

a man far enough from being a technical Economist, said in the Senate of the United States, that "*it is almost a crime against civilization*" to maintain commercial barriers between Canada and the United States.

There were tokens a plenty in the year of Grace just referred to, that the Science of Value in all the lands of the civilized world, and particularly in the United States, was drawing to itself a new and more popular esteem. It was seen more clearly and felt more deeply than ever before, that this science has a weighty word for every man and woman and child in the world; that there are certain Rights in every one inherent and inalienable to buy and sell for his own advantage; that most if not all of the Governments, under the lead of comparatively few selfish and powerful men, were infringing upon these Rights, and robbing under the forms of Law the masses of their citizens to immense amounts for the special benefit of these very men; that the only sure defences of the people against these abuses of all kinds were in the maintenance and diffusion of the scientific and consequently disinterested principles and maxims of a sound Political Economy; that such a science was only friendly to the broadest rights, to universal gains, to illimitable increase in human comforts and powers, to international fellowship, to peace on earth and good-will among men; that, accordingly, a science of such scope and tendencies must be encouraged and cultivated and improved; that what had been crude in it, and narrow, and merely national, must be sloughed off; that the English and insular and special speculations of a century ago, which regarded "Wealth" as consisting of material things only, excepting however considerable portions of Adam Smith's immortal book, were antiquated and unusable; that the Science had really moved into a broader and still a well-circumscribed field, new and more

permanent foundations were being laid, and fresh contributions from all countries should be welcomed; and that the time had fully come, when the accepted truths of this Science, like those of the other developed sciences, should be practically and steadily applied to the betterment of mankind. Under these broadening and inspiring and uplifting conditions Political Economy, as never before, thanked God and took courage.

3. Having now a satisfactory definition of Value, and knowing accordingly just what Valuables are in clear distinction from all other things in the world, we must examine with some care two or three of the most general facts and laws and limits of Value, before we pass in the next following chapters to study in detail each of the three kinds of Valuables, namely, material Commodities, personal Services, commercial Credits.

(a) Since Value in general is the relation of mutual purchase between two Services, and consequently the specific value of either can only be expressed by the other,—one Valuable being always measured by the Valuable exchanged against it,—it follows as a matter of course that such a thing as a general Rise or Fall of Valuables is an impossibility. The rise of one valuable involves of necessity a fall in the other, as the fall of one implies the rise of the other. If the articles exchanged be bushels of wheat and dollars of silver, and if a bushel buys a dollar to-day, then wheat is worth a dollar a bushel; but if wheat rises next week, so that a dollar will not buy a full bushel, that is precisely the same thing as saying, that the dollar has fallen in its purchasing-power as compared with the wheat. Such specific changes in the purchasing-power of one Valuable over another are incessant throughout the commercial world, and a merchant's sagacity consists in anticipating these so far as possible and in availing himself

of them alertly and prudently; but each one of us must needs see clearly and hold firmly in mind, that each fall in the purchasing-power of a Valuable means a corresponding rise of power in the other Valuable,—if the first buys more of the second than before, then the second must buy less than before of the first; and, consequently, a general rise of Valuables is a contradiction in terms, and so of course is a general fall of Valuables.

This brings us to *Price*. Price is Value reckoned in money; and this is the only difference in the meaning of the two terms. When one valuable is sold against another, even when one of the two is money, each is the *Value* of the other: Value is the general and universal term in Economics. When any other valuable is sold against money, the amount of money it buys is called its *Price*: Price is a specific and restricted term in Economics. Since we shall study Money thoroughly in a later chapter, and there explain the origin and extent of its functions throughout, it is only in order to remark here, that it is for convenience' sake, that is, to make easy the comparison of valuables one with another, that Value in commerce is commonly reduced to Price. Money becomes a sort of measure, by means of which to compare all other valuables with each other. In order to ascertain the Price of a Valuable, it only needs to be sold once against money; but in order to ascertain the Value of a Valuable, it would need to be sold once against all other valuables whatsoever. This last is clearly impracticable; and so Value for practical purposes is reduced to Price. The General is made Particular for convenience. Hence we have "Prices current," but never Values current.

