Response

COG AND GOD: A RESPONSE TO ANNE FOERST

by K. Helmut Reich

Abstract. This response offers considerable agreement with Anne Foerst's analysis in her essay "Cog, a Humanoid Robot, and the Question of the Image of God" *(Zygon: Journal of Religion and Science* 33 [March 1998]), yet endeavors to make her argument even more helpful. The response deals mainly with (1) the concept of symbol and the symbolic approach, (2) the symbolic description of a human being by artificial intelligence (AI) and by the theological symbol, "image of God" (*imago dei*), and (3) the ensuing dialogue between scientists and theologians.

Keywords: artificial intelligence; Cog; dialogue; image of God; *imago dei*; symbol; symbolic approach.

In her essay "Cog, a Humanoid Robot, and the Question of the Image of God," Anne Foerst (1998) argues that embodied artificial intelligence (AI) presents a heuristically interesting case for the religion-science dialogue as it brings into play an epistemological framework based on descriptions of reality as symbolic. This comes about because the conceptual design of a humanoid robot ("Cog" in the present case), the prototype of embodied AI, involves the scientist's image of a person, of a personal self. From the theologian's perspective, the symbolic material resides in the concept of the human person created in the image of God (*imago dei*). Along the way, Foerst provides a critique of Barbour/Haught categories of the science/theology relationships (Barbour 1990; Haught 1995) as well as of the Cartesian approach as opposed to the Latourian (Latour and Woolgar 1986). Although I am in considerable agreement

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with Foerst's interesting analysis and set of proposals, I hope to show how her argument could be rendered even more helpful and fruitful.

Symbol, Symbolism, Symbolic Approach

The concept of symbol has at least three distinct meanings in current usage: visible sign of something invisible, arbitrary or conventional sign used in writing or printing, and representation of an object or process of the unconscious mind according to psychoanalysis (*English College Dictionary*, 1st ed., s.v. "symbol"). In early Christian usage, *symbol* designated a formulation of the common accepted doctrine (examples: Bucher 1990; Oelkers and Wegenast 1991). I begin this discussion with my understanding of Anne Foerst's usage.

According to Foerst, the "[s]ymbolic approach understands environments as socially constructed and assumes that every description of reality is metaphorical" (1998, 93). I interpret her term *metaphorical* to mean *figurative*. To illustrate the symbolic approach, Foerst uses the Kanizsa Triangle: "The triangle we see in the center does not exist but is constructed by our perception apparatus" (p. 96). Nevertheless, for most viewers it is visible and hence "real." Obviously, a meaningful and fruitful dialogue requires such a perception; otherwise, arguments about the "reality" of the triangle lead nowhere. Continuing from there, Foerst envisages a situation in which scientists and theologians would look together for a common "triangle," in a joint search for truth as well as for fulfillment of existential needs and quests that go beyond scientific objectives. Striving to do just that, religion traditionally employs symbols, along with myths and parables. In AI, *symbol* has the meaning of a mathematical sign but also that of "opaque and discrete entities . . . whose meaning is derived from their relative position in a program and, hence, by the effect they have on the program's execution" (p. 97). Continuing, Foerst states that in the symbolic approach the term *symbol* has a "transcendent" meaning, which includes the immanent symbol understanding that Foerst attributes to AI.

Although all this is basically clear, I would have wished that Foerst had been more explicit concerning the last sentence. What exactly is meant by "transcendent"? For example, does Foerst refer to Thomas Luckmann's (1988, 16) "little" (spatial and temporal) transcendencies of everyday life, the "intermediate" transcendencies (which cannot be experienced, such as the consciousness of another person), or the "great" transcendencies (which point to something that is not part of ordinary reality)? In what ways is the symbol understanding of AI immanent, and how exactly is it included in the transcendent meaning?

Symbolic Description of Human Beings in AI

"We can take Cog as another story telling us something about ourselves" (p. 104). To be credible as a humanoid, Cog's parents have provided him with a head, a neck, a torso, two arms, eyes and ears, "muscles," "nerves," and a "brain." He learns through interaction with the environment, just as a baby learns by exploring. At this stage the symbolic AI description of human beings stresses essentially materialistic aspects. However, with increasing sophistication of the design and of the experience acquired, Cog "might develop the same complexity [as, for instance, that of the human brain] and, hence, develop the same illusions [for example, consciousness]" (p. 104).

