

CHAPTER IV.

FALLACIES OF OBSERVATION.

Sec. 1. From the fallacies which are properly Prejudices, or presumptions antecedent to, and superseding, proof, we pass to those which lie in the incorrect performance of the proving process. And as Proof, in its widest extent, embraces one or more, or all, of three processes, Observation, Generalization, and Deduction; we shall consider in their order the errors capable of being committed in these three operations. And first, of the first mentioned.

A fallacy of misobservation may be either negative or positive; either Non-observation or Mal-observation. It is non-observation, when all the error consists in overlooking, or neglecting, facts or particulars which ought to have been observed. It is mal-observation, when something is not simply unseen, but seen wrong; when the fact or phenomenon, instead of being recognised for what it is in reality, is mistaken for something else.

Sec. 2. Non-observation may either take place by overlooking instances, or by overlooking some of the circumstances of a given instance. If we were to conclude that a fortune-teller was a true prophet, from not adverting to the cases in which his predictions had been falsified by the event, this would be non-observation of instances; but if we overlooked or remained ignorant of the fact that in cases where the predictions had been fulfilled, he had been in collusion with some one who had given him the information on which they were grounded, this would be non-observation of circumstances.

The former case, in so far as the act of induction from insufficient evidence is concerned, does not fall under this second class of Fallacies, but under the third, Fallacies of Generalization. In every such case, however, there are two defects or errors instead of one: there is the error of treating the insufficient evidence as if it were sufficient, which is a Fallacy of the third class; and there is the insufficiency itself; the not having better evidence; which, when such evidence, or in other words, when other instances, were to be had, is Non-observation: and the erroneous inference, so far as it is to be attributed to this cause, is a Fallacy of the second class.

It belongs not to our purpose to treat of non-observation as arising from casual inattention, from general slovenliness of mental habits, want of due practice in the use of the observing faculties, or insufficient interest in the subject. The question pertinent to logic is--Granting the want of complete competency in the observer, on what points is that insufficiency on his part likely to lead him wrong? or rather, what sorts of instances, or of circumstances in any given instance, are most likely to escape the notice of observers generally; of mankind at large.

Sec. 3. First, then, it is evident that when the instances on one side of a question are more likely to be remembered and recorded than those on the other; especially if there be any strong motive to preserve the memory of the first, but not of the latter; these last are likely to be overlooked, and escape the observation of the mass of mankind. This is the recognised explanation of the credit given, in spite of reason and evidence, to many classes of impostors: to quack doctors, and fortune-tellers in all ages; to the "cunning man" of modern times and the oracles of old. Few have considered the extent to which this fallacy operates in practice, even in the teeth of the most palpable negative evidence. A striking example of it is the faith which the uneducated portion of the agricultural classes, in this and other countries, continue to repose in the prophecies as to weather supplied by almanac makers: though every season affords to them numerous cases of completely erroneous prediction; but as every season also furnishes some cases in which the prediction is fulfilled, this is enough to keep up the credit of the prophet, with people who do not reflect on the number of instances requisite for what we have called, in our inductive terminology, the Elimination of Chance; since a certain number of casual coincidences not only may but will happen, between any two unconnected events.

