

GRADUATE THEOLOGICAL UNION

CONSTRUCTING THE HUMAN BY THE LIGHT OF SCIENCE:
THEOLOGICAL ANTHROPOLOGY OF BARBOUR, PEACOCKE AND HEFNER

ADVANCED SEMINAR IN THEOLOGY AND SCIENCE ST5900

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BERKELEY, CALIFORNIA

DECEMBER 16, 1999

*The most striking feature of the universe is...the fact that we are here to ask questions about it at all.*¹

INTRODUCTION

What is a human being? What is distinctive about us, that makes us humans and not something else? One's answer probably tells as much about one's own perspective as it does about the underlying reality. I suspect that most people, whether they have thought much about the question or not, would bring a mix of contemporary science and traditional wisdom to such an act of self-definition.

For this reason, it is helpful to look to those theorists who deliberately seek an understanding that can encompass both ways of seeing. Today's science-religion dialogue has progressed to the point that several major Christian theorists have provided a wealth of insight into the question of anthropology in just this manner. This paper is a constructive effort to build a synthesis of the views of Ian Barbour, Philip Hefner, and Arthur Peacocke. The three would not necessarily agree on all the details of such a synthesis, and without a doubt each would wish to add other considerations, but I believe they would consent to the overall thrust. Thus, my attempt here is to offer the beginnings of a general Christian anthropology-informed-by-science as given by the major players. By choosing to include the items that I have here, I mean to offer them my endorsement as pieces of a framework: I contend that this view is on the right track. However, it's no use soft-pedaling the difficulties that come with such a science-religion dialogue; in the final section, I will point to tensions in this enterprise.

The key scientific elements are as follows:

- 1.1. The view from science emphasizes human continuity with the rest of nature: there is nothing intrinsically different or "other" about humans.
- 1.2. What distinguishes humanity is the emergence of certain characteristics which are uniquely potent within the earthly continuum of life.

- 1.3. Humanity is especially characterized by a complex interplay of information contained in genes and culture.
- 1.4. The limits of scientific explanation are tested in the realm of sociobiology, in which material causes for the phenomena of morality and religious belief are sought.

Complicating matters for Christian theorists seeking a “fit” with these understandings is the set of commitments that they bring to the act of human self-definition. These include:

- 2.1. *Imago dei*: humans are created in the image of God.
- 2.2. Sin: humans are estranged from God, and from their own God-nature, by the condition of sin in which they exist.
- 2.3. Psychosomatic unity: the human body and soul are an indivisible whole.
- 2.4. Free will: within the horizon of a greater destiny, humans have the capacity to make their own choices. This sense of freedom is not an illusion of creatures in a deterministic world.

In seeking to combine these two viewpoints, theorists must contend with more than just the problem of finding a workable fit. There are overarching theoretical and methodological differences between the two views. To put this construction in perspective, I raise a few of them here, including:

- 3.1. Religion is prescriptive/normative, while science is descriptive/‘objective.’ At the same time, metaphysical assumptions are not entirely alien to scientists.
- 3.2. Purposiveness in nature: whether it is assumed or not is a radical difference.

1. SCIENTIFIC VIEWS OF HUMANITY

Theological construction in the context of science-religion dialogue cannot take place without a complete acceptance of established scientific understandings. Barbour, Hefner, and Peacocke all accept this constraint. At the same time, they of course project a panorama of theological commitments onto the scientific screen. As to how the strains of metaphysical assumptions on both sides of the science/religion line are handled, I will address this question in the final section.

1.1. *The view from science emphasizes human continuity with the rest of nature: there is nothing intrinsically different or “other” about humans.*

The strongest message from the biological sciences is that humanity is *in and from* nature, and is characterized more by similarity to the surrounding web of life than by distinctiveness from it. Peacocke avers, “Human beings are inherently part of nature, evolved out of the very stuff of the world.”² Humans share with all life-forms a common origin and a self-reproducing cycle of life and death, and a common heritage from which a unique line of genetic development has occurred – or, as Hefner terms it, *kinship*. Human emergence as a unique species out of the entire web of earthly life is itself a manifestation of the evolutionary propensity towards increased complexity which characterizes all of earthly life, a subject I shall treat further shortly.