As I understand it, Cog is a symbol for a functional human being assumed to be fully explainable in terms of materialistic processes (mainly physical and chemical), and that holds as well for what are traditionally called psychological processes. The question is, nevertheless, What psychological theory underlies Cog's design? Apparently it is not just that "humans are information processors." Nor would it be a maturational, behaviorist, or purely Piagetian theory. Could it be a connectionist approach (Elman, Bates, and Johnson et al. 1996)? Cog would then be equipped with a basic "brain" and a few "instincts," but the vast mass of behavioral "rules" would be acquired through interaction with the human and natural environment and with the memory impressed by experience. If that is the case, my question is the following. Current developmental psychology (such as that of Noam and Fischer 1996) insists on the importance of close human relationships for development in both its positive and negative aspects (for example, emotional traumas). Such relationships can either transform a person (as in falling in love or experiencing a "second birth") or block normal development (as in insecure attachment or sexual abuse). How about Cog in that respect? How does he experience close relationships, and what do they do to him? And, by the way, what consequences does his maleness (revealed in the Cog website story) have (see Bennenson 1996 for gender differences)? Is his religious development a conceptual possibility?

In my view, it would be important to be quite clear about these and further issues, which I will elaborate shortly, so as to have a framework for comparing the expectations (not to mention the promises) of the scientists with their achievements. More important, if the developments leading to a religious faith are to be excluded by the very design of Cog, then we know better how to prepare for dialogue between his parents and theologians. In that sense I would also have welcomed a more detailed description of what "humanoid robot" means: That Cog can (eventually) win Turing's game of elucidating, by means of an indirect interview, the gender identity of a couple that Cog can neither see nor hear? That Cog

indeed excels in Albert Dreyfus's (1971, 204) type IV ("nonformal") intelligent activities, such as solving riddles, translating natural languages free of errors, recognizing varied and distorted patterns? Or even being able to have the religious experiences of great transcendency referred to earlier?

Symbolic Description of Human Beings as the Image of God

Foerst's concept of the image of God (pp. 104–7) is taken mainly from the priestly portion of the Genesis epic: "Let us make humans in our image, after our likeness . . ." (Gen. 1:26–27 NRSV[1]). Her interpretation of the image of God is threefold: (1) a symbol of God's promise to humans, in which God elects us as partners, underscoring every person's value and dignity; (2) humans' assignation to responsibility, which includes upholding the value and dignity of the nonhuman creation; (3) the creation of both man and woman in God's image as social beings.

Clearly, such a symbolic description is different from that of the functional individual symbolized by Cog, given that it stresses such values as dignity, responsibility, and equality. It evokes not only a human community but also a relationship with a higher being. A really fruitful dialogue presupposes some differences in outlook and experience; in fact, it is the differences, basically, that are fruitful. However, this question arises: Is the difference so great that the "triangle" cannot clearly be seen by all the dialogue partners? Could one not have an interpretation of the image of God that is closer to the concepts of present-day scientists?

Historically, religious texts in general and the Genesis epic in particular have been adapted periodically to a changed situation (as in Batto 1992 or Hefner 1997). Can there be an interpretation that is not in contradiction to the scientific narrative (see Nancarrow 1997)? In this respect I take my cues, for instance, from Timothy Ferris (1997) for the Big Bang analysis and its cosmological sequels, and from Ursula Goodenough (1996) for a view of biological evolution. In my attempts at interpretation, I use a hierarchical model of reality (Reich 1997) ascending from the microphysical level to the supernatural or transcendent level; this involves "bottom-up" (anagogic) as well as "top-down" (katagogic) causality.

Following Bernard F. Batto (1992, ch. 2), I conceive of God primarily in terms of the Yahwist's epic (Gen. 2:4b–3:24), especially as an experimenting, a learning God. From the Priestly epic, I add the notion of the functional autonomy of the earth (Gen. 1:11) and the waters (Gen. 1:20). I also note that God's daily judgment "that it was good" is missing after the creation of human beings on the sixth day. In brief, such a concept of the image of God—although not drastically different from Foerst's and not denying God's power, companionship, and faithfulness—is closer to an evolutionary worldview and process theology (without, however,

accepting all its tenets). This concept might more easily resonate with scientists' conceptualizations, thereby facilitating more directly the emergence of the "triangle."