Now it will be plain to all, how there may easily be and often is a general rise or fall of Prices while a rise or fall of Values is impossible. Price is a relative word as much

as Value is, but it does not relate to so many things. Price is specific, and Value universal. Both equally involve buying and selling, but one sale of a single valuable against money leads to Price, while ten thousand sales of the same valuable against other than money would not conduct to complete Value. That would require a sale of this valuable against all other valuables in the world, and a complete statement of the comparative results.

General, or at least universal, changes of Prices in rise or fall in any given country are due to general and great changes in the Money current there. Subordinate changes in other valuables, money being supposed to remain uniform, will of course vary their Prices; but it is impossible that such changes should affect equally or even generally all the various and numberless valuables of a whole country; while some are coming easier, others are coming harder, while some are more desired than formerly others are less desired, and this will bring in of course altered prices, some higher and some lower; but a general rise of all prices, or a general fall in the same, can only come about by great changes of some kind in the circulating medium, that is, the money, of the country. For example, in the United States, between 1862 and 1878 inclusive, a government paper promise, called *greenbacks*, was the current money of the country; owing to its excessive issue, and to some doubt in the minds of the people whether the paper would ever be redeemed in gold, it soon became depreciated as compared with gold, the premium on which over the paper money varied at different times from 1 to 185 *per centum*; as all other valuables were then sold against greenback money, which had declined, their prices naturally rose in some sort of proportion as the medium fell; general *values* remained much as before, but general *prices* were much enhanced; and when, after the resump-

tion of specie payments in January, 1879, gold became again the standard medium, general prices declined in full accordance with the same universal principle reversed.

(b) Prices, as we have now seen, are only a subordinate form of Values: the universal law that regulates all the variations of them both, within certain fixed limits to be examined shortly, is called the LAW OF SUPPLY AND DEMAND. This is perhaps the most comprehensive and beautiful law in Political Economy. We shall look at it now only in outline: the filling in will be the pastime and profit of all that is to come.

"Demand" is a technical term in Economics, and accordingly needs to be defined, and then always used in its defined sense. So is "Supply." *Demand is the "desire" of a "person" for something in the hands of another person, coupled with the possession of something else capable of buying that something.* Mere desire has no function in Political Economy: hungry and penniless children passing by the stalls of a great market, have no influence on the prices or values of the viands, on which they cast their eager glances: only desires accompanied by "efforts" competent to excite the desires and to pay for the efforts of another are a Demand. Supply is the same thing as Demand looked at from the other side. Supply is the correlative of Demand. The Supplier is a person, who has in his possession something desired by the Demander, and who in turn desires something in the hands of the Demander, when both are willing to exchange their "renderings." There is no economical difference in the position of the Demander and the Supplier. Each is equally a Demand and a Supply with reference to the other. It is the old and ever-recurring case of Value, the propositions being here stated in their most universal terms.

For simplicity's sake, however, and for convenience,

without altering the substance of the definitions a particle, the valuables when looked at as a Demand are practically reduced in all markets to their equivalent in Money, so that Money offered or ready to be offered against any other exchangeable thing constitutes what is called in commercial language a Demand; and this is sufficiently accurate as well as current, although it must always be remembered that each valuable in any market in reality constitutes a Demand for another, and is equally a Supply in reference to that other. *Supply is any exchangeable thing offered for sale against any other exchangeable thing.* For example, corn in any market is at bottom a Demand and a Supply at once for every valuable offered in that market at that time, say, ploughs for one thing; but in the talk of the market, the presence of corn there, or its being ready to be immediately brought there and offered in exchange for money, constitutes what is called a Supply of corn; money offered, or ready to be offered, in exchange for corn, constitutes what is called a Demand.

