THE

THEORY OF POLITICAL ECONOMY.

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PREFACE.

THE contents of the following pages can hardly meet with ready acceptance among those who regard the Science of Political Economy as having already acquired a nearly perfect form. I believe it is generally supposed that Adam Smith laid the foundations of this science; that Malthus, Anderson, and Senior added important doctrines; that Ricardo systematised the whole; and, finally, that Mr. J. S. Mill filled in the details and completely expounded this branch of knowledge. Mr. Mill appears to have had a similar notion; for he distinctly asserts that there was nothing in the Laws of Value which remained for himself or

any future writer to clear up. Doubtless it is difficult to help feeling that opinions adopted and confirmed by such eminent men have much weight of probability in their favour. Yet, in the other sciences this weight of authority has not been allowed to restrict the free examination of new opinions and theories; and it has often been ultimately proved that authority was on the wrong side.

There are many portions of Economical doctrine which appear to me as scientific in form as they are consonant with facts. I would especially mention the Theories of Population and Rent, the latter a theory of a distinctly mathematical character which seems to give a clue to the correct mode of treating the whole science. Had Mr. Mill contented himself with asserting the unquestionable truth of the Laws of Supply and Demand, I should have agreed with him. As founded upon facts, those laws cannot be shaken by any theory;

but it does not therefore follow, that our conception of Value is perfect and final. Other generally accepted doctrines have always appeared to me purely delusive, especially the so-called Wage Fund Theory. This theory pretends to give a solution of the main problem of the science—to determine the wages of labour; yet, on close examination, its conclusion is found to be a mere truism, namely, that the average rate of wages is found by dividing the whole amount appropriated to the payment of wages by the number of those between whom it is divided. Some other supposed conclusions of the science are of a less harmless character, as, for instance, those regarding the advantage of exchange (see p. 134).

In this work I have attempted to treat Economy as a Calculus of Pleasure and Pain, and have sketched out, almost irrespective of previous opinions, the form which the science, as it seems to me, must ultimately take. I

have long thought that as it deals throughout with quantities, it must be a mathematical science in matter if not in language. I have endeavoured to arrive at accurate quantitative notions concerning Utility, Value, Labour, Capital, &c., and I have often been surprised to find how clearly some of the most difficult notions, especially that most puzzling of notions *Value*, admit of mathematical analysis and expression. The Theory of Economy thus treated presents a close analogy to the science of Statical Mechanics, and the Laws of Exchange are found to resemble the Laws of Equilibrium of a lever as determined by the principle of virtual velocities. The nature of Wealth and Value is explained by the consideration of indefinitely small amounts of pleasure and pain, just as the Theory of Statics is made to rest upon the equality of indefinitely small amounts of energy. But I believe that dynamical branches of the Science of Economy may

remain to be developed, on the consideration of which I have not at all entered.

Mathematical readers may perhaps think that I have explained some elementary notions, that of the Degree of Utility, for instance, with unnecessary prolixity. But it is to the neglect of Economists to obtain clear and accurate notions of quantity and degree of utility that I venture to attribute the present difficulties and imperfections of the science; and I have purposely dwelt upon the point at full length. Other readers will perhaps think that the occasional introduction of mathematical symbols obscures instead of illustrating the subject. But I must request all readers to remember that, as Mathematicians and Political Economists have hitherto been two nearly distinct classes of persons, there is no slight difficulty in preparing a mathematical work on Economy with which both classes of readers may not have some grounds of complaint.

It is very likely that I have fallen into errors of more or less importance, which I shall be glad to have pointed out; and I may say that the cardinal difficulty of the whole theory is alluded to in the section of Chapter IV upon the 'Ratio of Exchange,' beginning at p. 91. So able a mathematician as my friend Professor Barker, of Owens College, has had the kindness to examine some of the proof sheets carefully; but he is not, therefore, to be held responsible for the correctness of any part of the work.

My enumeration of the previous attempts to apply mathematical language to Political Economy does not pretend to completeness even as regards English writers; and I find that I forgot to mention a remarkable pamphlet 'On Currency' published anonymously in 1840 (London, Charles Knight and Co.) in which a mathematical analysis of the operations of the Money Market is attempted. The method of

treatment is not unlike that adopted by Dr. Whewell, to whose Memoirs a reference is made; but finite or occasionally infinitesimal differences are introduced. On the success of this anonymous theory I have not formed an opinion; but the subject is one which must some day be solved by mathematical analysis. Garnier, in his treatise on Political Economy, mentions several continental mathematicians who have written on the subject of Political Economy; but I have not been able to discover even the titles of their Memoirs.

