

**THE NATURE OF  
HYPOTHESIS,  
PP. 143-183**

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The nature of hypothesis, pp. 143-183 by Myron Lucius Ashley

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**MYRON LUCIUS ASHLEY**

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THE UNIVERSITY OF CHICAGO  
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# THE NATURE OF HYPOTHESIS

A DISSERTATION

SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF ARTS AND  
LITERATURE IN CANDIDACY FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

(DEPARTMENT OF PHILOSOPHY)

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BY  
MYRON LUCIUS ASHLEY

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## VII

### THE NATURE OF HYPOTHESIS

IN the various discussions of the hypothesis which have appeared in works on inductive logic and in writings on scientific method, its structure and function have received considerable attention, while its origin has been comparatively neglected. The hypothesis has generally been treated as that part of scientific procedure which marks the stage where a definite plan or method is proposed for dealing with new or unexplained facts. It is regarded as an invention for the purpose of explaining the given, as a definite conjecture which is to be tested by an appeal to experience to see whether deductions made in accordance with it will be found true in fact. The function of the hypothesis is to unify, to furnish a method of dealing with things, and its structure must be suitable to this end. It must be so formed that it will be likely to prove valid, and writers have formulated various rules to be followed in the formation of hypotheses. These rules state the main requirements of a good hypothesis, and are intended to aid in a general way by pointing out certain limits within which it must fall.

In respect to the origin of the hypothesis, writers have usually contented themselves with pointing out the kind of situations in which hypotheses are likely to appear. But after this has been done, after favorable external conditions have been given, the rest must be left to "genius," for hypotheses arise as "happy guesses," for which no rule or law can be given. In fact, the genius differs from the ordinary plodding mortal in just this ability to form fruitful

hypotheses in the midst of the same facts which to other less gifted individuals remain only so many disconnected experiences.

This unequal stress which has been laid on the structure and function of the hypothesis in comparison with its origin may be attributed to three reasons: (1) The facts, or data, which constitute the working material of hypotheses are regarded as given to all alike, and all alike are more or less interested in systematizing and unifying experience. The purpose of the hypothesis and the opportunity for forming it are thus practically the same for all, and hence certain definite rules can be laid down which will apply to all cases where hypotheses are to be employed. (2) But beyond this there seems to be no clue that can be formulated. There is apparently a more or less open acceptance of the final answer of the boy Zerah Colburn, who, when pressed to give an explanation of his method of instantaneous calculation, exclaimed in despair: "God put it into my head, and I can't put it into yours."<sup>1</sup> (3) And, furthermore, there is very often a strong tendency to disregard investigation into the origin of that which is taken as given, for, since it is already present, its origin, whatever it may have been, can have nothing to do with what it is now. The facts, the data, are *here*, and must be dealt with as they are. Their past, their history or development, is entirely irrelevant. So, even if we could trace the hypothesis farther back on the psychological side, the investigation would be useless, for the rules to which a good hypothesis must conform would remain the same.

Whether or not it can be shown that Zerah Colburn's ultimate explanation is needed in logic as little as Laplace asserted a similar one to be required in his celestial me-

<sup>1</sup> DE MORGAN, *Budget of Paradoxes*, pp. 55, 56; quoted by WELTON, *Logic*, Vol. II, p. 60.



chanics, it may at least be possible to defer it to some extent by means of a further psychological inquiry. It will be found that psychological inquiry into the origin of the hypothesis is not irrelevant in respect to an understanding of its structure and function; for origin and function cannot be understood apart from each other, and, since structure must be adapted to function, it cannot be independent of origin. In fact, origin, structure, and function are organically connected, and each loses its meaning when absolutely separated from each other. It will be found, moreover, that the data which are commonly taken as the given material are not something to which the hypothesis is subsequently applied, but that, instead of this external relation between data and hypothesis, the hypothesis exercises a directive function in determining what are the data. In a word, the main object of this discussion will be to contend against making a merely convenient and special way of regarding the hypothesis a full and adequate one. Though we speak of facts and of hypotheses that may be applied to them, it must not be forgotten that there are no facts which remain the same whatever hypothesis be applied to them; and that there are no hypotheses which are hypotheses at all except in reference to their function in dealing with our subject-matter in such a way as to facilitate its factual apprehension. Data are selected in order to be determined, and hypotheses are the ways in which this determination is carried on. If, as we shall attempt to show, the relation between data and hypothesis is not external, but strictly correlative, it is evident that this fact must be taken into account in questions concerning deduction and induction, analytic and synthetic judgments, and the criterion of truth. Its bearing must be recognized in the investigation of metaphysical problems as well, for reality cannot be independent of the knowing process. In a word, the purpose of this discussion of the

hypothesis is to determine its nature a little more precisely through an investigation of its rather obscure origin, and to call attention to certain features of its function which have not generally been accorded their due significance.

## I

*The hypothesis as predicate.*—It is generally admitted that the function of the hypothesis is to provide a way of dealing with the data or subject-matter which we need to organize. In this use of the hypothesis it appears in the rôle of predicate in a judgment of which the data, or facts, to be construed constitute the subject.

In his attempts to reduce the movements of the planets about the sun to some general formula, Kepler finally hit upon the law since known as Kepler's law, viz., that the squares of the periodic times of the several planets are proportional to the cubes of their mean distances from the sun. This law was first tentatively advanced as a hypothesis. Kepler was not certain of its truth till it had proved its claim to acceptance. Neither did Newton have at first any great degree of assurance in regard to his law of gravitation, and was ready to give it up when he failed in his first attempt to test it by observation of the moon. And the same thing may be said about the caution of Darwin and other investigators in regard to accepting hypotheses. The only reason for their extreme care in not accepting at once their tentative formulations or suggestions was the fear that some other explanation might be the correct one. This rejection of other possibilities is the negative side of the matter. We become confident that our hypothesis is the right one as we lose confidence in other possible explanations; and it might be added, without falling into a circle, that we lose confidence in the other possibilities as we become more convinced of our hypothesis.

It appears that such may be the relation of the positive and negative sides in case of such elaborate hypotheses as those of Kepler and Newton; but is it true where our hypotheses are more simple? It is not easy to understand why the fact that the hypothesis is more simple, and the time required for its formulation and test a good deal shorter, should materially change the state of affairs. The question remains: Why, if there is no opposition, should there be any uncertainty? In all instances, then, the hypothesis appears as one among other possible predicates which may be applied to our data taken as subject-matter of a judgment.

*The predicate as hypothesis.*—Suppose, then, the hypothesis is a predicate; is the predicate necessarily a hypothesis? This is the next question we are called upon to answer, and, since the predicate cannot very well be taken aside from the judgment, our question involves the nature of the judgment.

While it will not be necessary to give a very complete account of the various definitions of the judgment that might be adduced, still the mention of a few of the more prominent ones may serve to indicate that something further is needed. In definitions of the judgment sometimes the subjective side is emphasized, sometimes the objective side, and in other instances there are attempts to combine the two. For instance, Lotze regards the judgment as the idea of a unity or relation between two concepts, with the further implication that this connection holds true of the object referred to. J. S. Mill says that every proposition either affirms or denies existence, coexistence, sequence, causation, or resemblance. Trendelenburg regards the judgment as a form of thought which corresponds to the real connection of things, while Ueberweg states the case a little differently, and says that the essence of judgment consists in recognizing the