Coleridge, in one of the essays in the *Friend*, has illustrated the matter we are now considering, in discussing the origin of a proverb, "which, differently worded, is to be found in all the languages of Europe," viz. "Fortune favours fools." He ascribes it partly to the "tendency to exaggerate all effects that seem disproportionate to their visible cause, and all circumstances that are in any way strongly contrasted with our notions of the persons under them." Omitting some explanations which would refer the error to mal-observation, or to the other species of non-observation (that of circumstances), I take up the quotation farther on. "Unforeseen coincidences may have greatly helped a man, yet if they have done for him only what possibly from his own abilities he might have effected for himself, his good luck will excite less attention, and the instances be less remembered. That clever men should attain their objects seems natural, and we neglect the circumstances that perhaps produced that success of themselves, without the intervention of skill or foresight; but we dwell on the fact and remember it, as something strange, when the same happens to a weak or ignorant man. So too, though the latter should fail in his undertakings from concurrences that might have happened to the wisest man, yet his failure being no more than might have been expected and accounted for from his folly, it lays no hold on our attention, but fleets away among the other undistinguished waves in which the stream of ordinary life murmurs by us, and is forgotten. Had it been as true as it was notoriously false, that those all-embracing discoveries, which have shed a dawn of *science* on the *art* of chemistry, and give no obscure promise of some one great constitutive law, in the light of which dwell dominion and the power of prophecy; if these discoveries, instead of having been, as they really were, preconcerted by meditation, and evolved out of his own intellect, had occurred by a set of lucky *accidents* to the illustrious father and founder of philosophic alchemy; if they had presented themselves to Professor Davy exclusively in consequence of his *luck* in possessing a particular galvanic battery; if this battery, as far as Davy was concerned, had itself been an *accident*, and not (as in point of fact it was) desired and obtained by him for the purpose of ensuring the testimony of experience to his principles, and in order to bind down material nature under the inquisition of reason, and force from her, as by torture, unequivocal answers to *prepared* and *preconceived* questions,--yet still they would not have been talked of or described as instances of *luck*, but as the natural results of his admitted genius and known skill. But should an accident have disclosed similar discoveries to a mechanic at Birmingham or Sheffield, and if the man should grow rich in consequence, and partly by the envy of his neighbours and partly with good reason, be considered by them as a man *below par* in the general powers of his understanding; then, 'O what a lucky fellow! Well, Fortune *does* favour fools--that's for certain!--It is always so!' And forthwith the exclaimer relates half a dozen similar instances. Thus accumulating the one sort of facts and never collecting the other, we do, as poets in their diction, and quacks of all denominations do in their reasoning, put a part for the whole."

This passage very happily sets forth the manner in which, under the loose mode of induction which proceeds *per enumerati onem simplicem*, not seeking for instances of such a kind as to be decisive of the question, but generalizing from any which occur, or rather which are remembered, opinions grow up with the apparent sanction of experience, which have no foundation in the laws of nature at all. "Itaque recte respondit ille," (we may say with Bacon,[18]) "qui cum suspensa tabula in templo ei monstraretur eorum, qui vota solverant, quod naufragii periculo elapsi sint, atque interrogando premeretur, ane tum quidem Deorum numen agnosceret, quaesivit denuo, *At ubi sunt illi depicti qui post vota nuncupata perierunt?* Eadem ratio est fere omnis superstitionis, ut in Astrologicis, in Somniis, Ominibus, Nemesibus, et hujusmodi; in quibus, homines delectati hujusmodi vanitatibus, advertunt eventus, ubi implentur; ast ubi fallunt, licet multo frequentius, tamen negligunt, et praetereunt." And he proceeds to say, that independently of the love of the marvellous, or any other bias in the inclinations, there is a natural tendency in the intellect itself to this kind of fallacy; since the mind is more moved by affirmative instances, though negative ones are of most use in philosophy; "Is tamen humano intellectui error est proprius et perpetuus, ut magis moveatur et excitetur Affirmativis quam Negativis; cum rite et ordine aequum se utrique praebere debeat; quin contra, in omni Axiomate vero constituendo, major vis est instantiae negativae."

