

## Communication

*The Problem of Epistemology and Cosmic Models*

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In 1975 Gunther S. Stent, then professor of molecular biology at the University of California at Berkeley, published in *Science* an article in which he argued that (a) the influence of positivism which informed the first centuries of the natural scientific enterprise is waning; that (b) structuralism (of which conceptualism is a type) has become a plausible alternative to positivism; and that (c) the theory of evolution can resolve the dilemma inherent in structuralism's assertion of innate ideas.<sup>1</sup> He then concluded that because the brain has evolved as a survival organ to process information in a particular way, its innate structures are not particularly adept at scientific inquiry insofar as that inquiry attempts to grasp reality on scales much beyond the brain's immediate experience, and that certain areas will be forever closed to the scientific method.<sup>2</sup>

While Stent focused primarily on questions revolving around the human self, I will attempt to expand his insight to include all cosmic models. I will argue that such models are not based primarily on objective evidence but instead project the innate substructure of human consciousness. Ludwig Feuerbach once argued in *The Essence of Christianity* that theology is really anthropology. In the same way, I will argue that cosmic models are themselves not accurate depictions of the universe but humanizations of it. Indeed, as creations of the human mind from the perspective of the conceptualist or the structuralist, they can express nothing beyond sense perceptions

manipulated by innate ideas and cultural presuppositions. Thus current scientific models, including models of origin, share more with ancient models, including models of creation, than they do with any actual events. They are merely the tales we tell ourselves when confronted with that great mystery. They are the way we make an alien universe seem human.

In the west, subsequent to Plato, reason served an architectonic function. It was generally assumed that knowledge was made possible by forms, whether those forms existed apart from God or in the mind of God, and that the forms were universal. In the later Middle Ages, however, this general consensus began to break down in favor of alternative positions. One of these alternative positions was what we know as conceptualism or structuralism. The conceptualists or structuralists argue that knowledge is made possible not by universal forms but by mental structures that either are peculiar to a species or even peculiar to a subgroup within a species. Thus in the view of the structuralist, knowledge of the world is particularized. Creatures see a world that is appropriate to them and their needs, but there is no reason to assume that various creatures see the same world. For example, a robin and a human being might see a car, but when they see that car, they do not see the same thing. From the perspective of the structuralist or conceptualist, this presents no problem to the species since each species survives quite well in its version of the world, but it would present a problem if species tried to claim exclusive validity for their versions. Of course, robins are not inclined to debate with humans on the nature of a car, but humans are inclined to assume that the world they see is the world as it is. The structuralist or conceptualist would insist

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that there is no reason to assume that the human sees the world as it is. All that can be assumed is that the human sees a human world. In the popular mind, this perception finds expression in the parlor debate, based upon the enumeration of rods and cones, as to whether cats and dogs see color.

In a nutshell, structuralism subverts the architectonic function of reason since from a structuralist standpoint there is no rationale for assuming that the mind, as it constructs its models of reality, employs perceptions that have universal validity. The most influential modern structuralist/conceptualist was Immanuel Kant.

### The Kantian Critique

In his *Critique of Pure Reason* published in 1781, Kant maintained that reason, unassisted by experience, would eventually generate contradictory conclusions.<sup>3</sup> Logic, he argued, is successful only insofar as it is limited to exhibiting and proving formal rules of thought.<sup>4</sup> It teaches nothing regarding the content of knowledge.<sup>5</sup> That content must be provided by the empirical sciences.<sup>6</sup> But empiricism or, as Kant called it, "sensuous knowledge" is an incoherent manifold unless structured by reason.<sup>7</sup> To forge coherent knowledge, reason and empiricism must be employed together, each correcting the other's deficiencies.

Kant understood knowledge as the result of a synthesis of various representations given either a priori or empirically.<sup>8</sup> Since knowledge is not possible without a concept, a general something that could serve as a rule,<sup>9</sup> this general something must be given a priori.<sup>10</sup> Kant called this a priori given "pure intuition."<sup>11</sup> It was not itself an object, but the formal condition for perceiving an object.<sup>12</sup>

To account for pure intuition, Kant introduced the idea of Categories. These Categories he defined as pure concepts of the understanding, by which he meant that they were given to the mind not empirically but a priori.<sup>13</sup> Kant discussed these Categories at great length. For our purposes, it is not important to look at them in detail, but we should note the following point. The Categories were roughly analogous to Platonic Forms but with this difference: In Plato's system of knowledge, the Forms were universal and made universal knowledge possible whereas in Kant's system, the Categories existed solely in the human mind. There is no way to know for certain if they correspond to objective reality, but we can know for certain that they correspond to subjective reality.<sup>14</sup> Thus Kant embraced a type of conceptualism, a philosophical tradition that goes back at least as far as Abelard. The Categories (or pure knowledge) made it possible for the mind to receive representations (or sensuous knowledge).