Indeed, to pose any biological property of humanity as utterly unique is a challenge – one candidate after another is found to be paralleled by at least limited continuities with other species. Many of the things we may posit as special about humans turn out to be extreme developments of features observed in other animals: such hallmarks as adaptability, individualization, socialization, and even cultural transmission of knowledge can be found to lesser degrees in some of the higher mammals. What is observed is not absolute novelty, but extraordinary differences in degree. Barbour offers a view of the continuum of development and several dimensions in which human capacities exceed those of other animals by enormous leaps. Complex social orders are observed in many species of insects; but these are seen as entirely genetically determined. Such self-organizing phenomena are greatly surpassed by the higher animals’ capacity for learning, individuality, and even the social transmission of information. At the human end of the continuum, the difference becomes exceptional. The rudimentary self-

awareness of higher mammals is dramatically exceeded by imaginative powers of human self-consciousness. Whereas chimpanzees have impressive capacities for symbolic communication, these abilities are vastly surpassed by human language. Still, the point is that biologists find the rudiments of these impressive capacities when they look to other species.

1.2. What distinguishes humanity is the emergence of certain characteristics which are uniquely potent within the earthly continuum of life.

a. Humanity as emergence par excellence

In spite of continuity with other life, human beings do undoubtedly stand out radically from the background of nature. Evolutionary theory has required an explanation of the way that such complexity can build upon simple origins; yet certain phenomena, such as human consciousness, bedevil the ontological reductionist position that events at a higher level of complexity can be determined by events at lower levels. How, for example, can the relationships between neural, behavioral, and mental activities be sorted out? Theories of complex dynamic systems provide powerful tools for conceptualizing such relationships, because, like mind phenomena, such systems, as Barbour explains, “exhibit global properties that are not predictable from their components.” “Emergence” is the term used to describe the way in which new forms of order arise in nonlinear thermodynamic systems far from equilibrium. “Emergent properties” arise in pockets of higher-level order within a collection of systems operating at ascending levels of complexity, nested within each other and each having qualities that are only describable on its own terms. The language of emergence, then, can be used to express the qualitative difference between, on the one hand, the lives of the higher animals, and, on the other, the complexity and apparent purposiveness of humans acting in their intensely signal-rich milieu of culture. Humans

are the furthest expression of a process of “the emergence of new functions and capabilities consequent upon the growth in complexity which characterizes the evolution of biological systems.”³

The concept of emergence, then, sharpens our understanding of human discontinuity from the rest of nature. If emergence is discontinuity within continuity, it can account for a humanity radically different from its surrounding environment. But must events at higher levels be determined by events at lower levels, or can they themselves be causally effective? Do our conscious intentions cause the effects that we perceive, or are we merely watching a projection and feeling it to be effective? I shall return to this question in a subsequent item.

b. Elements of distinctiveness: special capacities, extraordinary span, and the peculiar misfits

Many properties have been put forward as most distinctly humanlike. Typically cited are such capacities as the diverse ways that humans have of transmitting information from generation to generation, unparalleled intellectual and creative power, rational reflection, and moral responsibility. Hefner describes the phenomenon of human action-in-context in a complex sequence: (1) development of consciousness; (2) individuality within community; (3) self-consciousness; (4) ability to make decisions; (5) action on the basis of decision; (6) reception and assessment of complex feedbacks; (7) correction; (8) renewed action on the basis of correction; (9) the ability to take responsibility for these actions.⁴

Peacocke offers an intriguing measure of distinctiveness that is very different from these abilities-oriented criteria. He places humanity in the context of a hierarchy of the sciences proceeding from (to name a few levels) physics to chemistry to biology to neuroscience to cognitive psychology. Each of these levels is constrained by the all the levels below it (that is, a

particular discipline cannot contradict the disciplines which form its own foundation). The extraordinary thing about the human species is that the *entire* span of these scientific disciplines is required to account for it. There is no other part of the observed universe about which that can be said (structures such as galaxies, for example, as complex as they are, are explained on the basis of elementary laws in physics, at the low end of the hierarchy). Because of this range, there is a strongly holistic quality to human personhood. A kind of critical mass is achieved in the totality of that which we call a “person.” Not surprisingly, then, humanity, more than any other form, is able to bring to light some of the creative forces at work in the world.⁵

