

Article



Rodney J. Scott

Relating Body and Soul: Insights from Development and Neurobiology

Rodney J. Scott and Raymond E. Phinney Jr.



Raymond E. Phinney Jr.

Various models of personhood exist within Christianity. These often involve a particular understanding of the human soul. We believe that three common assumptions about the soul are incorrect and may lead to errors in Christian praxis. These assumptions are that the soul (1) is instantaneously created at the moment of fertilization, (2) is immaterial and pure and somehow better than the body, and (3) is the “real person.” Using insights from biology, we suggest a new perspective that we call “developing hominization.” Our model is open regarding anthropological monism or dualism. However, we seek to clarify Christian anthropology by stipulating that models employing the foregoing beliefs must be changed or eliminated since they do not meet philosophical, scriptural, and practical qualification to properly inform our understanding of personhood and all its ramifications in theology and science. We examine, through examples, how our model would better inform Christian praxis.

In the current era of biotechnological advances, there is a critical need for Christians to better understand what it means to be a human person. Many recent biotechnological innovations—such as IVF with the potential for embryo reduction, genetic testing for the selection of embryos, some forms of birth control, and the use of embryonic stem

cells—may be considered either life-destroying or life-enhancing depending on one’s view of what it means to be a person. New knowledge in biology has provided insights that should help to answer this ancient question.

But the importance of understanding what it means to be a person goes beyond issues related to biology. Specifically, we believe that several assumptions about what has traditionally been called “the soul” and its relationship to the human body have been a source of error in Christian practice. We believe that there are three common assumptions about the soul that seem incorrect and, if unquestioningly accepted, may lead to errors in practice.

1. The soul is instantaneously created at the moment of fertilization. We label this belief “immediate ensoulment.” Although this is often taken as a core belief that supports many Christians’ commitment to “sanctity of life” issues,

Rod Scott is an associate professor of biology at Wheaton College, where he has taught for twenty-three years. His area of specialization is genetics. He is a Fellow of the American Scientific Affiliation and a member of the Planning Committee for the Wheaton/Naperville local chapter of the ASA. He recently served as the Program Chair for the 2011 ASA Annual Meeting. He is currently on sabbatical as a Fulbright Scholar in Costa Rica where he is conducting studies in conservation genetics.

Raymond E. Phinney Jr. received a BA in psychology from the University of Puget Sound (1987), and a PhD in psychology from Washington State University (1995). At WSU he specialized in visual psychophysics, studying human stereopsis and visual motion perception. He has studied optic flow processing in macaque parietal cortex as a research fellow at the Center for Molecular and Behavioral Neuroscience at Rutgers University (1995–1999), and used functional imaging to study human perception and attention at the Medical College of Wisconsin (1999–2004). He is currently assistant professor and Chair of Undergraduate Psychology at Wheaton College. He studies attention, motion perception, and stereopsis in humans.

we believe it may actually provide an inadequate motivation for this commitment.

2. The soul is immaterial and pure and somehow better than material things (including the human body); we label this view “hierarchicalism.” We think that this perspective has led to an inappropriate devaluing of the physical nature of humanity, and ultimately, among other things, to Christian practices that have subjugated women and unwittingly encouraged pathological lifestyle choices among women.

3. The soul is the “real person.” We label this view “discorporealism” and distinguish it from hierarchicalism by virtue of the errors in practice that it perpetuates. These errors relate to an unbiblical interpretation of the gospel that focuses almost exclusively on spiritual salvation at the expense of meeting the physical needs of a broken world.

Our ultimate goal in this article will be to assess the validity of these assumptions and to develop different perspectives that can better support the mission of the church. We begin by considering options for a Christian understanding of what it means to be a person. We first survey what scripture does and does not say about this topic, and then explore five models of personhood suggested by different Christian thinkers. Next, we discuss how insights from current thinking in biology might inform our appraisals of the five models. These insights lead us to propose an alternative pedagogical model for understanding personhood. Finally, we apply our model to three problems (each related to one of the three assumptions described above) that require a specific Christian response.

Insights from Scripture

We begin this section by disclosing our purpose for it—we wish to demonstrate that the Bible does not provide an explicit anthropology that supports a dualistic perspective. We agree with theologian Joel Green who has written in support of a monistic perspective of personhood, and who concludes that biblical word studies related to this concept can provide “only limited and primarily negative results.”¹ While a review of Green’s work would support our purpose, to avoid the impression of selectively citing antidualist authors, we have chosen instead for this

cursorial overview to rely on the writings of theologian John Cooper who holds a position he calls “holistic dualism.”² Cooper, too, concedes that in biblical word studies, “the variety and interchangeability of terminology simply do not provide a footing for a clearly dualistic reading.”³

Old Testament Biblical Anthropology

Cooper states,

There is little question that traditional exegetes have viewed the Old Testament picture of human nature through the lenses of Christian Platonism ... a material body and an immaterial soul or spirit was simply taken for granted.⁴

He then notes that more recently “the pendulum has swung to the opposite side.” Current scholars have “become highly suspicious—almost paranoid—of the presence of Platonic dualism in the traditional interpretations of Scripture.”⁵ Cooper explains that the Hebrew people of the Old Testament era “viewed human nature as a ‘unity’ of personal and bodily existence.” And “the Old Testament is resoundingly this-worldly.”⁶

We present five key Old Testament terms used to describe aspects of persons.⁷

1. *Nephesh* is frequently translated as “soul,” but it can also mean “throat,” “neck,” or “stomach”—even “corpse” or “dead person”⁸ (Num. 19:11, 13, NIV⁹). It “is used of animals as well as people in the sense of ‘living creature.’” It has bodily desires, and it is “the seat of emotions and moral dispositions.” Cooper concludes that, in many contexts, it might well be translated as simply “person,” “self,” “I,” or “myself.”

2. *Ruach* means “wind or moving air” and, by extension, “breath.” It is also translated as “spirit,” more often as the spirit of God rather than that of humans. Cooper sees it as “a vital force ... which animates living creatures” but not as an “immaterial substantial soul.” It is also the “seat of various conscious dispositions and activities. The spirit can reason, deliberate, choose, will, rebel against God ...” Cooper concludes that none of the Old Testament uses indicates an “immaterial subsistent self.”

3. *Basar* is frequently translated as “flesh.” It is often used to describe muscle tissue or the human body itself. Cooper notes that it is never used in such a

Article

Relating Body and Soul: Insights from Development and Neurobiology

way as to “imply a metaphysical distinction between living physical matter and nonphysical substantial spirit.”

4. *Qereb* is often translated as “inner parts” of the body or “bowels” and sometimes has direct reference to specific organs. The Old Testament Hebrews did not seem concerned with the physiological properties of the human organs, but emphasized their association with spiritual and/or ethical awareness.

5. *Leb* is the heart. Cooper explains that this meant the “hidden control-center of the whole human being.” He further notes, “The entire range of conscious and perhaps even unconscious activity of the person is located in and emanates from the heart.” Along with *nephesh* and *ruach*, *leb* overlaps considerably with current concepts of the person or self.

The Old Testament Hebrews did not see any one of these terms as equivalent to the current concept of the soul. Rather, the terms are often used to refer to various aspects of the person, or even to the whole being. *Nephesh* and *ruach* most frequently “seem either to refer to the whole psychophysical person or otherwise to the energizing life-force given by God. Neither use refers to an immaterial entity.”¹⁰

Intertestamental and New Testament Anthropology

During this period, there was an expansion of ideas regarding the afterlife and immortality. Views ranged from materialistic such as those of the Sadducees, to extremely dualistic, as expressed in several books of the apocrypha which suggest that body and soul are permanently separated at death. The words *nephesh* and *ruach* (soul and spirit, respectively) were given additional meanings and “could now refer to the discarnate dead as well as to the whole person, life-force, and the breath.” Cooper acknowledges that there was some influence of Greek thinking in various strains of intertestamental writings, but he contends, “there is little evidence of the principle antibody, antimaterial bias of Greek idealism or Gnosticism.”¹¹

Generally, Old Testament categories are retained in the New Testament through the use of approximately equivalent Greek terminology. For example, *sarx* becomes the equivalent of flesh (*basar*), *soma* takes the meaning of body (as a whole), *psychē* is the

word for soul (*nephesh*), and *pneuma* is the word for spirit (*ruach*). However, in the two cases of the words translated as soul and spirit, there are new meanings that correspond to the additional (discarnate) meanings added in the intertestamental period. Though Cooper himself ultimately favors a dualistic perspective, he notes that the anthropological terms and usages do not require any dualistic anthropological interpretation of scripture.

While space limitations prevent us from assessing in detail more subtle considerations regarding possible biblical anthropologies, we have indicated that the Bible does not, as some assume it does, offer a straightforward teaching on this matter.¹²

Models of Personhood

We now consider five models of personhood suggested by different Christian thinkers. The first three are historical and propose dualistic relationships between an immaterial soul and a material body. The fourth and fifth examples are recent proposals that attempt to incorporate modern science as it relates to the nature of personhood. The fourth posits a dualistic relationship that is based on an “emergent” spiritual soul, while the fifth posits that humans are totally material beings capable of relating to others and to God both in this life and in a life to come.

