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regarded as proving the strength of the individualist case or the trend of popular opinion in the country where private ownership has undoubtedly been accompanied by evils more serious than anywhere else in the world. But of much more serious interest is it to remark that, whether these young men hereafter become lawyers or railway officials, journalists, politicians or professors of political economy, they at least must have received a training which in England would have been to them absolutely inaccessible. W. M. ACWORTH

EXTRACT FROM LECTURE INTRODUCTORY TO SESSION OF EVENING CLASSES FOR 1893-4 AT OWENS COLLEGE, MANCHESTER, ON 'JEVONS AND HIS WORK,' BY A. W. FLUX, COBDEN LECTURER IN POLITICAL ECONOMY.

AN attack (I can hardly apply any gentler name to it) has recently been made upon Jevons by Professor Nicholson, hardly less severe than those made upon Mill by Jevons himself.¹ It is true that Jevons was not a mathematician of the first rank, and no one knew it better than himself. It is true also that some parts of his book have not benefited by the introduction of lengthy interpretations of results into symbolical language. Jevons in adopting this plan transgressed a principle which he himself explicitly recognised for the cases to which I refer are those in which the results are really attained without the assistance of the symbols, and indeed in some cases are even a little obscured by being expressed symbolically rather than in ordinary language. This fault, together with the defect noticed by Professor Marshall of pushing his theories a little blindly to cases where they lead to error, are doubtless traceable to the more or less complete absorption in his own view of the subject which characterises the discoverer, the inventor, and the prophet, and which, I venture to think, forms part of the mental attitude necessary to greatness in these directions. Jevons' mind was a well-balanced one, but, had it been so well-balanced as to enable him to set a less comparative value on his own modes of viewing economic theories, it is quite possible that we should be lacking to-day his extremely valuable contributions to economic science.

Jevons declares at the commencement of his book that 'value depends entirely on utility.'² This statement would appear to be as one-sided as that which he seeks to replace, which represents value as dependent on 'Cost of Production.' We find, however, that Jevons is not quite so one-sided in his view as appears at first sight. He shows later on that he does not fix his attention entirely on the 'Demand'

¹ President's Address to Section F of the British Association, 1893.

² *Theory of Political Economy*, p. 1.

side of the problem, for he explicitly states that the cost of production enters into consideration through limiting or extending the supply.

Even further, he extends the notion of utility to include the disutility or irksomeness of prolonged toil, and completes his theory on the lines of utility alone by stating that the labourer ceases his toil as soon as the irksomeness of further work exceeds the usefulness of that share of the product of such further work which falls to the labourer's share. He thus arrives at the same time at a theory of wages entirely at variance with the Wages Fund Theory. This view, founded on the idea that wages are derived from the product of labour and are not entirely dependent on pre-existing capital, has now obtained very general acceptance. In Jevons' hands, though Economic Science assumed a more rigid dress than before by the introduction of mathematical symbols, it yet showed itself more readily adaptable to the real facts of modern life, owing to the recognition of a truth which was then rising into prominence in economics for the first time, viz., that man is not possessed of the fixed character of a machine but undergoes alterations in consequence of the nature and amount of his labour and of its reward, alterations of first-class importance economically, and even more so socially.

On another point, not being a metaphysician, I feel some hesitation in differing from Professor Nicholson. He states that price is essentially the expression of objective and not of subjective value, and that this is the view of the older economists. In the latter statement he is probably correct, but the former attacks the very foundation of Jevons' analysis. Jevons' contention is that subjective relative values are expressed objectively as price-ratios, if I do not misunderstand him: that value is in fact essentially subjective, and that, to express it, we compare it simply with another subjective impression, viz., that of the degree of satisfaction anticipated from the expenditure of a sum of money (or from the possession of some other commodity), and it is this sum of money which is the price. I may have only obscured the point which I wish to make clear, but there is little doubt in my own mind that every estimate of relative value worthy of consideration consists of a balancing of two subjective estimates of anticipated pleasure or pain.

The subjective equality of two utilities is, then, the underlying fact expressed in a statement of price. Price is determined by the relations of supply and demand, but both these determinants are dependent on utility, so that, even though some other mode of expression may be preferred by some writers, Jevons' statement is not in this respect lacking in accuracy.

The next point on which Professor Nicholson dwelt was one which again is of fundamental importance in Jevons' theory. It is the question of the use of marginal increments.

Jevons appears to have first grasped the principle clearly, in its application to the case of capital. He says: 'I shall show that the

whole capital employed can only be paid for at the same rate as the *last portion added*; hence it is the increase of produce or advantage which this last addition gives, that determines the interest of the whole.'