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THE

THEORY OF POLITICAL ECONOMY.

CHAPTER I.

INTRODUCTION.

THE science of Political Economy rests upon a few notions of an apparently simple character. Utility, value, labour, land, capital, are the elements of the subject; and whoever has a thorough comprehension of their nature, must possess or be soon able to acquire a knowledge of the whole science. As almost every economical writer has remarked, it is in the simple elements that we require the most care and precision, since the least error of conception must vitiate all our deductions. Accordingly, I have devoted the following pages to a complete investigation of the conditions and relations of the above-named notions.

Repeated reflection and inquiry have led me to the somewhat novel opinion, that *value depends entirely upon utility*. Prevailing opinions make labour rather than utility the origin of value; and there are even those who distinctly assert, that labour is the *cause* of value. I show, on the contrary, that we have only to trace out carefully the natural laws of the variation of utility, as depending upon the quantity of commodity in our possession, in order to arrive at a satisfactory theory of exchange, of which the ordinary laws of supply and demand are a necessary consequence. This theory is in perfect harmony with facts; and whenever there is any apparent reason for the belief, that labour is the cause of value, we obtain a complete explanation of the reason. Labour is found often to determine value, but only in an indirect manner, by varying the degree of utility of the commodity through an increase in the supply.

These views are not put forward in a hasty or ill-considered manner. All the chief points of the theory were sketched out ten years ago; but they were then published only in the form of a very brief paper communicated to the Statistical or Economic Section of the British

Association at the Cambridge Meeting in the year 1862. A still briefer abstract of that paper was inserted in the Report of the Meeting [a], and the paper itself was not printed until June 1866 [b]. Since writing that paper, I have, over and over again, questioned the truth of my own notions, but without ever finding any reason to doubt their substantial correctness. I have therefore thought it needless to delay any longer submitting the theory to the criticism of those who are interested in the progress of Political Economy.

Mathematical Character of the Science.

It seems perfectly clear that Economy, if it is to be a science at all, must be a mathematical science. There exists much prejudice against attempts to introduce the methods and language of mathematics into any branch of the moral sciences. Most persons appear to hold that the physical sciences form the proper sphere of mathematical method, and that the moral sciences demand some other method, I know not what. My theory of Economy, however, is

[a] 'Report of the British Association, Cambridge, 1862.' 'Reports of Sections,' p. 158.

[b] 'Journal of the Statistical Society,' vol. xxix. p. 282.

purely mathematical in character. Nay, finding that the quantities with which we have to deal are subject to continuous variation, I do not hesitate to use the appropriate branch of mathematical science, involving though it does the fearless consideration of infinitely small quantities. The theory consists in applying the differential calculus to the familiar notions of wealth, utility, value, demand, supply, capital, interest, labour, and all the other notions belonging to the daily operations of industry. As the complete theory of almost every other science involves the use of that calculus, so we cannot have a true theory of Political Economy without its aid.

To me it seems that our science must be mathematical, simply because it deals with quantities. Wherever the things treated are capable of being *more or less* in magnitude, there the laws and relations must be mathematical in nature. The ordinary laws of supply and demand treat entirely of quantities of commodity demanded or supplied, and express the mode in which the quantities vary in connection with the price. By this fact the laws *are* mathematical: Economists cannot deprive them of their nature by denying them the

name; they might as well try to alter red light by calling it blue. Whether or not the mathematical laws of Economy are stated in words, or in the usual symbols, x, y, z, is an accident, or a mere matter of convenience. The most complicated mathematical problems may be stated in ordinary language, and their solution might be traced out by words. In fact, some of the most distinguished mathematicians have displayed a great liking for getting rid of their symbols, and expressing their arguments and results in language as nearly as possible approximating to that in common use. Laplace attempted to express the truths of physical astronomy in common language in his admirable 'Système du Monde;' and Thomson and Tait interweave their great 'Treatise on Natural Philosophy' with an interpretation in ordinary words, supposed to be within the comprehension of general readers.