The faculty in the mind for receiving representations, Kant called "sensibility"; the effect it produced, he called "sensation"; and intuitions about the objects of sensation,

he called "empirical intuitions."<sup>15</sup> Discussing sensuous knowledge, Kant argued that all intuition was the representation of phenomena.<sup>16</sup> The phenomena themselves cannot exist apart from our knowing them. Hence, we do not know what they are in themselves. We know them only as our mind, through our senses, constructs them for us.<sup>17</sup> They are sensuous representations only and must not be confused with the object apart from that representation, that is, as the object is in itself.<sup>18</sup> Kant then argued that intuition and the concepts associated with it are the basis of all our knowledge.<sup>19</sup> Indeed, he believed that the faculty of imposing an a priori unity upon the manifold of given representations was the highest principle of human knowledge.<sup>20</sup> Thus, the synthetic unity of consciousness is the objective condition of all human knowledge and all human thought.<sup>21</sup>

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Knowledge, of course, makes judgments possible. Judgments, according to Kant, are generalizations that compass the many under a single representation. They are expressions of the mind's ability to think in terms of concepts. They make explicit the mind's understanding.<sup>22</sup> Understanding, in Kant's view, is the ability to perceive patterns, categories, and order.

Thus Kant constructed a critical epistemology which, though fundamentally subjective, allowed for the apprehension of objective reality in terms of that very subjectivity.<sup>23</sup> Such an epistemological model can be diagrammed this way: *the event itself/the event as perceived/the event as interpreted*. Perception structures the event, making it accessible to the mind, but perception, by structuring the event, also alters it, investing it with the structure of consciousness itself. Thus, according to Kant, the world we see is a fundamentally human world, and therefore a limited one. Other beings might perceive and interpret it differently and just as validly. As long as we are dealing with practical questions, that limitation on our knowledge is of no particular consequence. We learn by trial and error, by tests that produce predictable results. We apply what we learn. We adopt those applications that produce the results we seek. However, when we attempt to expand our knowledge from those practical issues to metaphysical ones, when we attempt to answer ultimate questions, such as "What is the universe really like?" then those limitations

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become extremely important. They mean that all we can do is construct a picture of what the universe might look like to a cosmic human limited by the kind of knowledge we possess at any particular moment in history. The principles under which we operate may be quite sound. After all, we use them because they prove serviceable in our daily lives. But the world view we derive from those principles may not be valid because our way of knowing means that we cannot apprehend a thing as it is, we can only apprehend it in human terms.

### The Kantian Critique Today

In his Whidden Lectures delivered in January 1975 at McMaster University, Noam Chomsky argued that human knowledge was founded on the mind's "innate capacity to form cognitive structures,"<sup>24</sup> and that such a property could be accounted for in terms of "human biology."<sup>25</sup> The use of the term human biology is significant here since Chomsky suggests that although such structures doubtless evolved, it is a mistake to believe that some universal capacity for learning unites the various species. Instead he seems to see species as having abilities that are distinct.<sup>26</sup> Of course, as one who accepts evolution, he imagines that complex mental abilities developed over time in the same way that complex organs did.<sup>27</sup> Thus he argues: "The human mind is a biologically given system with certain limits and powers."<sup>28</sup> He also notes that there is no evolutionary pressure leading humans to possess minds fitted to abstract theorization and that when human cognitive capacity is well matched to a particular field of inquiry, it is purely accidental.<sup>29</sup> He writes:

Among the systems that humans have developed in the course of evolution are the science-forming capacity and the capacity to deal intuitively with rather deep properties of the number system. As far as we know, these capacities have no selective value, though it is quite possible they developed as part of other systems that did have such value.<sup>30</sup>