1. Substance Dualism as Conceived by Plato and Neoplatonism as Adapted by Augustine

Plato (428–347 BCE) proposed that humans are composed of two distinct parts: a mortal body and an immortal, eternal soul. The soul preexists and outlives the body; during earthly life, the soul is “imprisoned” in the body. Nancey Murphy comments concerning Platonic dualism, “The soul’s true home is a transcendental realm of ‘ideas.’”¹³ Augustine (CE 354–430) adapted Plato’s ideas for use within a Christian worldview. Augustine’s view, neoplatonism, carefully modified two of Plato’s positions that would have been seen as heretical—that the soul is preexistent, and that it is “imprisoned” in the body, being freed in death.

2. Aquinas’s Compound Dualism

Neoplatonism dominated Christian theology for almost 1,000 years but was eventually superseded

by the teachings of Thomas Aquinas (CE 1225–1274). Aquinas used many ideas about matter and spirit that originated with Plato’s student Aristotle, after the reintroduction of Aristotle to Europe via Arab scholars. Aquinas (per Aristotle) viewed matter as passive, but also as multipotent, that is, it could “become all sorts of things”¹⁴ when activated by a spiritual substance that Aristotle called a “form.” Some types of forms, which Aquinas called “souls,” provided the capacities for living things to grow, reproduce, and do things characteristic of only living things. In Aquinas’s view, the human soul is a form—it determines the body’s growth and development. It also activates the body and provides what we conceive as consciousness. According to compound dualism, the human person is both body and soul (matter and form)—neither constitutes a complete person without the other.

Aquinas believed that all living things have “souls,” but that different types of organisms have different types of souls. Plants have “vegetative” souls, allowing them to grow and reproduce. Animal souls have additional capacities, allowing them “to perceive things and move around.”¹⁵ Finally, humans have rational souls, allowing for cognitive capacities beyond those of animals, such as the capacity to be attracted to goodness, including attraction to the ultimate good—God himself.

Aquinas believed that the rational soul is infused by God into the body at 40 days for males and 90 days for females.¹⁶ But, if the soul guides bodily development, how can it not be present until 40 or 90 days? The answer is multiple souls. Aquinas believed that human fetal development was caused by the action of successive “types” of souls. The vegetative soul is stimulated to develop by the action of the semen during intercourse. It organizes the mother’s menstrual blood to begin forming the body. Following this, a sensitive soul is generated which further refines the body for reception of the rational soul which God directly infuses.

Christian philosopher J. P. Moreland is a current-day advocate of Thomistic substance dualism.¹⁷ His views will be considered later when we consider how current biology may inform our view of the soul.

3. Cartesian Dualism

René Descartes (CE 1596–1650) was a highly influential Christian philosopher whose dualism gave primacy to the soul as the “real” person. Descartes’s formulation resulted from an argument meant to convince those “without faith” (i.e., outside the church) that God and a human soul that is distinct from the body exist.¹⁸ He claimed to have arrived at a conviction regarding the spiritual nature of the “mind” or “soul” by using a radical form of reasoning based on doubting everything he had previously accepted on authority or by virtue of common agreement. He ultimately concluded that the body and the mind are two separate substances and that the mind is the true basis for what it means to be a person. That Descartes conceived of the soul (or mind) as the basis for the “real” person is illustrated by his famous pronouncement “*Cogito, ergo sum*” (“I am thinking, therefore I exist”).

... I knew that I was a substance, the whole essence or nature of which is to think, and that for its existence there is no need of any place, nor does it depend on any material thing; so that this “me,” ... the soul by which I am what I am, is entirely distinct from body ... and even if body were not, the soul would not cease to be what it is.¹⁹

Richard Swinburne is a well-known contemporary dualist who arrives at his position by reasoning that is similar to Descartes’s,²⁰ but whose concept of the soul differs in several striking ways that have been affected by current biological insights. For example, while Descartes famously denied that animals have souls or even consciousness, Swinburne recognizes animal consciousness and concludes that animals, as well as humans, have a type of soul.²¹ Swinburne also takes a developmental approach to the soul that would have been quite foreign to Descartes, believing that the operation of the soul is linked to that of the brain (during life) and that the soul therefore must not function until about 20 weeks after conception (though he leaves room for the possibility that a nonfunctioning soul may exist at an earlier time).²²

4. Emergent Dualism

In emergent dualism, the mind, or soul, develops naturally from the highly complex structures and interactions of the human nervous system. As in the models above, the soul is a nonphysical, spiritual entity, but this entity naturally emerges as a new

Article

Relating Body and Soul: Insights from Development and Neurobiology

property, directly from the organic substrate of the human body. William Hasker states that the soul could emerge from the body in a manner similar to the way certain physical properties emerge (or are believed to emerge).

The core idea of emergence is that, when elements of a certain sort are assembled in the right way, something new comes into being, something that was not there before. This new thing is not just a rearrangement of what was there before, but neither is it something dropped into the situation from the outside. It “emerges,” comes into being, through the operation of the constituent elements, yet the new thing is something different and often surprising; we would not have expected it before it appeared.²³

Hasker provides examples of emergent phenomena. He notes that when a certain type of simple mathematical formula is plotted “onto a set of coordinates, a fractal pattern appears—complex, unexpected and sometimes stunningly beautiful.” He describes crystals that sometimes “emerge” when certain molecules are dissolved in water. He also depicts life in the form of a cell composed of “the right number and kind of chemical molecules ... arranged in a particular complex structure,”²⁴ and even depicts conditions associated with consciousness as possible examples of emergence.

The emergence of a nonphysical soul from a physical body would require the action of as-yet-unknown “new laws, new systems of interactions between the atoms, and so on.” These new laws would then bestow upon the brain “*emergent causal powers*.” The net result would be the development of “a new entity, the mind” which is itself immaterial and constitutes “an *emergent individual*.”²⁵

For Hasker, the benefit of emergent dualism is the view of the body as equal to the soul in value and importance. He says,

It prevents the splitting of the person into two distinct entities and cuts off the implication (sometimes found in “Platonic” theories of the soul) that everything of true worth is to be found in the spiritual dimension and that the body is at best a tool, at worst an encumbrance for the soul.²⁶

5. Monistic Views of the Human Person

We now address two different ideas that describe persons as entirely physical or material, but that use

different approaches to reach this conclusion. We treat them together because each appears, to us, somewhat incomplete for the purpose to which we apply them. However, taken together, they suggest a coherent whole that is highly applicable to our purposes. Since the person, in both views, is entirely physical, personhood is not the possession of some spiritual component, but, rather, it is the possession of abilities to reason and to act in uniquely human ways.²⁷

Nonreductive physicalism, as championed by Murphy, relies primarily on findings of current science to attribute personhood to mental states.²⁸ The second view, emergent materialism, argues for the existence of a new type of property (an emergent property) to account for human consciousness.

Nonreductive Physicalism

Murphy prefers the term “physicalism” over “materialism” because the latter has been associated with a worldview stipulating “denial of the existence of God.”²⁹ Murphy claims that humans do not have immaterial souls. We are wholly material or physical beings. The term “nonreductive” indicates that one need not view this entirely physical person as causally reducible to low-level quantum physics. We also prefer the term physicalism as it encompasses things that are entirely physical, yet are not matter (e.g., energy, gravity, or other “nonmaterial” physical forces).

Murphy states that for dualists the soul “serves the purpose of explaining what we might call humans’ higher capacities:” rationality greater than that of animals, morality, and “a relationship with God.”³⁰ The reductionist, she says, would argue that humans without souls must “not be truly rational, moral or religious,” but, instead, these capacities must all be “really nothing but brain processes.” Murphy states her view as follows:

... if there is no soul, then these higher human capacities must be explained in a different manner. *In part* they are explainable as brain functions, but their full explanation requires attention to human social relations, to cultural factors, and most importantly, to God’s action in our lives.³¹

As her terminology suggests, Murphy is concerned that her view not be taken as a standard reductionist view of persons. She is apprehensive that her critics may ask, “If humans are purely physical ... then how

can it not be the case that all human thought and behavior are simply determined by the laws of neurobiology?"³² Murphy's response rests on the concept of "downward causation," in which mental states have top-down causal power on the physical processes that make up a person. She asserts that most humans think in Newtonian terms in which all causal powers are invested at the lowest level of reduction and that any complex systems are mere aggregates of more elementary constituents (e.g., marbles in a bag) or mechanisms. The Newtonian understanding of mechanism says that the parts of a mechanism are inert, and act upon one another in specified ways but are not themselves affected by their relationships to the whole or the other parts of the mechanism. She wishes to redress this causal reductionism by discussing how one might also conceive of the actions within a mechanism as acting "downward" on the parts.³³

Emergent Materialism

Timothy O'Connor suggests consciousness is an emergent property of a human body (like Hasker), but the soul or mind exists "without there being any substance distinct from the body ..."³⁴ Hasker's emergence is a version of substance dualism; O'Connor's is a version of materialism. Thus, although the soul is eventually able to exist independently of the body in emergent dualism, the soul always depends on the body in substance monism. O'Connor calls this the *causal unity thesis*: "macro-level phenomena" (such as human free will) are assumed to arise "through entirely natural *micro*-physical causal processes" and their existence "continues to causally depend on processes of this kind."³⁵ This could, at first blush, seem to pose problems for accommodating the Christian doctrines of eternal life and resurrection of the dead. However, such problems are common, to some extent, to every model presented in this analysis, as we will discuss in the next section. Notice, however, that the causal unity thesis specifies both bottom-up causality and top-down causality. The complexity of the physical organism produces the emergent soul, which then has causal influence on the body. This is why it is called causal unity. It is not simply a bottom-up causal flow even though the macrolevel phenomena continue to depend on the microlevel phenomena. Though the former depend on the latter, they can, in turn, influence the next state of the latter.