These attempts, however distinguished and ingenious their authors, soon disclose the inherent defects of the grammar and dictionary for expressing complicated relations. The symbols of mathematical books are not different in nature from language; they are merely a perfected system of language, adapted to the

notions and relations which we need to express. They do not make the mode of reasoning they embody; they merely facilitate its exhibition and comprehension. If, then, in Political Economy we have to deal with quantities and complicated relations of quantities, we must reason mathematically; we do not render the science less mathematical by avoiding the symbols of algebra,—we merely refuse to employ, in a very imperfect science, much needing every kind of assistance, that apparatus of signs which is found indispensable in other sciences.

Prevailing Confusion between Mathematical and Exact Sciences.

Many persons indeed seem to entertain a prejudice against mathematical language, arising out of a confusion between a mathematical science and an exact science. They think that we must not pretend to calculate unless we have the precise data, which will give a precise answer to our calculations; but, in reality, there is no such thing as an exact science, except in a comparative sense. Astronomy is more exact than other sciences, because the position of a planet or a star admits of close

measurement; but, if we examine the methods of physical astronomy, we find that they are all approximate. Every solution involves hypotheses which are not really true: as, for instance, that the earth is a smooth, homogeneous spheroid. Even the apparently simpler problems in statics or dynamics are only hypothetical approximations to the truth.

We can calculate the effect of a crow-bar, provided it be perfectly inflexible and have a perfectly hard fulcrum, which is never the case [c]. The data are almost wholly deficient for the complete solution of any one problem in natural science. Had physicists waited until their data were perfectly precise before they brought in the aid of mathematics, we should have still been in the age of science which terminated at the time of Galileo.

When we examine the less precise physical sciences, we find that physicists are, of all men, most bold in developing their mathematical theories in advance of their data. Let any one who doubts this examine Airy's 'Theory of the Tides [d];' he will find a wonderfully complex

[c] Thomson and Tait's 'Treatise on Natural Philosophy,' vol. i. p. 337.

[d] 'Encyclopædia Metropolitana.'

mathematical theory which is confessed by its author to be incapable of exact or even approximate application, because the results of the various and often unknown shapes of the seas do not admit of numerical verification. In this and many other cases we may have perfect mathematical theory without the data requisite for precise calculations.

The greater or less accuracy attainable in a mathematical science is a matter of accident, and does not affect the fundamental character of the science. There can be but two classes of sciences—those which are *simply logical*, and *those which, besides being logical, are also mathematical.* If there be any science which determines merely whether a thing be or be not—whether an event will happen, or will not happen—it must be a purely logical science; but if the thing may be greater or less, or the event may happen sooner or later, nearer or farther, then quantitative notions enter, and the science must be mathematical in nature, by whatever name we call it.

Capability of Exact Measurement.

Many will object, no doubt, that the notions which we treat in this science are incapable of

any measurement. We cannot weigh, or gauge, or test the feelings of the mind; there is no unit of labour, or suffering, or enjoyment. It might thus seem as if a mathematical theory of Political Economy would be necessarily deprived for ever of any numerical data.

In the first place, I would remark, that nothing is less warrantable in science than an uninquiring and unhoping spirit. In matters of this kind, those who despair are almost invariably those who have never tried to succeed. A man might be allowed to despair had he spent a lifetime on a difficult task without a gleam of encouragement; but the popular opinions on the extension of mathematical theory tend to deter any man from attempting tasks which, however difficult, ought, some day, to be achieved.

If we trace the history of other sciences, we gather no lessons of discouragement. In the case of almost everything which is now exactly measured, we can go back to the time when the vaguest notions prevailed. Previous to the time of Pascal, who would have thought of measuring *doubt* and *belief?* Who could have conceived that the investigation of petty games of chance would have led to the creation of perhaps the

most sublime and perfect branch of mathematical science — the theory of probabilities? There are sciences which, even within the memory of men now living, have become exactly quantitative. When Adam Smith founded Political Economy in England, electricity was a vague phenomenon, which was known, indeed, to be capable of more or less, but was not measured nor calculated: it is within the last thirty or forty years that a mathematical theory of electricity, founded on exact data, has been established. We now enjoy the most precise quantitative notions concerning heat, and can measure the temperature of a body to less than $\frac{1}{5000}$ part of a degree Centigrade. Compare this precision with that of the earliest makers of thermometers, the Academicians del Cimento, who used to graduate their instruments by placing them in the sun's rays to obtain a point of fixed temperature.