Thus Chomsky is supposing a kind of Kantian epistemology that, by the very structure which makes human intellectual achievement possible, sets limits on that achievement. He believes that Darwinism offers a

"biological underpinning" for such an epistemology.<sup>31</sup> He writes:

[T]here is no reason to suppose that the capacities acquired through evolution fit us to "fathom the world in its deepest scientific aspects."<sup>32</sup>

Nor is he alone in this assessment. Steven Pinker writes:

Given that the mind is a product of natural selection, it should not have a miraculous ability to commune with all truths; it should have a mere ability to solve problems that are sufficiently similar to the mundane survival challenges of our ancestors. ... [R]eligion and philosophy are in part the application of mental tools to problems they were not designed to solve.<sup>33</sup>

Indeed, he appeals specifically to Chomsky when he writes:

Maybe philosophical problems are hard ... because *Homo sapiens* lacks the cognitive equipment to solve them.<sup>34</sup> ... [T]here are indirect reasons to suspect this is true. ... [T]he species' best minds have flung themselves at the puzzles for millennia but have made no progress in solving them. [T]hey have a different character from even the most challenging problems of science.<sup>35</sup>

And while Stephen Hawking is critical of Kant's argument that theories about the origin of the universe are self-contradictory<sup>36</sup> and contends that the reasoning abilities bequeathed to us via evolution should at least prove sufficient to develop "a complete unified theory that will describe everything in the universe,"<sup>37</sup> he is also aware that scientific theories are no more than mathematical models existing only in our minds,<sup>38</sup> and that our sense of time's direction is a psychological phenomenon based in the fact that "we must remember things in the order in which entropy increases."<sup>39</sup> But this twin admission, it seems to me, robs Hawking's original reason for dissent of much of its power. After all, if our sense of time is purely psychological, purely a creation of the way we remember events, then Hawking's thesis—that the reasoning abilities we inherited through evolution should be sufficient to develop a theory explaining everything in the universe—collapses. If our sense of time

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is circumscribed by the structure of our psychology, how can we be sure that the same is not also true of our grasp of reason? Thus how much credit can we assign to those mathematical models that (as he says) exist only in our minds? And with this question, the limits imposed by Kant's critique of all such models reemerges as forcefully as ever.

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Plainly when Pinker raises the epistemological issue, he applies it to intractable philosophical problems, and when Chomsky discusses the possible limits on what human intelligence can achieve, he refers to specific kinds of problems, like in-depth accounts of our normal use of language.<sup>40</sup> After all, both men are evolutionists and would not see evolution, because it is "scientific," as falling under the purview of a Kantian critique. Hawking seems more aware of the problem but does not address it adequately.

The problem is this: Kant understood his epistemology to exclude cosmic questions and to invalidate the models we construct when attempting to answer such questions. For example, he writes:

Human reason is by its nature architectonic, and looks upon all knowledge as belonging to a possible system. ... The propositions of the antithesis, however, ... render the completion of any system of knowledge quite impossible.<sup>41</sup>

Kant points out that transcendental philosophies assume that reason is qualified to answer those questions that occur to it, but that all such questions to which transcendental philosophy leads are cosmological.<sup>42</sup> He then analyses such questions and concludes that the "cosmical idea" which gives rise to them "is either too large or too small for the empirical regressus, and therefore for every possible concept of the understanding."<sup>43</sup> This is the fault not of the empirical regressus but of the cosmological idea itself since it cannot be resolved by an appeal to experience. After all Kant argues: "It is possible experience alone that can impart reality to our concepts; without this, a concept is only an idea without truth, and without any reference to an object."<sup>44</sup> Kant's purpose, as we noted

above, was to defend empirical science against Hume's radical skepticism. To do this, he limited the scope of human inquiry to immediate practical problems instead of abstract and ultimate ones. Science had validity as a vehicle for addressing specific issues that could be resolved via direct observation and experimentation. It was not to be a vehicle for building cosmic models for such models would inevitably draw science into the transcendental realm. Evolution, of course, is a cosmic model.

## Conclusion

Here is the dilemma: If a mind grasps its world by means of mental categories that have evolved solely to ensure the survival of that mind, there is no reason to assume that the world the mind grasps is the world as it is. Many minds survive in this world, yet see the world in fundamentally different ways. There is robin-world, bullfrog-world, woodchuck-world, and housefly-world. And there is human-world. The world of each of these creatures is validated insofar as it ensures the survival of the creature, but no further. The positivist assumes that a human mind grasps the world as it is, but from an evolutionary standpoint, there is no reason to make such an assumption. Instead there are many reasons to assume an observed world differs from the world as it is.

