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NEO-CLASSICAL ECONOMICS IN BRITAIN

I

NEO-CLASSICAL economics in Britain is most conveniently dated from the work of Stanley Jevons. For it was he who first tilted the balance in value theory from cost to utility, applied mathematics to the supply and demand curves, and conceived the project of building with elaborate statistical material an exact science. This science he defined as "the mechanics of human interest." There are not a few passages, especially in the opening chapters in his *Theory*, which show how near his mind came to a broader and more balanced statement of the utilitarian calculus than that which he actually took.

"Political Economy must be founded upon a full and accurate investigation of the conditions of utility; and as we understand this element, we must necessarily examine the character of the wants and desires of men." Now "utility" taken broadly in any utilitarian system should include disutility, or cost, since this clearly comes into the wants and desires of man. The elementary psychology by which Jevons explains the utility of consumption with its grades of variety and intensity is equally applicable to production. In this very book, indeed, Jevons made an elementary excursion into the intensity of labor, relating it to hours of labor etc., and in his Preface he definitely states, "In this Work I have attempted to treat Economy as a calculus of Pleasures and Pains." Yet nowhere did he link up into a single calculus the pleasures and pains of the processes of production and consumption. No, "The whole theory of

Economy" as he saw it "depends upon a correct theory of consumption" (p. 47). In the last chapter of his *Theory* he says, 'The great problem of Economy, may, as it seems to me, be stated thus: Given, a certain population, with various needs and powers of production, in possession of certain lands and other sources of materials; required, the mode of employing their labour so as to maximize the utility of the produce" (p. 255). It seems curious that he should have failed to add the words "and so as to minimize the disutility of producing it." Here was a real turning point in economic theory. Had Jevons worked out his prefatory promise the study might have been put upon a sound basis of utility conceived as human welfare; the utilities as well as the disutilities of production might have been put into the account, together with the disutilities which attend certain forms and portions of consumption.

How far the definitely hedonistic turn of the utilitarianism which Jevons had taken on from the Mills and Bentham, would have served him for a satisfactory art of human welfare, may be open to discussion. But such an application of the utilitarian method would have been a great advance along the road to a science for the interpretation of economic processes in terms of human well-being.

It might, however, have been expected that followers of the Jevonian method would have repaired the defects of their master. Had they done so, the Jevonian theory of value, resolving wealth into the various degrees of utility or enjoyment it furnishes to consumers, might have been the harbinger of a human political economy in Britain. Disinterested Science had only to take two tolerably obvious steps in order to construct a valid basis of a Science or Art of Economic Welfare. The first was to apply to the production or supply side of the equation of value the same subjective analysis as was applied to the consumption or demand side. If you are to evaluate a given quantity of concrete wealth, you must ask two related questions, how much utility it furnishes in its consumption, and how much disutility it involves in its production. For only by this double analysis can you realize what this wealth is really worth in human terms of net satisfaction or enjoyment. For, if each consumer, in purchasing a quantity of any article for consumption, gets for the last shilling of his expenditure a utility or satisfaction that is "just worth while", it follows that for every prior shilling of that expenditure he gets a positive gain increasing in magnitude as it approaches the first shilling, the utility of which may, if the article in question be a necessary of life, be infinite. This concept of a surplus or fund of positive gain for consumers is, of course, equally applicable to the cost or supply side of the problem of purchase. If it is just worth while for the producer to put forth the last and costliest unit of productive effort incorporated in a supply which fetches a price of one shilling per unit, then on every earlier unit of productive effort he gets, in the shilling he receives, something more than an equivalent for that effort, i. e., a producer's surplus, measuring the diminishing subjective cost of the earlier units. In theory, at any rate, the first unit of this output of productive energy may be considered to have a vital cost that is immeasurably small.[1]

Such might seem to be an obvious first step towards a scientific hedonist calculus. The second step would have been an orderly correlation of the results of this double analysis, a setting of the human costs of production represented by a stock of concrete goods against the human utilities of their consumption—a profit and loss account. In the process of both analyses it would have become evident that, though costs predominated in production, and utilities in consumption, some elements of costs found a place in consumption, some elements of utility, or satisfaction, in production. Wider inequalities of distribution would signify that some goods passed the barrier which separated utility from satiety, while certain kinds and amounts of productive energy are pleasurable in their output. In the analysis of any given stock of goods, therefore, it would be the net utility of consumption that would be set against the net disutility of production.

[1] This producer's surplus must be distinguished from that which arises from the possession by a producer of some specially favorable position enabling him to produce his whole output, including its last unit, at a lower subjective cost than his competitors.

This analysis would inevitably have led to a new reorientation of the problem of distribution. For it would have become evident that the total amount of satisfaction, enjoyment, welfare, attaching to any given quantity of wealth, would vary with the ways in which the efforts of making it and the enjoyments of consuming it were apportioned among the members of the community. Such an apportionment, or distribution, of productive efforts as would involve the smallest aggregate of disutility in making it, and such apportionment, or distribution, of consumptive opportunities as would yield the largest aggregate of enjoyment, would evidently maximize the "welfare" which attaches to any given quantity of goods.

Here a third step in the new subjective science might have been expected, involving a literally vital change in the method of the hedonist calculus. It might have been recognized that the costs and utilities, attaching to the production or consumption of any set or class of goods, cannot be discovered by a separate analysis of the processes of producing and consuming these goods. For these particular costs and utilities are associated with others derived from other sets of goods in a standard of production and a standard of consumption. The latter standard is self-evident in its bearing on the hedonist calculus. The utility of any single article of consumption depends on, and in some measure varies with, the utility of other articles incorporated in the personal standard of consumption. The division of labor has, however, gone so far in modern industry as to obscure what should be the equal significance of a human standard of production; a varied day's work should by its organic composition reduce the total disutility and incorporate elements of positive utility. To some extent this variety of work can be made to subserve efficiency and total productivity within the factory system: in other cases it requires a sufficient quantity of leisure to enable workers, earning their main livelihood in some single craft or routine process, to choose subsidiary occupations that provide relief elements and give play to otherwise thwarted instincts of workmanship in body or mind. This conception of an interrelation between standards of work and of consumption, based upon a comprehension of the harmonious needs and satisfactions of man as an organism, might have been evolved from the crude beginning of the Jevonian theory of value.

An advance along these lines might have been expected to produce a subjective Science and Art of Economic Welfare which would have realised Ruskin's assertion "All Wealth is Life", and pointed the way to a general social economic movement of reform.

This did not happen. It was not for want of intellectual leads. As early as 1854 Giessen published a book[1] containing an outline of this utilitarian calculus of utility and disutility. But nowhere in Britain did the method receive much attention. This was partly due to the concentration of most economists upon the conflict between "cost" and "utility" theories of value as the central problem of Economics. Not until Marshall had achieved a peace treaty between these combatants by showing how the "final cost" principle and the "final utility" principle are undoubtedly component parts of the one all-ruling law of supply and demand, each compared to "one blade of a pair of scissors", did English orthodox economics attain the equilibrium needed for resolving wealth into the sum of its utilities and disutilities.

But even then this subjective or human interpretation of wealth was sedulously avoided. Though Marshall opened his *Principles of Economics* with the comprehensive statement, "Political Economy or Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being", he nowhere proceeds to correlate the two processes of "attainment" and "use" from the standpoint of well-being. The elaborate studies of supply and demand curves in the determination of prices and the measurement of values in the various acts of purchase which constitute economic book-keeping, so thoroughly absorbed most of those who accepted the "scissors" metaphor[2] as to keep them upon a mechanical plane

[1] *Gesetze des Menschlichen Verkehrs.*

[2] "The 'cost of production' principle and the 'final utility' principle are un-

of inquiry precluding any close psychological analysis into the human values affecting the constitution of these curves.

Though Marshall recognized more clearly than any of his academic predecessors the delicacy and intricacy of the choices and adjustments that went into the operations of the economic system through acts of production and consumption, he made no serious and continuous attempt to go behind these choices in order to convert them into terms of the human satisfaction which underlay them. Nowhere do we find in his work any attempt to express economic income in human welfare. Doubtless the sense that human well-being is the end of economic activities may be said to pervade his work. But it is never formulated.

It seemed as if this reconcilement of Economic Science with humanity was the definite task to be undertaken by Marshall's pupil and successor, Professor Pigou. The title of his work, *The Economics of Welfare*, suggests that a full and formal examination of the contribution of economic art to human well-being will be made. In his opening chapter this purpose from time to time flickers before our eyes. Mr. Pigou clearly recognizes that the subject matter of Economics (whether as a Science or an Art) is a part of welfare. Wealth, in other words, he regards not as a mere aggregate of concrete products, but as a body of satisfactions. He carries his subjectivity so far as to insist that "welfare includes states of consciousness only and not material things" (p. 10).

There are passages which might suggest that "the states of consciousness" are to be submitted to some objective test of "the desirable", in the sense of a contribution to "the real good" of a man, or a society, and not in the sense that they are actually desired. But these are evidently unintended departures from his explicit declaration that his Economic Science is "a positive science of what is and tends to be, not a

doubtedly component parts of the all-ruling law of supply and demand: each may be compared to one blade of a pair of scissors. When one blade is held still, and the 'cutting' is effected by moving the other, we may say with careless brevity that the cutting is done by the second; but the statement is not one to be made formally, and defended deliberately."—Marshall, *Principles*, 4th edition, p. 569.

normative science of what ought to be." In a word, we are to deal with current satisfactions.