On this account Money seems to play a much more important part in trade than it actually does play; the corn is sold in the terms of money, that is, for dollars and cents as denominations of Value; convenience dictates such a reduction of general Value to this particular form of it, because this is found to make easier the ultimate exchange; but there is not one chance in a hundred, as trade runs nowadays in the larger markets, that this seller of corn will take his pay for it in actual money whether metallic or paper; money is never an ultimate product, but only an intermediate one; this seller of corn wants perhaps a plough or some other farming implement, and ten to one he will take for his corn a bill or order in some form on the seller of ploughs, and it will be corn for a plough, each becoming a Demand and a Supply for

the other, though money or rather its denominations has acted as an agent in bringing about the final trade; the details of all this in manner and result will be as plain as day when we come to study "Money" and "Credits" in following chapters; while the essential point to be noted here is, that all Valuables are a Demand and Supply as towards one another. In other words, the world over, A MARKET FOR PRODUCTS IS PRODUCTS IN MARKET.

What, then, is Market-Value returned in the terms of Money? And what is the universal Law of it?

Market-value is the present rate of exchange between dollars and cents and any other valuable, that can be fairly graded in a class made up of valuables similar to itself; and the law of market-value is the equation of Supply and Demand, that is, the current rate is adjusted when money enough is offered to take off within the usual times the valuables on hand and offered for sale. If Demand for any reason become quickened, and the Supply be not increased, there is competition among buyers for the stock in market, and the market-rate rises or tends to rise. If, on the other hand, Demand become sluggish, the Supply remaining the same, there is a like competition among the sellers to dispose of their stock, and market-value sinks or tends to sink. So far it is the simple action on Value of the element of one "desire" expressing itself through a money-demand, the elements of "desire" and of "efforts" expressing themselves through Supply being supposed to remain stable, and the pulsations in the market-rate follow accordingly.

How far can this simple action go? Demand increasing, Supply remaining as before, market-rate rises: how far can it rise from this cause? Here we must remember that Demand not only acts upon Value, but also Value reacts upon Demand. As Value rises, the number of those whose

means or inclinations enable them to purchase at the new rate is constantly diminished: there are ten persons who may wish an article at one dollar, of whom not over four will wish it at two dollars, and perhaps only one at three dollars. Every rise in market-rate then, under the impulse of enlarged Demand, tends to cut off a part of that Demand, that is, to lessen the number of those who will purchase at the increased price; and the rate consequently can only rise to that point, whatever it be, where an equalization takes place between the Supply and Demand, between the quantity of flour, for example, offered at the enhanced rate, and the quantity of money in the hands of those willing to exchange it for flour at the higher rate.

Just so in the reverse way, when Demand is slackened, Supply continuing as before, the market-rate is sure to decline; but declining rates tend strongly in turn to increase the demand by bringing the article within the range of a larger number of purchasers; Society is like a pyramid, each lower stratum is broader than the one above; and so the decline of rates under a weaker Demand is arrested by a stronger Demand coming from a wider circle of buyers, and a new market-rate is determined at the point of equalization between the new Demand and the old Supply. Thus every rise or fall of Demand tends to check itself, and will check itself in all the great classes of valuables, even without any variations in the Supply; everything oscillates under the variations of Demand; while the point of stable equilibrium, if we may use the expression of anything so unstable as Market-value, is always the equation of Supply and Demand.

But all considerable variations of market-rate are commonly checked at an earlier point than the one just indicated by variations in the Supply. A sharper Demand carries up the market-rate, and a higher market-rate com-

monly acts upon Supply to enlarge it, and an increased Supply too checks the rise of market-rate. *Per contra*, a slacker Demand lowers market-rates, and lowered rates often lessen the Supply by the action of holders and speculators, — holders withdrawing their stock for a better market, and speculators buying now when the article is cheap to store away until it shall be dearer. Thus rise of market-rate from Demand growing stronger is checked doubly; first, by curtailing the number of would-be buyers, and second, by enlarging the Supply: the fall of market-rate from Demand growing weaker is checked doubly; first, by increasing the number of consumers of a now cheaper article, and second, by a diminution of Supply by the action of holders and speculators. This double and harmonious working of the law of the Equalization of Demand and Supply is one of the most comprehensive and beautiful laws in Political Economy.

