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THE UTILITY OF INCOME AND PROGRESSIVE TAXATION.

THE purpose of this paper is to bring forward certain considerations bearing upon the relation between Utility¹ and Income and the practical application of the commonly accepted doctrine, which may seem to be of a somewhat heretical bent. Its argument falls naturally into three parts: (1) a constructive treatment of the relation between Utility and Income; (2) an examination of certain fundamental grounds on which the law of diminishing utility, as commonly interpreted, has been supported; and (3) a discussion of the alleged connection between the principle of progressive taxation and the law of diminishing utility.

The best way of making clear the fundamental notion to be expounded is to approach it gradually. First, then, we may notice that, even if income is generally subject to diminishing utility, there are certainly points of discontinuity too important to be overlooked. Thus in Fig. 1, units of income being measured along OX and units of utility along OY , let the successive ordinates of lg represent the increases in the total utility of income to a given person² as income advances up to Ob . When his income is Ob , say, he decides to have a motor car; and, in order to have a very simple case to deal with, let us imagine that the possession of a motor car would not in the least affect the manner in which he would spend income on other things or the utility attributed to them. Suppose the cost of the car, expressed as a continuous annual charge, is ab . Then the annual value of the car to him must be af when bf is such that $cde = efg$. Now, if, after getting the car, his income

¹ Utility is taken merely as a symbol representative of degrees of preference or choice, which are not to be regarded as necessarily measuring impulses or feelings. Through choices or decisions subjective human experiences are transformed into action. By "utilities" I mean the quantitative relations between these decisions or choices, which express, while leaving screened, the internal happenings which the psychologist studies. (See also page 33.)

² Throughout this paper, to avoid circumlocution, individuals will invariably be spoken of, though it would frequently be more appropriate to speak of families.

still increases, the curve of the new marginal utilities will obviously start at h (when $hb = da$), and fall from that point; for the car has displaced the things which brought the marginal utility of money below da . So, when this person's income is a little less than Ob , its marginal utility approximates to bg ; but, when it is a little more than Ob , its marginal utility approximates to bh , which is substantially greater than bg .

This demonstration holds of all expenditure on costly things, on the assumptions stated. But we cannot stop at this recogni-

FIG. 1.

tion of discontinuity. The new expensive thing, besides displacing certain things, may alter substantially the values attributed to other things—and is, indeed, almost bound to do so in some degree—so that a thorough-going rearrangement of the scheme of consumption in question is involved. Most schemes of consumption are discovered on close inspection to be coherent systems (of an organic nature, as one might say) the parts of which fit into one another and determine one another's subjective value. Nor is this all. It will be found in addition (as the doctrine of class standards of living lays it down) that different schemes of consumption are as a rule variations of certain distinguishable types, which are kept comparatively intact over

lengthy periods by habit and social assimilation, though they are never so well-defined that their existence cannot be overlooked. Objectively viewed these types may merge into one another, but subjectively—to the individual—they exist as discontinuous. People usually advance in the social scale by distinct steps.

Let us consider the effects of spending different incomes with reference to some specific standard of living the cost of barely realising which is £300 a year. When the income is just about £300 a year, and the standard is aimed at, the person in question feels pinched—that is to say, the marginal utility of money to him is high. When, on the contrary, the income is well over £300 a year, he feels himself to be in easy circumstances—that is to say, the marginal utility of money is low. The case, up to a point, is analogous to the much-quoted one of the collector who aims at a complete collection.¹ As in that case, so in this, the marginal utility gets greater as the object pursued is approached. Hence it would seem as if incomes devoted to realising a given type or standard of expenditure obeyed some such law as is exhibited by the curve of marginal utilities *gff* in Fig. 2, where the axes stand for the same as in Fig. 1.²

Next let us consider what happens to the adaptable person when his income advances from about £300 a year to a considerably larger one. Let the curve *gff* indicate the successive additions to total utility as his income varies when he spends it according to the £300 standard. Sooner or later, however, he alters his standard of living. Now the law of utility with respect to the new type will be of the same order as that with respect to the old, but the maximum of marginal utility of money will be reached, say, at £600. Let the curve *gh* in Fig. 2 represent the variations of the marginal utility of income with reference to this type. This curve must, for a time at least, rise less steeply than the curve *gf* because increments of income just in excess of *Oa* have relation to a further removed end when expended with reference to the higher type.³ Let us

¹ The reader may be referred to Dr. W. R. Scott's admirable analysis of this case in his paper printed as one of the monographs published by St. Andrews University at the time of its quinqucentenary celebrations.

² The shape of the curve probably resembles that of a lop-sided cocked hat. But, despite the more gradual descent on the right, the curve must soon get close to *Ox*, so far as the individual's expenditure on himself is concerned, because many possibilities are excluded by the constraints of the type.