The Problems of Immortality and Various Models Relating Body and Soul

Though many see the issue of immortality as a particularly hard question for the physicalist views of Murphy and O'Connor, in fact, every Christian view of the person is faced with similar difficulties. Although modern dualists consider their models superior in accounting for the afterlife, traditionally, the church fathers (all substance dualists) were very concerned that they could not well explain a bodily resurrection. They expended considerable effort trying to explain it.³⁶ Since the doctrine of the resurrection is nonnegotiable for orthodox Christians, all face problems in explaining how a body can die and decompose, but yet eventually be resurrected. Also, monists are not without philosophical resources to account for a vigorous intermediate state.³⁷ Thus, although most rank-and-file Christians are dualists, and believe this dualism is a more faithful anthropology, there is actually no simple philosophical advantage to a dualist or monist anthropology in explaining the biblical implications of eschatology and the afterlife. Kevin Corcoran discusses this at some length.³⁸

There are at least three significant questions that obtain regardless of which explanation of personhood one embraces. How is the actual person maintained in the transition from life, through death, to the afterlife? What happens to the person during the intermediate period between death and resurrection? And what exactly is involved in bodily resurrection? While these are significant questions, they are not of central importance for the purposes of this article. Therefore, to show that answers can be developed, we will merely sketch some of the responses made to these questions by dualists and monists.

Dualists generally contend that, because the soul is spiritual and is the essence of the person, there is no difficulty imagining how the actual person is maintained after death. The real person simply continues to exist apart from the body as a disembodied soul. Regarding the intermediate period between death and resurrection, dualists generally settle on one of two alternatives—either the soul "sleeps" during this period, or it remains conscious while awaiting the resurrection.³⁹ A greater difficulty is encountered for the dualist in the matter of the resurrection of the body.

Article

Relating Body and Soul: Insights from Development and Neurobiology

A common dualist view is that the soul “remembers” the form of the body and that God miraculously restores the physical body. A prime example is Aquinas’s compound dualism in which the soul is the form of the body. Therefore it makes perfect sense that God can recreate the body based on the existence of the soul. The problems that arise in this view have to do primarily with whether the new body must, in fact, be “the same” as the old body. If the answer is yes, then it becomes difficult to explain how even God can reassemble matter for one individual’s new body when that matter may well have gone on to become incorporated into other bodies that belong to other individuals. Some refer to this as the “cannibal problem,” in that cannibalism is the most direct way for one’s matter to become part of another’s body.

Monists are faced with problems that appear more daunting due to their wholly physical accounting of the human person. The Christian monist’s basic response to questions about immortality is that human life is supposed to be embodied life. God must ultimately save our physical bodies in eternity. One way of envisioning this is to assume that God “simply,” miraculously restores our physical beings at the time of the resurrection and due to our personhood being entirely physical, we now exist again, complete with our past experience (encoded in our brains, genomes, and epigenomes).⁴⁰

Another more significant criticism of monists is explaining an intermediate state between one’s death and the general resurrection. The primary text used is 2 Cor. 5:8, in which Paul expresses a preference to be “away from the body and at home with the Lord” (TNIV). First, it should be noted that this is one of the few passages in scripture that seems to make concrete statements about the divisibility of body and soul. Cooper, a biblical scholar and a dualist, concludes that the simplest interpretation is that Paul really believed that there could be a period of disembodied but animated existence after death.⁴¹ Pauline experts such as Murray Harris, Linda Belleville, Scott Hafemann, and Jerry Sumney note that Paul was never clear on this point and made numerous statements that better support anthropological monism and immediate transformation upon death to receive a spiritual body.⁴²

We agree with Belleville that this passage seems to be redressing Greek dualism and Christian Gnostic beliefs.⁴³ The text itself is about the “earthly tent” (our present body) versus the “building from God” (our resurrection body). This passage is not about the intermediate state but about one’s final, eternal state as embodied rather than disembodied. Paul was radically confronting Gnostic teachings that death frees the soul from bodily imprisonment. Paul stipulates in verse 4, “we do not wish to be unclothed but to be clothed with our heavenly dwelling.” He is endorsing the Christian hope of re-embodiment and “repudiating the Greek idea that disembodiment is desirable.”⁴⁴

While Christian physicalists often are skeptical of biblical warrant for a robust intermediate state, they are not without possible explanation for such a state. Also, deep-thinking dualists are not unaware that their view, too, is complicated. The fact that souls are usually considered, by their nature, to persist after death, allows one to model how personal survival may occur without *explaining* it. In fact, even the most impassioned of dualists, Cooper, acquiesces that perhaps one may need to exist as a “quasi-bodily person” in the intermediate state to fit the biblical data.⁴⁵ Monists typically believe that one simply does not exist during the intermediate period. They also note that we still have a poor understanding of the material universe and that we should not foreclose on the possibility that one might persist in a physical sense after one’s body is referred to as a corpse. Corcoran specifically asserts that while people are entirely physical in his view, they are not logically identical with their bodies. He goes to great lengths to demonstrate that a corpse’s mere presence does not *logically require* that the person has ceased to exist, even for materialists.⁴⁶ There is no evidence offered that this does actually occur (neither does the dualist have what science would call evidence of the afterlife), but the logical possibility opens up realms for monist thought on how a robust intermediate state may be possible.

To summarize, as we consider these complexities associated with eternal life and resurrection, we should recognize that *all* the models face difficulties in explaining how we may die, then live again, and how the new person would genuinely be ourselves and not simply a copy.

Insights from Developmental Biology

Having surveyed various scriptural and philosophical considerations related to the nature of persons, we now turn to insights from biological science. First we discuss insights from developmental biology that may be inconsistent with perspectives that endorse the three beliefs from the introduction (immediate ensoulment, hierarchicalism, and discorporealism).

Unique Soul Identity and the Problem of Embryo Twinning

The generation of monozygotic twins (i.e., two individuals derived from a single embryo) may pose problems for the concept of the soul.⁴⁷ One of the earliest references may be that of Roman Catholic priest Joseph Donceel.⁴⁸ Arguing against immediate ensoulment, he correctly notes that “identical twins ... start life as one ovum, fecundated [i.e., fertilized] by one spermatozoon.”⁴⁹ The embryo developing from this single fertilized ovum later divides to generate two embryos that eventually form genetically identical twins. Donceel, referring to Aquinas’s view of the soul, finds this condition difficult to reconcile with immediate ensoulment.

Conversely, J. P. Moreland and Scott Rae, who argue from a dualistic perspective based on Aquinas, do not see embryo twinning as an impediment to accepting immediate ensoulment.⁵⁰ In their view, the unusual case (the development of two ensouled individuals from a single embryo) can be explained by substance dualism (both Cartesian and Thomistic forms) with reference to how God normally achieves this end for a single individual. In both cases, certain physical conditions must exist before a new individual takes shape (e.g., the union of sperm and egg or the division of a single embryo), and once those physical conditions are met, God chooses to create a new soul. Since this is how he acts in typical examples of reproduction, we should not be surprised that this also occurs in unusual cases. Moreland and Rae extend the same rationale to the potential creation of a human clone—when and if such an event occurs, God will create a soul for the clone once the necessary physical conditions for a new life exist.

While this explanation may seem adequate at first, further consideration of the complexities of monozygotic twinning suggests it is anything but

adequate. If we assume that all such twinning occurs at a very early stage, perhaps our objection is trivial. However, twinning occurs at different days post-fertilization and can result in either separate or shared extra-embryonic membranes (e.g., amnion and chorion).⁵¹ The majority of monozygotic twins (60–70%) develop from embryos that divide three to eight days following fertilization. The process can occur as late as 12–13 days postfertilization. These late divisions sometimes result in conjoined twins. Presumably at original fertilization, a soul was created. After the twinning division, which organism gets that primary soul and which gets the new one? Or are two new souls created, and the old one perishes? Or does God, knowing that twinning will occur, delay ensoulment until the division occurs, at which time he adds two souls?

On our reading, those advocating creationism credit God with a different kind of interaction in the universe during soul creation than during the rest of creation. This seems a bit of an interventionist model,⁵² literally *requiring* a special intervention of God in something that happens untold times every day. Such an explanation raises the same type of problem as when Isaac Newton suggested that God must occasionally intervene in the universe to keep it operating smoothly.⁵³

Unique Soul Identity and the Problem of Chimeras

Chimeras in mythology are individuals composed of parts from various different kinds of organisms. In biology, a chimera is a single creature with cells from two different individuals.⁵⁴ These cases result from spontaneous fusions of fraternal twins *in utero*. They are generally detected when the individual presents two normally incompatible phenotypes, such as having a mixture of two blood types, or evidence of hermaphroditism.