Finally, one puzzling element of human distinctiveness, which will play a role later in the theological section, is a collection of signs pointing to a peculiar kind of *misfit* between humans and their environment – a sense of alienation. Humans are said to be a biological anomaly which have failed to identify their right environment. Peacocke cites the biological oddity of suicide and the widespread psychological phenomena of a sense of incomplete fulfillment and of wide-ranging aspirations that cannot be satisfied. Further, universal and deep-rooted behavior, seen in activities such as burial rituals, evidences a pervasive intuition that humans have, that there is some other dimension to existence which they are somehow missing or failing to connect with.⁶ Hefner too observes that humans do not know where they ‘fit’ in nature, in the sense that we cannot seem to find the right correlation between our genetic and cultural heritages. Our primary guidance, culture, treats our natural kin as genetic hypotheses, while our own symbol-making allows us to deny our relation to nature outside. Because of this disconnect, we have been unable to relate our deep kinship with nature to our most basic values. This unbelonging takes on its positive character in the relentless effort by humans to make their environments conform to them – witness enhancements ranging from the thimble to the automobile to Disneyland.

1.3. *Humanity is especially characterized by a complex interplay of information contained in genes and culture.*

“*Homo sapiens* is both a genetic and a cultural creature,” Hefner tells us. The defining distinctiveness of human beings as Hefner describes it, is a striking two-naturedness, as the bearers of these two intertwined information systems. The very continuance of our existence is said to be dependent on the symbiosis, the ongoing interaction and cooperation, of instructions encoded in the genes and knowledge floating in the stream of culture. Hefner defines human culture as an information system the purpose of which is to (1) interpret the world, (2) guide behavior, and (3) interface with the world. As to what it means to describe human beings in terms of *information*, Barbour offers a useful explanation:

“The concept of information is applicable to biological, cultural, and computer systems....Information is an ordered pattern that is one of many possible sequences or states of a system....Information is *communicated* when another system responds selectively – that is, when information is coded, transmitted, and decoded. The meaning of the message is dependent on a wider context of interpretation. It must be viewed dynamically and relationally rather than in purely static terms as if the message were contained in the pattern itself.”⁷

The interaction of the cultural and genetic information systems, along with their physical carriage, is spelled out in the biocultural evolutionary model as described by Solomon Katz:

Biocultural evolution consists of a series of *interactions* among: the *biological information* resident within individuals and populations in the form of the genetic constitution (i.e., the DNA); the *cultural information* which is the sum of the knowledge and experience which a particular society has accumulated and is available for exchange among its members; and thirdly, a human *central nervous system*...whose principal evolved function with respect to this model is to facilitate the communication or storage of individually and socially developed knowledge and awareness. (*italics mine*)⁸

This is a powerful portrait of humanity *as* the flux of information. A vast amount of this information – residing in individual minds and transmitted in the interactions between individuals and between groups, in speech, literature, and arts, and, increasingly, in external aids and artifacts such as books and computers – is stored and used in ways totally unlike those of any other creature. Conversely, as Hefner says, “Stored in the DNA is a wealth of historically acquired information, including programs for coping with the world.”⁹ While all other forms of life have rich genetic inheritances of information in the form of DNA, and while higher animals may also have the rudiments of cultural information, only in humans have the two combined and reinforced each other in such a steep trajectory of growth.

1.4. The limits of scientific explanation are tested in the realm of sociobiology, in which material causes for the phenomena of morality and religious belief are sought.

