Method and the Ideas of the Natural and the Supernatural

STEPHEN E. BENSON

I. METHODS OF FORMULATING KNOWLEDGE OF NATURE

THERE are a number of ways of approaching the history of man's perspectives of viewing and formulating knowledge about the world and universe around him. R. G. Collingwood traces three important periods of human thought about nature.[1] He analyzes these times by means of the analogy by which they interpreted nature. Thus he explains that the Greeks saw nature as an organism like the human being; that the seventeenth century thinkers compared nature to a machine; and that the modern view of nature through the progress in historical studies during the nineteenth century saw the world in terms of a temporal span.

I wish to take a slightly different perspective in viewing man's developing approach to nature, one related to but distinguishable from that used by Collingwood. Let us briefly look at the ways in which man has formulated his ideas of nature, in other words his methods; then we may trace the **goals** and **status** of the theory of nature, not so much its content.

A. The Greek Approach to Nature

We find an important statement of the Greek way of obtaining knowledge about nature in Plato's **Seventh Letter.**[2] Plato lists five means by which one obtains natural knowledge. We come to know an object (1) by naming it, (2) by adequately defining it in terms of a series of words, and (3) by forming its image. Then further (4) our right opinion or subjective assurance also helps our knowing the truth about an object as well as (5) the impact upon us of "the thing in itself which is known and truly exists."

We thus find that primary in Plato's approach to nature was the task of verbally representing it. Aristotle also was interested in pigeonholing the world of events. In his **Generation and Corruption** Aristotle presented a very dynamic picture of the world about him, much in the spirit of modern thought. However, he was concerned mainly in this work with naming and distinguished by definition the processes that occur, such as coming-to-be and passing-away, alteration, growth, etc. Aristotle was not interested very much in finding specific relationships betwen events, or ratios, but in crucifying dynamic nature upon a static network of terms.

Thus we are confronted in Greek thought about nature with a one-way street from event to definition. Thought about nature was induced from common sense experiences with the world without any necessity for that thought to return, to have implications for specific experience. The main goal of knowledge of nature to the Greeks was definition not action. This view of natural science as a verbal science apart from practical matters of doing established the trend that carried the day throughout medieval times.

B. The Seventeenth Century Change in the Methods of Natural Knowledge

In the latter sixteenth and early seventeenth centuries the intellectuals,

[1] Following here R. G. Collingwood, *The Idea of Nature,* (London: Oxford, 1945), *passim.*

[2] *Great Books of the Western World,* vol. 7, p. 809.

STEPHEN E. BENSON is a graduate of the University of Colorado and currently a student at The Iliff School of Theology.

the natural philosophers who had primarily been concerned with definition, began to become interested in practical problems. There had in medieval times long existed a separation of the intellectuals and the craftsmen. This gulf was closed partially by such men as Da Vinci, Galileo, and Gilbert, who ventured into such practical projects as the designing of a water system, the building of a telescope, and the providing for the basis of instruments of navigation. When abstract thinking about nature became tied down in the determination of its goals and purposes by specific concrete problems, the scientific revolution was born. Definition as an end of the study of nature was replaced by problems of action in nature.

In discussing the errors of his predecessors, Francis Bacon, an early rebel against the cult of Aristotle, maintained that "the greatest error of all the rest is the mistaking . . . of the last or furthest end of knowledge."[3] He reviews the various ignoble ends and concludes on this note: "But this is that which will indeed dignify and exalt knowledge, if contemplation and action may be more nearly and straitly conjoined and united together than they have been."[4]

Galileo Galilei was the first natural philosopher of note who actively followed this practice of more nearly relating contemplation and action. In his **Dialogues Concerning the Two New Sciences** Galileo described in detail a series of experiments using a rolling ball on an incline plane.[5] The experiment consisted in the rolling of a ball down a constant incline for different distances and in the measuring of the temporal span taken by each event by the observation of the amount of water that could flow through a small opening during the period in which the ball was moving. Thus the building blocks of a theory of the nature of things were to Galileo ratios, mathematical relationships, rather than precise definitions.

The Pythagoreans also had seen the world in terms of ratios. However, while they **postulated** mathematical relations as the basic reality of things, Galileo related mathematics to specific controllable happenings. Inference was no longer a one-way process, for ratios, having been formed from concrete facts, could be related back time and time again to the world of action.

Galileo espoused the Copernican theory of the sun-centered universe. However, Galileo went on through closer observations of relationships and motions in the heavens with his perfected telescope to collect data to verify the theory. Implicit in this important step was the appeal to the ability of a theory to predict natural activity rather than to definition as such.