The subject matter of Economics being thus a part of welfare, we ask what part, and are told "that part of social welfare that can be brought directly or indirectly into relation with the measuring rod of money" (p. 11)—an ominous suggestion of a return to the position that money is the measure, not merely of value, taken in its market meaning, but of that part of human values contained in welfare. With Professor Cannan, who also shows coy hankerings after the humanization of economics, he recognizes that no sharp demarcation is possible between economic and non-economic satisfactions. "Nevertheless, though no precise boundary exists, yet the test of accessibility to a money measure serves well enough to set up a rough distinction. Economic welfare, as loosely defined by this test, is the subject matter of economic science." "Rough distinctions" and "loose" definitions are perhaps no very strong foundation for a scientific study which in its detailed superstructure aims at nicety of measurements. But it is undoubtedly true that the only possible demarcation for economic phenomena is to confine them to things that are bought and sold, and we may presume that it is the welfare related to such marketable things that Mr. Pigou proposes to investigate.

But, though we may seem to be able at any given time and place thus to distinguish concrete economic goods from non-economic goods, when we turn to examine them, as they meet and even join in the consciousness of which they are "states of mind", new difficulties crop up. If we are to correlate the part, economic welfare, with the whole, human welfare, we must at any rate keep the same meaning for the term "welfare". We had supposed that, as the "ought", or normative law, was to be excluded from economic welfare, it must also be excluded from human welfare, reduced *pro hac vice* to the currently desired.

But hardly is this established than we come (p. 12) to a discussion of the objection that "an economic cause may affect non-economic welfare in ways that conceal its effect on economic welfare", illustrated by the damaging reactions which excessive industrialism may exercise upon the appreciation and cultivation of "the beautiful in nature or in art" forming "an important element in the ethical value of the world." Surely any such assessment of ethical value would seem to involve an introduction of the normative element just expressly excluded from the province of economic science.

In further discussion of the relations between economic and non-economic welfare, Mr. Pigou adduces two considerations, which, had he followed out their implications, would have led him far upon the road to a complete utilitarian calculus. That calculus requires, as we see, first, the recognition of satisfactions and dissatisfactions of production in their bearing upon economic and non-economic welfare; secondly, the interaction between this set of satisfactions and dissatisfactions and the set on the consumption side of the equation. Economists had hitherto failed in two ways, first, by looking exclusively to the yield of satisfactions from the consumption (or further application to production) of the real income of the community, secondly, by omitting to take account of the satisfactions of production (when they made their tentative analysis of human costs) or of the dissatisfactions of certain sorts and quantities of consumption.

Now Mr. Pigou seems in his opening analysis to recognize that the ways in which income is earned and spent have important reactions upon "non-economic welfare". On the production side "the surroundings of work react upon the quality of life. Ethical quality is affected by the occupations—menial service, agricultural labour, artistic creation, independent as against subordinate economic positions, monotonous repetition of the same operation, and so on—into which the desires of consumers impel the people who work to satisfy them" (p. 15). "In the Indian village collaboration of the family members not only economizes expenses but sweetens labour. Culture and refinement come early to the artizan through his work amidst his kith and kin."

Now while these indirect results of conditions of labor may be classed as "non-economic", why should those conditions be so regarded which directly raise or lower the dissatisfaction, or human cost of production?

Then again, Mr. Pigou affirms that "non-economic welfare is liable to be modified by the manner in which income is spent. Of different acts of consumption that yield equal satisfactions, one may exercise a debasing, and another an elevating influence" (p. 17). Here once more he brings to bear upon non-economic welfare a normative standard, which really puts his whole calculus out of gear. Either one must accept provisionally current standards of "the desired", alike for economic and non-economic welfare, or frankly apply to both fields some normative science of human values. Mr. Pigou recognizes formally a part of his difficulty though he does not appreciate its magnitude. For he argues (p. 18), "These very real elements in welfare [i. e., "ethically superior" interests in literature and art etc.] will, indeed, enter into relation with the measuring rod of money and so be counted in economic welfare, in so far as one group of people devote income to purchasing things *for* other people. When they do this, they are likely to take account of the total effect, and not merely of the effect on the satisfactions of those people—especially if the said people are their own children." In other words, here the ideally desirable is substituted for the actually desired. The importance of this distinction, fatal to Mr. Pigou's economic calculus, is seen when we remember that quite twenty-five per cent of the current income of the country is spent by public authorities in this way. The state's attitude both to production and consumption it is impossible to correlate with the estimate of economic welfare on the basis of "a positive science of what is and tends to be, not a normative science of what ought to be." The parent in spending money on his children, the philanthropist in doing good to others, and the state in its public expenditures, are manifestly concerned with "what ought to be."

It seems impossible to deal with a national income by excluding a normative science and sticking to the current standard of the desired. The cleavage between economic welfare estimated on the latter standard, and non-economic, or total, welfare estimated on the former, is wholly inadmissible. Either we must take actual current satisfactions and dissatisfactions for our standard, apply them to both sides of the economic question, and extend the same standard to non-economic welfare, or we must apply to the entire area of consideration some normative method based on ethics or biology. The attempt to reconcile these two standards must land us in intellectual chaos.

Mr. Pigou seems to have some inkling of his difficulty for he admits that "any rigid inference from effects on economic welfare to effects on total welfare is out of the question." He falls back, however, upon a presumption, "an unverified probability" that total welfare will probably vary with economic welfare in direction, though not in magnitude. This means that more wealth per head is presumed to carry more total satisfaction, irrespective of the methods of production or the distribution of its toil, upon the one hand, the nature of the wealth, its distribution and the uses or abuses of its consumption on the other hand. The presumption is, I think, open to grave doubt, at any rate until it is shown that with growing wealth there is some normal tendency towards lightening the day's work for the average worker, and towards more, not less equalization, in the distribution of incomes.

I have laid stress upon the failure of English economists to interpret economic welfare with equal regard to the production and consumption processes. This oversight is formally corrected by Mr. Pigou in his Chapter IV stating "The relation of economic welfare to the National Dividend." There he lays down the doctrine that: "The quantity of economic welfare associated with any volume of the dividend depends, not only on the satisfaction yielded by consumption, but also on the dissatisfaction involved in production" (p. 43). One may complain of the assumption that no positive form of satisfaction involved in production is recognized, but the passage does appear to furnish a consistent standard for measuring economic welfare as he defines it. You would assess in economic welfare any stock of goods according to the total satisfaction it afforded in its consumption over the net dissatisfaction attending its production.

But having given this formal recognition to the part which disutility plays in economic welfare, Mr. Pigou proceeds to deal with the national dividend, as a concrete annual product, *exclusively with regard to the effects of its distribution, in the shape of income,* upon economic welfare. The differences in amount of economic welfare, attendant on various shifts in disribution of income, and the special problems of state or business machinery by which changes in distribution may be brought about, occupy almost the whole of his long treatise.

Nowhere is there any further recognition of the truth that the economic welfare of a man, or a class, or a nation, is dependent on, consists in and varies with, the conditions of the production of the national dividend, as much as upon its consumption.

Economic welfare is thus in fact confined to utilities or satisfactions of consumption. And these utilities are to be assessed in terms of current desirability. Mr. Pigou does not seek to go behind existing standards. For purposes of economic welfare a dollar's worth of dope equals a dollar's worth of food or other necessary of life, for "of different acts of consumption that yield equal satisfactions, one may exercise a debasing, and another an elevating influence." Such bad consumption reacts apparently upon the quantity of welfare but not of economic welfare! This is made abundantly clear on page 28: "the first asserts that additions to work-people's wages do not really lead to economic welfare, but are merely dissipated in worthless forms of exciting pleasure. This objection is, indeed, obviously irrelevant, when economic welfare is defined as we have defined it."

The strongest and most serviceable part in Mr. Pigou's analysis consists in showing with precision how economic welfare, connected with the consumption of any given body of resources, increases the more evenly this body of resources is distributed between them. It would seem to be an obvious corollary, that economic welfare, connected with these same resources, increased the more evenly the human costs of producing them were distributed between the producers. But though, several times in elaborating his argument, Mr. Pigou introduces parenthetically some consideration bearing upon economic welfare from the production side,[1] some tough barrier in his thinking prevents him from giving it its proper place as a factor in economic welfare. What this barrier is remains a mystery. Perhaps, however, light is thrown upon it by the curious treatment of "costs" which has crept into the Cambridge doctrine, formerly confined to the theory of foreign trade. The most naïve statement of this doctrine is thus presented by one of the ablest of the young Cambridge economists, Mr. W. D. Henderson.

> The real costs which the prices of a commodity measure are not absolute but comparative. Marginal money costs reduce themselves in the last analysis to the payments which must be made to secure the use of the requisite agents of production. These payments *tend* to equal the payments which the same agents could have commanded in alternative employments. The payments which they could have commanded in alternative employments tend in their turn to equal the derived marginal utilities of their services in those employments. It is thus the loss of *utility*, which arises from the fact that these agents of production are not available for alternative employments, that is measured by the money costs of a commodity at the margin of production.[2]

Ignoring the difficulty of understanding in what possible sense "payments" can tend to "equal" utilities, one wonders why it should seem even plausible that it is easier to compare respective "losses of utility" in other goods than costs or disutilities involved in producing the actual goods that are the objects of exchange. The doctrine that the real cost of anything is the forgone utility of other things[3] perversely rules out all human considerations related to the supply side of exchange, by substituting an indirect and strictly irrelevant test for a direct and

[1] E. g. p. 343. In discussing the further operation of utilities he notes that as regards "the position of a public servant as it owns attraction in itself and also makes appeal to altruistic motives" there is created a new value "in the extra satisfaction which the said engineer or manufacturer derives from the fact of serving the public."