The field of sociobiology begins with an effort to explain altruism in animals; from there, some of its practitioners extend its reach in a bid to offer functional reasons for the appearance of elaborate expressions of human morality and religious belief. Altruism is defined by E.O. Wilson as “self-destructive behavior performed for the benefit of others. Altruism may be entirely rational, or automatic and unconscious, or conscious but guided by innate emotional responses.” In his landmark *Sociobiology* (1975), Wilson asks “how can altruism, which by definition reduces personal fitness, possibly evolve by natural selection?” His answer: “kinship.” That is, for nonhuman organisms, kin selection is the dominant mechanism promoting altruism. Those forms of cooperation which perpetuate the genes of the individual and its close relatives are favored. However, it is acknowledged that for humans, altruism also has an emotional basis and is largely culturally determined. Still, many biologists take the heart of morality to be

altruism. Wilson argues that the ultimate evolutionary function of morality is to keep the human genetic material intact.¹⁰

Evolutionary psychology asserts that the human mind evolved in response to the demands of reproductive fitness in the context of a hunting and gathering way of life. Moral behavior is explained here by the need to sustain a fragile group by promoting relationships based on reciprocity. Thus individuals must repress selfish behavior in favor of altruism. It is speculated that there are universal deep structures for moral beliefs due to these patterns. Self-deception is suggested as the means of disguising to oneself one's own selfish interests, thus making selfish acts appear more convincing to others. Thus the evolutionary inducements to having certain beliefs and behaviors might even be strong enough to actually predispose people to have spiritual experiences, because these experiences can serve the purpose of solidifying such adaptiveness.¹¹

As a field of speculative research, sociobiology is marked by controversy. Its contentions obviously challenge religious authorities and common ethical understandings alike. However, I have chosen the following criticism by Barbour and Peacocke only because they are posited on theoretical grounds. Without denying the role of genes in altruistic behavior, Barbour criticizes Wilson for reductionism and overlooking other levels of explanation. According to Barbour, Wilson sees human behavior as determined by the genes; real freedom is problematic; and the mind will sooner or later be explained as an epiphenomenon of neural operations. By concentrating his explanations on the level of genes, Wilson ignores the kind of multilevel approach which Barbour sees as necessitated by the systems theory approach discussed earlier. For Barbour, cultural evolution clearly trumps genetic determinism and biological evolution: cultural innovation replaces mutations as the critical source of innovation; in the competition

between ideas, selection occurs through social experience; transmission of information occurs through cognition and culture, not genes.¹²

A tug of war is going on here: which mechanism is in control, genes or culture? For Peacocke as well, humanity shapes its own evolution, although clearly within the limits of its own genetic instructions. Through evolution to a state of freedom, new possibilities of creativity and openness emerge beyond the language of biology to express. Human loyalties are seen extending to ever wider groupings – from community to race to church to nation – than the gene-sharing altruism would mandate. In the reach to explain morality and religion, the limits of scientific explanation are themselves tested. For these phenomena as with other phenomena of culture, as meaningful patterns, require reception by an individual in a manner that accepts that there is a meaning to meaning, a “realness...within language and form,” described by George Steiner as a “wager on transcendence.”¹³ To posit this apparently rich transaction as self-deception, or as the illusion of efficacious action, is a desiccation of the reality that we know which few are prepared to fully accept or embrace. Peacocke speaks of the “re-habilitation of the subjective” as a shift in science demanding a wider perspective on humanity, that jeopardizes the reductive stress on genes as the dictators of what we are.

This ends my selection of key elements from the scientific pole. Next, we turn to the theology of the human creature.

2. CHRISTIAN COMMITMENTS IN THE ACT OF HUMAN SELF-DEFINITION

In the shifting currents of the millennial century, in the changing context of contemporary science itself, theologians have creatively discovered tools for overcoming a retreat in the face of the explanatory power of science and re-engaging God in the world in plausible ways. These

tools include both new theological thinking and new findings and methods in, for example, physics, systems theory, evolutionary theory, and psychology. In consideration of this history, each of the items that follow has been chosen both because it has a long standing in the Christian tradition and because it has undergone substantial reinterpretation in the context just described.

2.1. *Imago dei*: humans are created in the image of God.