But the greatest of all causes of non-observation is a preconceived opinion. This it is which, in all ages, has made the whole race of mankind, and every separate section of it, for the most part unobservant of all facts, however abundant, even when passing under their own eyes, which are contradictory to any first appearance,

or any received tenet. It is worth while to recal occasionally to the oblivious memory of mankind some of the striking instances in which opinions that the simplest experiment would have shown to be erroneous, continued to be entertained because nobody ever thought of trying that experiment. One of the most remarkable of these was exhibited in the Copernican controversy. The opponents of Copernicus argued that the earth did not move, because if it did, a stone let fall from the top of a high tower would not reach the ground at the foot of the tower, but at a little distance from it, in a contrary direction to the earth's course; in the same manner (said they) as, if a ball is let drop from the mast-head while the ship is in full sail, it does not fall exactly at the foot of the mast, but nearer to the stern of the vessel. The Copernicans would have silenced these objectors at once if they had *tried* dropping a ball from the mast-head, since they would have found that it does fall exactly at the foot, as the theory requires: but no; they admitted the spurious fact, and struggled vainly to make out a difference between the two cases. "The ball was no *part* of the ship--and the motion forward was not *natural*, either to the ship or to the ball. The stone, on the other hand, let fall from the top of the tower, was a *part* of the earth; and therefore, the diurnal and annular revolutions which were *natural* to the earth, were also *natural* to the stone: the stone would, therefore, retain the same motion with the tower, and strike the ground precisely at the bottom of it." [19]

Other examples, scarcely less striking, are recorded by Dr. Whewell, [20] where imaginary laws of nature have continued to be received as real, merely because no person had steadily looked at facts which almost every one had the opportunity of observing. "A vague and loose mode of looking at facts very easily observable, left men for a long time under the belief that a body ten times as heavy as another falls ten times as fast; that objects immersed in water are always magnified, without regard to the form of the surface; that the magnet exerts an irresistible force; that crystal is always found associated with ice; and the like. These and many others are examples how blind and careless man can be even in observation of the plainest and commonest appearances; and they show us that the mere faculties of perception, although constantly exercised upon innumerable objects, may long fail in leading to any exact knowledge."

If even on physical facts, and these of the most obvious character, the observing faculties of mankind can be to this degree the passive slaves of their preconceived impressions, we need not be surprised that this should be so lamentably true as all experience attests it to be, on things more nearly connected with their stronger feelings--on moral, social, and religious subjects. The information which an ordinary traveller brings back from a foreign country, as the result of the evidence of his senses, is almost always such as exactly confirms the opinions with which he set out. He has had eyes and ears for such things only as he expected to see. Men read the sacred books of their religion, and pass unobserved therein, multitudes of things utterly irreconcilable with even their own notions of moral excellence. With the same authorities before them, different historians, alike innocent of intentional misrepresentation, see only what is favourable to Protestants or Catholics, royalists or republicans, Charles I. or Cromwell; while others, having set out with the preconception that extremes must be in the wrong, are incapable of seeing truth and justice when these are wholly on one side.

The influence of a preconceived theory is well exemplified in the superstitions of barbarians respecting the virtues of medicaments and charms. The negroes, among whom coral, as of old among ourselves, is worn as an amulet, affirm, according to Dr. Paris, [21] that its colour "is always affected by the state of health of the wearer, it becoming paler in disease." On a matter open to universal observation, a general proposition which has not the smallest vestige of truth is received as a result of experience; the preconceived opinion preventing, it would seem, any observation whatever on the subject.

Sec. 4. For illustration of the first species of non-observation, that of Instances, what has now been stated may suffice. But there may also be non-observation of some material circumstances, in instances which have not been altogether overlooked--nay, which may be the very instances on which the whole superstructure of a theory has been founded. As, in the cases hitherto examined, a general proposition was too rashly adopted, on the evidence of particulars, true indeed, but insufficient to support it; so in the cases to which we now turn, the particulars themselves have been imperfectly observed, and the singular propositions on which the

generalization is grounded, or some at least of those singular propositions, are false.

Such, for instance, was one of the mistakes committed in the celebrated phlogistic theory; a doctrine which accounted for combustion by the extrication of a substance called phlogiston, supposed to be contained in all combustible matter. The hypothesis accorded tolerably well with superficial appearances: the ascent of flame naturally suggests the escape of a substance; and the visible residuum of ashes, in bulk and weight, generally falls extremely short of the combustible material. The error was, non-observation of an important portion of the actual residue, namely, the gaseous products of combustion. When these were at last noticed and brought into account, it appeared to be an universal law, that all substances gain instead of losing weight by undergoing combustion; and, after the usual attempt to accommodate the old theory to the new fact by means of an arbitrary hypothesis (that phlogiston had the quality of positive levity instead of gravity), chemists were conducted to the true explanation, namely, that instead of a substance separated, there was on the contrary a substance absorbed.

