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Article

Human Evolution and a Cultural Understanding of Original Sin

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In this article we explore the interface between new theories of human evolution and a cultural understanding of original sin. According to recent theories developed in evolutionary biology, the human being is essentially a “cultured” being with the ability to live in different environments. This is a crucial difference between humans and other species, including other primates. Humans are thus necessarily dependent on socialization by their community. As a result, both the creative insights and shortcomings of human individuals are instilled in their descendants. This article explores whether, and if so how, this can contribute to our understanding of the propagation of sin through the human population. In doing so it becomes clear that while new scientific views concerning the development of the human species do raise problems for Christian theology, they also allow for new creative explorations that may deepen our understanding of classic doctrines.

Many people, both Christians and non-Christians, perceive the relationship between the Christian faith and science as a one-directional retreat. Science is seen as putting faith under ever-increasing pressure, and the Christian faith is seen as increasingly incompatible with science, to such an extent that, for many people, it is no longer worth considering. In practice the picture is much more nuanced, not only because the Christian faith is continually being reinterpreted, but also because the world of science is constantly changing.

Science does not progress simply by adding new insights to what has already been acquired, but also by replacing older theories with newer ones that appear to be more consonant with reality. These

newer theories may pose fresh challenges to the Christian faith, but it may also be the case that they remove earlier challenges or allow for new creative interactions. An example of the former would be the theory of the Big Bang that removed the challenge of the universe being seen as eternal in both Aristotelian and Newtonian science. An example of new opportunities for creative interaction can be found in the discovery of the so-called fine-tuning of the universe¹ or in the unpredictability of complex dynamical systems, which allows for new ways of conceiving human and divine action in a world that formerly seemed to be governed by “Newton’s rigidly deterministic account” of the natural world.²

Scientific theories concerning the evolution of the human species have presented major challenges for Christian understandings of original sin. It has become harder to hypothesize and locate a single first human couple. There is, furthermore, strong evidence that human beings have inherited a significant part of their—apparently flawed—physical and

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psychological make-up from prehuman ancestors. However, in this article we want to argue that, in other respects, newer insights into the evolution and characteristics of the human species are more favorable to the doctrine of original sin and may allow for a creative and constructive interaction with theology. In particular, we argue that the way in which theories concerning the development of the human species have been undermining the “nature-culture” dichotomy, provides new insights into how we may understand the unity of the human race, which is presupposed in the doctrine of original sin.

The unity of the human race is a crucial element of the doctrine of original sin. In technical language this is referred to as the *peccatum originale originatum* or “originated original sin.” Why is it that the consequences of the sins of human individuals are determinative for their offspring, so much so that sin becomes their “second nature”?³ Traditionally, the most common answers come from Augustine and Calvin. In the Augustinian tradition, humanity is seen as a metaphysical unity. The position is sometimes called “realist” in that every future human being was in a real sense present in Adam. When Adam fell, human nature itself fell with him. The Calvinist tradition sees the unity of the human race in sin as a “federal” or covenantal unity: Adam was the covenant head, the covenantal or legal representative of the human race, and therefore God accounts (or imputes) Adam’s sin to all of his offspring.

Both of these positions have been confronted with the problem of theodicy, as is shown by Gerrit C. Berkouwer.⁴ How can a just God attribute the sin of the first couple to all their offspring? The doctrine of the federal imputation of sin seems to contradict the principle in Ezekiel 18:20 that one can only be culpable for one’s own sin and not for the sin of one’s parents.⁵ Even if the question regarding the justice of God can be sufficiently answered or put aside, the question still remains concerning the reason for this imputation: why would a good God have chosen to do so?⁶ The realist understanding of the unity of the human race answers the question by responding that sin is not imputed, because the sin of Adam was our own sin: we were in Adam or “in the loins of Adam.” In a certain sense, this does not answer the question, but simply asserts that there is an answer by stating that we were in Adam, which still raises the question of the goodness of God as Creator: why did God create the world in such a way that the

sin of one human being became the sin of all God’s descendants?

In this article, we intend to show that newer evolutionary understandings of human nature, which see the development of nature and culture as “symbiotic,”⁷ provide the basis for a new understanding of the human race, an understanding that shows the powerful nature of inherited sin yet maintains the goodness of creation. It therefore avoids both the semi-Pelagian tendencies of older theories of the cultural inheritance of original sin and Manichean tendencies because it maintains that our sinfulness is a “second nature,” but not an inherent part of who we are. This understanding also has consequences for the question of theodicy as it relates to original sin, because it shows that the inheritance of sin is intrinsically bound up with the way God in his goodness created us as “co-creators”⁸ and in his image.

There are a number of other issues that are important when considering the doctrine of original sin in the light of modern theories of human evolution that this article will not address. For example, it does not address the issue of how sin came into the world (the *peccatum originale originans* or “originating original sin”). Yet the insights elaborated here are compatible with a number of scenarios, such as the traditional belief that sin came into the world through the fall of an Adamic head of a first undivided human community, a scenario involving a gradual development of sin, or a scenario involving parallel “falls” in different parts of the inhabited world.⁹

The science of human evolution is developing rapidly for a number of reasons, including the use of DNA mapping of populations, the comparison of human DNA with the DNA of near cousins in the evolutionary tree, and, even more recently, the comparison of human DNA with paleo-DNA from Neanderthals and other related *Homo* species.¹⁰ Another crucial field is the study of cognitive science and the extrapolation of contemporary data—often necessarily speculative—into evolutionary history. Because of these rapid developments, it would be unwise to expect too much from or be too worried about specific developments before the field settles. For now, these reflections are therefore tentative and explorative. My amateur opinion, however, is that the understanding of the evolution of the human species as a “symbiosis” or “coevolution”¹¹ of genes and culture is here to stay.