One recently discovered case involved a woman who needed an organ transplant.⁵⁵ Her family members were tissue typed to search for a compatible donor. Two of her three sons had genotypes indicating that they were not her biological offspring. Further investigation showed that the woman was a chimera. Her blood system (used to determine her immunological type) was derived entirely from one of the two original embryos. The woman possessed

Article

Relating Body and Soul: Insights from Development and Neurobiology

the immunological markers consistent with the two sons, but they simply were not carried in her blood.

What do such beings tell us about the soul? If we hold to immediate ensoulment, do such individuals actually have two souls—one from each embryo? Or perhaps the two original souls fuse to form a “chimeric soul.” Perhaps one soul “died” or was somehow subsumed by the other soul in order that there would be only one final soul remaining.

The first option, one person with two souls, seems a theologically complicated alternative. It seems incompatible with important features of many theories of the soul such as the soul as “the form” in compound dualism. Furthermore, if the soul is responsible for human reason, consciousness, ability to love, and other things, it seems that such a person would have an incredible problem with personal identity, perhaps exhibiting dissociative identity disorder or something worse. But this is not the case. Although some XX/XY chimeric hermaphrodites experience psychological and identity challenges, chimeras do not generally evidence more psychological distress than the general population.⁵⁶

The second and third options that involve either fusion of two souls or the disappearance of one at the expense of the other also seem theologically unsound. In most dualist formulations, the soul is an essential substance, not something that could reasonably be merged with another such substance. If instead, one soul was somehow destroyed or “voluntarily” disappeared, this calls into question God’s good will for that soul. Of course, the natural world is fallen, and one could argue that chimeric humans occur as a result of the Fall. Of the three options, this last one seems least objectionable to us on theological grounds; however, theories involving delayed ensoulment, emergentism, or monism largely avoid this problem.

Insights from Animal Consciousness and Neurobiology

We now address implications from studies of animal consciousness and from neurobiology. Much information from these areas suggests that humans may not have immaterial souls, thus negating dualistic views associated with immediate ensoulment, hierarchicalism, and discorporealism.

There is increasing evidence to suggest at least some animals have a form of consciousness. Donald Griffin and Gayle Speck review the literature this way:

Although no single piece of evidence provides a “smoking gun” [that demonstrates animal consciousness] ... the data ... renders it far more likely than not that animal consciousness is real and significant.⁵⁷

They survey the literature on brain structure and find that “the basic nature of the central nervous system function is much the same in all animals with central nervous systems ...” and that “no uniquely human correlate of consciousness [with regard to brain structure] has been discovered.”⁵⁸ They also describe several recent behavioral studies in which animals’ responses to novel challenges “provide suggestive evidence of animal consciousness.”⁵⁹ They also consider animal communication and show that several types of observations can be “useful as evidence of conscious experiences.”⁶⁰

Joel Green makes similar observations and also addresses the existence of mirror neurons in some animals. Mirror neurons are neurons that fire both when an individual acts and when the individual observes another individual performing the same action. Green says that this attribute in animals

provides clear biological evidence that these animals are, like humans, characterized by a “theory of the mind” —that is by the ability to understand that others have beliefs and intentions.⁶¹

Though space constraints prohibit extensive consideration, we make two observations regarding how animal consciousness bears on the distinctiveness of the human soul. First, some definitions of the human soul (such as Descartes’s) state that the human soul is what allows us to have consciousness. Of course, it is possible to modify this element of a strong dualistic model in several ways. Some dualists, such as Hasker, would argue that the soul is not responsible for *all* conscious activity,⁶² while others, such as Swinburne, simply believe that animals do have souls.⁶³ Second, if human consciousness is not categorically different from animal consciousness, then it is not necessarily the possession of an immaterial soul that makes us “in God’s image,” but rather many aspects of our embodied existence, such as our responsibility to care for creation and to have relationships with other humans and with God.⁶⁴

Observations from neurobiology further suggest that a strong form of dualism is less tenable than once thought. There is a vast literature on this topic. We merely sketch the direction of current discussion by focusing primarily on some considerations of Malcolm Jeeves, a Christian neuroscientist who doubts the existence of an immaterial soul and whose thinking on this subject mirrors that of most neurobiologists.

Jeeves has written extensively on questions related to neuroscience and faith.⁶⁵ He describes several observations, both historic and recent, from what he calls a “bottom-up” perspective. In these instances, physical changes in the brain (caused by accidents, disease, or experiment) caused corresponding changes in behavior and/or cognition. He tells the compelling story of a schoolteacher who, seemingly beyond his control, began exhibiting “lewd behavior and pedophilia.”⁶⁶ The day before he was to be sentenced on child molestation charges, he complained of a severe headache. An MRI showed the presence of a large brain tumor. Once it was removed the man’s unusual behavior ceased. A year later, the lewd behavior began to recur. Another MRI showed that the tumor had regrown, and again, removing it caused the behaviors to cease. This clinical example, along with examples of experimental manipulations of the brain, show time and again that physical perturbation of the brain causes changes in a subject’s behavior and/or cognition. It seems clear from these examples that cognition is not associated with some nonphysical component that functions separately from the functions of the brain.

Jeeves also provides examples of “top-down” effects, which he says involve “cognition producing localized changes in the brain.”⁶⁷ For example, one MRI study compared London taxi drivers, “renowned for their extensive and detailed navigation experience and skills,” to normal controls. After two years of “intensive training in navigation,” the cabbies’ brains were found to have significantly larger anterior hippocampi.⁶⁸ Studies like this again show the close link between consciousness and the brain. What happens in our minds can somehow change the structures of our brains. Again, this does not seem consistent with a stronger form of dualism that claims a distinct separation of soul and body.

In considering the actual relationship between mind and body, Jeeves suggests that “brain events” and “mental events” may best be interpreted as “complementary descriptions.” In proposing “duality” without “dualism,” he notes,

We may regard mental activity and correlated brain activity as inner and outer aspects of one complex set of events that together constitute human agency. Two accounts can be written about such a complex set of events, the mental story and the brain story, and these demonstrate logical complementarity. In this way, the irreducible duality of human nature is given full weight, but it is a duality of aspect rather than a duality of substance.⁶⁹

Donald MacKay suggests from a similar neurobiological perspective that Christians should never endorse a view of the soul that would require any mental state that is not dependent upon brain activity. It is the ultimate God-of-the-gaps problem should we discover that all mental states are determined by (if not identical with) brain events.⁷⁰ Although Jeeves speaks for the vast majority of neurobiologists in skepticism of substance dualism, some neurobiologists do disagree, most notably Sir John Eccles.⁷¹

Developing Hominization— A Model of Personhood and Its Applications

A Model of Developing Hominization

In light of the difficulties posed by science against immediate ensoulment, hierarchicalism, and discorporealism, we present a model of “developing hominization” that should enhance our understanding of what it means to be a human person. The basic premises of this model are as follows. First, humans are different from other animals in such attributes as the extent of consciousness that we possess, and in other traits such as our ability to love, to relate to others of our kind and to God, to bear responsibility, and to act sacrificially. The substance or property (hereafter referred to as the “essence”) that enables these uniquely human attributes to exist may be material or immaterial, physical or spiritual. In whichever case, God is able to maintain this essence

Article

Relating Body and Soul: Insights from Development and Neurobiology

or precisely and uniquely recreate it in an inscrutable way that enables humans to survive after death. The essence that makes us uniquely human is not present in complete form at the moment of fertilization. This essence interacts so intimately with the entire person, that it is only the entire person that exhibits functional unity. And finally, this essence should not be considered somehow better or purer than any other part of the person, and it should not be considered to constitute the “real person.”

We have chosen the term “developing hominization” to emphasize that the model advocates a developmental view of the human person. It is not *specifically* monist or dualist, though it can accommodate either. There are three key aspects of this model. The model is (1) *open* to several possible interpretations of what it means to be a person. It is (2) *integrative* with regard to interpretations from both theology and science. And it is (3) *intentional* with regard to considerations of potential consequences of embracing the model itself.

Openness—The developing hominization model is unlike the five models presented above. It is more of a “metamodel” that can potentially incorporate ideas from several of the models and in some cases, can acknowledge the possible correctness of one or more of them. Given the conditions described above, the only models among the five presented earlier that would be explicitly rejected are a strong version of the Neoplatonic model and a substance dualism such as that advocated by Descartes.