Besides this, we must note the effect on Value of conditions in Supply only, Demand being supposed to continue steady. There are three classes of valuables in respect to the law of their Supply. (1) When the Supply is scant, and cannot be increased at all, as is the case with choice antiques and certain gems and paintings by the old masters, their value may rise to any point under the action of Demand, there is and can be in such cases no market-rate, and the individual value will be struck at the point of equalization of the demand then existing with the supply there offered. For instance, the French Government paid, in 1852, 615,300 francs for a painting by Murillo, which had belonged to Marshal Soult. The genuine Murillos are comparatively few, and their number cannot be increased, and their merit causes a strong "desire" to possess them, and their value rises in connection with the limitation of Supply to a point beyond which no one purchaser

can be found. When this painting was offered in Paris for sale, many "persons" of course were anxious to buy it, there was but one painting, there could be but one purchaser, value rose under the influence of a sharp Demand, the rise could not be checked by any duplication of the Supply, and the equation was complete and the value for that sale determined when one party distanced all other competitors and offered a sum greater than any one else would give. The same principle controls all sales of this sort, and is practically the principle of the *Auction*, whose very name indicates its nature in this regard, that Demand becomes restricted to one party, and that the highest bidder.

(2) When the Supply, instead of being absolutely limited, can only be increased with difficulty or after the lapse of time, similar but less extreme results will be observed. Let us suppose, that pianos are selling in some rural community at \$300 each, that there are twenty persons in the place who want a piano immediately, that there are but fifteen pianos on hand, and that the number cannot be increased for half a year. The market-rate will certainly rise above \$300. How much above? To that point, at which only fifteen of the twenty will be willing to purchase at the new rate. The equation of Supply and Demand will be reached by a rising rate which cuts off five competitors. This is the principle, working only roughly in practice through the estimates and good judgment of dealers and purchasers. A better illustration of this second class of cases is, perhaps, the Grains and other agricultural products. When these have been gathered, there is no more home supply for a year; and any deficiency in the crops will raise their market-rate, not at all in the ratio of the deficiency, but according to the relations of the diminished Supply to a new Demand. Since the

abolition of the Corn-Laws in England in 1846, and the resulting ease of grain-imports from abroad, a deficiency of home crops has no such effect on the price of cereals as it had before that time; when, according to Tooke's History of Prices, an expected falling-off of one third in the crops often doubled and sometimes quadrupled the usual prices; which shows that the world ought to become one country in respect to all food supplies, as indeed happily it is now for the most part, each country allowing them to be distributed freely everywhere in accordance with this law of Demand and Supply. Speculation is more busy in grain, in cotton, and in such things generally, because a new Supply can only be had once a year; early information is eagerly sought at the trade centres in regard to the prospects of the growing crops, and has its influence one way or the other on current prices; but the world is so wide and all the parts of it now so closely connected together by steamship and telegraph, that the prices of the great food staples are remarkably uniform over the earth, and Speculation has not the chance it once had to count and "corner."

(3) In the only remaining and by far most comprehensive class of cases, in which the Supply of Commodities and Services and Credits can be readily and indefinitely increased to meet enhanced Demand, and easily withdrawn from market and stored when Demand declines, each rise and fall of market-rate tends to be speedily checked through the mere action of Supply; and the doubly and harmoniously working Law but just now referred to keeps Value in this class of cases comparatively steady all over the world.

