

of the dinosaurs a mistake that had to be rectified at a later stage, or was the loss of dinosaurs from the earth a mistake? The Bible clearly teaches that the mistake was a human one. The original creation was in perfect order. Man's rebellion against God had enormous consequences, which included changes in the natural world and the demise of these great beasts. Maybe this helps to put man's rebellion in a better perspective.

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Religious Presuppositions in Historical Geology

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James Hutton is reputed to be the first British geologist to have abandoned the Mosaic Chronology, and one of the first to have adopted a long timescale for Earth history. His methodology, observations and deductions have earned him the title "The Founder of Modern Geology". This article attempts to identify philosophical and religious factors in Hutton's thinking and is also intended to help clarify issues relevant to the contemporary debate about origins.

1. Christian and Naturalistic Worldviews

Philosophical enquiry after the Renaissance examined the phenomena of rationality and how 'thinking man' can arrive at truth and understanding. Brief sketches of major thinkers are found in Brown¹. The continental philosophers focussed their attention upon supposedly self-evident truths, and sought to construct comprehensive world-views based on reason. In Britain the emphasis was different; interest in empiricism was led by Locke (1632-1704), Berkeley (1685-1753) and Hulme (1711-1776). These men argued that all knowledge is ultimately derived experientially – the validity of assertions can only be established by testing them in experience.

A very helpful analyst of philosophical trends was Francis Schaeffer, particularly in his books *Escape from Reason*² and *The God Who is There*³. He points out that the Renaissance problem of 'nature and grace' is no problem for the Christian. There is no necessity to compartmentalise knowledge because, by revelation, God unifies all knowledge. This truth was rediscovered at the Reformation.

"This did not mean that there was no freedom for art or science. It was quite the opposite; there was now possible true freedom within the revealed form. But, though art and science have freedom, they are not autonomous – the artist and the scientist are also under the revelation of the Scriptures. As we shall see, whenever art or science has tried to be autonomous, a certain principle has always manifested itself – nature 'eats up' grace, and thus art and science themselves soon began to be meaningless" (ref. 2, p.23 - 24).

Subsequent to the Reformation, students of philosophy are largely following the struggles of men who, having ignored or denied revelation because of their commitment to human autonomy, still sought to unify knowledge. The continental Rationalists rejected the concept of revelation *in toto*. They wrestled with the problem of bringing the natural world into a relationship with innate concepts of human freedom and dignity – but instead of unity they found conflict and tension.

"They feel the pressure 'downstairs' of man as the machine. Naturalistic science becomes a very heavy weight – an enemy. Freedom is beginning to be lost. So men, who are not really modern as yet and so have not accepted the fact that they are only machines, begin to hate science. They long for freedom even if the freedom makes no sense, and thus autonomous freedom and the autonomous machine stand facing each other" (ref. 2, p.34).

Schaeffer then goes on to trace these intellectual trends through Hegel and the 'line of despair', and so on to the

modern period. Hegel is the turning point because he, at last, acknowledged that the quest for a unified field of knowledge was doomed to failure. He launched out in a new direction – one that required the sacrifice of rationality.

“It is true that Hegel is usually classified as an idealist. He hoped for a synthesis which would have some relationship to reasonableness somehow. Nevertheless he opened the door to that which is characteristic of modern man. Truth as truth is gone, and synthesis (the both-and), with its relativism reigns.

The basic position of man in rebellion against God is that man is at the centre of the universe, that he is autonomous – here lies his rebellion. Man will keep his rationalism and his rebellion, his insistence on total autonomy or partially autonomous areas, even if it means he must give up his rationality” (ref. 2, p.41, 42).

The Empiricists shared the post-Renaissance commitment to autonomous man, and indifference to or rejection of revelation. Their emphasis on knowledge gained through the senses is one which took them far from the Christian Way. Although some of the empiricists were professing Christians, they had imbibed a non-Christian philosophy.