Integrative—This model is based on input from both theology and science. Much of the input from theology is “negative” in that what scripture does *not* say has been taken seriously. Specifically, there seems to be no consistent scriptural articulation of the nature of the essence that makes humans unique, nor description of how or when the essence comes into being. An intermediate state for humans between death and the resurrection seems to suggest a requirement of disembodied existence, but monists have given explanations that would be faithful to scripture.⁷² Thus, the existence of an immaterial soul does not seem to be an absolute requirement for orthodoxy. Likewise our model neither requires nor restricts the existence of a soul. However, it does limit the degree to which the soul can be thought of as the “essence,” since we stipulate that this essence

is not in any part but only in the whole of a person. The model also responds to positive input from scripture and theology with its recognition that the material aspect of human beings is of great value. Furthermore, that this model also integrates input from science, leading to fruitful reduction in the number of tenable theories, is one of its chief strengths.

Intentional—The effectiveness of the church throughout history appears to have been hampered, in many cases, by unintended consequences of particular views of the human soul. For instance, a historical tendency toward asceticism in the early church has lingering effects today, including an associated devaluing of women (see below). This unfortunate example seems clearly linked to an overly negative view of the material world based in a strong dualistic perspective emphasizing the perspective we label hierarchicalism. The developing hominization model may serve to correct erroneous views of human personhood, thus avoiding this and other similarly based errors in praxis. This model also has at least one feature—its rejection of immediate ensoulment—that could itself generate errors of praxis if an intentional approach to application is not taken.

Application of a Model of Developing Hominization

What is at stake if, as we have suggested, several commonly held beliefs about the human soul are wrong? There are points of disagreement between believers on many theological concepts—why is this one so crucial? It is crucial because what we believe about the spiritual nature of humanness is foundational to so many other beliefs. It affects what we think about the very nature of the material world—is it good or is it evil? ... can we trust our senses? ... what is our relationship to the rest of the created order? It affects how we view and treat other humans. Are they fellow sojourners, sources of temptation, souls to be won for Christ, or individuals who need healing? Furthermore, what we think about our human nature is crucial because it is often divisive. Those who hold extreme views frequently discount the views of others and leave little room for compromise.

The model that we have proposed attempts to harmonize clear perspectives from theology and

science, seeking to establish a firmer basis for objective understanding. While it excludes some extreme theological positions, its openness creates more potential to unify different strains of thought than it does to divide them. We believe that our model can be applied to Christian scholarship in various ways. For example, perspectives derived from this model could inform discussion about topics such as human biotechnology, neuropsychology, or evolution. Each of these is too broad and nuanced to address here. However, to demonstrate the utility of our model, we will use it to consider briefly three topics that are more readily accessible, and which are directly related to the concepts of immediate ensoulment, hierarchicalism, and discorporealism.

Immediate Ensoulment and the Sanctity of Human Life

The developing hominization model rejects the assumption that our personal essence is present in complete form at the moment of fertilization. Because of the particular methods employed by many contemporary American Christians to defend human life, this aspect of the model may seem to undermine the “sanctity of life” position. Since this may be a legitimate concern, we should carefully consider this objection.⁷³

While the belief in immediate ensoulment may influence decisions about protecting early human life, it is not a necessary assertion for preserving a commitment to the sanctity of human life *in utero*. However, as this is often the only “pro-life” assertion made in our culture, some additional rationale is needed. Corcoran gives such additional justification by noting that destroying a developing human life is an action that is opposed to God’s good intention for that developing person.⁷⁴ It is difficult to see how destroying an organism that will become a human person and for whom God himself has that good intention is less problematic than destroying a soul. Besides, as Corcoran also notes, if one holds a strongly dualistic view, then “it is plausible to think that abortion never ends the existence of a person” since that person’s soul (their “real self”) continues to exist.⁷⁵

This last observation leads logically to a consideration of how nondualists (both within and outside

of Christianity) may view arguments related to the sanctity of human life. Some may disbelieve in the existence of a soul; for this reason, they disregard arguments for sanctity of life altogether.⁷⁶ Others may recognize the potential gravity of ending an early-stage human life, but they consider that this act is less grave because it really does not destroy the “real” person. We assert that someone’s personhood status is not the appropriate measure of whether they should be protected. It leaves vulnerable both the unborn and those who have suffered a loss of mental functions. For instance, up to 40% of people labeled as in persistent vegetative states are misdiagnosed.⁷⁷ If they do not possess reason, or cognitive ability, or cortical activity, are they to be euthanized or assisted in “suicide”?

One need not be a Christian, or even a theist, to follow an argument similar to God’s good will—regarding *potential*. No one disputes that the egg in an endangered eagle’s nest will one day be an eagle even though it is not currently “viable.” Thus, the egg is protected. Similarly, a human embryo is, in fact, human and deserving of respect and protection as a *potentially* valuable individual. While accepting the possibility that a fully formed, nonmaterial soul may not exist from fertilization onward may weaken one argument for preserving human life *in utero*, it may strengthen other arguments for it. These arguments may be more convincing to nondualists and non-Christians than the common argument of immediate ensoulment. Careful attention to these other justifications, such as God’s good intention and human potential, should provide equivalent (and possibly better) protection for the preborn and others at risk, since non-Christians and nondualists may be more swayed by them. And finally, if one believes the assertion that a fully developed soul is not present at fertilization, it is disingenuous to use the soul to argue in favor of the sanctity of preterm life.

Hierarchicalism, Asceticism, the Marginalization of Women, and Anorexia

Many factors have contributed to the historic phenomenon of gender inequality, and sadly, the influence of some forms of Christianity has often been cited.⁷⁸ This relationship is undoubtedly complex, but we believe that one contributing factor has been the influence of soul-body hierarchicalism. In this

Article

Relating Body and Soul: Insights from Development and Neurobiology

section, we consider the historical justification for this assertion and probe one current-day manifestation of gender-biased beliefs, the condition known as anorexia nervosa.

Elizabeth Hall notes that whenever hierarchical dualism is held, one of two results ensues: license or asceticism.⁷⁹ We contend that the ascetic movement of the early church, and that of later heresies, was linked to such hierarchicalism. The ascetic movement, which culminated in the fourth century, involved treating the body harshly in sexual restraint (even within marriage), in the consumption of food, and in other normal human activities.⁸⁰ The idea was that subjugating the body allowed the more important spiritual self to flourish. Though it is difficult to discern between legitimate spiritual practices and certain pathological behaviors, some documented behaviors were extreme and perhaps pathological. Whereas many practitioners were heretical (e.g., Gnostics), many were within orthodox Christianity. In fact, some well-known advocates of such practices were among the church fathers themselves, whose asceticism sadly often contained a somewhat misogynistic perspective, presumably motivated from a concern for safe-guarding sexual purity.⁸¹

By the Middle Ages, the most notable forms of asceticism were evident in the heretical sects.⁸² Within orthodoxy, however, asceticism was also quite pervasive.⁸³ It was during this era that extreme fasting became a common practice, especially among women seeking to live holy lives. Gail Corrington documents this trend, describing it, in part, as a response to male domination, and linking it to current-day patterns associated with anorexia. She describes both groups of women in their noneating practices as “resisting a male image of women (passive, lustful, with obvious feminine characteristics) in favor of an image men promote for themselves (stringent self-denial; slimness and fitness).”⁸⁴

Sabom also draws connections between the asceticism of the Middle Ages (as practiced by Gnostics) and current-day anorexia, noting that “the beliefs and practices of anorexics share common themes and theological errors with adherents of the ancient Christological heresy of Gnosticism.”⁸⁵ Sabom describes a form of asceticism in which “the body is treated as separate from the ‘real self’ or ‘soul,’

and becomes an object of capricious manipulation if not outright contempt.”⁸⁶ These beliefs include both hierarchicalism and discorporealism as we define them.

Caroline Giles Banks provides evidence from surveys, clinical records, and a case study to argue that some current-day cases of anorexia are partly rooted in poor Christian theology with an emphasis on asceticism.⁸⁷ She cites several sources to show that anorexia appears to be more common among people with conservative religious backgrounds than in the general population. She describes multiple interviews with a woman identified as “Margaret C.,” about ten years after Margaret was hospitalized for anorexia. Margaret spoke frequently and idealistically of her Christian faith, and Banks suggests that Margaret even rationalized some of her very strange eating habits (e.g., eating only between midnight and sunrise) with statements about her faith. One description related to Margaret’s view of death clearly demonstrates a dualist inclination:

When [the Bible] says, “Thou shalt never see death,” I believe it ... Well, the part of you that goes [to Heaven] is really yourself because the body is nothing ... Anybody who believes in the Bible would believe in that as a matter of fact.⁸⁸

Corrington also describes several published accounts of interviews with anorectic women that suggest their illnesses may have theological roots. She notes that “anorexia is described by anorexics themselves as a form of *askesis*, a discipline of the body for the sake of a ‘higher purpose.’”⁸⁹

Obviously, there are many sources of both practices that encourage gender inequality, and of conditions that promote the phenomenon of anorexia, but if one contributing factor is poor Christian theology, Christian scholars should work to correct this situation. We believe that rejecting soul-body hierarchicalism is one step that should be taken toward this goal.

