

one, was needful in this case; although usually many experiments, or the careful observation of many particulars, are necessary in inductions; but the generalization having been gained, Deduction had a chance to try its hand; it had long been observed that electricity could be conducted from point to point, and if electricity and lightning be identical, then lightning can be so conducted; therefore, deduced Franklin, a pointed iron rod elevated above buildings will harmlessly conduct lightning from the clouds into the ground. Deduction gave mankind the lightning-rod, and so made one point of science "active," as Bacon phrased it; and it is noticeable, that Turgot's felicitous epigram turns on the deductive rather than the inductive side of Franklin's experiment: *Eripuit cælo fulmen sceptrumque tyrannis.*

Let us catch up another illustration from the science of Botany, to show how Deduction may strengthen and sharpen an inductive result. The botanists say, that apple-tree blossoms are always five-petaled, because blossoms from a large number of apple-trees in various localities have been observed to have just five petals to the blossom; so far, they affirm inductively, and indeed securely; but they have also reached by means of another induction a much broader law of plant-life, namely, that outside-growers, when they have petaled flowers at all, always have them five-fold; now apple-trees are outside-growers; and therefore, deductively also, and conclusively beyond shadow of question, apple-tree blossoms are five-petaled.

Political Economy is just as open to Deduction as it is to Induction, and the two continually are reaching each other the hands of economical reasoning, not always indeed pursuing each a separate and distinct path to the end, as in the botanical instance just adduced; because in

practice the two processes mingle constantly, and neither is carried out in full and due form, since premises used by the mind are often dropped in the statement, and shortened forms of expression take the place of long-drawn-out formulas. But all good reasoning in Economics, as in all other sciences, is analyzable into one or other of these two processes, both based alike on the uniformities of Nature and the structure of the human mind.

Deduction has not quite the same scope and certainty in Economics as in the Physical Sciences, because any one may act contrary to the vastly probable action of many individuals; still, it is a safe and potent process in economics, since it may descend securely from the larger masses to the smaller, even though perchance the individual escape, because of the simplicity and universality and certainty of the impulses that lead men to exchange. John Bascom gives the reason well, why both Induction and Deduction have so firm a grasp upon this science: "*Between one dollar and two dollars a man has no choice, he must take the greater; between one day and two days of labor he must take the less; between the present and the future he must take the present. This is not a sphere of caprice, nor scarcely even of liberty; the actions themselves present no alternative, and, if an alternative giving an opportunity for choice does arise, it arises from some partial or individual impulse, from some one of those transitory and foreign influences, which, while rippling the surface, neither belong to nor affect the current of the stream.*"

(3) *Introspection.* Everybody buys and sells, and almost everybody watches the action of his own mind enough to see what are his motives in buying and selling, and soon comes to know also that the other party has corresponding motives. Even the child knows perfectly, that it takes two to make a bargain, that each party renders something

to the other, that each is glad to part with something for the sake of receiving something from the other, and that this higher esteem put by each on what is taken from the other makes for each the gain of the trade. A very little introspection tells anybody, that were this higher esteem wanting in the minds of either of the two, the trade would not take place at all. Everybody within the pale of *compos mentis* knows, that, were his own desire for the rendering of another to increase, he himself would offer more of his own rendering rather than forego the trade; and he rightly infers, that what is true of himself is true of all other men; and so, every seller rightly tries to display his wares in such a way as to increase the desire of buyers for them; knowing full well from his own experience in buying that, other things being equal, they will be willing to render him more for them in consequence.

The phrase above, "rightly infers," is based upon the truth, that all men are remarkably alike in certain great departments of action; and that, in no department are they so nearly alike as in this of buying and selling. Introspection, therefore, an easy self-knowledge open to all persons alike, and a personal experience in these matters that everybody gains, give most trustworthy answers to Inductive inquiry along these lines. Trade is natural and gainful, as any person can see, who stops to ask himself why he has made, or is about to make, a given trade; and if natural and gainful to *him*, equally so for precisely the same reasons to the party of the other part; hence no law or encouragement is needed to induce any persons to enter upon traffic; and any law, or artificial obstacle, that hinders any two persons from trading, who would otherwise trade, not only interferes with an inalienable right that belongs to both, but also destroys an inevitable gain that would otherwise accrue to both. Political economy

is very fortunate, accordingly, in being able to make its appeal to the common sense of all men, giving sound starting-points through self-knowledge possessed by all men, guiding to safe steps by means of Induction all who like to generalize and prove, and especially breaking up current fallacies by asking the potent question, "How would you like it yourself?"