The late Mr. De Morgan excellently said[e], 'As to some magnitudes, the clear idea of measurement comes soon: in the case of length, for example. But let us take a more difficult one, and trace the steps by which we acquire and fix the idea: say *weight*. What weight is, we

[e] 'Formal Logic,' p. 175.

need not know . . . . . We know it as a magnitude before we give it a name: any child can discover the *more* that there is in a bullet, and the less that there is in a cork of twice its size. Had it not been for the simple contrivance of the balance, which we are well assured (how, it matters not here) enables us to poise equal weights against one another, that is, to detect equality and inequality, and thence to ascertain how many times the greater contains the less, we might not to this day have had much clearer ideas on the subject of weight, as a magnitude, than we have on those of talent, prudence, or self-denial, looked at in the same light. All who are ever so little of geometers will remember the time when their notions of an angle, as a magnitude, were as vague as, perhaps more so than, those of a moral quality; and they will also remember the steps by which this vagueness became clearness and precision.'

Now there can be no doubt whatever that pleasure, pain, labour, utility, value, wealth, money, capital, &c. are all notions admitting of quantity: nay, the whole of our actions in industry and trade certainly depend upon comparing quantities of advantage or disadvantage. Even the most abstract theories of morals

have fully recognised the quantitative character of the subject. Bentham's 'Introduction to the Principles of Morals and Legislation' is thoroughly mathematical in the character of the method. He tells us to estimate the tendency of an action[f] thus: 'Sum up all the values of all the pleasures on the one side, and those of all the pains on the other. The balance, if it be on the side of pleasure, will give the good tendency of the act, upon the whole, with respect to the interests of that individual person; if on the side of pain, the bad tendency of it upon the whole.'

I confess that it seems to me difficult even to imagine how such estimations and summations can be made with any approach to accuracy. Greatly though I admire the clear and precise notions of Bentham, I know not where his numerical data are to be found.

'Then where,' the reader will perhaps ask, 'are your numerical data for estimating pleasures and pains in Political Economy?' I answer, that my numerical data are more abundant and precise than those possessed by any other science, but that we have not yet known how to employ them. The very abundance of

[f] p. 52.

our data is perplexing. There is not a clerk or book-keeper in the country who is not engaged in recording numerical data. The private account books, the great ledgers of merchants and bankers and public offices, the share lists, price lists, bank returns, monetary intelligence, Custom-house and other Government returns, are all full of the kind of numerical data required to render Political Economy an exact mathematical science. Thousands of folio volumes of statistical, parliamentary, or other publications await the labour of the investigator. It is partly the very extent and complexity of the information which deters us from its proper use. But it is chiefly a want of method and completeness in this vast mass of information which prevents our readily employing it in the investigation of the natural laws of Political Economy.

Far be it from me to say that we ever shall have the means of measuring directly the feelings of the human heart. A unit of pleasure or of pain is difficult even to conceive; but it is the amount of these feelings which is continually prompting us to buying and selling, borrowing and lending, labouring and resting, producing and consuming; and it is from the

quantitative effects of the feelings that we must estimate their comparative amounts. We can no more know or measure gravity in its own nature than we can measure a feeling, but just as we measure gravity by its effects in the motion of a pendulum, so we may estimate the equality or inequality of feelings by the varying decisions of the human mind. The will is our pendulum, and its oscillations are minutely registered in all the price lists of the markets. I know not when we shall have a perfect system of statistics, but the want of it is the only insuperable obstacle in the way of making Political Economy an exact science. In the absence of complete statistics, the science will not be less mathematical, though it will be infinitely less useful than if, comparatively speaking, exact. A correct theory is the first step towards improvement, by showing what we need and what we might accomplish.

Previous Attempts to employ Mathematical Language in the Moral Sciences.

Several writers have, from time to time, applied the language and processes of mathematical reasoning to the moral or political sciences.

As long ago as the early part of last century, Francis Hutcheson, in his 'Inquiry into the Original of our Ideas of Beauty and Virtue,' gave formulæ for representing the motives of the human mind[g]. It may be said, perhaps, that little advantage arises from their use, because the relations expressed have not a degree of complexity demanding the aid of symbols. But I have never been able to see anything absurd in their employment, though Hutcheson's example has found few followers.