Discorporealism, Evangelism, and Social Responsibility

The conference on world evangelization (Lausanne, Switzerland, 1974) was perhaps “the most strategic evangelical gathering in contemporary history.”⁹⁰ According to Tokunboh Adeyemo, it articulated

a vision that “positively expresses socio-political involvement as a Christian duty and places it on the same level as evangelism,” a perspective that has led to what is now called “holistic mission.”⁹¹ This perspective was at that time (and still is, in some circles) a matter of considerable debate. We believe that a disjunction between these two callings (social welfare and evangelism) is a relatively recent historical aberration and may have resulted, in part, from an erroneous view of human personhood, which we define as discorporealism.

Padilla strongly argues for holistic mission, pointing to the life and ministry of Jesus Christ himself as a model for this approach.

His earthly life and ministry ... came to be the model of the life and mission of the church. If that is the case, the proclamation of the good news to the poor, the preaching of freedom for captives, of the recovery of sight for the blind, and the liberation of the oppressed is a basic criterion by which to assess how far the mission of today’s church was really the continuation of the mission of Jesus of Nazareth.⁹²

Though the specific patterns varied throughout the history of the church, a strong sense of social responsibility was an early and enduring element of the mission of the church.⁹³ Bong Ro suggests that it was only during the twentieth century that evangelical Christians shifted in their emphasis away from social involvement and “laid increasing emphasis upon preaching the gospel with a view to saving individual souls.” Ro sees this shift as a reaction against twentieth-century theological liberalism and the “liberal associations of the ‘social gospel.’”⁹⁴

Vinay Samuel and Chris Sugden suggest an explanation for the evangelical retreat from social responsibility that goes to the central tenets of this article, namely a certain hierarchical dualism. They note,

We suggest that one reason why people assign this sort of priority to man’s vertical relationship is that they have a dualistic understanding of existence assuming that man lives in two realms, an inner realm and an outer realm. This dualism cannot be sustained either by biblical teaching or by philosophical reasoning.⁹⁵

Though Samuel and Sugden use the language of “inner” and “outer” realms, not “soul” and “body,”

they further clarify these terms with language that indicates one could label them such:

The inner realm is the locus of the vertical relationship with God. It is a realm of unchanging spiritual realities ... it is a realm of religion, ideas, concepts and language. This realm can be experienced only individually ...

[On the other hand,] the outer realm is the locus of horizontal relationships with man. It is the realm of physical and material existence.⁹⁶

Padilla agrees:

The reduction of the Christian mission to the oral communication of a message of otherworldly salvation grows out of a misunderstanding of God’s purpose and the nature of human beings. It is assumed that God wants to “save souls” rather than “to reconcile to himself all things, whether things on earth or things in heaven” (Col. 1:20) and that the human being only needs to be reconciled to God rather than to experience fullness of life. In the final analysis, this is a reduction related to ideas taken from Greek philosophy, not from Scripture.⁹⁷

If these authors are correct, it seems that gaining a corrected view of the nature of personhood is vital even to the ultimate mission of God’s church on earth.

Final Considerations

We have considered various views of what it means to be a human person, and have shown that many traditionally accepted views are not required by a faithful reading of scripture nor are they well supported by current science. We believe that some of these views have led to errors in praxis among Christians, and we have suggested an alternative model—developing hominization—that can be accepted by orthodox Christians and that should help to avoid the errors we have identified.

This model does not presume to provide a definitive explanation of the nature of personhood, but rather an overview of likely options. In this regard, it should not be considered a dogmatic pronouncement, but rather a pedagogical model for promoting teaching and learning and for stimulating consideration regarding the nature of personhood.

Perhaps the most contentious aspect of this model is its rejection of immediate ensoulment. For many

Article

Relating Body and Soul: Insights from Development and Neurobiology

Christians, the assumption of immediate ensoulment is equivalent to an article of faith, and we do not wish to provoke a spirit of disharmony within the Body. We may never have epistemic certainty as to whether or when a soul exists, or what it may be constituted of. We do not mean to advance this model as a weapon with which to bludgeon others. However, we do believe, based on current knowledge, that immediate ensoulment does not occur and that belief in immediate ensoulment can lead to errors in praxis. It is also worth reiterating that if one rejects the theory of immediate ensoulment, it is necessary to identify other justification (such as presented here) for preserving embryonic and fetal life when warranted. While this may seem like a weakness to the model, finding other justifications more understandable to nondualists and non-Christians may be just what is needed for more-productive political dialogue.

The assertions of this model, that the essence that makes us uniquely human should not be considered somehow better or purer than any other part of the person, and should not be considered to constitute the “real person,” are much less controversial. However, we believe that much harm has been done throughout history and into the present when Christians have failed to fully acknowledge these assertions. If our presentation of the model of developing hominization has any lasting effect, we hope that it will be to stimulate critical consideration of the importance of these assertions to the Christian worldview. *

Notes

¹Joel B. Green, *Body, Soul, and Human Life: The Nature of Humanity in the Bible* (Grand Rapids, MI: Baker Academic, 2008), 57.

²John W. Cooper, *Body, Soul, and Life Everlasting: Biblical Anthropology and the Monism-Dualism Debate* (Grand Rapids, MI: Eerdmans, 1989), 40. Cooper believes his construct, holistic dualism, allows for functional holism and substance dualism in explicating human anthropology.

³*Ibid.*, 47.

⁴*Ibid.*, 36.

⁵*Ibid.*, 37.

⁶*Ibid.*, 41.

⁷*Ibid.*, 42–7. All quotes in the five definitions are from these pages.

⁸*Ibid.*, 43. Cooper uses the term “dead person,” but many biblical translations, for instance, Today’s New International Version (TNIV), use “corpse.” The subtle difference

between “dead person” and “corpse” can play into whether one endorses a monistic or a dualistic anthropology. The TNIV uses “corpse” in Lev. 22:4 and in Num. 19:11, 13. The NIV uses it only in Leviticus. Those who emphasize that it means “corpse” do so to show that if one of the words translated “soul” can also mean “corpse” – which term most moderns understand to mean all of a person *except* the soul – then this terminology cannot be construed as support for a strong substance dualism.

⁹All scripture is quoted from the New International Version (NIV), unless noted otherwise.

¹⁰Cooper, *Body, Soul, and Life Everlasting*, 43.

¹¹*Ibid.*, 102.

¹²Green gives significant attention to these more subtle considerations that space limitations prevent us from addressing. In the second chapter of *Body, Soul, and Human Life*, he addresses three obstacles that challenge the development of a Christian anthropology from biblical data. The first obstacle (pp. 46–9) is that the biblical evidence is generally implicit rather than explicit. When the biblical authors wrote about the nature of the human being, it was not with the intent of presenting a cohesive model of the human person. The second obstacle (pp. 49–50) relates to the tendency of Western scholars to interpret writings from different times or cultures through the filter of a Western worldview. Green focuses primarily on how this tendency has played out in biblical interpretation with regard to the Cartesian understanding of the human mind. The third obstacle (pp. 51–61) relates to three separate methodological pitfalls that often accompany biblical studies aimed at articulating the nature of humanity. Firstly, that the relationship between Hebrew and Greek thinking is often much more complex than the investigator may realize. Secondly, that biblical terminology is more linguistically subtle than most investigators realize. And thirdly, many investigators have focused on eschatological questions (e.g., “What happens when we die?”) to answer anthropological questions. This approach concerns Green because ancient peoples had different perspectives on the afterlife than do current-day interpreters, and because this type of evidence is analogical and speculative.

¹³Nancey Murphy, *Reconciling Theology and Science: A Radical Reformation Perspective* (Kitchener, ON: Pandora Press, 1997), 48.

¹⁴*Ibid.*, 49.

¹⁵*Ibid.*

¹⁶John Haldane and Patrick Lee, “Aquinas on Human Ensoulment, Abortion and the Value of Life,” *Philosophy* 78 (2003): 255–8.

¹⁷See, for example, James P. Moreland, *The Recalcitrant Imago Dei: Human Persons and the Failure of Naturalism* (London: SCM Press, 2009); —, “The Physical Sciences, Neuroscience and Substance Dualism,” in *The Nature of Nature*, ed. William Dembski and Bruce Gordon (Wilmington, DE: ISI Books, 2011); —, “Substance Dualism and the Argument from Self-Awareness,” *Philosophia Christi* 13, no. 1 (January 1, 2011): 21–34; —, “Naturalism and the Crisis of the Soul,” *Faith & Mission* 24, no. 4 (2008): 50–60; James P. Moreland and Scott B. Rae, *Body and Soul: Human Nature and the Crisis in Ethics* (Downers Grove, IL: InterVarsity Press, 2000), 218–24.