The observer is neither neutral nor passive. Rather, the observer, by the very act of observing, participates in and structures the world. For the positivist, this dilemma is fatal. Yet from a Darwinian perspective there is no reason to assume it is not true. Ironically Darwinism leads to a logical cul-de-sac. If the Darwinist is right, there is no reason to assume that the Darwinist can accurately model the world. If the Darwinist is wrong, there is no reason to assume that the Darwinist can accurately model the world.

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## Notes

<sup>1</sup>That dilemma being, how do those innate ideas happen to match so well with the world in which we find ourselves?

<sup>2</sup>Gunther S. Stent, "Limits to the Scientific Understanding of Man," *Science* 187, no. 4181 (March 21, 1975): 1052-7. *Structuralism* embraces any theory that embodies structural principles. In philosophy, structuralism posits the brain as possessing innate structures which, by processing information, make knowledge possible. *Conceptualism*, of which there are several varieties, is a branch of structuralism that attempts to forge some common ground between nominalism and realism and regards universals as concepts rather than Platonic forms.

<sup>3</sup>Immanuel Kant, preface to *Critique of Pure Reason*, 1st ed., (1781), xxiv.

<sup>4</sup>*Ibid.*, preface to 2d ed. (1787), xxix.

<sup>5</sup>*Ibid.*, I. "The Elements of Transcendentalism," second part, sub-part IV, "Of the Division of Transcendental Logic into Transcendental Analytic and Dialectic," 50; first division, bk. I, chap. 1, section 3: "Of the Pure Concepts of the Understanding, or of the Categories," 60; Book II: "Analytic of Principles," 117-8.

<sup>6</sup>*Ibid.*, preface to 2d ed., xxx; I. "The Elements of Transcendentalism," first division, bk. I, chap. 2, section 1: "Of the Principles of a Transcendental Deduction in General," 79.

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<sup>7</sup>Ibid., first division, bk. I, chap. 1, section 3: "Of the Pure Concepts of the Understanding, or of the Categories," 60.

<sup>8</sup>Ibid.

<sup>9</sup>Ibid., bk. I, chap. 2, section 2, subsection 3: "Of the Synthesis of Recognition in Concepts," 104.

<sup>10</sup>Ibid., 102.

<sup>11</sup>Ibid., I. "The Elements of Transcendentalism," first part, "Transcendental Aesthetic," p. 22; Ibid., subsection 3: "Of the Synthesis of Reproduction in Imagination," 102.

<sup>12</sup>Ibid., I. "The Elements of Transcendentalism," bk. II, chap. 3, appendix, "Of the Amphiboly of Reflective Concepts, owing to the Confusion of the Empirical with the Transcendental Use of the Understanding," 219.

<sup>13</sup>Ibid., first division, bk. I, chap. 1, section 3, 60.

<sup>14</sup>The debate as to whether the Categories are universally human, or cultural constructs, or some mixture of both is a debate we need not get into here.

<sup>15</sup>Kant, *Critique of Pure Reason*, I. "The Elements of Transcendentalism," first part, 21.

<sup>16</sup>Ibid., Part I: "The Elements of Transcendentalism, General Observations on Transcendental Aesthetic," 35–6.

<sup>17</sup>Ibid., p. 36; I. "The Elements of Transcendentalism," bk. II, chap. 3, appendix, 217.

<sup>18</sup>Ibid., first division, bk. I, chap. 2, section 2, subsection 3, 103.

<sup>19</sup>Ibid., Part II: "Transcendental Logic," introduction, "The Idea of Transcendental Logic," 44.

<sup>20</sup>Ibid., I. "The Elements of Transcendentalism," first division, bk. I, chap. 2, section 1, 79.

<sup>21</sup>Ibid., 81.

<sup>22</sup>Ibid., chap. 1, section 1: "Of the Logical Use of Understanding in General," 54–5.