[2] *Supply and Demand*, pp. 164–5.

[3] "The real cost of *anything* is the curtailment of the supply of other useful things which the production of that particular thing involves." *Supply and Demand*, p. 166.

relevant one. It reminds one of the famous definition of sugar as "the stuff which makes tea nasty when you don't put any in."

This change-over in post-Jevonian theory from the producer point of view of the older classical political economy (where consumption had no valid place and no utility save as it was "productive", i. e. contributory to the end of promoting more production) to this modern stress upon the utility of consumption, as not only the practical end of the economic costs, but the first principle of economic theory, is often claimed as a great advance in humanism. Utility, as issuing from wealth, real income, is now in the saddle. Economists concern themselves more and more with the problems of increasing the output of concrete goods, and of enlarging their utility by better distribution. But the twist of mind which leads so many of them to hold that it is easier and more relevant to welfare to evaluate goods for purposes of exchange, or for inherent satisfactions, by confining attention to the utilities of consumption they embody, is the more amazing since their professed master, Dr. Marshall, performed his greatest single service to economic theory in his balanced interrelation of supply and demand prices and the equality of their importance in the determination of value.

Nor is this disparagement of the human interpretation of costs, and the disposition to transmute them into utilities, confined to British economists. Here is Professor Taussig declaring that, "In the last analysis, the income of an individual, or of a community, consists of a sum of utilities steadily accruing from its store of economic goods. It consists, that is, of the total utility of all its goods." [1] So Professor Taussig, like Professor Pigou, appears to envisage economic welfare entirely in terms of concrete goods shedding utility in processes of consumption.

It is particularly strange that this one-sided theory should have attained such vogue, at a time when practical reformers in every industrial country devote so much attention to problems

[1] *Principles of Economics*, vol. I, p. 134.

of lessening the human costs of production: by shortening hours of labor; restricting the employment of younger and weaker workers and imposing intervals of rest, or of alternative work; lightening the muscular and nervous strains; improving factory hygiene; and otherwise trying to reduce the net human costs of production by what is significantly called "welfare work".

The failure of the post-Jevonian, or neo-classical economists of Britain and of the United States to humanize economic theory, in the sense of finding methods of expressing concrete economic goods and processes in terms of human welfare, is contained in four chief defects:

First, their failure to interpret the human welfare attaching to a concrete body of wealth, (a real dividend) so as to include equally the utilities and disutilities of producing them and of consuming them, with due regard to the actual conditions of the producing and consuming processes.

Secondly, their failure to realize adequately the difficulties attending the processes of applying "the measuring rod of money" to: (a) the varying satisfactions or dissatisfactions of different persons at the same time and the same persons at different times; (b) the separate measurement of different kinds of satisfactions or dissatisfactions in a standard working day or a standard of consumption.

Thirdly, their failure to keep consistently to the professed assessment of economic welfare and the total welfare into which it enters, in terms of present desiredness.

Fourthly, their hesitant attitude in assessing, as elements of the National Dividend, Personal Incomes and Economic Welfare, the products of public services, such as health, education, insurance, art, recreation.

Some of these defects I have here sought briefly to expose. Others are best reserved for discussion in a more formal criticism of Marginalism.

Our immediate problem is to try to understand how it came about that the neo-classical school of British economists failed to develop the subjective treatment introduced by Jevons, so as to produce a consistently human theory of wealth. It was doubtless partly due to the force and vividness with which the objective structure and processes of the industrial system imposed themselves upon observers. This objective system of the business world with its productive processes and its markets absorbed so much attention that little was left for considering the consumptive processes, though the utility associated with them figured as the formal goal of economic activities. Consumption only figured indirectly through demand curves. More and more the neo-classical economics concerned itself with the determination and movement of prices within the limits of the business world. How strong the influence of this school has been is well illustrated in the recent work of the Swedish economist, Gustav Cassel, whose *Social Economy* resolves all economic problems into questions of *price* based on scarcity.

This concentration upon price movements and their causes and effects in terms of the business system has been due partly to the discovery of a fascinating field for abstract reasoning. It is not without significance that so many of the younger school of economists in England and America received their academic training in mathematics. For, as will presently appear, the notion that all qualitative differences can be resolved into quantitative may be regarded as the modern substitute for that economic man moving in the "simple system of natural liberty" by which vested interests defended themselves against dangerous assaults in the earlier era of modern capitalism. The mathematical mind, set to work upon supply and demand curves and the conditions which regulated them, rapidly constructed an abstract economic system operated by the movement of identical and infinitesimal units whose accurate adjustment produced a new "economic harmony". It was not necessary to assume a society composed of "economic men" with completely informed selfishness as their single motive. A series of minute adjustments at the margin of each supply and demand will do all that is required. This is provided chiefly by the intelligent application of new units of capital, labor, and other factors at the several points of vantage in the system, and by the gradual letting down of productive power at points where less is wanted. This unceasing movement of insensible increments on the producing and consuming sides tends both to put the technically right amount of the factors of production in each employment for the maximization of the product, and to distribute that product in accordance with the separate productivity or economic worth of each factor of production. It is not contended that there are no obstacles to the accurate operation of this "tendency". But Science, which can only deal with tendencies, may legitimately ignore such friction as is itself immeasurable!

The acceptance of this new method and instrument for economic service is due, however, not merely to the craving of scientific men for exactitude. Its immanent conservatism recommends it, not only to timid academic minds, but to the general body of the possessing classes who, though they may be quite incapable of following its subtleties of reasoning, have sufficient intelligence to value its general conclusions as popularized by the press.

Disconcerted by social and political "attacks on property" and by socialist propaganda, sometimes also by social compunctions relating to the unfair apportionment of this world's goods, they not unnaturally look with favor upon the line of defences which this new political economy provides.

Now for their purpose the main use of this new doctrine is that it serves to dispose of the charge against capitalists of exploiting labor. In England the best example of this treatment is given by Mr. Wicksteed, in a work which is at once the most complete and the most naive exposition of Marginalism.

If the final unit of capital, labor, or any other factor in a business or an industry, gets just as much in value as it produces (and it cannot get more or less, for otherwise a larger or a smaller number of units would be employed), then there is no surplus over and above these necessary marginal payments. For since the marginal units are neither more nor less productive than other units, but only marginal in the sense that they represent the limit to the total number employed, all units are equally productive and equally remunerative. As Mr. Wicksteed puts it:

We now see once for all that the marginal distribution in our sense (that is to say, the distribution of the product amongst the claimants in proportion to the significance of the addition or withdrawal of a small increment at the margin determined by the present supply) exhausts the whole product.

Again:

It is not open to anyone who understands the facts to argue that when, by a marginal distribution, every factor, reduced to the common term, has been satisfied, there remains any residue or surplus to be divided or appropriated. The vague and fervid visions of this unappropriated reserve, ruling upward as we recede from this marginal distribution, must be banished forever to the limbo of ghostly fancies.[1]

Not only is there no unearned surplus to fight over among the owners of several factors of production, but substantial justice is done to every separate producer by paying him "what he is worth"—that is his market value on a fair and equal computation under existing economic conditions.

If it is a fact that the most miserable earners of starvation wages are getting *all their work is worth*, the lamentable fact of the existence of a vast population worth so little must, when once recognized, force us to face the question how we can make them worth more.[2]

There are two main ways of "making people worth more."

One is breeding, rearing, training and educating them from the beginning, so that they shall possess the vision, the habits and the particular skill which are likely to make them worth most. . . . The other is to shift them to places and conditions in which they will be worth more than where they are.

In a word, the only way of enabling the workers, collectively or individually, to get more is by increased productivity. Dr. J. B. Clark expounds in America the same simple doctrine of natural equity, showing how, along the lines of this marginal analysis, "the market rate of wages (or interest) gives to labor

[1] *The Commonsense of Political Economy*, pp. 572–3.

[2] *Ibid.*, p. 345. (Italics mine.—J. A. H.)

(or capital) the full product of labor (or capital)." And not only to collective labor, but to the individual worker, for—"Each man accordingly is paid an amount which equals the total product that he personally creates."[1] In what sense a man's product can equal his pay, and how a man's product can be measured, are questions rightly relegated to a closer study of the curious logic of Marginalism. Here we are mainly concerned to show how the emergence of this doctrine in economic science is accommodated to the requirements of the influential classes for the defence of their economic interests.

It supplies a complete substitute for the wage-fund-cum-Malthusianism of the older Classical Economics. For, if everybody gets for his labor, or any other factor of production, just what it is worth, and can only get more by making it more productive, since the payment to each of "what he is worth" exhausts the entire product, leaving no surplus over which to quarrel—why, we are living in the best of all possible economic worlds, and anyone who, by agitation and wilful misrepresentation, tries to incite envy or stir up discontent, is as wicked as he is foolish. The charge of profiteering is meaningless, and combination can get nothing solid for the workers.