Among political economists, Dr. Whewell has made the most elaborate attempt to apply mathematical formulæ to the science. In 1829 and 1831 he read to the Cambridge Philosophical Society two long memoirs[h], containing a mathematical exposition of the doctrines laid down in Ricardo's 'Principles of Political Economy.' These papers have received the least possible attention from economists; I do not, in fact, remember a single reference to them. Yet

[g] Third edition, 1729, pp. 186–191.

[h] 'Mathematical Exposition of some Doctrines of Political Economy.' Cambridge Philosophical Transactions, vol. iii. p. 191. (Read March 1829.)

'Mathematical Exposition of the leading Doctrines in Mr. Ricardo's "Principles of Political Economy and Taxation."' *Ib.* vol. iv. p. 155. (Read April and May 1831.)

they possess considerable interest, and are remarkable for clearness of style.

These memoirs fail, however, to lead to any satisfactory results, probably because they are a mere translation in symbols of Ricardo's propositions, some of which are of doubtful soundness. The very use of a mathematical language should be to render deductive reasoning easy and sure, so that we can independently reach and prove the conclusions of economists whenever they are true. But this is the reverse of Dr. Whewell's method. I consider, too, that his mathematical processes are wholly unsuited to the science. He treats quantities of demand, supply, wages, profits, interest, &c. as simple discontinuous amounts, and proposes to determine them by equations of a simple kind. He regards questions in economy as little more difficult than sums in arithmetic.

Dr. Whewell's example was followed by Mr. Tozer in memoirs on the effect of machinery upon the wealth of a country and the rate of wages, and on the effect of the non-residence of landlords[i]. These memoirs seem to be almost as able as those of Dr. Whewell, but are of a

[i] 'Mathematical Investigation of the Effect of Machinery on the Wealth of a Country, and the Fund for the Payment of

very similar character; and it can hardly be said that they lead to new truths. In more recent years, Mr. McLeod has applied algebraic formulæ to economical questions, especially to Banking[k]. I may also mention Professor Fleeming Jenkin's 'Graphic illustrations of the Laws of Supply and Demand,' in an essay published a year or two since[l].

There exists a work by Dr. Lardner[m] on 'Railway Economy,' a statistical treatise on the cost and financial conditions of railway communication, which treats certain questions of Political Economy in a highly scientific and mathematical spirit. Thus the relation of the rate of fares to the gross receipts and net profits of a railway company is beautifully demonstrated in pp. 286–293, by means of a diagram. It is proved that the maximum profit occurs at the point where the curve of gross receipts becomes parallel to the curve of expenses of

Wages.' By John Tozer, B.A. Cambridge Philosophical Transactions, vol. vi. p. 507.

'On the Effect of the Non-residence of Landlords on the Wealth of a Community,' *ib.* vol. vii. p. 189.

[k] 'The Theory and Practice of Banking,' vol. i. p. 189.

'Dictionary of Political Economy,' article *Credit*, &c.

[l] 'Recess Studies.'

[m] 'Railway Economy,' by Dionysius Lardner, D.C.L. London, 1850.

conveyance. The most advantageous rate of charge in this and many other similar cases is that at which a very small change of the rate makes no appreciable difference in the net profits.

In a work to which I shall have occasion to refer more than once, Mr. Jennings has pointed out that prices, rates of interest, and other distinct money quantities form the *metallic indices*, and the means of observation in our science[n], 'not less capable of being made subservient to the processes of exact calculation than are the instruments of any purely physical art.' And he adds the remark, 'The results of these principles, when observed, may thus be expressed in figures; as may also be the anticipated results of their future operation, or such relations as those of quantity and value, value and rate of production, may be exhibited in the formulæ, and analysed by the different methods of algebra and of fluxions.' This is a clear statement of the views which I have also adopted.

Of the Measurement of Feeling and Motives.