(c) It only remains in this branch of the general discussion on Value, to indicate the Limits, within which all oscillations of Value are contained. These extreme limits

are specially to be found in the element of Value which we have called "Efforts." We have clearly seen already, that "efforts" (or Labor) are not, as has been often asserted, the cause of Value, but only one of several constituent causes; if Labor be asserted to be the sole cause of Value, the inquiry becomes instantly pertinent, what is the cause of the value of Labor; yet we know, that "efforts" always stand in preconnection with value, and, the mutual "desires" being presupposed, there must always be Limitations of Value lying partly in the efforts made by the person serving and partly in the efforts saved to the person served. In every valuable transaction, each of the parties is reciprocally serving and served, and it is clear, that the two would not exchange "renderings" unless the service which each renders to the other is less onerous than the "efforts" which each would have to make if each served himself directly. For example, it takes a certain effort for me to bring water from the spring for the use of my family; I am willing to pay a neighbor for bringing it for me, but I should not be willing to make a greater effort for him in return than the effort is to bring it myself; neither should I be willing to make an effort for him in return which I regarded just as onerous as the bringing the water myself; and unless there is some service which he will accept less onerous to me than that, I shall continue to bring the water. On the other hand, he will surely not render the service to me of bringing the water, unless it be less onerous to him to do so than the doing that for himself which I am ready to do for him.

This principle, applicable to all exchanges whatsoever, draws on the one side the outermost line, beyond which Value never can pass. It may be asserted with confidence, that no person will ever knowingly make a greater effort to satisfy a desire through exchange, than the effort need-

ful to satisfy it without an exchange. Therefore, it follows, that all exchanges lessen onerous efforts among men relatively to the satisfaction of their desires, and tend to lessen these more and more as exchanges multiply in number and variety, otherwise the exchanges would not take place.

Moreover, within this outermost Limit of Value, which is made by the comparative onerousness of the respective "efforts," there is a second limitation of a similar kind to be found specially in the element which we have called "estimates." The estimate of each exchanger is based at once on his own effort about to be rendered and on his desire for the return service offered: the element of effort in the case of both being considered for the time as fixed, Value will vary according to the varying desire of each for the return service of the other, affecting of course the "estimate" of each, and furnishing also a secondary Limit of Value. To pursue the same illustration, suppose I regard the effort required to bring the water myself as 10; that there are several persons, who would be glad to do that service for me at a return service which I consider as 8; that there are two persons, who are willing to do it for something which I estimate at 6; and that there is only one person, who will do it for a return service which I regard as 5. It is evident, that the extreme limits of that service to me are 10 and 5. Higher than 10 it cannot go, lower than 5 it cannot sink. But why have I before me three possible classes of renderers? Because the persons in each class, while estimating their own efforts alike in the proposed rendering to me, have varying "desires" as towards a possible rendering from me to them, and consequently put differing "estimates" upon the possible transactions. The man who will bring the water for 5 has for some reason (no matter what) a stronger desire for the

return than anybody else, and I should of course employ him so long as he would serve me on those terms; if he decline the exchange, I fall back on one of the two persons in the class above him, and Value rises now from 5 to 6, and will be steadier there than it was before; if each of these in turn should give out, I should fall back upon the larger class ready to serve me at 8, and Value would be very steady at that rate, because there are numerous competitors; and by no possibility could it rise above 10. Between 10 and 5 the value may fluctuate, but it cannot overpass these Limits in either direction under existing circumstances.

Therefore we may conclude, that the *maximum* Value of any Service in exchange will be struck at the point where the recipient will prefer to serve himself, or go without the satisfaction, rather than make the exchange; and the *minimum* Value of any Service in exchange is struck at the point below which the recipient cannot get himself served even by him who most highly estimates the return service offered.

(4) We come now to the last and most important Inquiry in this initial chapter, namely this, *Can there be, and is there, a strict Science of Buying and Selling? Is there a Science by itself, clear and certain, that covers and controls Valuables?*

Here we must go slowly, if we would go surely. We must first find out exactly what a Science is in general, and then ascertain in particular whether Political Economy bears all the marks and stands all the tests of the other genuine Sciences. What is a Science?