Many of the absurd practices which have been deemed to possess medicinal efficacy, have been indebted for their reputation to non-observance of some accompanying circumstance which was the real agent in the cures ascribed to them. Thus, of the sympathetic powder of Sir Kenelm Digby: "Whenever any wound had been inflicted, this powder was applied to the weapon that had inflicted it, which was, moreover, covered with ointment, and dressed two or three times a day. The wound itself, in the meantime, was directed to be brought together, and carefully bound up with clean linen rags, but *above all, to be let alone* for seven days, at the end of which period the bandages were removed, when the wound was generally found perfectly united. The triumph of the cure was decreed to the mysterious agency of the sympathetic powder which had been so assiduously applied to the weapon, whereas it is hardly necessary to observe that the promptness of the cure depended on the total exclusion of air from the wound, and upon the sanative operations of nature not having received any disturbance from the officious interference of art. The result, beyond all doubt, furnished the first hint which led surgeons to the improved practice of healing wounds by what is technically called the *first intention*." [22] "In all records," adds Dr. Paris, "of extraordinary cures performed by mysterious agents, there is a great desire to conceal the remedies and other curative means which were simultaneously administered with them; thus Oribasius commends in high terms a necklace of Paeony root for the cure of epilepsy; but we learn that he always took care to accompany its use with copious evacuations, although he assigns to them no share of credit in the cure. In later times we have a good specimen of this species of deception, presented to us in a work on Scrofula by Mr. Morley, written, as we are informed, for the sole purpose of restoring the much injured character and use of the Vervain; in which the author directs the root of this plant to be tied with a yard of white satin riband around the neck, where it is to remain until the patient is cured; but mark--during this interval he calls to his aid the most active medicines in the *materia medica*." [23]

In other cases the cures really produced by rest, regimen, and amusement, have been ascribed to the medicinal, or occasionally to the supernatural, means which were put in requisition. "The celebrated John Wesley, while he commemorates the triumph of sulphur and supplication over his bodily infirmity, forgets to appreciate the resuscitating influence of four months' repose from his apostolic labours; and such is the disposition of the human mind to place confidence in the operation of mysterious agents, that we find him more disposed to attribute his cure to a brown paper plaister of egg and brimstone, than to Dr. Fothergill's salutary prescription of country air, rest, asses' milk, and horse exercise." [24]

In the following example, the circumstance overlooked was of a somewhat different character. "When the yellow fever raged in America, the practitioners trusted exclusively to the copious use of mercury; at first this plan was deemed so universally efficacious, that, in the enthusiasm of the moment, it was triumphantly proclaimed that death never took place after the mercury had evinced its effect upon the system: all this was very true, but it furnished no proof of the efficacy of that metal, since the disease in its aggravated form was so rapid in its career, that it swept away its victims long before the system could be brought under mercurial influence, while in its milder shape it passed off equally well without any assistance from art." [25]

In these examples the circumstance overlooked was cognizable by the senses. In other cases, it is one the knowledge of which could only be arrived at by reasoning; but the fallacy may still be classed under the head to which, for want of a more appropriate name, we have given the appellation Fallacies of Non-observation. It is not the nature of the faculties which ought to have been employed, but the non-employment of them, which constitutes this Natural Order of Fallacies. Wherever the error is negative, not positive; wherever it consists especially in *overlooking*, in being ignorant or unmindful of some fact which, if known and attended to, would have made a difference in the conclusion arrived at; the error is properly placed in the Class which we are considering. In this Class, there is not, as in all other fallacies there is, a positive mis-estimate of evidence actually had. The conclusion would be just, if the portion which is seen of the case were the whole of it; but there is another portion overlooked, which vitiates the result.