Leaving aside for the moment the question of the truth or falsity of this doctrine, consider how beautifully it fills the requirements of conservatism! What a rebuke alike to the envy and class hatred of the workers, and what an exposure of the folly and futility of ca' canny! What a sedative to the foolish compunction astir in the minds of many men of great possessions when they survey the condition of the poorer classes! And all this got out of a refined application of Butler's famous tautology that—

> ". . . . . the value of a thing
> Is just as much as it will bring."

equity being imported into the convincing proposition: "Every man gets what he can get."

The earlier uses of margins, as we see, made for the dis-

[1] *Essentials*, p. 92.

closure of rents and quasi-rents, not only in the case of land, but in other factors of production, yielding a large composite body of surplus, unearned, unnecessary payments, capable of being diverted by appropriate action either into higher wages or fuller revenue, while the Jevonian calculus of subjective utilities visibly led towards a still more dangerous revelation of the inequality of apportionment of satisfaction in the processes of production and distribution. The effect of the later Marginalism has been to sidetrack both these inconvenient applications of theory, and to substitute one admirably adapted for the re-establishment of confidence in the natural equity and efficiency of the economic system as it stands.

This statement I propose to support by a closer account of the logic of the use of margins.

II

Human Welfare in Neo-Classical Economics

In discussing the progress of Neo-Classical Economics in Britain, I have laid stress upon the increasing tendency to endeavor to convert Economics into a purely quantitative science. For the attainment of this object there are two chief prerequisites. The first is that the material measured shall be minutely divisible, its quantity growing or dwindling by infinitesimal units. This is the essential for the use of curves. The second is that all apparently qualitative differences shall be treated as capable of resolution into differences of quantity, by reference to some common standard. These two assumptions will be found to underlie that marginal calculus by which it is sought to secure for economics something of the authority of an exact science, as well as to render it a serviceable instrument for the defense of the existing economic system by displaying the economy and harmony of its normal working.

The marginal concept, as first employed by an extension of the Ricardian application in grading the productive qualities of the several factors of production, has a definite use. Just as in the utilization of the available supply of land for wheat or any other agricultural purpose, there is some land which, at the price of the product ruling in the market, it is just worth while to employ (marginal land), so with the existing supply of concrete plant or other capital available in a given industry, where it varies in efficiency, some of it will be only just worth while employing at a given price level for the product. If that price level should fall, the marginal capital (like the marginal land) will pass out of use. Similarly as to labor, where the available supply exceeds the normal demand, there will at any time be a marginal grade of workers just worth employing.

It is sometimes alleged that, regarded from the standpoint of payment, there is a difference between the marginal concept as applied to the several factors. Marginal land may yield no rent, marginal capital may yield no profit, but marginal labor must have a subsistence wage. But this distinction is invalid. If marginal land is to remain in cultivation, what is taken out of it in fertility must be replaced by rest, recuperation and fertilizers: concrete capital, if it is to be kept in use, must have its wear-and-tear provision. These costs correspond strictly to the subsistence wage of labor.

There is nothing mysterious in this use of margins of occupation, or employment, to designate the portion of the supply of any factor of production which, by reason of its quality, position, or some expense of utilization, is just worth using. This grading is a simple deduction from the fact that there can be only one price for the same article in the same market. It furnishes a convenient rule of thumb or observation-post for reckoning the rises and falls of prices, rents, profits, wages, in particular industries.

But when economists began to apply the concept of a margin intensively, as well as extensively, they began to get into difficulties. James Mill first popularized the conception of a farmer applying to a given piece of land "dose" after "dose" of capital and labor (either or both) until he reached a "dose" which added so little to the previous net product that it was only just worth while, i. e. the additional product, thus got, only just paid for the unit of capital and labor, leaving nothing over to remunerate the landowner. Now since no part of the produce of this marginal or most intensive cultivation can be regarded as rent, while the expense of raising this marginal product measures the price of the whole supply, it seems to follow that rent does not enter into, or form part of, the supply price. Dr. Marshall, showing that this argument is applicable, not to agricultural produce only, required us to hold that "ground rent does not enter into the expense of manufacture."[1]

The fallaciousness of this conclusion from the intensive use of the margin appears at once, if we apply to *a fixed quantity* of capital or labor the same dosing method. Take a given factory, or store, and apply to it successive doses of labor in the shape of operatives or shop clerks, you will come in time to a marginal employee whose productive work adds to the previous total product no more than just suffices to pay his wages (or strictly speaking a "minimum" more). The goods which this marginal worker must be conceived as making, pay wages only, with only a nominal provision for profit to the employer. Since the conditions of this marginal unit of supply must be regarded as regulating the conditions of price for the whole supply, it would appear that profit cannot enter into the price of the manufactured product, or the retail goods. The same result will evidently issue, if we take a farmer, or a business manager, representing a definite amount of organizing and executive capacity, and apply to him increasing quantities of capital and labor, so that his energy is spread over a larger and larger area of productive activity. There will be a limit to the size and complexity of the operations he can best undertake. So there will be a marginal product which only just remunerates the last dose of the capital and labor and leaves him no appreciably larger reward for his ability than he would have got by refusing the last extension of his business. His wages of management appear by this reasoning to play no part in the price of the product of his business, for the marginal product can pay no more than the "cost" of the marginal capital and labor involved.

The palpable absurdity of this line of reasoning is due to a

[1] *Principles*, second edition, p. 462.

false application of the Law of Diminishing Returns, and arises from an improper treatment of one factor of production as fixed, while another is variable. But though some recent adherents of Marginalism admit this application to be illicit, they still cling to one of its implications, viz. the attribution of a separate productivity and a separate value to the marginal increment of a simple or a composite factor of production. Some of them also persist in attributing, if not a causally determinant, at any rate a regulative part to the marginal increment in the theory of prices.[1]

The whole trouble is due to a misunderstanding of, and an exaggerated appreciation of, the Law of Diminishing Returns. The Law of Diminishing Returns is not peculiar to agriculture, and does not depend upon the "niggardliness of nature." It applies to every sort of business and industry. It simply means that in any line of industry there are efficient types of business which cannot be increased in size without damage. As regards the structure of whole industries, it implies that there is a tendency to throw all the business contributing to a market, e. g. the market in steel rails or cotton cloth or shoes, into forms best adapted to financial success. At any given time, having regard to selling prices, there will only be room for a particular number of such businesses (or plants) and they will all tend to be on a level of productivity and profit. If any more of these representative businesses pressed in (unless invited by some increase of demand in relation to available supply, raising prices) there would an oversupply at previous profitable prices and a diminishing return of profit to the trade.

[1] "There is a commercial principle which causes the last or marginal part of the supply to be strategic in its action on the value of the whole group. The value of the whole crop . . . *conforms* to that of the marginal bushel. If there are marginal laborers, in the sense in which there are marginal quantities of wheat, cotton, iron, etc., then the final or marginal men are likewise in a strategic position; *for their products set the standards* of everyone's wages. . . . The last increment in the supply of any commodity *fixes* the general price of it."—Clark, *Distribution of Wealth* (1899), p. 90. "The specific productivity of labor fixes wages—that is the thesis to be supported in this volume" (*ibid.*, p. 47). "There is before us the picture of social labor cooperating with social capital. Both are governed by the law of diminishing returns and their earnings are *fixed* by the productivity of their final units" (*ibid.*, p. 373). *Cf.* Davenport, p. 470.

The Law of Diminishing Returns simply means that in every business there is a type or types of maximum efficiency and productivity and profit, and that in any industry or market there is at any given time a limit to the number of such contributing businesses. So far as this law has meaning and validity it is equally applicable to all departments of industry. It is, indeed, an obvious deduction from the very concept "Economy."

Every department of production alike is subject to this economy. The so-called Law of Increasing Returns, supposed to be applicable to most departments other than agriculture, is based on a misapprehension of the economies of large-scale production. The power of a growing business to reduce its costs of production is only operative up to a certain limit. That limit reached, any further extension would bring an increased cost from diminishing efficiency of management. There may be businesses whose total available market is not yet large enough to evoke their full economy of large-scale production, and which, in consequence, appear to be conformable to a law of increasing returns. Some modern trusts or combines may achieve such continuous economies in production that, even after establishing a virtual monopoly, they have not fully exhausted the net economy of large-scale production, and still continue to be able to produce more cheaply as their monopolized market expands. But this only means that the limit which would launch such a big business on to an economy of diminishing returns has not yet been reached. It does not mean that there exist either businesses or industries free from this limit.

This explanation of the so-called Law of Diminishing Returns should suffice to gain admission for my central thesis, that the existence in every branch of production of a type or types of business with maximum efficiency negatives the conception of marginal factors of production less productive than non-marginal factors determining, or even regulating, by their separate productivity, the supply-price for a market. Supply prices are directly regulated by, and measure, the normal average cost of production for a unit of supply in a representative business. Reduced supply prices are due to some improved technique or organization, or access to cheaper materials or labor, for such representative businesses operating in free competition through enlargement of supply.

