalized, as a result of the replacement of the additive utility function by the generalized utility function, and of the measurable utility function by the nonmeasurable one.

⁴¹ It should be noted, in this paper we have not dealt with the question of whether Stigler's judgment is appropriate for economists of generations earlier than the material welfare school.

dated concentration on an aspect of the significance of commodities for which the canonical concept of human behavior is the satisfaction of needs or "wants." While intensity of preference among people could not be ranked in any way that would not be considered arbitrary, interpersonal intensity of needs could be ordered in a way that would only be considered arbitrary by a sceptic. However, in the presence of confusion as to the concept of utility being appealed to, it was possible for the scarcity school to characterize material welfare economics as guilty of subscribing to arbitrary conventions or "value judgments," and to explain the persistence of these practices by the neglect of positivist scientific method. Similarly, it was possible for the material welfare school to interpret the strictures of ordinalists on interpersonal comparisons of utility as mere scepticism on the part of economists who were prepared to hamstring the science by giving disproportionate weight to possible but unlikely configurations of utility among people.

The received view is that ordinalism represents scientific progress relative to the material welfare school, but one can talk unequivocally about the progress of a science only when it continues to address the same questions. The period offers two yardsticks with which the achievements of economics are to be measured because the questions asked by economics changed. The evaluation of the schools is thus confounded by the fact that the work of neither encompassed that of the other. It is necessary to balance the gains in understanding markets which the ordinalist framework facilitated against the losses in understanding human welfare, suffered by abandoning the material welfare framework.

An important feature of the received view of the ordinalist revolution is that the explanation of why it occurred is a simple corollary of its evaluation: it hap-

pened because all economists, sharing the goal of advancing their science, perceived the merits of the ordinalist approach. In contrast, our account makes it necessary to dissociate the explanation from the evaluation of the change. As far as the explanation is concerned, we have shown that the two schools had different frameworks, the older framework consisting of a material welfare definition of economics, an empiricist conception of method, and an interpersonal conception of utility, whereas the newer framework consisted of a scarcity definition of economics, a positivist conception of method, and an ordinalist conception of utility. The essential unity of each framework explains some features of the change, such as the difficulty each side had in comprehending the other's arguments.⁴² In order to provide a more complete explanation of the change in doctrine, an examination of the relationship of the two schools to the wider intellectual and political climate of the time now seems indispensable. For the moment, we can do no better than to echo Lindley Fraser (1937, p. 36) who, having discussed the scarcity and material welfare definitions of economics, despaired of objective criteria for adjudicating among them. He concluded that the choice "would have to rest largely on the individual temperaments of the persons concerned."

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⁴² Our account suggests that the ordinalist revolution was not unanimously accepted by economists. Indeed, Pigou (1951) maintained his belief in the material welfare program into the 1950s, and there do not appear to have been any notable conversions of faith among other members of the material welfare school.

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