Many readers may, even after reading the preceding remarks, consider it quite impos-

[n] 'Natural Elements of Political Economy,' pp. 259, 260.

sible to create such a calculus as is here contemplated, because we have no means of defining and measuring quantities of feeling, like we can measure a mile, or a right angle, or any other physical quantity. I have granted that we can hardly form the conception of a unit of pleasure or pain, so that the numerical expression of quantities of feeling seems to be out of the question. But we only employ units of measurement in other things to facilitate the comparison of quantities; and if we can compare the quantities directly, we do not need the units. Now the mind of an individual is the balance which makes its own comparisons, and is the final judge of quantities of feeling. As Mr. Bain says[o], 'It is only an identical proposition to affirm that the greatest of two pleasures, or what appears such, sways the resulting action; for it is this resulting action that alone determines which is the greater.'

Pleasures, in short, are, for the time being, as the mind estimates them; so that we cannot make a choice, or manifest the will in any way, without indicating thereby an excess of pleasure in some direction. It is true that the mind often hesitates and is perplexed in

[o] 'The Emotions and the Will,' p. 447.

making a choice of great importance: this indicates either varying estimates of the motives concerned, or a feeling of incapacity to grasp the quantities concerned. I should not for a moment think of claiming for the mind any accurate power of measuring and adding and subtracting feelings, so as to get an exact balance. We can seldom or never affirm that one pleasure is a multiple of another in quantity; but the reader who carefully criticises the following theory will find that it seldom involves the comparison of quantities of feeling differing much in amount. The theory turns upon those critical points where pleasures are nearly, if not quite, equal. I never attempt to estimate the whole pleasure gained by purchasing a commodity; the theory merely expresses that, when a man has purchased enough, he derives equal pleasure from the possession of a small quantity more or from the money price of it. Similarly, the whole amount of pleasure that a man gains by a day's labour hardly enters the question; it is when a man is doubtful whether to increase his hours of labour or not, that we discover an equality between the pain of that extension and the pleasure of the increase of possessions derived from it.

The reader will find, again, that there is never, in a single instance, an attempt made to compare the amount of feeling in one mind with that in another. I see no means by which such comparison can ever be accomplished. The susceptibility of one mind may, for what we know, be a thousand times greater than that of another. But, provided that the susceptibility was different in a like ratio in all directions, we should never be able to discover the profoundest difference. Every mind is thus inscrutable to every other mind, and no common denominator of feeling is possible. Even if we could compare the feelings of different minds, we should not need to do so; for one mind only affects another indirectly. Every event in the outward world is represented in the mind by a corresponding motive, and it is by the balance of these that the will is swayed.

I must here point out that, though the theory presumes to investigate the condition of a mind, and bases upon this investigation the whole of Political Economy, practically it is an aggregate of individuals which will be treated. The general form of the laws of Economy is the same in the case of individuals and nations; and, in reality, it is a law operating

in the case of multitudes of individuals which gives rise to the aggregate represented in the transactions of a nation. Practically, however, it is quite impossible to detect the operation of general laws of this kind in the actions of one or a few individuals. The motives and conditions are so numerous and complicated, that the resulting actions have the appearance of caprice, and are beyond the analysis and prediction of science. With every increase in the price of such a commodity as sugar, we ought, theoretically speaking, to find every person reducing his consumption by a small amount, and according to some regular law. In reality, many persons would make no change at all; a few, probably, would go to the extent of dispensing with the use of sugar altogether while its cost was excessive. It is by examining the average consumption of sugar in a large population that we should detect a continuous variation connected with the variation of price by a constant law. It will not, of necessity, happen, that the law will be exactly the same in the case of aggregates and individuals, unless all those individuals be of the same character and position as regards wealth and habits; but there will be a more or less regular law to which the same

kind of formulæ will apply. The use of an average, or, what is the same, an aggregate result depends upon the high probability that accidental and disturbing causes will operate, in the long run, as often in one direction as the other, so as to neutralise each other. Provided that we have a sufficient number of independent cases, we may then detect the effect of any *tendency*, however slight. Accordingly, questions which appear, and perhaps are quite, indeterminate as regards individuals, may be capable of exact investigation and solution in regard to great masses and wide averages.

Logical Method of Political Economy.

I may add a few words on the logical character of the science of Political Economy, as to which somewhat diverse opinions have been held. I think that Mr. Mill is right in considering it an instance of the Concrete Deductive Method, or, as I have elsewhere proposed to call it, the Complete Method [p], which Mr. Mill has so admirably described [q]. Political Economy is, undoubtedly, grounded upon observed facts, and is, so far, an inductive science; but it does

[p] 'Elementary Lessons in Logic,' p. 258.