One essential item of Christian self-understanding is given in Genesis 1:26: “God said, ‘Let us make man in our image, after our likeness....’” In what does the *imago dei* consist? And how does this notion relate to a scientific picture of biologically-evolved humanity? There are many choices for how to conceive of the *imago dei*; I will briefly consider three here: (1) Humans have a distinctive *role* in the world, i.e., dominion over all living creatures. (2) Humans have distinctive *properties*, different from anything else in nature. (3) Humans have a special, unique *relationship* with God.

To put these options in context, I shall rely here first on an analysis by Jürgen Moltmann.¹⁴ Regarding the first choice, dominion, this mandate immediately follows God’s intention to make man: “and let them have dominion...over all the earth” so that they might “fill the earth and subdue it” (Gen. 1:26-28). The interpretation of this message as a commission to stewardship on God’s behalf, in the context of human exploitation of nature and potentially sustainable alternatives, is a major subject in its own right. However, Moltmann and others have argued that this commission is not intrinsic to humanity as God’s image; rather, it is additional to it.

More relevant to this discussion, the “distinctive” biological properties of humans which were so central to the preceding exposition from science are similar to many traditional interpretations of what *imago dei* means. However, this correlation has been rejected by

contemporary theologians. The reason for this is, as Moltmann says, that “the starting point for all these answers [is] in ‘the phenomenon human being’” – that is, observations *from nature*. This starting point is said to be based on a false inference, because “Likeness to God means God’s relationship to human beings first of all....It is this relationship that gives human nature its definition.” The theologically preferred understanding, then, is that as mirror-reflection of God, humans have responsibilities to sustain certain key relationships.

I think that the three authors under consideration here would agree with Moltmann, but they tread lightly around the interpretation of the *imago dei*. Peacocke does not appear to address it at all in his *Theology for a Scientific Age*. For Barbour, the image of God means simply that humans “alone are responsible selves who can be addressed by God....free moral agents who can respond to the demands of righteousness and justice.”¹⁵ Hefner argues for the need to recast the anthropocentrism of the *imago dei* idea, and this is a consequence of the fact that “whatever we say about the status of human beings applies, at least in potentiality, to all of nature.” Thus for Hefner, the character of the *imago dei* should be as “free creator of meanings, one who takes action based on these meanings and is also responsible for those meanings and actions.”¹⁶

2.2. *Sin: humans are estranged from God, and from their own God-nature, by the condition of sin in which they exist.*

The story of Adam and Eve tells us that death and suffering are punishments for sin, or consequences for the fall: “Behold, the man has become like one of us, knowing good and evil...” (Gen. 3: 22-23). To prevent him from also eating of the tree of life, and living forever, God sent Adam and Eve forth from the garden of Eden, unable thereafter to participate in the immortal life. But one insight of evolutionary biology into the nature of life makes the supposed relationship between sin and death unintelligible; that is the obvious truth that death and

suffering “are necessary conditions of life in an evolutionary world.” Our forbears in the long chain of evolution must die biological deaths in order that we may live. Therefore Barbour casts sin as the result of human choices and reduces the image of Adam and Eve in paradise to “a symbol of the goodness of creation and the conviction that finitude as such is not evil.”¹⁷

Peacocke continues on this line, acknowledging that science dictates that there was no fall and death did not begin with sin. He asserts that by viewing the human capacity for sin in the context of cultural emergence, we may say that sin is a known quantity that arrived on the scene as an unfortunate partner to the complexities of human existence. For Peacocke, then, the opportunity to rethink sin is a case of science liberating Christianity from a grave error, and allows the profound truth of what sin is to breathe new life.

Earlier I spoke of the peculiar mis-fit between humans and their environment. For Hefner, this estrangement of the very creatures who bear the image of God yet “are also creatures who do not actualize in a full sense what we were created to be” is a way of recasting the problem of sin.¹⁸ This realization jibes with his construction of human beings as the “created co-creator,” a being both conditioned and free, which I will discuss further shortly. “We are not sinners because we possess such distinctive brains and cultures, nor because of the possibilities that brain and culture can envision. Rather, we are sinners in that we do not and cannot exercise our created co-creatorhood as creatures of God who reflect God’s image.” Hefner proposes a view of the fall and original sin as mythic renditions of a biologically grounded sense of discrepancy that is built into our brain structure. For this notion, he draws on Paul MacLean’s rendering of the evolved triune central nervous system, which features two evolutionarily more ancient components – the reptilian and paleo-mammalian brain components – and the specifically human contribution, the neocortex. Hefner asserts an inherent value conflict between

the pre-human information inputs given by more ancient brain and supplementations provided by the neocortex. The survival orientation that is dictated by our “reptilian” nature leads to our sinfulness; our more developed side is aware of this and tries, at least at times and rather unsuccessfully, to rebel against it.¹⁹