How have economists come to regard this separatist treatment of the marginal factor and product as intellectually satisfactory? They appear to visualize an entrepreneur, who plans a business, balancing the advantages of putting in labor-saving machines, or employing more hand-workers, and hesitating whether to employ so many male workers in a department or so many more female workers. They see an employer deciding after some experience that it is worth while increasing his staff in some department by so many men or reducing the staff in another, though the size of his market remains the same. But this only means that an entrepreneur has not firm knowledge of all relevant facts and so feels liable to error, or that he actually commits errors and corrects them. But neither Marginalism or any other principle can rest upon the assumption either that an entrepreneur doesn't know the proper plan of the business he is laying out, in his own mind, or that his correction of a miscalculation he has made by adding another machine or another worker can play any determinant part in the regulation of output or supply price.

Given an entrepreneur with complete understanding of his problem, he will apportion his available resources in the purchase of so many plots of land, so many workshops or office buildings, so much equipment of various sorts, so much money for purchase of materials and for wages and salaries. All these quantities will be definite and involve an accurate apportionment of his total capital resources to different purposes. Taking all together, he may consider that a capital of £150,000 is just what he requires. But this way of looking at it gives no significance or serviceable determination to the last £1000, or to the last, or any other, unit of productive power in the different departments.

The recent extension of Marginalism treats "doses" as infinitesimal quantities, applying them to the demand as well as to the supply side of the economic equation represented in a market or a normal price, and to all economic activities and salable articles. Economic life is thus reduced on its objective side to a number of infinitesimal activities and transfers of matter, on its subjective side to a number of infinitesimal acts of choice, both registered in the monetary medium.

Money being a single absolute standard of values and infinitely divisible and fluid, the concrete economic objects that it handles, measures and moves have a similar character imputed to them. This is the great bluff which the mathematical economists have put up. They have transferred to the organized industrial system the qualities of identical nature, infinite divisibility and absolute fluidity, that belong to money. In other words, they have taken the abstract or bookkeeping aspect of economics and applied it to concrete economics. Now concrete economics deals on its objective side with objects and physical activities, on its subjective side with feelings and valuations, that are different in quality or kind. To neither side is it rightly applicable. For these objective and subjective factors are finitely, not infinitely, divisible, and of slow and difficult mobility. In a word, the treatment of economics by the calculus of the infinitesimal is a wholly unjustifiable abstraction from the material of the study. Science, of course, must always proceed by abstraction, i. e. by ignoring not merely individual characters but such general characters also as are not relevant to the nature of its generalizations. So mathematics applied to astronomy may ignore the chemical composition and all the characters of heavenly bodies other than the movements with which it is concerned. Mathematics applied to economic phenomena may similarly abstract from the special characters of particular industries or standards of consumption in stating laws of supply and demand. But it cannot properly abstract from, or ignore, characters which belong to that very economic nature which is professedly the object of study. Yet this is what it does when it treats economic facts and forces as infinitely divisible, absolutely mobile, and capable of being reduced to a single kind by resolving qualitative differences into quantitative. It is not the abnormal or the irrelevant which it thus abstracts from, but the normal and the relevant.

Ruskin was right in charging the economists of his day in their treatment of the economic man with a folly analogous to that of a physiologist who should treat the human body as if it had no skeleton. Our modern Marginalists commit a similar mistake in affecting to treat economic material in general as being quite other than it actually is.

Let us take first the infinite divisibility of economic quantities, whether goods or factors of production, involved in the application of marginal increments to industrial movements. Continuous supply curves are based on the accumulation of such infinitesimal increments, effected by minute rises or falls of price operating on the agents of production. Now no concrete goods are infinitesimal in size. Even water is for purposes of supply composed of sizable drops. The earlier "doses" employed by economists were of appreciable size. Even the "marginal" shepherd of Marshall's theory, just worth his keep in the extra sheep he saved, was a whole human unit of labor.

Now in dealing with supply-curves representing the units of supply, the true unit is the representative business. Differing in form and size in each industry, there always exists one or more types of up-to-date, properly planned and equipped plants, whether they be factories, workshops, stores, mines, or farms, which because of their efficiency, tend to survive and to occupy the whole industry and market for the goods they produce. If increased demand for any of these classes of goods by raising prices stimulates increased supply, that increase proceeds, not by insensible and infinitesimal increments, but by whole representative plants. If an addition to supply is made in the cotton industry, it takes shape in a new up-to-date mill. That is the minimum unit. If more steel rails are wanted, a whole expensive plant must be installed. In any highly organized industry this happens. The limit of supply, or "dose", if the term be preferred, is a whole new business involving a considerable amount of capital and labor. An infinitesimal, or very minute, rise of supply prices will have no effect in bringing about this enlargement of supply. The rise of supply price must attain a certain size and security before it can bring in a new representative plant. Merely momentary or casual movements of prices may, of course, be met by speeding-up, or overtime, or other fuller use of existing factors of production. But even these increments in an organized industry are not "infinitesimals" but of considerable sizes. All increments or decrements of hours, or wages, or other conditions affecting costs of production, output, supply prices, are of sensible size. When the Millers' Association decides that too much flour is being produced in this country, it decides to close down so many mills, recognizing the mill as the unit of supply.

The representative mill is the unit of production, its full output is the unit of supply, its cost of production the regulator of supply price. The whole trade tends to be concentrated in mills of this type, though at any moment there may survive a few obsolescent or ill-managed mills carrying on a precarious existence and doomed to early extinction, just as there may be one or two super-mills with some special advantage of a secret process or some other pull.

The actual material of economics on its supply or productive side is thus seen to consist not of infinitesimal but of definitely sized quantities, organized units of production. But the same is true of the demand, or consumptive, side. At first sight this is not obvious. Consumption consists, it may be urged, of innumerable little single acts of purchase for use by individuals. Infinitesimal or minute changes in market price might seem to exert similar minute changes in quantity purchased by consumers. Though elasticity of demand will be different in different markets, curves can, it is urged, legitimately be drawn expressing by infinitesimal changes the effect of price-changes upon volume of demand.

But, just as on the supply side this theory ignores (or abstracts from) the organic structure of a business, the unit of production, so, on the demand side, it ignores (or abstracts from) the standard of consumption. For, just as it is the composite structure of the representative plant that determines how many machines or workers in the different processes shall be employed, so it is the standard of living in a representative family, or group, that determines how many units of this or that article of consumption shall be demanded. Though there will be wider variations in families and their standards than in businesses, the procedure of ignoring the complex nature of these standards of consumption is equally invalid. Infinitesimal rises and falls of market price are not reflected in demand and consumption until they have accumulated into sensible magnitudes. Otherwise expressed, changes in demand take place by increments of considerable size, according as some effect is produced by a price change upon the standard of a class.

A class standard of living is an organic complex, involving the purchase for consumption of a large variety of articles of kinds and quantities determined in part by real or supposed physiological needs or satisfactions, in part by habit, or tradition, or fashion. Everywhere some slight element of individual taste or need will be superimposed upon, or will vary, the standard. But the proportion of expenditure expressing the class-standard in most family incomes is very large.

But even the variations from a class-standard consist of sensible increments, not affected by insensible price changes. Most changes in personal consumption are not continuous and minute but sudden and considerable. When taxation on tobacco and liquors causes individual consumers to give up cigars and take to pipes, to substitute beer for whiskey, or to drop the consumption of one or both, these are changes of considerable magnitude, affecting, by imitation or common consent, whole groups of consumers and causing a large mutation of demand.

I use the term "mutation" deliberately because of its connection with the theory of development in organisms. For one of the main charges against the application of the infinitesimal calculus to economics is that it treats organic material as if it were inorganic. Or, if the term "organic" be questioned, in its applicability to a business or a standard of living, the term organized, expressing the active will of organic beings, supports the same charge. Changes in organization are not accomplished by insensible but by sensible increments.

Moreover, alike in business and standards of living, the changes that take place are determined, not at the margins of production or consumption, but at the centers, and affect the whole composition of the bodies. When a business changes by taking in some new machine or process, this mutation is sudden, and reacts in countless ways upon the various other material and human agents. Similarly with a standard of consumption, when any new article of consumption enters or is removed, the change involves a new composition of the standard. Prohibition in America, so far as effectual, has changed the whole distribution of the family income, involving, not merely an expanded use of sugar, but an increased demand for Ford cars, with innumerable other economic and vital alterations.

It is the neglect of the organic nature of business and standards of living that leads some economists to think that not only definite size can be abstracted from, but qualitative differences. Money, as the measure of all economic things, can substitute quantitative for qualitative value. Different kinds of costs and utilities can be brought to a common measure at their margins!

The treatment runs as follows. Whenever you buy anything, you may either set your mind on the utility or satisfaction attaching to the thing you buy, or on the cost of doing without the other thing you would have bought if you hadn't bought this instead. Since what everyone is really after is some sort of satisfaction, it is best provisionally to take the view that every purchase expresses a preference for a particular kind of utility over other kinds. This is evidently true both of a producer buying factors of production in his business or of a consumer buying consumable goods for his family's livelihood.

Now if a business man's accounts show that in any given year or week, he spends a number of different sums of money upon the purchase of raw materials for his works, coal, rent for his premises, wages for manual and clerical labor, it must be admitted that the last pound he pays for any one of these things purchases the same amount of productive service or utility as the last pound spent on any other. If he is found spending £60 a week on manual wages, £8 on clerical wages, the sixtieth pound in the former must be considered to buy the same amount of utility as the eighth pound in the latter. This follows from the warranted assumption that our business man is an economist and knows what he is doing. The fact that he has apportioned his expenditure in this way seems to carry an implication that he has carefully and separately balanced the services of the office boy he has included in his clerical expenses with the services of another young machine tender he might otherwise have got for the same money, or with the extra ton of coal he might have laid in, in anticipation of an early rise of coal prices.

