

CHAPTER XXI.

OF THE EVIDENCE OF THE LAW OF UNIVERSAL CAUSATION.

Sec. 1. We have now completed our review of the logical processes by which the laws, or uniformities, of the sequence of phenomena, and those uniformities in their coexistence which depend on the laws of their sequence, are ascertained or tested. As we recognised in the commencement, and have been enabled to see more clearly in the progress of the investigation, the basis of all these logical operations is the law of causation. The validity of all the Inductive Methods depends on the assumption that every event, or the beginning of every phenomenon, must have some cause; some antecedent, on the existence of which it is invariably and unconditionally consequent. In the Method of Agreement this is obvious; that method avowedly proceeding on the supposition that we have found the true cause as soon as we have negated every other. The assertion is equally true of the Method of Difference. That method authorizes us to infer a general law from two instances; one, in which A exists together with a multitude of other circumstances, and B follows; another, in which, A being removed, and all other circumstances remaining the same, B is prevented. What, however, does this prove? It proves that B, in the particular instance, cannot have had any other cause than A; but to conclude from this that A was the cause, or that A will on other occasions be followed by B, is only allowable on the assumption that B must have some cause; that among its antecedents in any single instance in which it occurs, there must be one which has the capacity of producing it at other times. This being admitted, it is seen that in the case in question that antecedent can be no other than A; but, that if it be no other than A it must be A, is not proved, by these instances at least, but taken for granted. There is no need to spend time in proving that the same thing is true of the other Inductive Methods. The universality of the law of causation is assumed in them all.

But is this assumption warranted? Doubtless (it may be said) *most* phenomena are connected as effects with some antecedent or cause, that is, are never produced unless some assignable fact has preceded them; but the very circumstance that complicated processes of induction are sometimes necessary, shows that cases exist in which this regular order of succession is not apparent to our unaided apprehension. If, then, the processes which bring these cases within the same category with the rest, require that we should assume the universality of the very law which they do not at first sight appear to exemplify, is not this a *petitio principii*? Can we prove a proposition, by an argument which takes it for granted? And if not so proved, on what evidence does it rest?

For this difficulty, which I have purposely stated in the strongest terms it will admit of, the school of metaphysicians who have long predominated in this country find a ready salvo. They affirm, that the universality of causation is a truth which we cannot help believing; that the belief in it is an instinct, one of the laws of our believing faculty. As the proof of this, they say, and they have nothing else to say, that everybody does believe it; and they number it among the propositions, rather numerous in their catalogue, which may be logically argued against, and perhaps cannot be logically proved, but which are of higher authority than logic, and so essentially inherent in the human mind, that even he who denies them in speculation, shows by his habitual practice that his arguments make no impression upon himself.

Into the merits of this question, considered as one of psychology, it would be foreign to my purpose to enter here: but I must protest against adducing, as evidence of the truth of a fact in external nature, the disposition, however strong or however general, of the human mind to believe it. Belief is not proof, and does not dispense with the necessity of proof. I am aware, that to ask for evidence of a proposition which we are supposed to believe instinctively, is to expose oneself to the charge of rejecting the authority of the human faculties; which of course no one can consistently do, since the human faculties are all which any one has to judge by: and inasmuch as the meaning of the word evidence is supposed to be, something which when laid before the mind, induces it to believe; to demand evidence when the belief is ensured by the mind's own laws, is supposed to be appealing to the intellect against the intellect. But this, I apprehend, is a misunderstanding of the nature of evidence. By evidence is not meant anything and everything which produces belief. There are many things