³ For example, money laid out on clothes, when the lowest type was aimed at, would be spent with a view merely to comfort; but, when a higher type was aimed

suppose that the minimum income necessary for subsistence is Oa , and ignore any utility connected with this. Then the higher standard will be adopted when income is Ob , Ob being such that $gfe=cde$. So, as income advanced from a to k (on the assumptions that there is no simpler type of expenditure than the one of which the variations in utility are shown by the curve gj , and that yet a third type of expenditure is not assumed) the marginal utility of income would be traced out by the line $gfcdh$, those parts of the curves which are marked gd and cj remaining hypothetical. In Fig. 2 expenditure according to two standards only

FIG. 2.

is admitted, but, of course, more than two might have to be allowed for.

A few words may be said here to prevent any misunderstanding as to the nature of the curves of marginal utilities of income in Fig. 2.¹ Neither curve must be confounded with a

at, some comfort would be sacrificed to appearances, though the sacrifice would yield nothing appreciable in utility till income was large enough for the type to be substantially realised. It may be remarked that there seems to be no unanswerable reason for supposing that the peaks of successive curves like those in Fig. 2 could never, even for the shortest period, range upwards in height from left to right.

¹ The equation to each of them is $y = \frac{dU}{dx}$ when U stands for utility and x for income, and an assumption is made in each case as to the standard of living to which expenditure has reference.

successive utility curve. By the latter is meant a curve whose ordinates stand for the incremental additions made to utility as equal units of an income of a given amount are successively spent, on the assumption that each unit of income in turn is laid out so as to realise the greatest immediate utility, consistently, nevertheless, with the end finally desired; or, to put the same thing in another way, a curve whose ordinates mark from right to left the sacrifices of utility that would be entailed were the things purchased with the income instantly removed in the order in which the consumer would elect to relinquish them, all things being taken in units of equal cost. For every size of income a curve of successive utilities can be drawn theoretically. Now, for an income of any given size, say Oi , the sum of the successive utilities (apart from the utility of the minimum income Oa) would, of course, equal $aiefg$ if gfe is the curve of the marginal utility of income as previously explained. But, for such an income, the final one of the successive utilities would be greater than ei , and the initial one would be less than ag ; and similarly for all other sizes of income. The larger the income the lower is the initial one of the successive utilities (beyond the necessity minimum), because it is spent in some degree with reference to a more distant end. The extra height of the final successive utility over the marginal utility of income is caused by the fact that *ex hypothesi* the former, regarded as a sacrifice, cannot be reduced by modifying the expenditure of the rest of the income when the sacrifice is made. Further, it may be observed that, when the curve of marginal utility of income begins by ascending, the curve of successive utilities must ascend at first. It might be thought that the latter could not because it expresses, when read from right to left, the effects of losing successively what can be dispensed with at least cost of utility. But this reasoning is unsound, as can be demonstrated formally as follows. If x and y are two things, or two groups of things, consumed, and U_{x+y} stands for the utility of x and y when taken together, U_x for the utility of x in the absence of y , and U_y similarly for the utility of y in the absence of x ; then the reasoning implies that :

$$(i) U_{x+y} - U_x < U_x$$

can be directly deduced from :

$$(ii) U_{x+y} > U_x > U_y$$

and obviously it cannot (see also page 32). When this false

inference is drawn, the erroneous assumption (implying an atomistic view of experience) is made that :

$$U_{x+y} = U_x + U_y.$$

However, it ordinarily happens that, when (ii) holds, (i) holds also.

It seems likely that the curves of Fig. 2 and the relations between them are such that the individual who is not very poor is generally, if not always, on an eastern slope, so to speak. When he steps to the higher type, he comes, as a rule, to such a position that money in his new circumstances is still subject to diminishing utility. So there are jumps ; but there is seldom, if ever, any continuous increasing utility of income when people are not passing out of a state of extreme poverty. Nevertheless—and this is the important point—the view here expounded does involve the hard saying that the marginal utility of money may be greater to a man after his circumstances have improved.¹ I am sure that this is so in an appreciable number of cases ; I think it is not infrequently the case ; and it may be the ruling case when certain income limits (which vary with the individual) are passed by inconsiderable amounts. It is a common experience to meet with people who have obtained a slight accession of income, and whose enjoyment of life has obviously been increased quite out of proportion to the accession of income. This cannot be explained satisfactorily if additions to income can only bring diminishing additions to utility. Such people (after taking a larger house, say) are quite likely to be more careful about casual expenditure (though possibly careless with pence for reasons to be expounded), and people do not get more careful with things as the things fall in value to them. Again, the wastefulness, or open-handedness, of many unusually well-paid working men long after their old habits, formed when they were much poorer, have had time to crumble away, as contrasted with the penuriousness of many men in a somewhat better-paid economic class, at least suggests that the marginal utility of money is less for the former than the latter, if the two marginal utilities may be compared (see, below, page 33). Illustrations might be indefinitely multiplied. Of course, the ultimate test is furnished by the judgment of people who have had, in a reason-

¹ It should be pointed out that the doctrine is involved also in such a case as is dealt with in Fig. 1, which does not incorporate the fundamental notion here advanced. Such a case might be waived aside as an exception, but I should doubt whether, in view of the many very expensive items in the budgets of the rich, the number of such exceptions is so few that they may be lightly dismissed.

ably short period, wide experiences of different incomes and who realise the points at issue; but, unfortunately, most people are not good at introspection.