Now these several productive utilities, though quite different in kind, are supposed to be referred to some common standard of utility in the mind of our business man. The earlier units in each set of expenditures are taken for granted as belonging to the accepted routine. But the final units are matters of delicate balance and selection between different advantages. It may not be easy to envisage psychologically how the relative advantages of smoother office work, increased output, and provision against a future coal-shortage can be brought to a common denominator in the mind of our business man. But the action taken seems to imply that this miracle has been performed, differences in kind being reduced to differences in quantity of some common good.

Still more interesting is the application of this principle to the consumer. The housewife who spends three-and-sixpence in buying seven pounds of sugar, instead of spending three shillings for six pounds and putting the odd sixpence into a fund she is accumulating to buy a pair of boots, has compared two marginal uses of this sixpence and decided in favor of the seventh pound of sugar. The whole of her expenditure of the family income involves, it is urged, a number of these delicate marginal choices of alternatives which appear to differ in the kinds of utilities they procure. Or, if these utilities seem not widely different in kind, take the case, cited by Mr. Wicksteed, where a man decides to spend a loose pound, in six shillings on a dinner, four shillings on a concert ticket, ten shillings on a contribution to a missionary society, when he might have distributed the sum on these same objects in some different proportion. Has he not succeeded in performing the feat of comparing the various sorts of satisfaction which good feed ing, music and moral satisfaction would procure by reducing these diverse goods to some common subjective standard? Has he not decided that the tenth shilling given to missionary enterprise just yields more satisfaction than another course at dinner, or a slightly better place in the theatre?

Now it would be foolish to deny that there are circumstances under which these delicate adjustments at margins of expenditure, apparently involving comparisons of different sorts of units of satisfaction or utility, take place. What are these circumstances? They arise when some alteration in a standard of production, or of life, is required.

Taking the case of a representative business, I have shown that, since the quantity of each factor of production is predetermined by the unity of the business plan, no significance can be attached to the final units of each factor. The mind of the entrepreneur does not concern itself with comparing the final units of expenditure upon each factor to see that they yield the same productive utility.

Now the same holds of a consumer, laying out a regular family income on an accepted standard of living. The housewife, with her £4 to spend upon the maintenance of her family, proceeds on the lines of an accepted budget, which expresses, not a number of separately measured items, but a certain unity or harmony of needs or requirements. Each of the items has a definite quantity or limit, but that quantity is determined by the general plan of family well-being conceived by the housewife with sufficient clearness of consciousness to guide her actions.

She lays out the regular family income on the same principle as the entrepreneur lays out his capital in running a representative business, so much on this item, so much on that, the "so much" in each case derived from the requirements of the composite standard.

Now if standards of business and of living were absolutely static, in respect to goods, services and prices, this explanation would suffice. But, of course, they are not. Neither for the business man nor for the housewife is this week an exact replica of last. Some change, however small, in the income available for expenditure may take place, some changes in the prices of goods and services are always happening, and some changes in the nature of the family needs. Now when such changes are reasonably predictable, they can be provided for in the plan or standard of a business, or a family maintenance, and can thus be incorporated in the standard. A reserve or insurance fund will often provide for such changes. But when they are not, when some unforeseen business incident, or change in income, requires some deviation from the accepted standard of expenditure, the procedure inevitably concentrates upon marginal alterations. The standard remaining substantially the same, no attention need be paid to most of the units in its several factors. But when the required reform involves a number of small but disproportionate reductions in the size of several factors, in order perhaps to incorporate some new factor, the paring process must be closely watched and the shifting carefully measured.

If our business man is called upon to add some new process, involving an economy of current expenses, or of factory space, the detailed adjustments he makes will involve taking just so much from this and from that in order to find just so much of the new accommodation. If he is not quite certain of his ground, he may proceed by trial and error, making a series of little adjustments "at the margin" until he settles down to the new economy. But, all the same, this new economy, the exact "how much" for each item of expenditure, is regulated by the organic character of the business as a whole, not by the changes at the margin. These changes are consequential in their nature and size upon the new economy of the business as a whole.

Just the same with the housewife who is called upon to economize in other items of her budget in order to make special provision for a sick member of the family. This sudden obligation to extemporize a new standard of living compels her to examine closely the parts played by her former purchases in the old standard, so as to see how much she can transfer from each of the old factors to make provision for the new. Now, that she must pare off just so much from this, just so much more or less from other factors, perhaps leaving some untouched, is obvious. But how far must we visualize her making marginal comparisons of different kinds of utility or satisfaction, in order to get the new standard? Her new standard will involve buying a pound less butter, suspending the weekly shilling towards new boots, knocking off a joint of meat, and reducing by ninepence the family expenditure on "the pictures". She has thought out, or more properly she has felt, what the new standard involves and this is what it comes to. But in what sense has she made the set of separate comparisons of marginal utilities which this scientific analysis of her conduct implies?

Is there any way in which she can be conceived as balancing the utility of another half pound of butter against ninepence of "the pictures" and just deciding against the latter? I think it is a psychological error to represent her as doing this. The error consists in reading a psychological act which does not take place into an objective act that does. Undoubtedly she thinks, "How much does the new emergency require me to knock off this item, and how much off that, in order to provide for an estimated new expense?" But she doesn't perform the impossible task of comparing marginal values of two different kinds of satisfactions. The emergency has put into her mind a new standard of living with changed valuations for the old items, regarded *en bloc*. These changes of valuations *carry with them* reductions of purchases of different sizes and properties. The mathematical treatment, imputing a number of separate acts of measurement and a reduction of different kinds of feeling to some common term, misrepresents the nature of a personal act of judgment, and a personal economy.

A person adjusting the use of his resources to the demands of a new situation makes a number of delicate adjustments at the margins. But the determinate judgments, of which these delicate adjustments are expressions, are made, not at the margins, but at the center. They are the quantitative implications of the new organic plan he has applied. If we regard him as a creative artist working out a new ideal with the materials at his disposal, we shall get nearer to the true psychological interpretation. A painter in mixing colors to get some particular effect must exercise care to obtain the exactly right proportions. This care will be greatest when in mixing he comes near the limit, and is in danger of putting too much or too little of the several colors into his mixture. A marginal economist, observing him, might pronounce the judgment that he kept adding increments of the different colors until he stopped, and that therefore an exactly equal art value must be attached to the last increment of each color. For if the last brushful of Turkey-red had been found to have less value than the last brushful of green, another would be added, so as to even out the values of the different colors at the margin.

Now this, of course, simply means that in every sort of composite plan, economy or harmony, involving the use of different materials, some exact amount of each material is required. In forming such a plan no special thought is directed to the marginal unit of each factor. But in carrying out a change of an existing plan, the process of shifting pieces from the old plan to the new involves a series of operations at the margins. The size of these operations is, however, determined and laid down in the conception of the scheme as a unity. The painter, not knowing exactly how much of each color is required to produce his effect, may try a little too much of this or too little of that, rub out, and begin again until he has it just right.

But the idea of imputing any special value to the marginal units, or of regarding the artist as comparing the colors at each margin by some common standard of art value, is alien from the psychology of art. As soon as it is clearly comprehended that the business man, the consumer, and every man pursuing a line of policy or conduct, is acting as an artist, the invalidity of Marginalism will be equally apparent in their cases.

In any line of conduct where quantities of different factors are involved, the plan of conduct involves in its execution exact manipulation of these quantities. But there is no meaning in assigning to the final units of the different factors the same value, or indeed any separate value. Such separatism or atomism is the repudiation of creative action and the organic unity which it expresses.

Summarizing, we may say that when a statical condition of a business or an industry, a family or a class standard of living, is the subject of inquiry, the separate cost or utility of the marginal unit, were it ascertainable, would have no significance. The exact quantity (and therefore the margin) in each case is determined, in the causal sense, by the organic make-up of the business, industry, or standard of living, as a whole.

Where a new standard is in course of formation, the operation involves a number of quantitative changes in the factors of the old standard which occasion a rise or fall of the margins. There may be a practical utility in watching and measuring these marginal changes which register the differences between the old standard and the new. The acts of composition and substitution, of which economic conduct so largely consists, demand many of these marginal adjustments.

So far we have been dealing with objective standards of production and consumption, and their monetary indices. But any treatment of economics, as an art, or science, of human welfare, involves the translation of the fund of objective wealth, its factors of production and of consumption, into terms of human or subjective utility and cost.

The product of a business, or an industry, will, it appears, vary in the amount of economic welfare it contains, according as the total cost or disutility of producing and the utility of consuming it are high or low. The amounts on both sides of the equation will evidently vary with the distribution of the productive cost and the consumptive utility. The maximum wealth, or welfare, attaching to a stock of goods, will involve such a distribution of the productive energy as will yield the minimum of painful or injurious effort on the one hand, and such a distribution of the consumptive utility as will yield the maximum of pleasurable or serviceable consumption. The true principle of "economy" is thus expressed in the maxim "From each according to his powers, to each according to his needs," for this would assign the lowest aggregate cost and the highest aggregate utility to any product. The art of political economy should evidently be directed to the contrivance of methods for the fullest possible application of this principle. But when we come to subjective costs and utilities, satisfactions and dissatisfactions, how far is it possible to aggregate them by additions, or by setting off one against another? And in such a process, so far as it is possible, what part is played by margins or surpluses?