Let me explain this a little more in detail.

Suppose a business man to be considering whether he will borrow a further £500 to invest in an extension of his business or an alteration in it. If, after allowing for extra expenditure incurred, his profit reaches 5 per cent., *i.e.* £25 more, absolutely, than before, and he can borrow, taking account of the risk involved in the loan, at 5 per cent., it is indifferent to him whether he makes the change or not, so far as his profit is concerned. If his profit exceed the additional £25, and he be a type of many others, there will be a demand for loans for the purpose of extending business, and lenders may be able to get a trifle more than 5 per cent. If it fall short of the £25, there will tend to be a contraction of loans, supposing our business man not to deliberately try to lose money—a fair assumption. Now all loans on equal security in the open market command practically the same rate, so that the rate for all is determined by the rate at which it is indifferent whether a trader borrow or not, which rate marks the actual productiveness of a little further investment.

Professor Nicholson objects that the importance assigned to this 'last portion added' is apt to run into the fallacy which he expresses as 'the tail wags the dog, and the tip of the tail wags the tail.' This is no doubt very striking and calculated to bring a certain degree of ridicule to bear on the theory, an instrument perhaps more powerful than any other in its destructive effects, when presented to the average Briton at any rate. I venture to think, however, that this ridicule is entirely misplaced.

It would not be difficult to find analogies from other sciences to show that economics is not alone in directing supreme attention to marginal effects.

The most appropriate analogy is probably that of the use made of the principle of 'virtual work' in mechanics. The investigation of positions of equilibrium of systems of bodies commonly proceeds by the equating of the work (positive or negative) which must be done upon such a system in producing a small displacement, and the work which the actual forces to which the system is subject would do in the process of the same displacement. This is using marginal variations in precisely the same manner as they are employed in economic discussions by those who adopt the methods of Jevons.¹ Neither in these cases, nor in economics, does the especial prominence thus given to the final adjustments render the rest of the process unnecessary or insignificant. There is an old proverb that, 'It is the last straw which breaks the camel's back,' which expresses a truth not altogether dissimilar to that involved in the consideration of these marginal effects.

¹ *Vide Jevons, Theory*, p. 102.

It would, of course, be evidently absurd to maintain that this violent result is due to the last straw alone, and does not depend on the presence of all those which precede the last.

While maintaining the importance of the method of 'marginal' effects, we may still agree heartily with Professor Nicholson, that 'the method of the so-called orthodox English economists has only been modified and supplemented, not revolutionised and supplanted, by the (historical and) mathematical methods of recent writers.' The use of mathematics is acknowledged by those writers who are best qualified to speak, to be found in a more powerful and lucid consideration of the same ideas as those held by the older writers, not in replacing them by entirely new ideas. Even the idea referred to above that man is variable in accordance with his surroundings is not absent from, though often lost sight of in, the theories of the older teachers.

It is perhaps necessary to say just a few words more in regard to Jevons' mathematical theory. Had he possessed a clearer and more intuitive perception of mathematical ideas, he would not have fallen into some errors which unfortunately mar his work. To grasp the concurrent variations of more than two quantities required an effort of which at times he was incapable. That two things should alter together was easy to see, and then one might be said to determine the other, but that both of these might also be simultaneously affected by the operation of a third and fourth cause, or even by many others, producing an interdependence of a high degree of complexity, was more easily acknowledged than grasped with a clearness which would render it useful in theoretical exposition.

This is the key to at least one serious blunder in tracing the steps of connection between cause and effect.¹

Again, the extension to trading bodies of the theory which is undoubtedly true in considering the action of a single individual is certainly venturing a step too far, as has been pointed out by Professor Marshall.²

THE MEASUREMENT OF UTILITY BY MONEY.

IN the last number of the *ECONOMIC JOURNAL* Professor Edgeworth has done me the honour of noticing in detail my treatment³ of the measurement of utility by money and more especially Consumers' Rent.

My principal objection to his criticism is that it is not directed to the main point at issue, namely, the measurement of utility by *money*. I never denied the importance of the conception of utility in economics ;

¹ The series of steps connecting 'Cost of Production' and 'Value,' given by Jevons (*Theory*, p. 179), viz., 'Cost of Production determines Supply, Supply determines Final Degree of Utility, Final Degree of Utility determines Value,' is faulty through the cause here referred to (*v. Marshall, Principles*, Bk. V., ch. xiv, note).

² Marshall, *loc. cit.*

³ As given in my *Principles of Political Economy*, Bk. I., ch. iii., and Appendix.