- ¹⁸René Descartes, *Discourse on Method and Meditations*, trans. Lawrence J. Lafleur (Indianapolis, IN: Bobbs-Merrill, 1951), 61.
- ¹⁹René Descartes, *Discourse on Method and Meditations*, trans. Elizabeth Sanderson Haldane and G. R. T. Ross (Mineola, NY: Dover Philosophical Classics, 2003), 23.
- ²⁰Richard Swinburne, *The Evolution of the Soul* (Oxford: Oxford University Press, 1987), see especially chapter 8. Swinburne uses a complex thought experiment involving “a brain transplant” procedure in which the brain of one person is split into two separate hemispheres and both are transplanted into separate bodies from which brains have been removed to make the point that “however much we know in such a situation about what happens to the parts of a person’s body, we would not know for certain what happens to the person.” He assumes that both bodies (with new half-brains) survive and that each individual is now a separate person. Though he succeeds in making his point (that we do not know which person—if either—is the original person), it seems to us that this example does nothing to support the existence of an immaterial soul. If the essence of a person were linked to a material entity (e.g., the brain), the two individuals could develop into separate people by changes to the remaining brain material.
- ²¹*Ibid.*, 180–96.
- ²²*Ibid.*, 176–9.
- ²³William Hasker, “On Behalf of Emergent Dualism,” in *In Search of the Soul: Four Views of the Mind-Body Problem*, ed. Joel Green and Stuart Palmer (Downers Grove, IL: InterVarsity Press, 2005), 76.
- ²⁴*Ibid.*
- ²⁵*Ibid.*, 76–8.
- ²⁶*Ibid.*, 78–9.
- ²⁷Most Christians wrongly believe that monism simply entails stripping away all spirituality, and the existence of God and angels, from one’s account of life and the universe, leaving only the “material.” Numerous atheists attempt to support or even prove their atheism with materialism, but this is a logical error. An atheist worldview cannot be confirmed or denied by scientific inquiry. However, although materialism does not require atheism, it does seem that atheism, as formulated by modern scientists, does require materialism. A lack of clear thinking about the one-way dependence leads many Christians to assume that no physicalist or materialist account of the world, or of humankind, can be properly Christian. For a documentation of this, see Karl Giberson and Mariano Artigas, *Oracles of Science: Celebrity Scientists versus God and Religion* (Oxford: Oxford University Press, 2007).
- ²⁸Nancey Murphy, “Nonreductive Physicalism,” in *In Search of the Soul: Four Views of the Mind-Body Problem*, ed. Green and Palmer, 115–38.
- ²⁹*Ibid.*, 116.
- ³⁰*Ibid.*
- ³¹*Ibid.*
- ³²*Ibid.*, 132.
- ³³Nancey Murphy and Warren S. Brown, *Did My Neurons Make Me Do It?* (Oxford: Oxford University Press, 2007). See especially pages 8–10.
- ³⁴Timothy O’Connor, “Causality, Mind and Free Will,” in *Soul, Body, and Survival: Essays on the Metaphysics of Human Persons*, ed. Kevin Corcoran (Ithaca: Cornell University Press, 2001), 51.
- ³⁵Timothy O’Connor, *Persons and Causes: The Metaphysics of Free Will* (New York: Oxford University Press, 2000), 110.
- ³⁶Kevin Corcoran, *Rethinking Human Nature: A Christian Materialist Alternative to the Soul* (Grand Rapids, MI: Baker Academic, 2006), 121–2.
- ³⁷Kevin Corcoran, “Physical Persons and Postmortem Survival without Temporal Gaps,” in *Soul, Body, and Survival*, ed. Corcoran, 201–17.
- ³⁸Corcoran, *Rethinking Human Nature*, especially chapter 5, 119–34.
- ³⁹Cooper, *Body, Soul, and Life Everlasting*, 174–9.
- ⁴⁰Corcoran, *Rethinking Human Nature*, 119–34.
- ⁴¹Cooper, *Body, Soul, and Life Everlasting*, 155–63.
- ⁴²Linda L. Belleville, *2 Corinthians*, The IVP New Testament Commentary Series (Downers Grove, IL: InterVarsity Press, 1996), 129–44; Jerry Sumney, “Post-mortem Existence and Resurrection of the Body in Paul,” *Horizons in Biblical Theology* 31, no. 1 (2009): 12–26; Murray Harris, “Resurrection and Immortality: Eight Theses,” *Themelios* 1, no. 2 (1976): 50–5.
- ⁴³Belleville, *2 Corinthians*, 131. Belleville notes that Paul’s language in 2 Cor. 5:1–10 suggests that Paul is also combating some form of Greek dualism, where immortality is viewed as the shedding of the physical body at death and the persistence of the soul beyond the grave.
- ⁴⁴*Ibid.*, 134. Also, Hafemann notes that even scholars that argue Paul is referring to the intermediate state are split, with some believing that the “building from God” is a covering to keep one from being found naked in the intermediate state. Thus even some who believe in the intermediate state, believe humans will be embodied therein. See Scott J. Hafemann, *2 Corinthians*, The NIV Application Commentary (Grand Rapids, MI: Zondervan, 2000), 208.
- ⁴⁵Cooper, *Body, Soul, and Life Everlasting*, 220–1.
- ⁴⁶Corcoran, *Rethinking Human Nature*, 65–82.
- ⁴⁷For example, see J. J. Diamond, “Abortion, Animation and Biological Hominization,” *Theological Studies* 36 (1975): 305–24; R. G. Edwards, “Test-Tube Babies: The Ethical Debate,” *The Listener* 27 (1983): 12; both as cited in Norman Ford, *When Did I Begin? Conception of the Human Individual in History, Philosophy and Science* (Cambridge: Cambridge University Press, 1988), 111; C. Munthe, “Divisibility and the Moral Status of Embryos,” *Bioethics* 15, no. 5-6 (2001): 382–97.
- ⁴⁸Joseph Donceel, “Immediate Animation and Delayed Animation,” *Theological Studies* 31, no. 1 (1970): 76–105.
- ⁴⁹*Ibid.*, 98.
- ⁵⁰Moreland and Rae, *Body and Soul: Human Nature and the Crisis in Ethics*, 218–24.
- ⁵¹O. Bomsel-Helmreich and W. Al Mufti, “The Phenomenon of Monozygosity: Spontaneous Zygotic Splitting,” in *Multiple Pregnancy: Epidemiology, Gestation, and Perinatal Outcome*, 2nd ed., ed. I. Blickstein and L. G. Keith (Boca Raton, FL: Taylor & Francis, 2006), 94–101.
- ⁵²In objecting to an interventionist model, we are not deists. We believe, however, that God ensouls a human being, that ensouling action is no more nor less miraculous, no more nor less a direct work of God, than a book falling under the influence of gravity when dropped. Thus we are objecting

Article

Relating Body and Soul: Insights from Development and Neurobiology

to how differently Moreland and Rae seem to regard God's ensouling work versus God's work in maintaining the physical universe (e.g., gravitation).

⁵³John Walton, *Genesis: From Biblical Text ... to Contemporary Life* (Grand Rapids, MI: Zondervan, 2001). Walton warns that one ought not think of the natural universe as running on principles and not the constant upholding power of God (p. 46). Thus, whenever one speaks of God "intervening" (e.g., to create a soul as a separate act from creating a person or a body), one is assuming a deist understanding of the "natural" world, but then supposing certain "supernatural" interventions.

⁵⁴For example, chimeric mice have been used for research purposes since first generated in a lab in the 1960s. The first human chimera was discovered in 1962, and over thirty cases have since been reported. See P. P. Tam and J. Rossant, "Mouse Embryonic Chimeras: Tools for Studying Mammalian Development," *Development* 130, no. 25 (2003): 6155-63; S. M. Gartler, S. H. Waxman, and E. Giblett, "An XX/XY Human Hermaphrodite Resulting from Double Fertilization," *Proceedings of the National Academy of Sciences of the United States of America* 48, no. 3 (1962): 332-5; For a description of other more recent discoveries of human chimeras, see V. Malan, M. Vekemans, and C. Turleau, "Chimera and Other Fertilization Errors," *Clinical Genetics* 70 (2006): 363-73.

⁵⁵Neng Yu, Margot S. Kruskall, Juan J. Yunis et al., "Disputed Maternity Leading to Identification of Tetragametic Chimerism," *New England Journal of Medicine* 346 (2002): 1545-52.

⁵⁶Malan, Vekemans, and Turleau, "Chimera and Other Fertilization Errors."

⁵⁷Donald R. Griffin and Gayle B. Speck, "New Evidence of Animal Consciousness," *Animal Cognition* 7 (2004): 5-18.

⁵⁸Ibid.

⁵⁹Ibid.

⁶⁰Ibid., 12.

⁶¹Green, *Body, Soul, and Human Life*, 78.

⁶²See Hasker, "On Behalf of Emergent Dualism," in *In Search of the Soul: Four Views of the Mind-Body Problem*, ed. Green and Palmer, 75-114.

⁶³Swinburne, *The Evolution of the Soul*, 180-96.

⁶⁴For a persuasive argument from a different perspective that these qualities may be sufficient to qualify humans as being made in God's image, see H. D. Bouma, D. Diekema, E. Langerak, T. Rottman, and A. Verhey, "Imaging God in Sickness and in Health," in *Christian Faith, Health and Medical Practices* (Grand Rapids, MI: Eerdmans, 1989), 27-66. For a biblical studies perspective, see J. Richard Middleton, *The Liberating Image: The Imago Dei in Genesis 1* (Grand Rapids, MI: Brazos Press, 2005).

⁶⁵For example, see Malcolm Jeeves, "Brain, Mind, and Behavior," in *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature*, ed. Warren Brown, Nancey Murphy, and H. Newton Malony (Minneapolis, MN: Fortress Press, 1998), 73-97; —, "Changing Portraits of Human Nature," *Science and Christian Belief* 14 (2002): 3-32; —, "Neuroscience, Evolutionary Psychology, and the Image of God," *Perspectives on Science and Christian Faith* 57, no. 3 (2005): 170-86.