In this problem of envisaging a body of objective wealth in terms of subjective wealth, or welfare, it is impossible to give a separate treatment to the cost of production and utility of consumption. For the amount of "satisfaction" which such a body of wealth represents must take both into simultaneous consideration. Both the individual and the group, or society, must be treated from a producer-consumer standpoint. You cannot, even theoretically, consider the amount of disutility, or painful cost, which goes into producing a body of goods, separately from the consideration of the amount of utility, or satisfaction, it yields in its consumption. For these two considerations evidently interact. Conditions of production, in respect of hours of labor, nature of work, etc., must react upon conditions of consumption, i. e. capacity for utilizing or enjoying objective wealth. Conversely, conditions of consumption, e. g. amount of leisure, skill in utilization of commodities, will, by reacting on efficiency, make a given working day easier or more difficult. This will be true even as regards the translation of a given concrete body of goods into human welfare. It will, however, be much more important if the concrete body of goods is not given, but depends for its composition upon the needs and desires of the producer-consumer group.

Here we come to the proper setting of the problem of economic welfare. How to utilize the human and material resources of the group for the best satisfaction of their wants? That satisfaction must have equal regard to the most serviceable and least injurious employment of human activities in production and in consumption. It must not take activities of production as mere means to consumption, even if there be a general presumption in favor of diminishing the total activities of production and increasing those of consumption.

Welfare may be taken to reside as much in the instinctive and trained activities of a man for constructive work as in the application of the product or concrete result of these activities to some human use or consumption after its production is ended. In the realm of economic goods the kind of production termed "art" is the chief example of the close relation between the producing and consuming sides. It also serves to disabuse our minds of the assumption that a stock of goods must represent some net cost, or disutility, in its production. This is evidently untrue of work which is upon the whole, interesting, pleasurable, and not too exacting in the terms of its production. The central problem of economics may thus be conceived as "How to get as much work as possible to yield a net balance of utility or satisfaction in its performance, consistently with an equal regard to the utility or satisfaction obtainable from the products after they are produced." The trouble is that a large proportion of the work required to satisfy primary physical needs appears to be such as must involve some net cost of disutility or disagreeability to the producers, only to be made up to them in their consumer capacity.

We are, however, concerned here not with proposals for the establishment of an ideal economic society, but with the narrower question how far a mathematical calculus is applicable to the problem. And here, I think, psychology must have a decisive word to say.

We have already seen that an individual possesses, in some general unified conception of his personal good, a power of valuing the rival claims of different sorts of satisfaction or dissatisfaction. Crusoe's economy would clearly be directed by some such general conception of his producer-consumer personality. His distribution of his time and energy among various activities of production would follow the lines of his thought, or feeling, in relation to the interest, arduousness, disagreeability, or risk, of the different sorts of work, with due and simultaneous regard to the importance or satisfaction of the uses of the product of each sort of work. He would give just so much time and effort to producing just so much utility of consumption of different sorts. It is thus possible to conceive the last minute Crusoe gives to cutting down a tree as having the same cost as the last minute given to roofing a shed, or digging a bit of land. But this marginal equivalence has no real significance. It simply follows from Crusoe's total conception of his plan of life, including the utility of consuming the product of his last unit of labor together with the irksomeness of producing it. Nor would this quantitative analysis yield a separate producer's surplus for one particular kind of work, or even for his work-day as a whole. It is true that if he decided to dig his field for just two hours, by breaking up this time into a series of five-minute units we can discover a curving surplus of producer's gain, growing in size towards the first unit.[1] But since, in the subjective valuation of his digging he included the utility of the various units of consumption with the disutility of the various units of production, his margin of digging and the producer's surplus would be affected by the marginal consumption of the food produced and the consumer's surplus. In other words, he is after the largest producer-consumer's surplus, and the margins on each side of the equation are determined by this whole plan of work and living.

Now this economy of his is dependent on and derives from his organic unity or harmony. Can we impute a similar economy to a society or group of producer-consumers? Were it possible for a completely socialist society to operate successfully, such an economy might seem attainable. It would, however, involve an abandonment of the strictly subjective or personal valuation in a Crusoe economy and the substitution of a social valuation which would be more abstract in the sense of disregarding the closely individual feelings that enter into work and enjoyment. Having to decide how much productive energy of different sorts, and operating under various conditions, should be put into producing variously sized stocks of goods for the immediate and postponed satisfaction of many different wants, it would have begun with substantially the same problem as Crusoe. But not having the same closely unified personality to test the various claims and choices, it could not solve it as effectively. It could not add together the subjective values of its different members, for such a psychological performance is

[1] Not, however, an even curve, as industrial psychologists now show, for the first five minutes are more disagreeable than the second.

impossible. There is, strictly speaking, no standard for comparing A's pain or pleasure, in his first hour of work, or his day's work, with that of B, and the same applies to their respective satisfactions in consuming any given good.

All that the socialist society could do would be to erect standard economic men and women, by arranging the indications of the subjective valuations as objectively expressed in measured curves of supply and demand. It would have to ignore all deviations from these standards, or at least, to make certain allowances which would, in their turn, be standardized averages. This criticism is no reflection upon socialist experiments, which are based upon assumptions about common needs and common human nature.

But such a socialist society would have to ignore certain important qualitative facts which should rightly play an important part in determining any aggregate of economic welfare. For instance, the obligation it would impose on all alike to perform a certain minimum of routine service for society would involve very little, if any, subjective cost on persons who enjoy, or do not mind, such work, while it would involve a heavy, sometimes almost intolerable, cost on others. Equality of sacrifice, in other words, involving impossible subjective estimates, could not be even approximately secured. Nor could a socialist society, apportioning the product according to some objective standards of need, allow for the wide differences in capacity of enjoyment or utilization in persons possessing different tastes or trainings.

Nor could these defects in the subjective producer-consumer economy be remedied adequately by the statistics of a price-system. For though it might be held desirable for a socialist state to regulate the rates of production and consumption of different goods by adjustments of wages for labor and of commodity prices, this would by no means secure the ideal distribution favorable to the maximization of welfare. For the inequalities of income it would involve would have no determinate relations to consumers' needs or utilities. Or conversely, changes in consumption, thus occasioned, which involved some large increase of heavy routine labor in production, might involve a net loss of producer-consumer welfare, the total real income representing a rise in subjective costs that exceeded the rise in subjective utility or satisfaction from the alteration in the standard of consumption.

In other words, a socialist state, not having the organic sense or consciousness of a Crusoe, cannot be capable of making those delicate references to a standard of personal values which are possible for the individual producer-consumer.

Can a competitive society of producer-consumers fare better? By delicate discrimination and choice, free owners of labor and capital may apply their factor to such productive activities as will yield them the largest net advantage. The owner of labor will weigh producer costs against consumer utilities; the owner of capital will weigh present consumers' goods against future. Such is the hypothetical procedure. But is there anything in it to guarantee, even approximately, a maximization of economic welfare as expressed indifferently in productive and consumptive costs and utilities? Professor Pigou, as we have seen, confining his analysis of economic welfare to the consumer side, does not furnish any answer to this question. His elaborate application of Marginalism gives a general endorsement of the view that under free competition the product will be maximized, and that the natural distribution of it cannot, even in the interests of the poorer classes, be advantageously interfered with. "Artificial" interference with distribution may, indeed, be effective in increasing the "welfare" attached to the product, so far as "monopoly" conditions attach to an industry, or where an increase in the workers shows results in increased working efficiency, and in one or two other exceptional cases. But:

> generally speaking, a transference of resources from the relatively rich to the relatively poor, brought about by interference with the natura' course of wages at any point, is unlikely to do otherwise than injure the national dividend, and therewith, in the end, the real income of the relatively poor.[1]

[1] *Wealth and Welfare*, Part III, chapter viii, s. 2.

The relevant and important fact, that in most normal processes of bargaining, the inequality of power between the relatively rich and the relatively poor (apart from any definite monopoly) gives to the former a share of the product which is excessive, in the sense that it furnishes no necessary incentive to productive activity, is excluded from Dr. Pigou's analysis. This exclusion, which follows inevitably from the application of Marginalism, precludes economic policy from all effective steps to a better distribution of the product. For, though Dr. Pigou admits at the outset of his analysis that there are sound grounds for holding that "other things being equal" an approximate equalization of increase would enlarge the "welfare" attaching to the national dividend,[1] his method of procedure rules out all possibility of accomplishing such equalization, except by steps which, in his opinion, so reduce the dividend that even the poorer classes will be worse off than before. Although this depressing judgment is qualified by an admission that some artificial interference with natural laws of distribution, so as to secure the poor against "extreme want" is justified, that very qualification contains an implicit recognition of the futility of the whole procedure regarded as a mode for correlating economic wealth with economic welfare. For here the collapse of the quantitative analysis appears in the admission that "the good of abolishing extreme want is *not commensurable* with any evils that may follow from the diminution of the dividend."[2] When Dr. Pigou goes somewhat further, as he does, in endorsing the economic feasibility of a higher minimum in a relatively rich country,[3] one feels that he is imperiling the delicate and fragile structure of his calculus, in favor of some humanitarianism that is grit in the mathematical machine.