*A Science is the body of exact definitions and sound principles educed from and applied to a single class of facts or phenomena.*

The very first condition, accordingly, of any science is,

that there be a single class of facts, objective or subjective, that can be separated from all other classes of facts, in the mind by a generalization and in words by a definition, and that such generalization and definition be clearly made and held; the second condition is, that the class of facts so circumscribed and defined be open to some or all of the logical processes of construction, of which the most important are Induction and Deduction; the third condition is, that the subordinate definitions and working principles within the inchoate Science be all educed from and applied to these circumscribed facts in strict accordance with these well-known logical processes; and the last condition is, that these definitions and principles have gradually become "*a body*," in which there is an organic arrangement of parts, all being placed in a just order and mutual interdependence. There is no old Science, and there can be no new Science, in which these four conditions do not meet and become blended; and the beauty of it is, that this Definition applies to any Science in all stages of its growth. No one of all the Sciences is as yet completed; but just so soon as any correct definitions and principles are drawn from and applied to any *class* of things clearly circumscribed as such, and these definitions and principles are orderly arranged in a *body*, there is an incipient Science; and its progress towards perfection will proceed in precisely the same manner in which its foundations have been laid; new facts and principles and definitions will gradually be discovered, and these when reapplied to the class of things out of which they have sprung, will lead to corrections and adjustments and enlargements of the Science; and no matter how far these logical processes may be carried, the general Definition with which we start will also be found ample at the end of the journey.

All of the Sciences without exception have been devel-

oped into their present position in just this manner; and they fall easily into three great classes, namely, the Exact, the Physical, and the Moral Sciences. The ground of this triple classification is partly the distinct subject-matter in the three classes of Sciences, and partly the distinctive prominence of one or more of the logical processes of construction in each.

Thus, the class of the Exact Sciences consists only of the formal Logic, and pure Mathematics. These two are distinct from all other sciences, because their logical method of procedure is wholly Deductive. Deduction is the process of the mind, by which we pass from a *general* truth to a *particular* case under it, that is to say, from *more* to *less* inclusive propositions. Stuart Mill argues at much length in his book on Logic, that even the axioms of pure Mathematics are originally gained by Induction, while others claim that the truth of these axioms is perceived *intuitively*, but no matter how this point is decided, the construction process of the Pure Mathematics is from the General to the Particular. So it is also with the Aristotelian logic, whose Major Premise, whether only *supposed* to be true or *intuitively perceived* or *inductively proved* is always General in its terms. This is the form of Aristotle's Syllogism:— All sinners deserve to be punished; John is a sinner; and therefore, John deserves punishment.

Physical Sciences are those concerned with the classifications and laws of action belonging to material substances. There are a great circle of these, of which Astronomy, Botany, and Chemistry, may serve as examples. They have been mostly developed since the time, and in accordance with the methods, of Lord Bacon; who, in strong reaction against the Deductive logic of Aristotle, exalted Induction or the mode of generalizing from *particulars*, as the true way of building up Sciences; and, as the subject-



matter of each of the physical sciences is well open to observation and experiment, to Induction and Deduction, and to corrective verifications, both inductive and deductive, the new method proved remarkably pregnant and successful. Each of these sciences has a distinct *Class* of objects or phenomena to which its attention is directed; the class is circumscribed by the scientific Conception and Definition; its devotees as a rule are skilled in using the Baconian tools; and consequently, its conclusions receive the confidence and control the action of men. All of the Physical Sciences are constantly enlarging "the body of exact definitions and sound principles" connected with their several classes "of facts or phenomena."