2.3. *Psychosomatic unity: the human body and soul are an indivisible whole.*

The Old Testament conception of the human being is of a personal unity of body, mind & spirit. Death in the Christian understanding is a complete death of the body and soul. Resurrection is equally complete; it is conceived as a return to embodied unity (in this light, Christian negative attitudes toward the body are seen as a later gnostic infection). This vision of psychosomatic unity has been under assault from psychology for many decades (with conceptions of the self divided into conscious and unconscious), and today’s cognitive science continues to elaborate on that view, with demonstrations of the cognizing subject as “fundamentally fragmented, divided, or nonunified”; for example, many aspects of mental function never rise to the level of conscious awareness.²⁰ In spite of this, Barbour sees some scientific evidence supporting this vision of psychosomatic unity, such as genetic and biochemical factors influencing human personality. “If one imagines a soul immune to such influences, it would be an abstract and detached entity unrelated to the living person.”²¹ He also looks for support in the holistic view of the person as a hierarchy of levels, represented at the highest level as the self. The recent focus in cognitive science on the embodied mind or the embodied self give reason to believe that the picture of the fragmented self is not the final rendering.

2.4. *Free will: within the horizon of a greater destiny, humans have the capacity to make their own choices. This sense of freedom is not an illusion of creatures in a deterministic world.*

I think that the most comprehensive attempt to develop a new theological program for explaining humanity is Hefner's vision of the human being as the "created co-creator." By this he means that we are both conditioned and free. First, "Both science and theology tell us that we are *created* and not self-creating." That is, we act within "the evolutionary processes from which we have emerged" and which govern our planet. At the same time, "we are creators because of the distinctive brains and cultures we exhibit," which allows us to undertake interventions and manipulations take us dramatically beyond the biblically-explicated notion of "stewards of nature." He cites genetic engineering and computers as examples.²²

For Hefner, we begin in continuity with and emergence from the entire web of earthly life. We are conditioned by our biological grounding. We are free to the extent that our consciousness, self-consciousness, and location in the web of culture-borne information forces upon us the unavoidable necessity of making choices, then of building justifications for these choices. Freedom is freedom *to*...It seeks an end, a purpose. Co-creatorhood is seen in the stretch of culture to create new conditions in which to survive, conditions not found within the originary purview of the genes. For Hefner, then, freedom is the situation of having to act while at the same time having to discern and even to construct the norms, rules, goals, and meaning of that action as we go along.

One final note on free will: Peacocke avers that chaos theory may provide mechanism allowing for free will within a deterministic world, in that systems which are deterministic at micro-level can be unpredictable in their succession of overall states at the macro-level.

3. THEORETICAL AND METHODOLOGICAL TENSIONS

I have shown cases of science informing, challenging, and changing theology as well as cases of confirmation and accord. This is the way the dialogue goes. But there are other levels to the whole matter. I shall finish with a brief look at some of the larger issues tugging at this attempt at understanding.

3.1. Religion is prescriptive/normative, while science is descriptive/'objective'. At the same time, metaphysical assumptions are not entirely alien to scientists.

It is one thing to examine the straightforward relational pair, humans and nature. Theological anthropology goes beyond this simple relationship in needing to explicate three relationships: humans-to-creation/nature, God-to-humans, and so, unavoidably, God-to-creation/nature. In important respects, it's a completely different beast.