[q] 'System of Logic,' book vi. chap. 9, s. 1.

not proceed by an elaborate collection of facts and their gradual classification, as Mr. Richard Jones would have us believe. A few of the simplest principles or axioms concerning the nature of the human mind must be taken as its first starting-point, just as the vast theories of mechanical science are founded upon a few simple laws of motion. That every person will choose the greater apparent good; that human wants are more or less quickly satiated; that prolonged labour becomes more and more painful, are a few of the simple inductions on which we can ground, as I attempt to show, a complete deductive mathematical theory. Thence we deduce the laws of supply and demand, the nature and laws of that ambiguous and difficult conception, value; especially the laws governing its relation to labour or cost of production. The theory, however, needs verification, and this it finds in the agreement of its conclusions with common sense and direct observation.

The theory may, perhaps, be described as the mechanics of human interest. I may have committed oversights in explaining its details; but I conceive that, in its main features, this theory, whether useful or useless, must be the true one. Its method is as sure and demon-

strative as that of kinematics or statics, nay, almost as self-evident, when the real meaning of the formulæ is fully seized, as are the elements of Euclid.

The usefulness of the theory is a different question from that of its truth, and is one upon which I am not quite so confident. To attain correct and clear notions of the nature of value and capital is, indeed, the first essential of a knowledge of Political Economy; and to this object the following pages are in a great degree devoted. But I do not hesitate to say, too, that Political Economy might be gradually erected into an exact science, if only commercial statistics were far more complete and accurate than they are at present, so that the formulæ could be endowed with exact meaning by the aid of numerical data. These data would consist chiefly in accurate accounts of the quantities of goods possessed and consumed by the community, and the prices at which they are exchanged. There is no reason whatever why we should not have those statistics, except the cost and trouble of collecting them, and the unwillingness of persons to afford information. The quantities themselves to be measured and registered are most concrete and precise. In

a few cases we already have information approximating to completeness, as when a commodity like tea, sugar, coffee, or tobacco is wholly imported. But when articles are untaxed, and more or less produced within the country, we have yet the vaguest notions of the quantities consumed. Some slight success is now, at last, attending the efforts to gather agricultural statistics; and the great need felt by men engaged in the cotton and other trades to obtain accurate accounts of stocks, imports, and consumption, will probably lead to the publication of far more accurate information than we have hitherto enjoyed.

The deductive science of Economy must be verified and rendered useful by the purely inductive science of Statistics. Theory must be invested with the reality and life of fact. But the difficulties of this union are immensely great, and I appreciate them quite as much as does Professor Cairnes in his admirable lectures 'On the Character and Logical Method of Political Economy.' I make hardly any attempt to employ statistics in this work, and thus I do not pretend to any numerical precision. But, before we attempt any investigation of facts, we must have correct theoretical notions; and

of what are here presented, I would say, in the words of Hume, in his 'Essay on Commerce,' 'If false, let them be rejected: but no one has a right to entertain a prejudice against them merely because they are out of the common road.'

Relation of Political Economy to Moral Philosophy.

I wish to say a few words, in this place, upon the relation of Economy to moral science. The theory which follows is entirely based on a calculus of pleasure and pain; and the object of Economy is to maximise happiness by purchasing pleasure, as it were, at the lowest cost of pain. The language employed may be open to misapprehension, and it may seem as if pleasures and pains of a gross kind were treated as the all-sufficient motives to guide the mind of man. I have no hesitation in accepting the Utilitarian theory of morals which does uphold the effect upon the happiness of mankind as the criterion of what is right and wrong. But I have never felt that there is anything in that theory to prevent our putting the widest and highest interpretation upon the terms used.