Moral Sciences are those concerned with the classifications and laws of action belonging to beings having Thoughts and Desires and Will. The most developed of these sciences at present are Metaphysics, Ethics, and Economics. Each of these is concerned with a single class of phenomena, which may be exactly conceived of and defined, and is open to the logical processes by which alone Sciences can be built up. But Induction cannot march up with quite so sure a stride, nor Deduction descend with so large degrees of certainty, in relation to *persons* endowed with free-will, as in relation to physical substances held firm in the grip of unvaried law. Still, the doubt always attaches far more to the actions of an *individual* than to the actions of the *masses* of men. It is much easier to know human nature in general, than one man in particular, because many Inductions guided by observation and History make it almost certain how masses of men will act under a given set of conditions, while any one *may* act in a contrary way. Deduction, accordingly, cannot hold quite the same place in the Moral Sciences so far as individuals are concerned, as it holds in the

Physical and Exact Sciences; but this lack is perhaps more than made up by other advantages. *Experience* in the moral sciences corresponds to *Experiments* in the physical sciences. Then there is the great advantage of *Introspection*; since each man has within himself the means of interpreting and testing the inductions of Metaphysics, Ethics, and Economics. Then also there is the great resource of *Feigned Cases*, which, provided only they be cases possible to occur, open up to Reasoning a new means of proving and correcting. Besides these, which it enjoys in common with them, Economics, as we shall soon see, possesses one other great advantage over and above the rest of the Moral Sciences.

Since, then, Political Economy deals primarily with Persons, and only quite secondarily with Things, it is, under the definition and on every ground, a "moral science"; yet it must not be confounded in the least with what is sometimes called the science of Morals, or Ethics. There is one word that marks and circumscribes the field of Ethics, and that word is *Ought*; there is one word also that marks and circumscribes the field of Economics, and that word is *Value*. Now, the idea of *obligation*, on which ethical science is founded, and the idea of *gainful exchange*, on which economical science is founded, are totally distinct ideas. The imperatives of ethical obligation rest upon the consciences of men, and Duty is to be done at all hazards; guilt is incurred if it be neglected; while pecuniary gains and losses, however large, do not, or at least ought not, weigh a feather against an intuition of Right and Wrong. Economics, on the other hand, does not aspire to place its feet upon this lofty ethical ground; no man is ever under any moral obligation to make a trade; he properly makes it, or not, according to his present sense of its gainfulness to himself; and so economic science finds a solid and ade-

quate footing upon the expedient and the useful. Ethics appeals only to an enlightened conscience, and certain conduct is approved because it is Right, and for no other reason; Economics appeals only to an enlightened self-interest, and exchanges are made because they are mutually Advantageous, and for no other reason; each of the two Sciences, therefore, has a basis and sphere of its own, and the grounds of the two are not only independent, but also incommensurable.

We will now apply *seriatim* to Political Economy the four fundamental conditions belonging to all recognized Sciences, and so determine for ourselves whether it be not a strict science, and thus worthy in its leading propositions of all acceptance.

(a) Every science must have to begin with a definite Class of facts, which lie in an easily circumscribable field, and which are not likely to be confounded with other facts of a differing nature. Economy has such a class of facts, that lie in such a field, and that cut themselves off by sharp lines from all other things. *Valuables* is its class of things. It has nothing to do with any other class of things. Its field is Value, or Sales, or Exchanges. This field is perfectly definite. Sales are never confounded with gifts, and are never confounded with thefts. They have a distinctive character of their own. They have always been in the world, will always be in the world in ever-multiplying volume, and no one ever mistakes their main features for anything else. Anything whatsoever that is salable, or is about to be made so, comes within the view of Economics, and scientifically it cares for nothing else. While it finds its field definite, it also finds it broad. It has no wish to encroach on other sciences, nor will it tolerate any encroachments on its own. Before anything is sold, or is being made ready to sell, it cares

nothing what other science employs itself upon that thing; after the thing is sold, Economy loses its interest in it, and other sciences may take it up if they choose. *Valuableness* is the one quality that constitutes the Class of things with which the Science is conversant, and it claims complete jurisdiction over all things just so far forth as they have this one quality, and no farther. Now there *is* in the actual world such a Class of things; its exterior boundaries have been exactly ascertained by a long series of Inductions and Deductions, tentative, corrective, and confirmatory; and accordingly, Political Economy has now in full possession the first grand condition of a Science.