(4) *Feigned Cases*. There are two kinds of these, namely, those which might be realized in actual fact, and those which never can be so realized. The acute mind of the Greeks marked in their flexible language a decided difference between the class of suppositions that might possibly become facts, and another class of suppositions impossible to become facts, by developing a distinct form of expression for each. This distinction must always be borne in mind by those who use or note in economical discussions the expedient of Feigned Cases. Reasoning is always legitimate and often pregnant from suppositions, whenever these are such as might readily become facts of experience, because in that case the argument proceeds upon recognized and inductive resemblances; but otherwise, no inference at all can be drawn from them, because it is an universal truth in Nature and in Logic, *ex nihilo nihil fit*, out of nothing nothing can come. In plausible suppositions impossible to become facts is a nest of logical fallacies, that need to be watched. A good illustration may be found in the Monetary Conference at Paris in 1881. Delegates were there from all the nations of Europe, from the United States, and even the distant India. Some of these in their eagerness for a factitious ratio of value between gold and silver forgot the important distinction now in hand, and argued of the good results to flow from the realization of a supposition, *which in fact never could be realized*. Mr. Evarts voiced the French and American

delegates in this declaration: "Any ratio now or of late in use by any commercial nation, if adopted by an important group of states, could be maintained; but the adoption of a ratio of  $15\frac{1}{2}$  of silver to 1 of gold would accomplish the principal object with less disturbance in the monetary systems to be affected by it than any other ratio." The fallacy in this passage is in the words, "could be maintained," which are a supposition, and what is much worse, a supposition contrary to fact, from which all arguing is nugatory. Why it is contrary to fact will be seen at length in the following chapter on Money.

On the other hand, a supposition that may clearly become a fact is a substantive thing, and logical inferences may be drawn from it, just as geometrical inferences may be drawn from a *supposed* circle: the circle on the page is not a *perfect* circle — no such circle was ever drawn — but *suppose* it perfect, as it might possibly be, and argument becomes at once valid. Let us take another Monetary Conference at Paris in 1867 as an illustration: its judgment as voiced by Mr. Ruggles of New York was taken with logical propriety, when the great benefits of an international coinage of gold alone were argued and announced, because, while that was then a mere conjectural project, it was possible any day by mutual agreement among the nations to become a reality. An international coinage of gold is a simple question of equivalence of *weights* in the coins of different countries: an equivalence of *values* as between gold and silver coins for any great length of time is neither simple nor possible.

(5) *Results measurable in numbers.* The four preceding logical processes of proof and construction Political Economy is glad to share with the other Moral Sciences, but this fifth and last one it has to itself alone, and this is its chief scientific advantage over them, and is consequently the main

reason why it is already more advanced and more symmetrically developed than any of them. In common with them it has important subjective elements, such as Desires, Estimates, and Satisfactions; in marked advantage over them it has also objective elements, that can be weighed and measured and even hardened into statistics. Economics has an ever ready objective test, which mere mental and ethical and other moral processes never can have from their very nature. The *result* of each and of all economic transactions may be measured by money, and put down in a ledger, and published to the world in the form of statistics. An economic blunder, whether in legislation or in private action, pretty soon proves itself to be such by the lessened gains of somebody, and these losses can be stated arithmetically; and similarly, an economic improvement evidences itself at once by increased gains coming to somebody; while it may take years and years to work out the results of an ethical mistake, and even then their amount can only be guessed at.

Theories in metaphysics can only be tested by the *Reason* of men, and reasonable men without apparent bias of motive take opposite views of Sensations and Intuitions and Volitions; while theories in economics, which can be even better tested by the *Reason*, have an additional and almost immediate and constantly recurring test through men's pockets and the tables of the Census. The people indeed sometimes deceive themselves, and are also too often deceived by others, in these matters of buying and selling; but it is none the less of the utmost consequence to this Science, that all the results of good and bad practice in Economics work themselves at last into a definite shape, into facts and figures that cannot lie. It is not, as in Ethics and Metaphysics, that tendencies and potencies only are ascertained, but everything speedily drifts into results measurable in

numbers, which stand out like landmarks against the sky. It is just for this reason, as both the schools of the Roman lawyers admitted, namely, that we have in all cases the Return-Service as the outward expression and measure of the Desire and Effort of him who renders the service, and because it makes no difference which of two services exchanged be regarded as the return-service, that our Science is reared on the firm ground of objective realities, notwithstanding the strong subjective elements that have a constant part in it.