Jeremy Bentham put forward the Utilitarian theory in the most uncompromising manner. According to him, whatever is of interest or importance to us must be the cause of pleasure or of pain; and when the terms are used with a sufficiently wide meaning, pleasure and pain include all the forces which drive us to action. They are explicitly or implicitly the object of all our calculations, and form the ultimate quantities to be treated in all the moral sciences. The words of Bentham on this subject may require some explanation and qualification, but they are too grand and too full of truth to be omitted. 'Nature,' he says[r], 'has placed mankind under the governance of two sovereign masters—*pain* and *pleasure*. It is for them alone to point out what we ought to do, as well as to determine what we shall do. On the one hand the standard of right and wrong, on the other the chain of causes and effects, are fastened to their throne. They govern us in all we do, in all we say, in all we think: every effort we can make to throw off our subjection will serve but to demonstrate and confirm it. In words a man

[r] 'An Introduction to the Principles of Morals and Legislation,' by Jeremy Bentham. Edition of 1823, vol. i. p. 1.

may pretend to abjure their empire; but, in reality, he will remain subject to it all the while. The *principle of utility* recognises this subjection, and assumes it for the foundation of that system, the object of which is to rear the fabric of felicity by the hands of reason and of law. Systems which attempt to question it, deal in sounds instead of sense, in caprice instead of reason, in darkness instead of light.'

In connection with this passage we may take that of Paley, who says, with his usual clear brevity [s], 'I hold that pleasures differ in nothing but in continuance and intensity.'

The acceptance or non-acceptance of the basis of the Utilitarian doctrine depends, in my mind, on the exact interpretation of the language used.

As it seems to me, the feelings of which a man is capable are of various grades. He is always subject to mere physical pleasure or pain, necessarily arising from his bodily wants and susceptibilities. He is capable also of mental and moral feelings of several degrees of elevation. A higher motive may rightly overbalance all considerations belonging even to the next

[s] 'Principles of Moral and Political Philosophy,' book i. chap. 6.

lower range of feelings; but so long as the higher motive does not intervene, it is surely both desirable and right that the lower motives should be balanced against each other. Starting with the lowest stage—it is a man's duty, as it is his natural inclination, to earn sufficient food and whatever else may best satisfy his proper and moderate desires. If the claims of a family or of friends fall upon him, it may become desirable that he should deny his own desires and even his physical needs their customary gratification. But the claims of a family are only a step to a higher grade of duties.

The safety of a nation, the welfare of great populations, may happen to depend upon his exertions, if he be a soldier or a statesman: claims of a very strong kind may now be overbalanced by claims of a still stronger kind. Nor should I venture to say that, at any point, we have reached the highest rank—the supreme motives which should guide the mind. The statesman may discover a conflict between motives; a measure may promise, as it would seem, the greatest good to great numbers, and yet there may be motives of uprightness and honour that may hinder or forbid his promoting the measure. How such difficult questions may be

rightly determined it is not my purpose to inquire here.

The Utilitarian theory holds, that all forces influencing the mind of man are pleasures and pains; and Paley went so far as to say, that all pleasures and pains are of one kind only. Mr. Bain has carried out this view to its complete extent, saying[t], 'No amount of complication is ever able to disguise the general fact, that our voluntary activity is moved by only two great classes of stimulants; either a pleasure or a pain, present or remote, must lurk in every situation that drives us into action.' The question certainly appears to turn upon the language used. Call any motive which attracts to a certain action pleasure, and that which deters pain, and it becomes impossible to deny that all actions are prompted by pleasure or by pain. But it then becomes indispensable to admit that a single higher pleasure will entirely neutralise a vast extent and continuance of lower pains. It seems hardly possible to admit Paley's statement, except with an interpretation that would probably reverse his intended meaning. Motives and feelings are certainly of the same kind to the extent that we

[t] 'The Emotions and the Will,' p. 460.

are able to weigh them against each other; but they are, nevertheless, almost incomparable in power and authority.

My present purpose is accomplished in pointing out this hierarchy of feeling, and assigning a proper place to the pleasures and pains with which Economy deals. It is the lowest rank of feelings which we here treat. The calculus of utility aims at supplying the ordinary wants of man at the least cost of labour. Each labourer, in the absence of other motives, is supposed to devote his energy to the accumulation of wealth. A higher calculus of moral right and wrong would be needed to show how he may best employ that wealth for the good of others as well as himself. But when that higher calculus gives no prohibition, we need the lower calculus to gain us the utmost good in matters of moral indifference. There is no rule of morals to forbid our making two blades of grass grow instead of one, if, by the wise expenditure of labour, we can do so. And we may certainly say, with Bacon, 'while philosophers are disputing whether virtue or pleasure be the proper aim of life, do you provide yourself with the instruments of either.'