(b) This great class of facts, thus reached by logical Generalization and grasped and held by a mental Conception and fixed by an adequate verbal Definition, is remarkably open to all the logical processes of reasoning, by which alone sciences are constructed, and thus possesses in full measure the second grand condition of the Sciences. Not one logical resource is denied to the economists: all the tools of the scientific workshop are at their hands. Let us now catalogue these in their order.

(1) *Induction*. This is the logical and universal process, by which the mind naturally passes up from a certain number of observed cases, in which a certain quality appears, to a Generalization, which is a conception of the mind followed by a statement in words to the effect, that *all possible cases* of that kind will exhibit the quality already observed in *the few cases*. It has as its basis a confidence in the resemblances and uniformities of Nature; it proceeds upon the axiom that Nature throughout is consistent with herself; and this confidence has been ten thousand times justified in the issue, when it is found that Nature preordained the Sciences by causing grand analogies to run through each department of her works, including man

and his works. The structure of the human mind corresponds with these objective resemblances; it seizes upon them, and delights in them, and naturally and joyfully infers and concludes that what has been observed of a *part* may be safely affirmed of *the whole* of that kind; accordingly, the world over, when certain things are found to be true in a considerable number of cases, the mind leaps over space and time to a whole class, and frames for itself a general rule or principle, which binds all the cases into one bundle, and thereafter confidently affirms what is known to be true of some to be probably true of all. This is inductive Generalization; and the strength and the joy of it is well expressed by Descartes: "*I have thought that I could take as a just generalization that which I very clearly and vividly conceived to be true.*"

Experience in Economics corresponds to Experiment in the Physical Sciences, and furnishes to Induction all the fuel it can ask for to feed its logical furnace and to forge the chains that bind the Cases to the Classes. Personal experience in buying and selling, local experience in buying and selling, and national experience in buying and selling, with all that belongs to these, the records of which are full to overflowing, afford to the inductive inquirer in Economics an inexhaustible supply of material. Instances abound. Particulars may be gathered up one by one on every hand and linked into the inductive chain. If any doubt be felt about the strength of any one of these chains, another one may at once be linked in terms drawn from another field of Experience with a view to test the strength of the first. Most fortunate from this point of view is the United States, because here there are States with substantive powers of control over most matters of trade within their borders, as well as a Nation with sovereign powers of control over some points of trade within the country

as a whole. This feature has given birth to commercial experiments as well as commercial experience of all kinds; and Induction rejoices in all these abundant materials for generalization thus furnished free of cost to Science, though unfortunately not free of cost to the People.

(2) *Deduction.* This is a logical process exactly the reverse of the first, in that it descends from a generalized statement reached by the inductive process to some particular, or subordinate class of particulars, ostensibly covered by the general maxim. Induction examines a number of particulars, and then makes a leap, it may be a long leap, over all intervening particulars, to its Generalization clamping them. The main use of Deduction is to make sure of any one of these overleaped particulars, which may come into importance, and thus confirm the generalization, or correct it. It is not strictly true, what is often alleged against deductive reasoning, that there is nothing *new* in its result, that the Induction had already passed through that particular in rising to its Generalization, and therefore to descend to any particular link to examine that, is something useless. The exact truth is, that it *is* useless to examine again deductively the very particulars that were carefully studied inductively, but on the other hand there is always much actually untraversed territory between these already examined particulars and the inductive generalization, and Deduction is often very useful in carrying us down to questionable points in this territory. Even Lord Bacon, who scorned the syllogism, admits this: "*Axioms duly and orderly formed from particulars easily discover the way to new particulars, and thus render sciences active.*"

We will illustrate this by a reference to Franklin's famous induction to prove the identity of lightning with electricity. Only one experiment, and that a very rude