II.

It behoves us now to consider the chief reasons for which the view opposed to that advanced in this paper is held. Three main reasons are ordinarily given for the view that the utility of money invariably becomes less to a man when he becomes rich. Two are empirical, and the other is *a priori*.

Empirically, it is pointed out that, when well-to-do, a man is apt to be more careless about pence than when he is not so well off; which must mean, it is said, that the penny has a lower marginal utility to him in the former case. But must it? The following explanation is equally plausible for many instances, namely, that the penny ceases to figure as the unit of account in deliberations about expenditure when a man achieves wealth. The penny might have risen in utility, but, nevertheless, be neglected because of the greater aggregate utility of income. Time is too limited, in relation to the income to be spent, for the rich man to think of a penny—or, so to speak, his wealth makes his leisure too valuable for it to be worth his while to throw it away in devising plans for the saving of pennies.¹ The poor man saves pounds by looking after the pence; but the rich man, by looking after the pence, would lose pounds in value. Moreover, there is this further consideration, that the rich man is encouraged to think in large units by the high average price of the things bought by him. So, despite the rich man's carelessness about pence, his money might have been endowed with an access of utility on his becoming rich. In instituting a comparison, obviously we must not take as the standard unit a sum which is disregarded in one of the cases compared.

Again, still empirically, it is maintained that the richer a man is the higher is the pay needed to induce him to do more than a given amount of work; and that this must be because money has less utility to him when he is rich. But, assuming for the sake of argument that the first statement holds universally, the con-

¹ The explanation may be put crudely in this way. A man with, say, £200 a year, has 48,000 penny units of expenditure per year to think about, and he has just time for the task. But a man with £500 a year would have 120,000 units of expenditure to think about if he made the unit of account the penny, and for so extensive a task he might not have time. He, therefore, makes his income manageable by falling back on a higher unit of account and thinking of the problem as made up of 60,000 twopenny units or 40,000 threepenny units.

clusion drawn does not necessarily follow. Greater wealth generally means that leisure has a higher value, so that a larger absolute sacrifice is made in undertaking extra work when a man has become wealthier. Moreover, in the case in which the greater wealth results from greater earnings, the person in question will obviously be unwilling to under-cut himself, so to speak, by accepting work at a low rate of remuneration; and, apart from this, he will naturally take into account that the time given to the low-paid work might reduce his capacity to earn at the highly-paid work. These considerations make it evident that any abbreviating effect which rising incomes may have on the time given to earning can be explained without reference to the marginal utility of income.

The *a priori* argument puts it that the most pressing wants are satisfied first, and that as we get wealthier less pressing wants are left to be satisfied, so that in satisfying them we get less utility. This argument seems so convincing because it is self-evident in one sense, which, however, does not happen to be the sense that must be read into it when a contrast is drawn between incomes of different sizes. The mere fact that, when I have £200 a year, I buy six imitation Chippendale chairs, rather than a single genuine one which costs as much as the other six put together, proves that I prefer the six imitations to the one original chair when I have an income of £200 a year. But it does not prove that, when I have the larger income and have bought the costly chair, and compare my enjoyment of it under the new income conditions with my enjoyment of the six cheap chairs under the old income conditions—that then I must judge the former enjoyment to have been greater than the latter.¹

Some of the defences of the doctrine that the marginal utility of money must always be less for the larger than for the smaller income are, it would seem, less impregnable than they appear at first sight.

III.

