

a30 Percepts, precepts < basis, theory >

... be gentle with yourself. / You are a child of the universe,
no less than the trees and the stars; / you have a right to be here.

—Max Ehrmann, *Desiderata*, ca. 1920.¹

We must wholeheartedly believe in free will. If free will is a reality, we shall have made the correct choice. If it is not, we shall still not have made an incorrect choice, because we shall not have made any choice at all, not having a free will to do so. —Edward (Ed) Norton Lorenz (1917-2008).²

... the history of geology has been a history of controversy ... and each occurred precisely because there were no hard and fast rules by which such interpretations could be made. Uniformitarianism is the closest geologists have come to such a rule. It was geology's answer to the problem of induction. Rather than being a trivial restatement of the invariance of natural laws, it was a fundamental assertion of geology's right to be a science. —Naomi Oreskes.³



To paraphrase Ernest Rutherford's presidential (1923) address, to the British Association for the Advancement of Science: Experiment without imagination, or imagination without recourse to experiment, can accomplish little, but, for effective progress, a happy blend of these two powers is necessary. The unknown appears as a dense mist before our eyes. In penetrating this obscurity we cannot invoke the aid of superior beings, but must depend on the combined efforts of a number of adequately trained ordinary people of scientific imagination. Each, in their own special field of inquiry is enabled by the scientific method to penetrate a short distance, and their work reacts upon and influences the whole body of other workers. From time to time there arises an illuminating conception, based on accumulated knowledge, which lights up a large region and shows the connection between the individual efforts, so that a general advance follows. The investigation begins anew on a widened vista, and often with improved techniques. The conception which led to this advance often appears simple and obvious when once it has been put forward. This is a common experience, and the individual often feels a sense of disappointment that they had not foreseen a development which ultimately seems so clear and inevitable.⁴

Rutherford's statement elaborates and leads from Kant's aphorism that warns: "Percepts without precepts are blind **and** precepts without percepts are empty."⁵ [Our sensing of things, what we think we see when we observe, *with no theory to guide our selection and help us see things in the first place*, is an aimless groping for the truth, **and**, a feeling of knowing or a sense of understanding, *with no back-up references to solid observations*, is as barren as is reasoning from hopes and dreams.] One can apply this statement to an insightful understanding of the uniformitarianist vs. catastrophist debate. Of the statement, analogical Huttonian geology is an example of the first part that avoids the trap, and nomological Wernerian geognosy that does not rule out catastrophism is an example of the second part that falls into the trap.

Hutton in 1785 stated his methodology: "Matter of fact is that upon which science proceeds, by generalization, to form a theory, for the purpose of philosophy, or the knowledge of all the causes; and it is by the comparison of these matters of fact with any theory, that such a theory will be tried."⁶

Testing has given Huttonian theory substance and modern geology is the result. □