C. The Newtonian System and the Status of Physical Theory

Newton, who closely followed Galileo and Bacon, is significant, because he systematized much of the data and theories of his predecessors and provided the basis for systematic predictions of actions in the world of events. The Newtonian mechanics rested upon two operational definitions, which referred to observable ratios between events, that is, the concepts of momentum and position.[6] If one knew the ratios defining these aspects of a moving particle, one could then define completely the state of that particle; and in the context of knowledge of the states of other particles and their gravitational attraction one could predict the future state of that particle. The knowledge of these two aspects of particles plus a ratio explaining

[3] F. Bacon, *Advancement of Learning,* in *Great Books of the Western World,* vol. 30, p. 16.

[4] *Ibid.,* p. 17.

[5] Following here, Galileo, *The Two New Sciences,* in *Great Books,* vol. 28, p. 208.

[6] F. S. C. Northrop, Introduction, in W. Heisenberg, *Physics and Philosophy,* New York: Harper, 1958, p. 6.

the attraction of gravitation was all that was necessary to conceptualize nature.

Further as Plato had absolutized the theory of nature through an ideal view of the capacities of the human rational faculty for grasping a realm of perfect truth, Newton in turn made his theory of mechanics absolute by assuming that his theory was a natural, complete, and necessary result of human perception of the world of mechanical events. In both cases the theory became perfect and the goal of the knowing process as such. The difference between the theories of Plato and of Newton lay in the fact that Newton's ideas made specific predictions of empirical events and thus provided for their own partial downfall. This Plato's theory did not do.

To sum up the methods of approaching nature presented thus far, we have traced an increasing appreciation and use of the concrete event in the process of the building of a theory of nature. However, all of these men through Newton continued to view the perfect rational system of nature as theoretically obtainable and thus the goal of the study of nature. Modern work in the field of physics and in the philosophical theory of pragmatism changed this latter assumption of the goal of the study of nature.

D. Modern Physics and the Pragmatic View of Theory

Newton based the certainty of his system on the assumption that through induction from a theoretically possible perfect perception and measurement of the momentum and position of a particle within a system of gravitational attraction, the physicist could know and predict with perfection, relative only to the adequacy and completeness of his methods of measurement, any subsequent occurence in the world of nature.

Around the end of the nineteenth century experiments, especially involving microscopic sub-atomic particles of light, or quanta, failed to provide the certainty of prediction that Newton had maintained. Also an experiment by Michelson and Morley in 1885 on the speed of light under various conditions undercut Newton's theory of the ether and thus the adequacy of the wave theory of light.

There have ben two distinct reactions to this inability to predict adequately at the microscopic level.[7] Albert Einstein, while drastically revising Newton's concepts of time and space, retained the Newtonian idea that predictive certainty was only a function of adequacy of measurement. Thus the theory of probability entered only at the level of observation or measurement; nature was to Einstein still ontologically the complete and perfect deterministic system.

Werner Heisenberg drastically differed with Einstein as to the implication of probability. The Heisenburg uncertainty principle maintained that with very small particles the instruments of measurement would influence the particle so that the physicist could not observe both the velocity and position of that particle simultaneously.[8] This statement ruled it theoretically impossible for the physicist to completely predict a future event due to an ontological difficulty in the relation of observer and object. This statement, greatly verified in the laboratory, provided the basis for the rejection of the last influential reason for considering physical theory in any perfect sense obtainable and thus further welded the idea to events **it could organize.**

A statement by F. S. C. Northrop clearly explains the new status and role of a physical theory in the light of the uncertainty principle.

> We know the object of scientific knowledge only by the speculative means of axiomatic theoretic construction or postulation. . . . There is no **a priori** or empirical meaning for affirming that the object of sci-

[7] *Ibid.*, pp. 4-10, *passim.*
[8] *Ibid.*, p. 24.

> entific knowledge . . . must be defined in a particular way. The sole criterion is, which set of theoretic assumptions concerning the subject matter of mechanics when pursued to their deductive experimental consequences is confirmed by the experimental data.[9]

A cosmological theory, for example Gamow's theory of the expanding universe, is an organizational network only. The deciding point between the two theories of the expanding and the steady-state universe will be entirely a matter of their ability to relate the ever-increasing set of astronomical, chemical, and geological observations. The modern importance of the concrete event is vividly shown in the primary concern in **The Universe**[10] with techniques of observing and measuring the heavens, such as the radio telescope, computing of the red shift in received light rays, and the methods of resolving light sources to specific positions on photographic plates.