“The movement is generally thought of as having made a great contribution to the general advance of modern agnosticism. For when Hulme pushed empiricist techniques to their logical conclusions, he left no alternative to scepticism” (ref. 1, p.61).

James Hutton (1726 - 1797) belonged to the Empiricist tradition, as is shown in Section 2. Whereas his geological colleagues sought, to some extent, to integrate their studies of the Earth with Biblical revelation, Hutton made it a principle to verify all statements about the past exclusively by reference to experientially-derived knowledge.

2. Hutton's *Principles of Knowledge*

Although chiefly remembered for his contributions to physical geology and explanations of the Earth's workings, Hutton's interests were diverse. Being of an amiable disposition, he found many friends amongst the literary and scientific society in Edinburgh, and greatly enjoyed the interchange of ideas. Towards the end of his life, in 1794, Hutton published the first of his two major works⁴, popularly called his *Principles of Knowledge*. The Empiricist tradition is apparent in Hutton's discussion of the experimental sciences and of geology. The acquisition of knowledge, says Hutton, begins with sensation, or sense perception. The physical experience is discerned in the mind and analysed. Observations are followed by inferences – involving comparisons with previous observations and conclusions which are confirmed by reference to “the actual state or appearance of things” – the ultimate foundation of knowledge.

In a very helpful article⁵, O'Rourke shows that Hutton was undoubtedly an Empiricist – but one whose independent mind developed his own version of Empiricism.

“Hutton's account of the thought process might be summarised as follows. The three basic stages are sensation, perception (or apperception), and conception. In sensation the mind receives a stimulus from an external agent through the five senses. In perception the mind acts to compare sensations and organise them into objects. In conception, general ideas such as time, space, and motion are abstracted from the comparison of perceptions, then reapplied, in a reciprocal phase of the process, allowing them to be confirmed in sensation. Conceptual knowledge as it is used in science attains wide generality and precise refinement, but it is remote from experience and is only “relative” in the literal sense of dealing with relations, whereas sensations are “absolute” in the literal sense that they cannot be analysed. Hutton differs from earlier empiricists in assigning a greater role to the operation of the mind in creating knowledge. In this he resembles Kant, whose reasoning was, however, entirely *a priori*.....

An eighteenth-century reader who understood Hutton's philosophy would know what to expect from his geology. Field experience would be stressed as both the source of information and its criterion. Observation would be separated carefully from inference. Statements about the past would have to be phrased in terms of present processes. Hutton's search for principles led him to see that there can be no direct knowledge of them, and since principle means literally beginning, he can be expected to doubt cosmogony” (p.11).

There has been a tendency among geologists who have regarded Hutton as a father-figure to assert that the *Theory of the Earth* was written in the field. This assessment seems to seriously undervalue Hutton's detailed and contemporaneous work on the philosophy of knowledge. Nevertheless, the neglect of Hutton's non-geological writing is understandable as he did not even mention his own philosophic work in the *Theory of the Earth*! O'Rourke's explanation of this situation, outlined in Section 3 is both unexpected and provocative. The interpretation of Hutton as a devotee of fieldwork and inductive science is ably exploded by Gould¹².

3. Hutton's *Theory of the Earth*

Throughout Hutton's geological volumes⁶, one is conscious of teleology: the “argument from design”. The basic concept is that the Earth is a world ordered by the Divine Being to be a home for man and the animals. Whilst a superficial glance might suggest that the ‘home’ is being destroyed by erosion of the land, this is not the case. The decay of rocks maintains the fertility of the soil, allowing life to continue. As land is destroyed in one place, it is regenerated in another. This is the rock cycle – well known now to students of geology. As the cycle continues, life persists, and the design of the Deity is fulfilled⁷.