DIALOGUE

When persons meet for a first time, it is helpful to establish commonalities before discussing differences. What are the commonalities between the two symbolic descriptions under discussion? A first major common point is the stress on the importance of the body, of embodiment, in the sense that our bodies are both physical structures (context and milieu of cognitive mechanisms) and lived experiential structures (Varela, Thompson, and Rosch 1993, xv–xvi). What would Christianity be without God's incarnation in Christ? A possible second major point (using the concept of the image of God introduced above) consists in the importance given to evolution and development.

Where could there be difficulties in this dialogue? In his considerations of mind, brain, and machine, philosopher Holm Tetens (1994, 127–34) has a section titled "How neuroscientists provoke philosophers." For example, when neuroscientists claim that "mental states are in reality brain states," philosophers tend to refute such a statement as involving a "category error." However, Tetens wonders how strong that argument is and doubts that it will rein in the widespread practice of drawing conclusions concerning persons' brain states from the data of their mental introspection. Foerst similarly invites dialogue partners not to be taken aback by an unfamiliar language. A further help could be to observe a basic rule of logic when employing symbols (here Cog and image of God): that symbols cannot be "objectified" but should simply be used as a help in communication. Their meaning is not independent of the context and the people who use the symbols (Meyer-Blanck 1995, 85). Furthermore, *symbol* should not be used in the sense of a declaration of an inerrant doctrine of faith!

What are the potential gains of such a dialogue? Theologians could become more aware of the body and its material side, currently very much a subject of research and discussion. For example, Raymond Price, 1995–1996, describes his wanderings from being a Freudian psychoanalyst to a prescriber of antidepressant drugs. Scientists could learn from theologians about values, particularly about responsibility in connection with robots (Foerst 1996–1997). Both together could deal with the fascination and fear excited by the likes of Frankenstein (Foerst 1996–1997), as expressed by Goethe in his "Sorcerer's Apprentice": "I no longer can free myself/From the spirits whom I called." The picture of the robot baby in Foerst (1996–1997) obviously contributes to our seeing Cog as closer to humans than to the Frankenstein monster.

Barbour, Haught, Descartes, and the Symbolic Approach

Given the newness and overwhelming interest of the issues dealt with so far, let me be brief about the categories formulated by Ian Barbour and John Haught, which Foerst uses for the science-theology relationship and about which much has been written already. She focuses on Haught's conflict, contrast, contact, and confirmation (see Foerst 1998, 92–93). To my mind none of these "*C*s" captures sufficiently the changing nature of that relationship. For instance, the categories described by these four terms were not a problem for Isaac Newton (Reich 1995). I have elsewhere commented on the imprecision of these terms (Reich 1996). In regard to "confirmation," Haught's view can also be further differentiated (van der Meer 1996). As to the Cartesian worldview, I am aware that it is still held, but has the philosophy of science not progressed considerably since Descartes (as in Clayton 1997)? At the very least, does one not have to introduce the Kantian distinction between generalizations of empirical results, and interpretation in universal terms (see his terms *phenomena* and *noumena*) (*Critique of Pure Reason*, chap. 3 of the "Transcendental Analytic"; e.g. Kant [1781] 1958, 257–76)?

I have considerable hopes for Foerst's approach as a means to a dialogue, particularly between artificial-intelligence scientists and theologians, a dialogue that seems to be difficult. However, I doubt whether it can solve all the problems she subsumes under the label "Cartesian approach." It seems to me that there will still be persons who want to maintain some kind of reality (hypothetical, critical, or any other kind)—if only to account for the success of science-based technology. Others will rely on the philosophy of science (examples: Kitcher 1993 and Murphy 1997), a different form of logic (the *"transversale Vernunft"* of Welsch [1995], or another form) to bridge the abysses of the Cartesian approach, as long as that is considered rational. But this reserve in no way diminishes the interest of Foerst's endeavor, to which I wish full success.

Note

1. New Revised Standard Version.

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