For instance, there is a remarkable doctrine which has occasionally found a vent in the public speeches of unwise legislators, but which only in one instance that I am aware of has received the sanction of a philosophical writer, namely M. Cousin, who, in his preface to the *Gorgias* of Plato, contending that punishment must have some other and higher justification than the prevention of crime, makes use of this argument--that if punishment were only for the sake of example, it would be indifferent whether we punished the innocent or the guilty, since the punishment, considered as an example, is equally efficacious in either case. Now we must, in order to go along with this reasoning, suppose, that the person who feels himself under temptation, observing somebody punished, concludes himself to be in danger of being punished likewise, and is terrified accordingly. But it is forgotten that if the person punished is supposed to be innocent, or even if there be any doubt of his guilt, the spectator will reflect that his own danger, whatever it may be, is not contingent on his guiltiness, but threatens him equally if he remains innocent, and how therefore is he deterred from guilt by the apprehension of such punishment? M. Cousin supposes that people will be dissuaded from guilt by whatever renders the condition of the guilty more perilous, forgetting that the condition of the innocent (also one of the elements in the calculation) is, in the case supposed, made perilous in precisely an equal degree. This is a fallacy of overlooking; or of non-observation, within the intent of our classification.

Fallacies of this description are the great stumbling-block to correct thinking in political economy. The economical workings of society afford numerous cases in which the effects of a cause consist of two sets of phenomena: the one immediate, concentrated, obvious to all eyes, and passing, in common apprehension, for the whole effect; the other widely diffused, or lying deeper under the surface, and which is exactly contrary to the former. Take, for instance, the common notion so plausible at the first glance, of the encouragement given to industry by lavish expenditure. A, who spends his whole income, and even his capital, in expensive living, is supposed to give great employment to labour. B, who lives on a small portion, and invests the remainder in the funds, is thought to give little or no employment. For everybody sees the gains which are made by A's tradesmen, servants, and others, while his money is spending. B's savings, on the contrary, pass into the hands of the person whose stock he purchased, who with it pays a debt he owed to some banker, who lends it again to some merchant or manufacturer; and the capital being laid out in hiring spinners and weavers, or carriers and the crews of merchant vessels, not only gives immediate employment to at least as much industry as A employs during the whole of his career, but coming back with increase by the sale of the goods which have been manufactured or imported, forms a fund for the employment of the same and perhaps a greater quantity of labour in perpetuity. But the observer does not see, and therefore does not consider, what becomes of B's money; he does see what is done with A's: he observes the amount of industry which A's profusion feeds; he observes not the far greater quantity which it prevents from being fed; and thence the prejudice, universal to the time of Adam Smith, that prodigality encourages industry, and parsimony is a discouragement to it.

The common argument against free trade was a fallacy of the same nature. The purchaser of British silk encourages British industry; the purchaser of Lyons silk encourages only French; the former conduct is patriotic, the latter ought to be interdicted by law. The circumstance is overlooked, that the purchaser of any foreign commodity necessarily causes, directly or indirectly, the export of an equivalent value of some article of home production (beyond what would otherwise be exported), either to the same foreign country or to some other; which fact, though from the complication of the circumstances it cannot always be verified by specific

observation, no observation can possibly be brought to contradict, while the evidence of reasoning on which it rests is irrefragable. The fallacy is, therefore, the same as in the preceding case, that of seeing a part only of the phenomena, and imagining that part to be the whole: and may be ranked among Fallacies of Non-observation.

Sec. 5. To complete the examination of the second of our five classes, we have now to speak of Mal-observation; in which the error does not lie in the fact that something is unseen, but that something seen is seen wrong.