<sup>23</sup>It is worth noting here that Popper, though he sharply distinguishes his own "critical rationalism" from Kant's epistemology, claims that, when applied to the philosophy of science, his approach completes the critique Kant began (*Conjectures and Refutations*, Introduction, section xv, 26–7). Kant was correct, Popper believes, when he argued that the human intellect imposes laws upon nature rather than discovering laws of nature, but Kant was wrong, Popper thinks, to believe that the laws humans imposed are necessarily true (Part I, chap. 1, section v, 48; chap. 2, section x, 95). Here, Popper argues, Kant proved too much and that to be glean the truth in Kant's idea, the problem he addressed must be reduced to its proper dimensions. Popper believes that instead of asking with Plato: "How do we know?" Kant should have asked: "How are successful conjectures possible?" Later Popper affirms in agreement with the idealist that theories are not forced upon us but are human creations, conceptual instruments we design for ourselves to assist us to think about things (chap. 3, section 6, "The Third View: Conjectures, Truth, and Reality," 117). Thus Popper modifies Kant in the following way: Believing that Kant's assertion that we impose laws upon nature is too radical, Popper argued that it must be modified to stress that our impositions are free creations of our minds and meet with varying success (chap. 8, section 1, "Kant and the Logic of Experience," 191).

<sup>24</sup>Noam Chomsky, *Reflections on Language* (New York: Random House, 1975), 23.

<sup>25</sup>Ibid., 32.

<sup>26</sup>For example, he points out that white rats are better than college students at learning to negotiate mazes (pp. 18–9, 158–9), a phenomenon that suggests to him that, given the obvious superiority of human intelligence to rat intelligence, there is no general theory of learning that applies to rats as well as humans. He also argues that the mental structures enabling humans to learn languages are unique to humans (p. 40), that they are "a species-specific, genetically determined property" (p. 79). Also see p. 11 for more on language as a species specific property.

<sup>27</sup>Ibid., 10.

<sup>28</sup>Ibid., 155.

<sup>29</sup>Ibid., 25.

<sup>30</sup>Ibid., 58–9.

<sup>31</sup>Ibid., 123–4.

<sup>32</sup>Ibid., 124.

<sup>33</sup>Steven Pinker, *How the Mind Works* (New York: W. W. Norton & Company, 1997), 525.

<sup>34</sup>Ibid., 561.

<sup>35</sup>Ibid., 562.

<sup>36</sup>Stephen W. Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 7–8. He challenges Kant based on Kant's unspoken assumption that time is distinct from the universe and continues backward forever whether or not the universe has existed forever. Hawking agrees with Augustine that the concept of time apart from the universe has no meaning (p. 8). He has a point in that Kant does distinguish between space and time, claiming, "Time is the formal condition, a priori, of all phenomena whatsoever. Space, as the pure form of all external intuition, is a condition, a priori, of external phenomena only" (*Critique of Pure Reason*, I. "Elements of Transcendentalism," First Part, second section, subsection 5: "Transcendental Exposition of the Concept of Time," p. 31). However, in saying this, Hawking implies that Kant thought of space and time as objective realities. He did not (see footnote 38).

<sup>37</sup>Ibid., 12–3.

<sup>38</sup>Ibid., 139. Hence Hawking concludes there is no distinction between real and imaginary time, a judgment with which Kant would have had no fundamental argument. Kant says: "Time ... is ... the real form of out internal intuition. Time therefore has subjective reality. ... Time is nothing but the form of our own internal intuition. Take away the peculiar condition of our sensibility, and the idea of time vanishes, because it is not inherent in the objects, but in the subject only that perceives them" (*Critique of Pure Reason*, I. Elements of Transcendentalism, first part, second section, subsection 5, p. 33).

<sup>39</sup>Ibid., 147. Such a realization, he notes, means that the Second Law of Thermodynamics is trivial.

<sup>40</sup>Chomsky, *Reflections on Language*, 25.

<sup>41</sup>Kant, *Critique of Pure Reason*, I. "Elements of Transcendentalism," second division, bk. II, chap. 2, section 3: "Of the Interest of Reason in these Conflicts," 336.

<sup>42</sup>Ibid., section 4, "Of the Transcendental Problems of Pure Reason, and the Absolute Necessity of their Solution," 338.

<sup>43</sup>Ibid., section 5, "Sceptical Representation of the Cosmological Questions in the Four Transcendental Ideas," 344 (italics in the original).

<sup>44</sup>Ibid.