But, reverting to our main topic, this able application of Marginalism to the correlation of wealth and welfare fails altogether to deal with the subjective problem.

[1] *Wealth and Welfare*, p. 66.

[2] *Ibid.*, p. 395.

[3] *Ibid.*, p. 397.

It fails in the first place, as I have already noted, because it takes no direct account of the "welfare" represented in the different modes and distributions of the utilities and costs of producing the national dividend. This is an error of primary importance. For, by a separatist treatment of the distribution of the dividend, Dr. Pigou fails to present the problem of economic welfare in its true organic unity as the collective efforts of the human instincts and desires to obtain satisfaction in an economic system. All the changes in the distribution of the dividend, which he discusses, must have reactions, through changes in the nature of consumption and demand, upon the productive activities, and so upon the net human "costs" involved in the dividend. Consideration of the interactions between the distribution and qualities of production of the dividend and the distribution and qualities of its consumption is essential to any fruitful correlation of wealth and welfare.

But, apart from this central flaw, Pigou's application of Marginalism to distribution of the product suffers from the general defects we have already noted. Marginalism by its *modus operandi* negates surplus income by assuming perfect terms of divisibility, mobility, and opportunity, for all new factors of production. Though Pigou and some other Marginalists introduce qualifications afterwards, by admission of monopoly powers or imperfection of mobility, these admissions go no further than allowances for frictions in an otherwise perfectly working mechanism.

For furnishing a calculus of economic welfare, comparable to the process by which a Crusoe regulates his economic life, Marginalism, representing a large number of separate acts of choice made by separate persons, is inherently incapacitated. The predetermined harmony by which these seemingly unrelated acts are wrought into a unity of social well-being, does not exist. It is simply assumed by excluding every element of economic truth that conflicts with it. This is not a legitimate process of abstraction rightly employed by science for its generalizing work. It is an illegitimate attempt to rule out the qualitative differences related to different human personalities, by pretending to resolve them into quantitative differences.

The admission, frequently made, that there are some parts of consumption, i. e. those of vital necessaries, which are infinite or immeasurable in utility, accompanied, as should be the case, by a similar admission that some "costs" are likewise infinite and immeasurable, should have put economists upon their guard. For just as there is no way of measuring necessaries against unnecessaries (for "all that a man hath will he give for his life"), so there is no legitimate way of measuring in subjective terms of human good, higher kinds of work and higher kinds of satisfaction against lower. The methods by which they *appear* to be measured, i. e. market prices, do not really measure them. What they do is to abstract an average economic man and measure them in him, treating him as a Crusoe for this purpose. Now the process of abstraction or generalization seems to enable them to give a social human value to a national dividend, according to its quantitative distribution.

But the abstraction ultimately rests on an assumption that, when two persons give the same sum of money for the same amount of a commodity, they are getting the same subjective utility, or human gain, out of the bargain. Now this assumption will not bear scrutiny. The equal price does not warrant this identity of gain. A rich man pays sixpence for a loaf of bread. So does a poor man. But by admission there is no commensurability between the utility or welfare conveyed in the one case and in the other. The false assumption is a double one. It assumes first equality of income or purchasing power, secondly, identity of personal needs and valuations. It is the latter false assumption that invalidates all purely quantitative valuations of subjective welfare. You cannot average these differences of kind, or refer them to a social standard analogous to the personal standard Crusoe brings to bear.

But though no social standard exists for the direct measurement and valuation of subjective utilities and costs, it by no means follows that science is helpless in the matter. The problem is familiar to psychologists. No direct measurement of psychical phenomena is possible. But when these are accompanied by physical phenomena, the latter are often susceptible of accurate measurement. So far as economic welfare consists in subjective good, it cannot come within the mathematical calculus. But where reliable physical indices of welfare are found, a social standard may be erected out of them, sufficiently reliable for practical purposes.

The correlation between statistics of wages and employment and certain accepted hygienic standards is one among many examples of this method. Low mortality and disease rates are legitimate indices of subjective welfare. Statistics indicating the increased demand for higher education, the diminishing expenditure per head on alcohol, unsanitary housing, and many other measurements of the objective standard of life, are rightly taken by statesmen, social reformers and others, as sound evidence of an advance or decline in social economic welfare. Statistics of the reduction of hours of labor in industries, the advantages of rest intervals, as shown in reduced accidents or better output, may similarly be taken as sound evidence of reduced human costs of production. Not only the science but the art of economics is largely based on assumptions that human welfare is affected favorably by a more equal distribution of material goods, and a more equal call upon productive energy. But though, alike for statesmen and reformers, these are warrantable assumptions, enabling them to erect social standards, it cannot be held that such standards are endowed with the qualities of exactitude that belong to the statistics utilized in their making. Nor is it true that any two statesmen or reformers, translating the measured evidences of improvement into their welfare content, will apply the same standard. For, in the last resort, it will be his own personal appreciation of what is good for others that will form each statesman's subjective standard of reference for the various objective economic gains or losses.

These considerations, however, do not invalidate social standards as much as might appear. So much stress is commonly laid upon human differences as to conceal the size and importance of "common humanity". In asserting the valuation of various ingredients in a standard of living, any two values are likely to be in close agreement as regards nine-tenths of the substance of the standard, as is shown by comparisons of the actual expenditure of different members of the same economic class. While, therefore, a social standard of economic welfare will be less exact for a society than for an individual, it will be conceived in the same way. Instead of a Crusoe referring each claim of production and consumption to the organic standard of his personality, the policy of a society, so far as directed by some general regard for public good, will operate by setting up a standard, or several standards which express the agreed elements among the different valuations of those who are effectively responsible for these standards. The adoption of a "common rule" for conditions of labor, and in general for various standards of living, is thus to be regarded, not as the addition of a number of separately measured desirables, but as based on an organic conception of social economic good, involving and imposing certain proportions in the expenditure of time, money, objective energy, and other measurable things.

The use of index figures and other modes of measuring exact movements of wages, employment, prices and volumes of trade, money and other economic objective facts and forces, is the assistance they render by enabling us to see where and how some existing standard of work or living is being weakened or undermined, and where and what steps can best be taken to safeguard it, or to improve it. In progressive economic communities such measurements are serviceable chiefly in helping the application of new and higher standards rendered possible by increasing wealth.

But the belief that economics can become even a moderately exact science rests upon fundamental misconceptions of the limits of science in dealing with economic conduct. The chief misconception, as above indicated, lies in the claim that somehow qualitative differences can be converted into quantitative. This has always been the crux of mathematical hedonism in all its applications. The utilitarian calculus is inapplicable to differences of kind. The mathematical hedonist economics, as Veblen shows, is unable to deal with development of the economic system as distinguished by mere growth. "Like other taxonomic sciences, hedonistic economics does not, and cannot, deal with phenomena of growth, except so far as growth is taken in the quantitative sense of a variation in magnitude, bulk, mass, number, frequency."[1] An improvement in the quality of work or of consumption, in its reactions upon worker or consumer, cannot be quantitatively assessed. You cannot say "how much" better is the "higher standard" of work, or consumption, than the "lower" whose place it has taken, any more than you can say that a noble character is fifty per cent better than an ignoble, or a great work of art worth twice as much as an inferior work. Money, the measure of all things economic, is inapplicable to measure qualities, even as reflected in current desirability. All art is a denial of the validity of this quantitative valuation. For though it involves exact quantitative measurements, these are always subordinated to considerations of organic unity or harmony of parts, qualitative considerations.

One point remains to complete our statement of the limits of a quantitative calculus in economics. In the main we have followed the usual course of science in dealing with things as they are, not as we conceive they ought to be, or might be. We have shown that, taking current standards of valuation for economic welfare, the methods of mathematical calculus can yield no results corresponding to their formal exactitude. For their assumptions of infinite divisibility and absolute fluidity of the material involved, are not legitimate assumptions, while the method by which differences of kind appear resolvable into differences of degree involves a *petitio principii*.

So far, however, current desirability, as reflected in the appraisals of all who take part in the economic operations, has figured as the underlying, though intrinsically immeasurable standard. But we cannot in the art of Economics exclude the other sense of the desirable, viz., what ought to be desired. This exclusion could only be possible if the attitude of the organized society, as state, merely kept a ring, and let the competing or combining interests in the economic sphere fight it out among themselves, each actuated by his own sense of the desirable. But the increasing part played by every modern

[1] *The Place of Science in Modern Civilization*, p. 192.

state in the control or regulation of economic matters, makes it no longer possible to identify the desirable with that which is currently desired. The state imposes standards of desirability based avowedly on hygienic, moral and economic politics, not representing the currently accepted conscious desires of those concerned, but some ideal of health, education, or other element of social welfare incorporated in a standard of life higher than, or different from, that expressed by any average or representative valuations along current lines of desire.

Though seldom departing very far from the current standard of values, it gives a "lead" in certain directions, guided by some half-conscious ideal. If, therefore, we are to take all relevant considerations into our view, we must envisage economic welfare as a mixed or compromise concept, in which average current desires are qualified by social ideals.

From the standpoint of a science aiming at exactitude, this seems very unsatisfactory. But we find the same compromise between current satisfactions and more distant aspirations in every sort of conduct. Everywhere it limits the ability of man to make clear, precise and certain plans for his immediate and future conduct.

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