which generate belief besides evidence. A mere strong association of ideas often causes a belief so intense as to be unshakeable by experience or argument. Evidence is not that which the mind does or must yield to, but that which it ought to yield to, namely, that, by yielding to which, its belief is kept conformable to fact. There is no appeal from the human faculties generally, but there is an appeal from one human faculty to another; from the judging faculty, to those which take cognizance of fact, the faculties of sense and consciousness. The legitimacy of this appeal is admitted whenever it is allowed that our judgments ought to be conformable to fact. To say that belief suffices for its own justification is making opinion the test of opinion; it is denying the existence of any outward standard, the conformity of an opinion to which constitutes its truth. We call one mode of forming opinions right and another wrong, because the one does, and the other does not, tend to make the opinion agree with the fact--to make people believe what really is, and expect what really will be. Now a mere disposition to believe, even if supposed instinctive, is no guarantee for the truth of the thing believed. If, indeed, the belief ever amounted to an irresistible necessity, there would then be no *use* in appealing from it, because there would be no possibility of altering it. But even then the truth of the belief would not follow; it would only follow that mankind were under a permanent necessity of believing what might possibly not be true; in other words, that a case might occur in which our senses or consciousness, if they could be appealed to, might testify one thing, and our reason believe another. But in fact there is no such permanent necessity. There is no proposition of which it can be asserted that every human mind must eternally and irrevocably believe it. Many of the propositions of which this is most confidently stated, great numbers of human beings have disbelieved. The things which it has been supposed that nobody could possibly help believing, are innumerable; but no two generations would make out the same catalogue of them. One age or nation believes implicitly what to another seems incredible and inconceivable; one individual has not a vestige of a belief which another deems to be absolutely inherent in humanity. There is not one of these supposed instinctive beliefs which is really inevitable. It is in the power of every one to cultivate habits of thought which make him independent of them. The habit of philosophical analysis, (of which it is the surest effect to enable the mind to command, instead of being commanded by, the laws of the merely passive part of its own nature,) by showing to us that things are not necessarily connected in fact because their ideas are connected in our minds, is able to loosen innumerable associations which reign despotically over the undisciplined or early-prejudiced mind. And this habit is not without power even over those associations which the school of which I have been speaking regard as connate and instinctive. I am convinced that any one accustomed to abstraction and analysis, who will fairly exert his faculties for the purpose, will, when his imagination has once learnt to entertain the notion, find no difficulty in conceiving that in some one for instance of the many firmaments into which sidereal astronomy now divides the universe, events may succeed one another at random, without any fixed law; nor can anything in our experience, or in our mental nature, constitute a sufficient, or indeed any, reason for believing that this is nowhere the case.

Were we to suppose (what it is perfectly possible to imagine) that the present order of the universe were brought to an end, and that a chaos succeeded in which there was no fixed succession of events, and the past gave no assurance of the future; if a human being were miraculously kept alive to witness this change, he surely would soon cease to believe in any uniformity, the uniformity itself no longer existing. If this be admitted, the belief in uniformity either is not an instinct, or it is an instinct conquerable, like all other instincts, by acquired knowledge.

But there is no need to speculate on what might be, when we have positive and certain knowledge of what has been. It is not true as a matter of fact, that mankind have always believed that all the successions of events were uniform and according to fixed laws. The Greek philosophers, not even excepting Aristotle, recognised Chance and Spontaneity ([Greek: tyche] and [Greek: to automaton]) as among the agents in nature; in other words, they believed that to that extent there was no guarantee that the past had been similar to itself, or that the future would resemble the past. Even now a full half of the philosophical world, including the very same metaphysicians who contend most for the instinctive character of the belief in uniformity, consider one important class of phenomena, volitions, to be an exception to the uniformity, and not governed by a fixed law.[26]

Sec. 2. As was observed in a former place,[27] the belief we entertain in the universality, throughout nature, of the law of cause and effect, is itself an instance of induction; and by no means one of the earliest which any of us, or which mankind in general, can have made. We arrive at this universal law, by generalization from many laws of inferior generality. We should never have had the notion of causation (in the philosophical meaning of the term) as a condition of all phenomena, unless many cases of causation, or in other words, many partial uniformities of sequence, had previously become familiar. The more obvious of the particular uniformities suggest, and give evidence of, the general uniformity, and the general uniformity, once established, enables us to prove the remainder of the particular uniformities of which it is made up. As, however, all rigorous processes of induction presuppose the general uniformity, our knowledge of the particular uniformities from which it was first inferred was not, of course, derived from rigorous induction, but from the loose and uncertain mode of induction *per enumerationem simplicem*: and the law of universal causation, being collected from results so obtained, cannot itself rest on any better foundation.