One consequence of this fact is that, as Peacocke points out, theological doctrines of the nature of humanity are distinctly normative in tone – naturally, since “they are as much concerned with what human beings should be *becoming* as with what they are.”²³ Inasmuch as the sciences aim to be descriptive rather than prescriptive, this aspect of theological accounts would seem already to exceed or break the scientific warrant. This prescriptive character of religious knowledge cannot not go away, and nor should it. So one might ask, is this a case of apples and oranges? I think not, because the burden is still on the relevant sciences to demonstrate that the richness of human values is strictly a matter of human invention in the service of survival needs, without any deep relation to either the world at large or some divine impetus. Human morality cannot be explained by being explained away: a legitimate anthropology must account for the things we feel and know to be true – inasmuch as we feel and

know ourselves to be *acting* on the truth of such feelings and knowledge! It's a great leap from the observation that we do not quite know our "fit" in the world to the hypothesis that we are perpetually deceiving ourselves about the basic nature of reality.

Returning to my observation about the need to explain the God-nature-human triad, I would note that theologians working in the manner of Barbour, Hefner and Peacocke can offer theological explanations that are neither supported nor refuted by the relevant science, but they cannot offer contradictions. Perhaps as a result of the care that they apply in this regard, I find the theology of all three to be muted with respect to the tradition, if bold and inventive with respect to contemporary understandings. I raise this observation because in scientific discourse is a strain of metaphysical assumption is known at times to accompany the scientific account: naturalist or materialist metaphysics, and epistemological reductionism, are clearly influential. I think that these three theologians are commendably vigilant to show their own commitments for what they are, and so it's not surprising that they are interested in showing the underlying assumptions of their scientific brethren. The self-reflective nature of anthropology makes this dynamic especially pertinent: the further one pushes either a materialist *or* a religious philosophy into the account, the further one's self-portrait gets from the basic confirmed facts I have outlined. For this reason, I find the middle course of Barbour, Hefner and Peacocke refreshing.

3.2. Purposiveness in nature: whether it is assumed or not is a radical difference.

The unfolding of the universe and the evolution of biological life-forms are explained by scientific means as emerging out of a *non-purposive* process, which lacks any particular direction or goal. Evolutionary development is, as Peacocke states, built upon the "capacity to form

structures that can undergo replication in self-perpetuating processes and patterns,” through which order increases. He adds that there is no longer any need to add any mysterious force – a vital force – to explain life. If a relationship then exists between God and humanity-from-nature, in what can it consist?

One of the consequences of Hefner’s turn to nature as the ground and source of our being as humans is that those on the search for purpose and meaning must also turn to look into nature’s face. We must look at the structure, processes, requirements and relationships of a thing to access its meaning. Thus humans must look at what we are and where we are – of nature and in nature. Pursuing the teleonomy of nature-in-humanity – that is, the idea that structures require certain responses and suggest certain values if they are to make sense – Hefner proposes a criterion, or a value, in the creatures of nature: the criterion is wholesomeness. Our purpose as humans is to be the agents to the birth of a wholesome future for nature.²⁴

I like Hefner’s description; I believe it to be true, but I *only believe* it. And at this, it seems to me, we arrive at the cusp of the entire problem: we are creatures of evolution; it is difficult to go very far in seeking direction or purpose in the process from which we arose; but we are creatures with our eyes wide open – we are reaching out towards some ultimacy that our intuition brings us. Is there a “pull” there? Some kind of gravity? I think so. Does all of life in some sense feel that tug? Maybe. But something very special has occurred in the emergence of human consciousness. At the least, we have grabbed hold of the *idea* of this tug. When the essential work of scientific discovery turns the gaze inward, and when theological reflection acts in concert with the findings that arise, the result may be that this relation – a relation of desire? – becomes more obvious with the passage of time, though no less mysterious.

4. CONCLUSION

I have presented a very brief synthesis of the anthropologies of three of the major science-engaged theologians of our time, Ian Barbour, Philip Hefner, and Arthur Peacocke. I have only scratched the surface of the contribution of each of them to this field, and I have presumed to create some agreement among them. It seems to me that a coherent vision can result from such an effort, and I would recommend that anthropological theologians pursue similar ventures themselves to establish in what matters actual agreement lies. It would be informative to know, for example, what the *consensus* position of these three thinkers would in fact be by their own accounts, because such broad agreements could serve as theological-interpretive benchmarks for our time, just as consensus in the scientific community serves to establish facts.