Perception being infallible evidence of whatever is really perceived, the error now under consideration can be committed no otherwise than by mistaking for conception what is in fact inference. We have formerly shown how intimately the two are blended in almost everything which is called observation, and still more in every Description.[26] What is actually on any occasion perceived by our senses being so minute in amount, and generally so unimportant a portion of the state of facts which we wish to ascertain or to communicate; it would be absurd to say that either in our observations, or in conveying their result to others, we ought not to mingle inference with fact; all that can be said is, that when we do so we ought to be aware of what we are doing, and to know what part of the assertion rests on consciousness, and is therefore indisputable, what part on inference, and is therefore questionable.

One of the most celebrated examples of an universal error produced by mistaking an inference for the direct evidence of the senses, was the resistance made, on the ground of common sense, to the Copernican system. People fancied they *saw* the sun rise and set, the stars revolve in circles round the pole. We now know that they saw no such thing; what they really saw was a set of appearances, equally reconcileable with the theory they held and with a totally different one. It seems strange that such an instance as this, of the testimony of the senses pleaded with the most entire conviction in favour of something which was a mere inference of the judgment, and, as it turned out, a false inference, should not have opened the eyes of the bigots of common sense, and inspired them with a more modest distrust of the competency of mere ignorance to judge the conclusions of cultivated thought.

In proportion to any person's deficiency of knowledge and mental cultivation, is generally his inability to discriminate between his inferences and the perceptions on which they were grounded. Many a marvellous tale, many a scandalous anecdote, owes its origin to this incapacity. The narrator relates, not what he saw or heard, but the impression which he derived from what he saw or heard, and of which perhaps the greater part consisted of inference, though the whole is related not as inference but as matter-of-fact. The difficulty of inducing witnesses to restrain within any moderate limits the intermixture of their inferences with the narrative of their perceptions, is well known to experienced cross-examiners; and still more is this the case when ignorant persons attempt to describe any natural phenomenon. "The simplest narrative," says Dugald Stewart,[27] "of the most illiterate observer involves more or less of hypothesis; nay, in general, it will be found that, in proportion to his ignorance, the greater is the number of conjectural principles involved in his statements. A village apothecary (and, if possible, in a still greater degree, an experienced nurse) is seldom able to describe the plainest case, without employing a phraseology of which every word is a theory: whereas a simple and genuine specification of the phenomena which mark a particular disease; a specification unsophisticated by fancy, or by preconceived opinions, may be regarded as unequivocal evidence of a mind trained by long and successful study to the most difficult of all arts, that of the faithful *interpretation* of nature."

The universality of the confusion between perceptions and the inferences drawn from them, and the rarity of the power to discriminate the one from the other, ceases to surprise us when we consider that in the far greater number of instances the actual perceptions of our senses are of no importance or interest to us except as marks from which we infer something beyond them. It is not the colour and superficial extension perceived by the eye that are important to us, but the object, of which those visible appearances testify the presence; and where the sensation itself is indifferent, as it generally is, we have no motive to attend particularly to it, but acquire a

habit of passing it over without distinct consciousness, and going on at once to the inference. So that to know what the sensation actually was, is a study in itself, to which painters, for example, have to train themselves by special and long-continued discipline and application. In things further removed from the dominion of the outward senses, no one who has not great experience in psychological analysis is competent to break this intense association; and when such analytic habits do not exist in the requisite degree, it is hardly possible to mention any of the habitual judgments of mankind on subjects of a high degree of abstraction, from the being of a God and the immortality of the soul down to the multiplication table, which are not, or have not been, considered as matter of direct intuition. So strong is the tendency to ascribe an intuitive character to judgments which are mere inferences, and often false ones. No one can doubt that many a deluded visionary has actually believed that he was directly inspired from Heaven, and that the Almighty had conversed with him face to face; which yet was only, on his part, a conclusion drawn from appearances to his senses, or feelings in his internal consciousness, which afforded no warrant for any such belief. A caution, therefore, against this class of errors, is not only needful but indispensable; though to determine whether, on any of the great questions of metaphysics, such errors are actually committed, belongs not to this place, but, as I have so often said, to a different science.