It would seem, therefore, that induction *per enumerationem simplicem* not only is not necessarily an illicit logical process, but is in reality the only kind of induction possible; since the more elaborate process depends for its validity on a law, itself obtained in that inartificial mode. Is there not then an inconsistency in contrasting the looseness of one method with the rigidity of another, when that other is indebted to the looser method for its own foundation?

The inconsistency, however, is only apparent. Assuredly, if induction by simple enumeration were an invalid process, no process grounded on it could be valid; just as no reliance could be placed on telescopes, if we could not trust our eyes. But though a valid process, it is a fallible one, and fallible in very different degrees: if therefore we can substitute for the more fallible forms of the process, an operation grounded on the same process in a less fallible form, we shall have effected a very material improvement. And this is what scientific induction does.

A mode of concluding from experience must be pronounced untrustworthy, when subsequent experience refuses to confirm it. According to this criterion, induction by simple enumeration--in other words, generalization of an observed fact from the mere absence of any known instance to the contrary--affords in general a precarious and unsafe ground of assurance; for such generalizations are incessantly discovered, on further experience, to be false. Still, however, it affords some assurance, sufficient, in many cases, for the ordinary guidance of conduct. It would be absurd to say, that the generalizations arrived at by mankind in the outset of their experience, such as these, Food nourishes, Fire burns, Water drowns, were unworthy of reliance.[28] There is a scale of trustworthiness in the results of the original unscientific Induction; and on this diversity (as observed in the fourth chapter of the present book) depend the rules for the improvement of the process. The improvement consists in correcting one of these inartificial generalizations by means of another. As has been already pointed out, this is all that art can do. To test a generalization, by showing that it either follows from, or conflicts with, some stronger induction, some generalization resting on a broader foundation of experience, is the beginning and end of the logic of Induction.

Sec. 3. Now the precariousness of the method of simple enumeration is in an inverse ratio to the largeness of the generalization. The process is delusive and insufficient, exactly in proportion as the subject-matter of the observation is special and limited in extent. As the sphere widens, this unscientific method becomes less and less liable to mislead; and the most universal class of truths, the law of causation for instance, and the principles of number and of geometry, are duly and satisfactorily proved by that method alone, nor are they susceptible of any other proof.

With respect to the whole class of generalizations of which we have recently treated, the uniformities which depend on causation, the truth of the remark just made follows by obvious inference from the principles laid down in the preceding chapters. When a fact has been observed a certain number of times to be true, and is not in any instance known to be false; if we at once affirm that fact as an universal truth or law of nature, without testing it by any of the four methods of induction, nor deducing it from other known laws, we shall in

general err grossly: but we are perfectly justified in affirming it as an empirical law, true within certain limits of time, place, and circumstance, provided the number of coincidences be greater than can with any probability be ascribed to chance. The reason for not extending it beyond those limits is, that the fact of its holding true within them may be a consequence of collocations, which cannot be concluded to exist in one place because they exist in another; or may be dependent on the accidental absence of counteracting agencies, which any variation of time, or the smallest change of circumstances, may possibly bring into play. If we suppose, then, the subject-matter of any generalization to be so widely diffused that there is no time, no place, and no combination of circumstances, but must afford an example either of its truth or of its falsity, and if it be never found otherwise than true, its truth cannot depend on any collocations, unless such as exist at all times and places; nor can it be frustrated by any counteracting agencies, unless by such as never actually occur. It is, therefore, an empirical law coextensive with all human experience; at which point the distinction between empirical laws and laws of nature vanishes, and the proposition takes its place among the most firmly established as well as largest truths accessible to science.