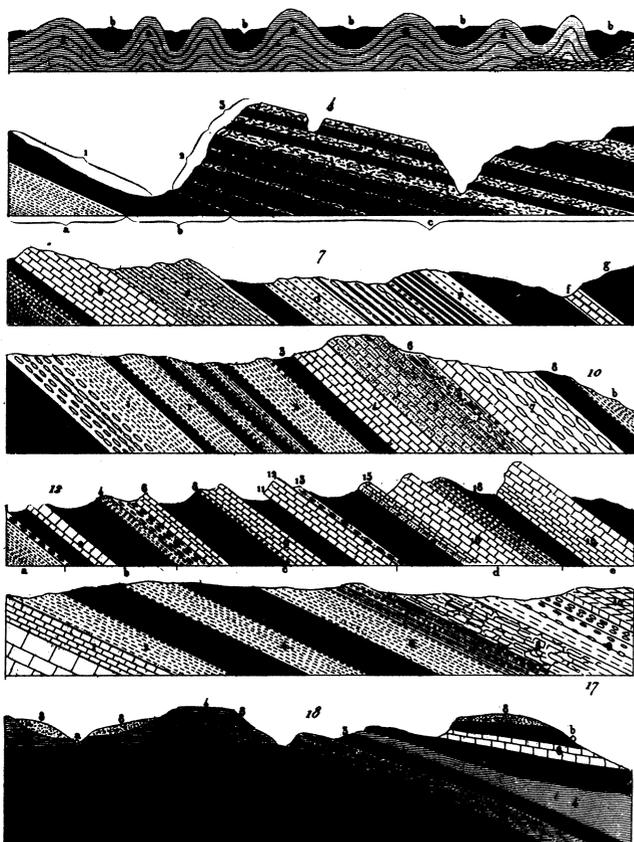
Hutton has traditionally been interpreted as a scholar working out his deistic views. Thus: “Hutton's theory is an almost perfect geological expression of deistic beliefs.”⁸

The argument from design is “the basic premise from which the entire Huttonian theory stems.” O’Rourke states that deism was pervasive amongst the intellectuals of Hutton’s day, and suggests that these people may well have influenced him (ref. 5, p.6).

The unexpected aspect of this situation is that the philosophical base of Empiricism is dramatically obscured by Deism.

“The reader who started with the explanation of the Earth’s operations would never guess that the same author had made an exhaustive analysis of its concepts, so thoroughly is the real argument masked by the teleology. The use of the new theory of knowledge can be seen, however, by referring to what he said about each topic – geologic process, uniformity, time, the primeval crust, and cosmogony – to the premise that knowledge begins with experience” (ref. 5, p.11,12).

The fascinating question is: why did Hutton choose to present his ideas on physical geology in this teleological way – when he had worked them out using an empiricist approach?



It is quite possible that there is a link between Hutton’s Deism and his particular version of empiricism. This is explored below. However, it is also possible that Hutton was conscious of a public resistance, not only to his geological views, but also to his Empiricism. That Empiricism was greatly overshadowed by Deism is indicated by Brown’:

“And if to many students Empiricism was *the* philosophy of the eighteenth century, it was not so to much of those who lived in that age. Among the

various philosophies that clamoured for attention (and indeed got it) was Deism” (p. 74).

Consequently, Hutton may well have couched his arguments in a teleological form to gain a wider and more sympathetic readership. This is, in fact, the explanation suggested by O’Rourke. In the following quotation, he summarises Hutton’s philosophical contribution and the dilemma which he faced.

“The problem in geology is then how we can claim any knowledge of a past never experienced. Hutton was able to take a new approach because he modified empiricism to emphasise the active role of the mind in organising sense data. The world is as we conceive it, and we can conceive of similar experience reaching back indefinitely. We should begin geology with the study of the earth’s operations as they are seen today. Much can be inferred from the terrain and its rocks, but such reasoning from effect to cause must also be verified in terms of present processes. Like Kant and the American pragmatists, Hutton required that any concept be confirmed in sense perception. Separating observation and inference at each step in the thought process, he arrived at a cause that cannot be observed, only inferred. Thus he avoided the fruitless speculations of earlier geologists and found many things they had overlooked, because his method disclosed what is and is not within reach. Yet he apparently felt that he could not expound a radically new philosophy in a geological treatise that was in itself too novel. So, he dressed the theory in a teleology that was already out of fashion” (ref. 5, p.19).