⁶⁶Jeeves, "Neuroscience, Evolutionary Psychology, and the Image of God," 174.

⁶⁷Ibid.

⁶⁸Ibid., 175.

⁶⁹Ibid.

⁷⁰Donald M. MacKay, "Brain Research and Human Responsibility," in *Psychology and the Christian Faith*, ed. Stanton L. Jones (Grand Rapids, MI: Baker, 1986), 38-45.

⁷¹For example, see John C. Eccles, *Evolution of the Brain: Creation of the Self* (London: Routledge, 1989).

⁷²Kevin J. Corcoran, *Rethinking Human Nature: A Christian Materialist Alternative to the Soul* (Grand Rapids, MI: Baker Academic, 2006), 70-3.

⁷³D. G. Williams, "Religion, Beliefs about Human Life, and the Abortion Decision," *Review of Religious Research* 24, no. 1 (1982): 40-8.

⁷⁴Kevin J. Corcoran, "The Constitution View of Persons," in *In Search of the Soul: Four Views of the Mind-Body Problem*, ed. Green and Palmer, 174. Also, Corcoran suggests that it is not the doctrine of the soul that protects sanctity of life, but the doctrines of creation, the incarnation, and resurrection that do so. See Corcoran, *Rethinking Human Nature*, 95-8.

⁷⁵Corcoran, "The Constitution View of Persons," 173.

⁷⁶Joshua D. Greene, "Social Neuroscience and the Soul's Last Stand," in *Social Neuroscience: Toward Understanding the Underpinnings of the Social Mind*, ed. A. Todorov, S. Fiske, and D. Prentice (New York: Oxford University Press, 2011), 263-73.

⁷⁷K. Andrews, L. Murphy, R. Munday, and C. Littlewood, "Misdiagnosis of the Vegetative State: Retrospective Study in a Rehabilitation Unit," *British Medical Journal* 313 (1996): 13-6.

⁷⁸Mary-Paula Walsh, *Feminism and Christian Tradition: An Annotated Bibliography and Critical Introduction to the Literature* (Westport, CT: Greenwood Press, 1999). This is a very detailed text with annotated references to several hundred sources on Christian feminism. Chapters 5, 6, and 7 provide historical overviews of different periods of the development of feminist theology (1968-1977, 1978-1985, and 1986-1996, respectively) and these chapters (among others) provide many annotated citations that clearly represent the feminist viewpoint that certain forms of Christian praxis, even some which are considered orthodox, bear much of the blame for gender inequality.

⁷⁹M. E. L. Hall, "What Are Bodies For? An Integrative Examination of Embodiment," *Christian Scholar's Review* 39, no. 2 (2010): 159-76.

⁸⁰Thomas Campbell, "Asceticism," in *The Catholic Encyclopedia*, vol. 1 (New York: Robert Appleton Company, 1907), <http://www.newadvent.org/cathen/01767c.htm>.

⁸¹One example from the early church fathers that suggests an overly harsh response to sensuality and a fear-based discrimination against women is found in the writings of Tertullian (ca. CE 160-225; as cited by Sarah Sumner, *Men and Women in the Church* [Downers Grove, IL: InterVarsity Press, 2003], 40-1):

And do you not know that you are (each) an Eve? The sentence of God on this sex of yours lives in this age: the guilt must of necessity live too. You are the devil's gateway: you are the unsealer of that (forbidden) tree: you are the first deserter of the divine law: you are she who persuaded him whom the devil was not valiant enough to attack. You

destroyed so easily God's image, man. On account of your desert—this is, death—even the Son of God had to die. And you think about adorning yourself over and above your "tunics of skin"?

Clark (E. A. Clark, "Reading Asceticism: Exegetical Strategies in the Early Christian Rhetoric of Renunciation," *Biblical Interpretation* 5, no. 1 [1997]: 82–104), in describing exegetical strategies of several church fathers, documents that Origen (ca. CE 185–254), John Chrysostom (ca. CE 347–407), and Jerome (ca. CE 347–420), though they differed from one another, all took a dim view of sexuality, even within marriage, and of women generally.

⁸²Clark, "Reading Asceticism: Exegetical Strategies in the Early Christian Rhetoric of Renunciation," 82–104.

⁸³*The Oxford Dictionary of the Christian Church*, ed. F. L. Cross and E. A. Livingstone (New York: Oxford University Press, 1997), s.v. "Asceticism," 113–4.

⁸⁴Gail Corrington, "Anorexia, Asceticism, and Autonomy: Self-Control as Liberation and Transcendence," *Journal of Feminist Studies in Religion* 2, no. 2 (1986): 51–61.

⁸⁵W. S. Sabom, "The Gnostic World of Anorexia Nervosa," *Journal of Psychology and Theology* 13, no. 4 (1985): 243.

⁸⁶*Ibid.*, 251.

⁸⁷Caroline Giles Banks, "'There is No Fat in Heaven': Religious Asceticism and the Meaning of Anorexia Nervosa," *Ethos* 24, no. 1 (1996): 107–35.

⁸⁸*Ibid.*, 120.

⁸⁹Corrington, "Anorexia, Asceticism, and Autonomy," 52.

⁹⁰Tokunboh Adeyemo, "A Critical Evaluation of Contemporary Perspectives," in *In Word and Deed*, ed. Bruce J. Nicholls (Grand Rapids, MI: Eerdmans, 1985), 47.

⁹¹*Ibid.*, 47.

⁹²C. René Padilla, "Holistic Mission," in *Lausanne Committee 2004 Forum for World Evangelization*, Occasional Paper 33 (2005): 16, http://www.lausanne.org/docs/2004forum/LOP33_IG4.pdf.

⁹³Bong R. Ro, "The Perspective of Church History from New Testament Times to 1960," in *In Word and Deed*, ed. Nicholls, 11–40.

⁹⁴*Ibid.*, 32.

⁹⁵Vinay Samuel and Chris Sugden, "Evangelism and Social Responsibility: A Biblical Study on Priorities," in *In Word and Deed*, ed. Nicholls, 195.

⁹⁶*Ibid.*

⁹⁷Padilla, "Holistic Mission," 15.

ASA Members: Submit comments and questions on this article at www.asa3.org → FORUMS → PSCF DISCUSSION.

CHRISTIANITY AND THE SCIENTIFIC REVOLUTION

A workshop preceding the 2012 ASA Annual Meeting

Featured Speaker: Edward B. ("Ted") Davis

Point Loma Nazarene University

San Diego, CA

Friday, July 20, 2012, 8:30 am–Noon

The workshop consists of two lectures given by Ted Davis. They cover key aspects of Christianity and the Scientific Revolution of the sixteenth and seventeenth centuries. Each lecture includes time for Q&A. Participants will receive digital copies of the slides. Register at www.asa3.org.

8:30–10:00 am: "Christianity, the New World Picture, and the New World View." Davis begins by explaining the new world picture of Copernicus, which put the earth into motion around the stationary sun. The acceptance of the new astronomy led to a new view of the relationship between science and religion. At the same time, religious attitudes and beliefs were important to the publication of Copernicus's work and its eager acceptance by Johannes Kepler. Another fundamental feature of the Scientific Revolution was a new world. Many came to see nature as a vast, impersonal machine—a view known as the mechanical philosophy. Although this new worldview challenged traditional views of divine action and is often associated with deism, its most outspoken advocate, Robert Boyle, was a deeply pious Christian. Boyle believed that the mechanical philosophy was both scientifically and theologically superior to the older worldview, in which "Nature" was equivalent to a pagan goddess.

10:30–noon: "Christianity and New Views of Knowledge." The Scientific Revolution also involved new views of scientific knowledge. Instead of coming from ancient books, knowledge should come directly from the divinely authored "book of nature." In addition, scientific knowledge is progressive, useful for improving the fallen human condition, and—above all—helpful for praising God. Modern scientists study nature using a combination of reason and experience, an approach that came together during the Scientific Revolution. Davis shows how this attitude toward nature was closely linked with Christian theological beliefs about God, nature, the Fall, and the human mind.



Ted Davis

Edward B. Davis (PhD, History and Philosophy of Science, Indiana University) is Professor of the History of Science at Messiah College, where he teaches courses on historical and contemporary aspects of Christianity and science. Best known for studies of Robert Boyle, Davis edited (with Michael Hunter) *The Works of Robert Boyle*, 14 vols. (Pickering & Chatto, 1999–2000), and a separate edition of Boyle's profound treatise on the mechanical philosophy and the doctrine of creation, *A Free Enquiry into the Vulgarly Received Notion of Nature* (Cambridge University Press, 1996). His current research, supported by the National Science Foundation and the John Templeton Foundation, examines the religious lives and beliefs of prominent American scientists in the 1920s. He has published several articles about this project, including one in *American Scientist* (May–June 2005) and a 3-part study of Nobel laureate Arthur Holly Compton in *PSCF* from June to December 2009.