(c) The third condition of a recognized Science is, that the logical processes appropriate to its class of facts have been already carefully applied to them and a certain number of "exact definitions and sound principles" have been already "deduced from and applied to" them. We do not hesitate a moment to claim, that this condition also is fairly and fully met by Political Economy, and that this is a "Science" under the definition from every point of view, and particularly from this third point of view; and a few examples will now be given as a specimen merely of the logical work already achieved in Economics. First, Induction more or less busy for two thousand years has given at last an exact and acceptable definition of the Science, and impliedly an exact description of the class of facts with which it is conversant, namely, the Science of Sales, or what is exactly equivalent, the Science of Value; and Deduction at all points along this slow road has helped to correct and to broaden successive imperfect inductions, which an inquisitive and tentative and cautious spirit—the mainspring of Constructive Science—has instituted from time to time.

Second, precisely the same processes often repeated have ascertained beyond question, that there are only three classes of Valuables and the exact differences between them, and that, consequently, only six cases of Value are possible to happen.

Third, so many nations at different times in all ages have lowered the standard of their Money under a misapprehension of its nature and in a vain hope of profit, and a general scale of rising prices following each attempt of this kind having been several times observed and no instance to the contrary, Economists came by Induction to assert the proposition, that falling Moneys cause rising Prices; the proposition stood secure on inductive grounds alone; but so soon as a perfect definition of Money, namely, a Measure of Services, had at last been reached both inductively and deductively, it became at once a safe Deduction from the definition, that rising Prices must succeed a falling Measure. Thus assurance became doubly sure.

Fourth, Introspection gives each buyer and seller such firm possession of *his own motive* in buying and selling, that he naturally and inductively concludes on the ground that men are substantially alike, that the *motive is similar* in the party of the other part; each further step of experience in traffic assures him of this beyond a doubt,—each wants to get and does get something from the other of more consequence to him than what he gives; every attempted deviation from rectitude in trade so far forth throws the trader out from opportunity to trade; opportunity to trade is nothing in the world but a *market*; a market is nothing in the world but men with products in their hands, desiring to buy other products with these; the more men anywhere with the more products in their hands of all sorts to buy with, the better market everywhere for other men (the more the better) with other products of all kinds to buy with; all the appropriate logical processes in action and reaction, all the commercial experience of all men everywhere, and all the true statistics of traffic ever gathered, do but assure the inductive assent to one of the best and broadest of all the

Generalizations in Economics, namely this: *A market for products is products in market.*

(d) Are the definitions and principles already logically deduced from and applied to the great class of Valuables orderly arranged in "a body"? This is the only inquiry that remains, in order to determine whether Political Economy is already a "Science" in the strictest sense of that term. It is admitted, that a jumble of even just definitions and principles do not constitute a science, but only these when placed in a just order and interdependence. A "body" implies an organic arrangement of parts. It has been well said of the human body, that all its parts are reciprocally means and ends; the same may be said of every living organic body, whether vegetable or animal; and the same may be said in the way of analogy of every developed and recognized Science. All the definitions and propositions and illustrations in any science should be so arranged, as to show the mutual relations and reciprocal dependence of all the parts, and as to display the whole in harmony and symmetry.

It is as certain as anything in the future can be in science, that new principles will be discovered in Economics as Time and Inquiry go on, and that these will find their place little by little in a fuller and more rounded "body" than is at present possible; while it is also as certain as anything in the future of science can be, that the Outline of economics is already perfectly drawn, that the great class of Valuables will never be enlarged nor be better described, that the category of Commodities, Services, Credits, is completed for all time, and that the analysis of each act of trade into two Desires and two Efforts and two Estimates and two Renderings and two Satisfactions will never yield additional elements. Political Economy is already a body of exact definitions and sound principles

deduced from and applied to a single class of facts. This body will indeed be enlarged by a future and finer scientific construction, the arrangement and interdependence of its parts will be better exhibited, the form and filling up of the Science within the outline already determined is sure to become more compact, more robust, and more beautiful, as the decades and centuries go by; while, as in the human body throughout all the changes of its growth and mature life, that future body of economic science in all its stages towards perfection will be but the continuation and fuller development of the present "body" of Political Economy.