Bernhardt defines metaphysics much in this spirit as an organizational discipline. Thus both metaphysics in this sense and cosmological theory serve to structure our encounters at the concrete perceptive level of experience, a structuring that is necessary for us to relate meaningfully to our world.

The pragmatic theory of knowledge in philosophy, which developed parallel to this work in modern physics, provided a more general application of the experimental, instrumental scientific method to our knowledge in general. Peirce, James, and Dewey agree that a concept to be true in any sense must be relatable to observable relationships in experiences.

A classic formulation of the pragmatic view of truth has been stated by Peirce.

> A conception, that is, the rational purport of a word or other expression, lies exclusively in its conceivable bearing upon the conduct of life; so that, since obviously nothing that might not result from experiment can have any direct bearing upon conduct, if one can define accurately all the conceivable experimental phenomena which the affirmation or denial of a concept could imply, one will have therein a complete definition of the concept, and **there is absolutely nothing more in it.**[11]

Thus we come to the complete integration of imperfect idea and events in need of organization. This is a long way from Plato's rational faculty or even Newton's theoretically perfect perception. The pragmatic way of knowledge provides for a continuous process of relating a changing rational perspective to a set of events, increasing more extensively observed.

II. SCIENTIFIC METHOD AND THE STATUS OF AN IDEA OF THE SUPERNATURAL

In terms of this examination of the development of methods of approaching and conceptualizing nature I would now like to venture a twofold hypothesis regarding the relation between this development and the place of the supernatural. The hypothesis is first that **as more emphasis has been given the concrete, observable event in shaping and verifying theory about nature and as the goal of knowledge of nature has shifted from verbal definition and system per se to action and relation in the concrete world of perceptual experience, less opportunity has been allowed within the framework of the theory of nature for the development of ideas of the supernatural.** The supernatural is defined, following Bernhardt, as the hypercosmic, the supertemporal, the hyperagathonic, and the metanoetic.

Thus Plato was able to move from experience of things to a system of perfect ideas and to hold a concept of a carpenter god, because he did not operate under the necessity of using his theory as the basis of a system of

---

[9] *Ibid.*, p. 9.

[10] *The Universe,* New York: Simon and Schuster, 1956, *passim.*

[11] C. S. Peirce, *Values in a Universe of Chance,* New York: Doubleday, 1958, p. 183.

operational definitions which would continue to ground his theory to events. To Peirce, Dewey, and Heisenberg, however, a theory which does not have actual or potential ability to specify certain observations and actions in the world of experience is entirely irrelevant to the **raison d'etre** of human knowledge. Thus both Plato's realm of ideas and his carpenter god are, on this basis, ignored as meaningless.

This first half of my hypothesis is a sort of corollary to a more general one made by Bernhardt.

> The realm of the inferred will be large and inclusive if one's understanding and appreciation of the observable is low, and the realm of the inferred will become more restricted as one's knowledge and appreciation of the observed increases.

I have tried more specifically to relate the size and inclusiveness of the realm of the inferred to the methods of forming theory and the subsequent use of that theory of nature.

The second aspect of my hypothesis is an observation about two modern reactions to the close relating of theory and event. One response is characteristic of a pragmatist like Peirce who dispenses with anything outside of experimental possibility. The other reaction is to be found in the works of an idealist such as William Ernest Hocking who sets up a dualism. There are two perspectives of knowledge about the relation between the self and the world, he maintains, (1) that of viewing the self as a responding being within the world of nature, and (2) that of considering the world as it is within the self, the self's idea.[12] This he calls the principle of duality. The second perspective is needed to satisfy certain inadequacies of the first for providing total meanings. Schopenhauer, who started with the world as his idea and his will, and Hegel, who equated logic and reality, both made primary use of the latter of these two perspectives.

It seems obvious, however, that if one wishes to remain a monist regarding method in formulating theory about life and at the same time accept the necessary tie between theory and event, then one must be prepared to dispense totally with the supernatural.

In conclusion it seems to me that one must look beyond ideas for important worth and justification for life. Ideas are tools of our existence, but they will never completely solve its mystery. There is great insight in the assertion by some existentialists that meaning for life must finally come through encounter. A. F. Mummery, a great chemist and mountaineer, stated that to him the answer to pessimistic philosophy was the rush of the blood in his veins when he climbs a mountain. I also have felt that ideas cannot replace, as far as a justification of life is concerned, the joys of physical and mental vitality and the rich associations with one's fellows. The idea of nature may help us relate to and control nature, but to be vital to us it must finally be experienced by the involved personality, emotionally as well as intellectually.

---

[12] W. E. Hocking, *The Meaning of Immortality in Human Existence,* New York: Harper, 1957, pp. 50-59, *passim.*