

of achieving paradise on earth and material welfare has never been genuine, since the culture does not place humankind at the center of the universe nor view worldly life as separate from eternal life.

Chapter Eleven

Philosophical Beliefs Underlying the Formulation of Physical Laws

Mahjoob Taha

The popular view of physics regards its laws and theories as a unique product on which no two persons could differ. This outlook rests on the premise that all scientific disputes may be settled in the lab, and that the scientific experiment is the final arbitrator. However, this applies only to natural science, and observations are just a starting point. Human theorization is essential and represents the true spirit of scientific work. Science emerges when the human mind comprehends facts and views them from every angle. Empirical methods have evolved over centuries, and progressed not only due to technological breakthroughs but also to the theorization and methods of scientific thought. This progress allowed us to establish a methodology leading to the formulation of general laws from experimental observations. There appear to be three different levels of abstraction: the conservation law level, deduced directly from observation and measurement; the general law level, a postulate that guarantees the validity of the known conservation laws; and the comprehensive theory level, which gives a unified mathematical formula for the fundamental interaction being studied. Human thought is a major factor in the generalization of experimental facts.

Natural sciences are based on a fundamental assumption that we live in a rational universe where natural events are causally connected. Causal correlation remains an essential ingredient of the scientific method but modifications in the postulate of determinism were tailored to agree with the results of experimentation. The view of the natural world entails the adoption of a philosophical standpoint, although defending such a standpoint by completely persuasive logic is impossible. Sometimes a scientific theory is rejected on philosophical grounds despite its accordance with experimental results. At a level of fundamental interactions, scientific research has always been associated with

philosophical premises that do not emanate from experiment. This association is important because it gives an intellectual and cultural dimension to research in the natural sciences. It could possibly contribute to the domain of technological applications and to the realm of human thought. The formulation of many basic scientific laws tends to sweeping generalizations, suggesting that certain philosophical standpoints result from empirical science. Such cases overstep the limits of experimentation and observation.

A researcher who believes in an All-Wise Creator also believes that human beings' free will is a reality and that determinism stops at a certain degree of complexity. The faith-based position rejects the notion of accident as incompatible with the laws of God. The notion of accident reflects humankind's blindness to the causes and reasons beyond the phenomena in question. A believer-researcher can explain the disparity between collective and individual behavior, while others would reject this line of thought, believing in the uniqueness of human mentality and the superiority of human reason to all else in the universe. Every effort exerted in the natural sciences is a human pursuit that reflects ideological, intellectual, and philosophical positions. This should be borne in mind when reading scientific writings.

The Editor

ABDELWAHAB M. ELMESSIRI (1938–2008) was professor Emeritus of English literature and critical theory at Ain Shams University, Cairo, and a foremost intellectual and activist. A prolific writer he published many articles and authored sixty books on various subjects including Zionism, modernism, postmodernism, secularism, and materialist philosophy, etc. His perhaps most famous work has also been called the most important Arabic encyclopedia in the twentieth century: *The Encyclopedia of Jews, Judaism and Zionism* (8 volumes).

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