Now, the most extensive in its subject-matter of all generalizations which experience warrants, respecting the sequences and coexistences of phenomena, is the law of causation. It stands at the head of all observed uniformities, in point of universality, and therefore (if the preceding observations are correct) in point of certainty. And if we consider, not what mankind would have been justified in believing in the infancy of their knowledge, but what may rationally be believed in its present more advanced state, we shall find ourselves warranted in considering this fundamental law, though itself obtained by induction from particular laws of causation, as not less certain, but on the contrary, more so, than any of those from which it was drawn. It adds to them as much proof as it receives from them. For there is probably no one even of the best established laws of causation which is not sometimes counteracted, and to which, therefore, apparent exceptions do not present themselves, which would have necessarily and justly shaken the confidence of mankind in the universality of those laws, if inductive processes founded on the universal law had not enabled us to refer those exceptions to the agency of counteracting causes, and thereby reconcile them with the law with which they apparently conflict. Errors, moreover, may have slipped into the statement of any one of the special laws, through inattention to some material circumstance: and instead of the true proposition, another may have been enunciated, false as an universal law, though leading, in all cases hitherto observed, to the same result. To the law of causation, on the contrary, we not only do not know of any exception, but the exceptions which limit or apparently invalidate the special laws, are so far from contradicting the universal one, that they confirm it; since in all cases which are sufficiently open to our observation, we are able to trace the difference of result, either to the absence of a cause which had been present in ordinary cases, or to the presence of one which had been absent.

The law of cause and effect, being thus certain, is capable of imparting its certainty to all other inductive propositions which can be deduced from it; and the narrower inductions may be regarded as receiving their ultimate sanction from that law, since there is no one of them which is not rendered more certain than it was before, when we are able to connect it with that larger induction, and to show that it cannot be denied, consistently with the law that everything which begins to exist has a cause. And hence we are justified in the seeming inconsistency, of holding induction by simple enumeration to be good for proving this general truth, the foundation of scientific induction, and yet refusing to rely on it for any of the narrower inductions. I fully admit that if the law of causation were unknown, generalization in the more obvious cases of uniformity in phenomena would nevertheless be possible, and though in all cases more or less precarious, and in some extremely so, would suffice to constitute a certain measure of probability: but what the amount of this probability might be, we are dispensed from estimating, since it never could amount to the degree of assurance which the proposition acquires, when, by the application to it of the Four Methods, the supposition of its falsity is shown to be inconsistent with the Law of Causation. We are therefore logically entitled, and, by the necessities of scientific Induction, required, to disregard the probabilities derived from the early rude method of generalizing, and to consider no minor generalization as proved except so far as the law of causation confirms it, nor probable except so far as it may reasonably be expected to be so confirmed.

Sec. 4. The assertion, that our inductive processes assume the law of causation, while the law of causation is itself a case of induction, is a paradox, only on the old theory of reasoning, which supposes the universal truth, or major premise, in a ratiocination, to be the real proof of the particular truths which are ostensibly inferred from it. According to the doctrine maintained in the present treatise,[29] the major premise is not the proof of the conclusion, but is itself proved, along with the conclusion from the same evidence. "All men are mortal" is not the proof that Lord Palmerston is mortal; but our past experience of mortality authorizes us to infer *both* the general truth and the particular fact, and the one with exactly the same degree of assurance as the other. The mortality of Lord Palmerston is not an inference from the mortality of all men, but from the experience which proves the mortality of all men; and is a correct inference from experience, if that general truth is so too. This relation between our general beliefs and their particular applications holds equally true in the more comprehensive case which we are now discussing. Any new fact of causation inferred by induction, is rightly inferred, if no other objection can be made to the inference than can be made to the general truth that every event has a cause. The utmost certainty which can be given to a conclusion arrived at in the way of inference, stops at this point. When we have ascertained that the particular conclusion must stand or fall with the general uniformity of the laws of nature--that it is liable to no doubt except the doubt whether every event has a cause--we have done all that can be done for it. The strongest assurance we can obtain of any theory respecting the cause of a given phenomenon, is that the phenomenon has either that cause or none.