Whilst these thoughts would help to explain a decision to play down essentialism, the writer remains unconvinced that they are entirely adequate. Hutton employs Deistic thinking in a way which adds up to rather more than a veneer to camouflage the philosophy. It is suggested here that Hutton’s “new approach” was only possible because of his Deistic beliefs. The universe was regarded as an elaborate mechanism that had been set in motion by the Deity and left to run. Evidences of design are to be found everywhere – as is also the case whenever one studies a man-made machine. The mechanism functions according to rules (laws) and its orderly behaviour is itself an expression of the purpose of the designer. The concept of an unchanging natural order and the predictability of the universe must follow from Deistic presuppositions.

How then is Hutton able to justify the use of present experience to interpret past events? Observations and experiences allow the mind to identify order, and so to identify the divine principles which govern all physical and chemical processes taking place in the universe. (Yet, since “order is in thought, not thing” (ref. 5, p.14), it is necessary for students of nature to show humility. They must distinguish between their perceptions of order, and that which is actually ordained by the Deity.) Access to the geological past is gained by taking the principles of order discovered by a study of present-day processes and assuming, *on the basis of continuity of divine government,*

that these principles have always been in operation. Thus, one arrives at the dictum, "The present is the key to the past." Philosophically, Hutton would state that any assertion about the past must be verified in terms of present processes. The issue is not uniformity of geologic processes in the Lyellian sense, but whether anything can be known about the past except from the perspective of the present.

Hutton's populariser, John Playfair, omitted the teleology when he redrafted the ideas of his mentor for the public¹⁰. Since Deism had waned towards the end of the eighteenth century, Playfair's work was much more acceptable to the succeeding generation of geologists and its impact was enduring. However, the justification of "the present is the key to the past" could no longer make reference to Deism. The question, which was never satisfactorily answered, becomes: what replaces Deism to justify Hutton's methodology?



Charles Lyell sought to establish Hutton as an inductive scientist but was not willing to appeal to Deistic views to justify the continuity of present-day processes with those of the past. Instead, he introduced a confusion of 'natural law' with 'uniformity of rate' and declared uniformity of geologic processes to be the only tenable scientific position. This myth has affected generations of geologists and the incisive analysis and powerful criticisms of Gould¹² are long overdue. Consequently, since the principle of uniformity of geologic processes can no longer be regarded as scientific, Hutton's methodology still lacks a rationale.

4. The Way Forward

The disciple of Christ is commanded to love God with all his heart, soul, mind and strength and to love his neighbour as himself. It is necessary, therefore, for a Christian to be a transformed person: in ethics and morality, in life-style, and in world-view. As was pointed out in Section 1, a unified view is possible because the Lord is not only the Creator of all things, but also the

Revealer of truth to man. Christians who are scientists have an obligation to address questions of methodology so that they are consciously Christian in their thinking. (A popular presentation of this subject by the writer¹¹ has sought to stimulate thought along these lines).

A methodology for Christian thinking in the geological sciences is in great need of clarification. There appear to be many Christians who regard the Huttonian principles as quite acceptable – and some may even wish to revive his teleological arguments. However, this article has sought to show that such an approach is fundamentally in error. Hutton's methodology derives from a blend of Empiricism and Deism – which are both hostile to the Christian world-view. Both deny revelation; both consider man as autonomous (an important aspect of man's rebellion against God); and Deism has a defective understanding of God's activity in creation and providence. Our desire to see a genuinely Christian understanding of earth history and origins needs to be accompanied by a genuinely Christian methodology for the earth sciences.

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