BIBLIOGRAPHY

- Barbour, Ian. *Religion and Science: Historical and Contemporary Issues*, revised and expanded edition. New York: HarperCollins, 1997.
- . "Neuroscience, Artificial Intelligence, and Human Nature: Theological and Philosophical Reflections." *Zygon, Journal of Religion and Science* Vol. 34, No. 3 (September, 1999): 361-398.
- Bradie, Michael. *The Secret Chain: Evolution and Ethics*. Albany: State University of New York Press, 1994.
- Hefner, Philip. *The Human Factor: Evolution, Culture and Religion*. Minneapolis: Fortress Press, 1993.
- . "*The Human Factor: Created Co-Creator as Symbol.*" Draft of paper delivered at the First International Conference on Science and Religion, Cork, Ireland, October 30, 1999.
- Moltmann, Jürgen. *God in Creation*. Minneapolis: Fortress Press, 1985.
- Peacocke, Arthur. *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human*, enlarged edition. Minneapolis: Fortress Press, 1993.
- Varela, Francisco, Thompson, E., and Rosch, E. *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge: The MIT Press, 1993.
- Wildman, Wesley J. and Brothers, Leslie A. 1999. "A Neuropsychological-Semiotic Model of Religious Experiences." In *Neuroscience and the Person: Scientific Perspectives on Divine Action*, eds. Robert John Russell, Nancey Murphy, Theo C. Meyering, and Michael A. Arbib, 347-416. Vatican City State: Vatican Observatory; Berkeley: Center for Theology and Natural Science, Graduate Theological Union.

ENDNOTES

¹ Arthur Peacocke, 1993, *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human*, enlarged edition (Minneapolis: Fortress Press), 72.

² Ibid, 213.

³ Ibid, 219.

⁴ Philip Hefner, 1993, *The Human Factor: Evolution, Culture and Religion* (Minneapolis: Fortress Press), 118-19.

⁵ Peacocke, 215.

⁶ Ibid, 73-77.

⁷ Barbour, Ian, 1999, “Neuroscience, Artificial Intelligence, and Human Nature: Theological and Philosophical Reflections.” *Zygon, Journal of Religion and Science* Vol. 34, No. 3, 380.

⁸ Hefner, 1993, 28.

⁹ Barbour, *Zygon*, 1999, 381.

¹⁰ Michael Bradie, 1994, *The Secret Chain: Evolution and Ethics* (Albany: State University of New York Press), 107.

¹¹ Wildman, Wesley J. and Brothers, Leslie A. 1999, “A Neuropsychological-Semiotic Model of Religious Experiences.” In *Neuroscience and the Person: Scientific Perspectives on Divine Action*, eds. Robert John Russell, Nancey Murphy, Theo C. Meyering, and Michael A. Arbib, (Vatican City State: Vatican Observatory; Berkeley: Center for Theology and Natural Science, Graduate Theological Union), 382.

¹² Ian Barbour, 1997, *Religion and Science: Historical and Contemporary Issues*, revised and expanded edition, (New York: HarperCollins), 255.

¹³ Peacocke, 243.

¹⁴ Moltmann, Jürgen, 1985, *God in Creation* (Minneapolis: Fortress Press).

¹⁵ Barbour, 1997, 268.

¹⁶ Philip Hefner, 1999, “*The Human Factor: Created Co-Creator as Symbol.*” Draft of paper delivered at the First International Conference on Science and Religion conference, Cork, Ireland, October 30, 239.

¹⁷ Barbour, 1997, 268.

¹⁸ Hefner, 1999, 2.

¹⁹ Hefner, 1993, 131-33.

²⁰ Francisco Varela, E. Thompson, and E. Rosch, 1993, *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge: The MIT Press, xvii.

²¹ Barbour 1997, 272.

²² Hefner, 1999 2.

²³ Peacocke, 213-14.

²⁴ Hefner, 1993, 39-40, 42.