The latter supposition might have been an admissible one in a very early period of our study of nature. But we have been able to perceive that in the stage which mankind have now reached, the generalization which gives the Law of Universal Causation has grown into a stronger and better induction, one deserving of greater reliance, than any of the subordinate generalizations. We may even, I think, go a step further than this, and regard the certainty of that great induction as not merely comparative, but, for all practical purposes, absolute.

The considerations which, as I apprehend, give, at the present day, to the proof of the law of uniformity of succession as true of all phenomena without exception, this character of completeness and conclusiveness, are the following:--First, that we now know it directly to be true of far the greatest number of phenomena; that there are none of which we know it not to be true, the utmost that can be said being, that of some we cannot positively from direct evidence affirm its truth; while phenomenon after phenomenon, as they become better known to us, are constantly passing from the latter class into the former; and in all cases in which that transition has not yet taken place, the absence of direct proof is accounted for by the rarity or the obscurity of the phenomena, our deficient means of observing them, or the logical difficulties arising from the complication of the circumstances in which they occur; insomuch that, notwithstanding as rigid a dependence on given conditions as exists in the case of any other phenomenon, it was not likely that we should be better acquainted with those conditions than we are. Besides this first class of considerations, there is a second, which still further corroborates the conclusion. Although there are phenomena the production and changes of which elude all our attempts to reduce them universally to any ascertained law; yet in every such case, the phenomenon, or the objects concerned in it, are found in some instances to obey the known laws of nature. The wind, for example, is the type of uncertainty and caprice, yet we find it in some cases obeying with as much constancy as any phenomenon in nature the law of the tendency of fluids to distribute themselves so as to equalize the pressure on every side of each of their particles; as in the case of the trade winds, and the monsoons. Lightning might once have been supposed to obey no laws; but since it has been ascertained to be identical with electricity, we know that the very same phenomenon in some of its manifestations is implicitly obedient to the action of fixed causes. I do not believe that there is now one object or event in all our experience of nature, within the bounds of the solar system at least, which has not either been ascertained by direct observation to follow laws of its own, or been proved to be closely similar to objects and events which, in more familiar manifestations, or on a more limited scale, follow strict laws: our inability to trace the same laws on a larger scale and in the more recondite instances, being accounted for by the number and complication of the modifying causes, or by their inaccessibility to observation.

The progress of experience, therefore, has dissipated the doubt which must have rested on the universality of the law of causation while there were phenomena which seemed to be *sui generis*, not subject to the same

laws with any other class of phenomena, and not as yet ascertained to have peculiar laws of their own. This great generalization, however, might reasonably have been, as it in fact was, acted on as a probability of the highest order, before there were sufficient grounds for receiving it as a certainty. For, whatever has been found true in innumerable instances, and never found to be false after due examination in any, we are safe in acting on as universal provisionally, until an undoubted exception appears; provided the nature of the case be such that a real exception could scarcely have escaped our notice. When every phenomenon that we ever knew sufficiently well to be able to answer the question, had a cause on which it was invariably consequent, it was more rational to suppose that our inability to assign the causes of other phenomena arose from our ignorance, than that there were phenomena which were uncaused, and which happened to be exactly those which we had hitherto had no sufficient opportunity of studying.

It must, at the same time, be remarked, that the reasons for this reliance do not hold in circumstances unknown to us, and beyond the possible range of our experience. In distant parts of the stellar regions, where the phenomena may be entirely unlike those with which we are acquainted, it would be folly to affirm confidently that this general law prevails, any more than those special ones which we have found to hold universally on our own planet. The uniformity in the succession of events, otherwise called the law of causation, must be received not as a law of the universe, but of that portion of it only which is within the range of our means of sure observation, with a reasonable degree of extension to adjacent cases. To extend it further is to make a supposition without evidence, and to which, in the absence of any ground from experience for estimating its degree of probability, it would be idle to attempt to assign any.[30]