Another important line of defence remains. Some of my readers may be prevented from according full assent to the notions brought forward in this article by their acceptance of a principle of taxation that is steadily winning the confidence of the public, namely, the progressive principle, which recommends taxing the higher incomes at a higher rate. This principle is

¹ See also pp. 29, 30.

not uncommonly deduced from two propositions: (1) that equal proportional sacrifice should be entailed by taxation, and (2) that the marginal utility of income falls continuously in such a way, as income increases, that taxation of all incomes at the same rate would cause proportional sacrifice of utility to vary inversely as income, other things being equal.¹

It is first necessary to bridge the gulf which has been left yawning between the experiences of different individuals (see note on page 25), since the kind of taxation referred to above aims, as it is put, at making the sacrifices in utility or satisfaction of different people equal in relation to their incomes of utility or satisfaction. There is no gulf to bridge if we can think of satisfaction as homogeneous and measurable (at least theoretically) as between different people.² But I am unable to think of it in this way; and, to be on the safe side, and avoid dogmatising about a psychological question, I never mean by utilities or satisfactions more than conventional symbols representative of the relations between an individual's preferences.³ Consequently, the satisfaction of one person cannot be contrasted with that of another person, according to this view, for obviously no preferential relation can link the two experiences together. However, there is no real difficulty when we come to a political question like taxation, since the gulf is at once bridged by the doctrine, which is essential to much political doctrine, that people who in all external relations seem to be the same must be treated as if they were the same, or, in other words, that the State must not be a respecter of persons. In short, the fiction on which we proceed in taxation (which need not be defended here) is to regard different people in the same or different circumstances as the same people in the same or different circumstances.

Now, given the correctness of the theory in this paper, the second proposition referred to above does not hold with any overwhelming degree of universality at least. On the contrary, it would seem likely that, in many cases, a man's proportional sacrifice of utility would be increased when his income became greater, were his income still taxed at the same rate. Does acceptance of the ideas here expounded, then, involve discarding belief in the progressive principle, and even maintaining, for not

¹ Every conceivable kind of diminishing utility of income does not, of course, necessitate progressive taxation if equal proportional sacrifice is to be secured.

² I am taking "satisfaction" to refer to a purely subjective state, and "utility" to refer to what is predicated of the thing producing it.

³ See note on p. 25.

a few circumstances, that the rate of taxation of the higher income ought to be less than that of the smaller one? If it does, we are certainly in a predicament, for most political philosophers, I imagine, have a sort of instinctive belief that the progressive principle is somehow right. But happily it does not, as I shall hope to show. With an easy mind we may deny the truth of the second premiss given above to justify progressive taxation (namely, that income must be subject to diminishing utility), because there are grounds for holding that the first premiss (that equal proportional sacrifices of utility should be aimed at) is untrue also. Indeed, the real basis of taxation may be quite other than a principle of distribution of utility-sacrifice.

Let us put the crucial question to ourselves in this way. Should we think it fair to reduce the rate of taxation of large incomes if, by a miracle, income above a certain amount became subject to immensely increasing utility? An answer in the affirmative is entailed if we believe that taxation should aim at equal proportional sacrifices of utility; but it seems absurd to suggest collecting less money for the State from the rich and more from the poor on the ground that the rich have become really richer. This crude *reductio ad absurdum* may serve to make the reader doubt whether the principle of equal proportional sacrifice of utility can be sound.

But, if this principle is not sound, what is the basis of progressive taxation? It is, in part at any rate, somewhat as follows, I should suggest: that the wants satisfied by the earlier increments to income are usually of more importance socially than the wants satisfied by later increments to income, whether the satisfaction of the former causes more utility or not. In speaking of the equity of taxation, we are obviously talking ethics, and therefore the wants primarily dealt with must be adjudged not according to the value of their satisfaction in fact (positive value), but according to the value of their satisfaction in a moral scheme of consumption (normative value). The poorer a man is, the more likely is some confiscation of income to cause him deprivation of comforts which add to efficiency (meaning the social value of his life) or even of necessities of efficiency; the richer he is, the more likely is the curtailment of his consumption to be effected at the expense of luxuries which add little or nothing to efficiency, or may even diminish it. So the right basis has a certain reference to faculty. If it is put in terms of sacrifice, it may be said that equal proportional sacrifice is the right thing to aim at, only the sacrifice meant must not be one of utility (positive

value) as commonly understood. If this kind of utility comes into the reason for progressive taxation at all, it can only do so, according to the opinions expressed here, in the event of its being arguable that the man who enjoys more utility than his fellows has social obligations much greater than theirs; and, if it figures in this way, the case for progressive taxation, so far as it depends upon utility, would be strengthened rather than weakened by the contentions in this paper as regards the connection between utility and the magnitude of income. What seems to me false doctrine, as regards the basis of progressive taxation, has no doubt been occasioned, in some degree, by a confusion between the urgency and the importance of wants, and by the assumption that, when wants are satisfied according to degrees of urgency, their progressive satisfaction must result in continuously decreasing accessions of utility.¹

S. J. CHAPMAN

¹ To make the argument definite, I have selected for examination the utility-sacrifice theory which seems to me most plausible. But the argument in general holds when any other utility-sacrifice theory is held, since, to deduce the necessity of progressive taxation from any of them, diminishing utility of income must be assumed. (See Edgeworth, *ECONOMIC JOURNAL*, vol. VII, p. 550 *et seq.*)