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The argument of this article presupposes a methodological distinction developed elsewhere between “doctrine” and “theological theory.”¹² The doctrine that we inherit a sinful “nature” from birth does not depend on specific theological theories such as the realist or federal understanding of the unity of the human race. We intend to show here that the essential elements of the doctrine of original sin may be better expressed and understood with the help of a different theoretical framework: the theory of cultural transmission. In the light of this distinction between doctrine and theological theory, it is revealing that the sixteenth-century Lutheran and Reformed confessional texts contain strong pronouncements on the radicalism and universal spread of original sin, but are virtually silent on the doctrinal theories that might support such pronouncements. They do not, for example, pronounce for or against federalism or realism, and they do not explicate the relationship between original guilt and original corruption, which played a major role in the discussions concerning the appropriate theological explanation of original sin.¹³

The Human Being as a Cultural Animal

As indicated previously, one of the decisive developments in newer theories of human evolution is the breaking down of “the modernist rupture of nature and culture.”¹⁴ Biologists no longer conceive of a finished *Homo sapiens* at the conclusion of a long process of biological evolution who subsequently started developing culture. Such a being would not be able to survive. On a purely physical level, the human species is a “Mängelwesen,”¹⁵ a needy being, that is much less well equipped to survive in a harsh natural environment than other species: humans have no fangs, are not well equipped to flee predators, and have no thick fur to protect them from the elements. Although humankind lives in many different habitats, it is not particularly well adapted to any of these, unlike other plant and animal species that are.

Humankind is therefore able to survive only with a certain degree of culture. They need a high level of social collaboration that goes beyond helping those who have identical or almost identical genes;¹⁶ they need to develop tools, hunting weapons, and protection from the elements so that they can compensate for their lack of biological adaptation. The specific biological form of the modern human being

must therefore have coevolved with culture: as the brain gradually evolved the ability to use tools, language, and culture, it became through the same process highly dependent on this culture for its own survival.¹⁷

Ralph Wendell Burhoe has proposed “symbiosis” as a model for understanding how the genetic makeup of the human species became uniquely adapted to living in a cultural environment.¹⁸ He uses the example of the evolution of social termites with that of the species of flagellate protozoa that live in their intestines. Both species are highly adapted to each other and have evolved together to such a point that their existence depends on this symbiosis. Burhoe proposes that one might conceive of human beings living together in culturally shaped social communities as new “super organisms” or “societal organisms” that develop in their own manner, in which the relevant information is no longer transmitted through genes but through cultural memory.¹⁹ These societal organisms do obviously depend on the existence of the genetically coded human species, but the human species, in turn, has developed genetically in such a way that it can only survive—let alone prosper and continue to develop—if it lives as part of a human society with a developed culture. The genetic code of the human species develops not only in symbiosis with the genetic codes of other species (such as domesticated cereals and livestock) but also in symbiosis with this “societal organism.” Human culture is therefore itself a biological phenomenon and one of the outcomes of biological evolution—which is, of course, something entirely different from saying that cultural processes can be reduced to biological processes.

This unique evolutionary development, therefore, produced one unique biological species that is capable of the development of culture:

... human beings are possessed of *two* major information systems, one genetic, and one cultural. It forcefully reminds us that *both* of these systems have potential for transmission or “inheritance” across space and time, that *both* have profound effects on the behavior of the organism, and that *both* are simultaneously co-resident in each and every human being.²⁰

Biologists have, of course, pointed to many phenomena in the nonhuman animal world that resemble human culture and seem to undercut the uniqueness of humankind as a creator of cultures: chimpanzees

use tools, many animals engage in complex social interaction, and a number of species have manners of communication that we may call “languages.” One answer to this challenge would simply be to indicate the sheer scale of the difference between these species and the enormous quantitative extent to which humans have developed tools, language, and social interaction. This quantitative difference might itself be sufficient to put the human species in a special category. The difference, however, in all probability runs more deeply. Let me, in this respect, point to three studies that give overviews of the differences between human culture and culture-like expressions in other animal species.

Terrence W. Deacon has analyzed the specific character of human language and the coevolution of language and the brain.²¹ He compares human language with similar phenomena in the nonhuman world such as the honey bee recruitment dance, the humpback whale song, and vervet monkey alarm calls. He concludes that these do not even constitute a “simple language” in comparison to human languages, because these languages do not constitute a “symbolic” universe, not even in its simplest form.²² Human languages do not simply express inner feelings or refer directly to certain outer events or realities (as in the call of vervet monkeys), but they create a symbolic universe in which different words become symbols that gain meaning in relation to each other and not just in relation to a nonlinguistic reality. In this sense, human language represents a tool that allows its users to organize and interpret the world in different ways and to transmit this interpretation or organization of the world to their offspring.

The nearest example Deacon provides of the understanding of “symbols” in this technical sense comes from a study of chimpanzees recorded by Sue Savage-Rumbaugh and Duane Rumbaugh.²³ The chimpanzees, Sherman and Austin, were able to cross what Deacon calls the “symbolic threshold,” yet the experiment also shows how laborious and difficult it was and suggests that even this small step across the threshold might have never been possible without elaborate training by humans who are already a “symbolic species.”

The second difference between human culture and nonhuman approximations of culture is brought out in a comparative study by Michael Tomasello at the Max Planck Institute for Evolutionary

Anthropology.²⁴ After comparing a number of studies of learning and culture among monkeys and primates, he concludes that human learning has a different character, because it allows for cultural learning, namely, for the transmission of culture from one generation to another. Animals do learn from “cultural” practices that are shared in their community (such as potato washing in certain groups of macaques or the use of sticks to retrieve ants from ant holes, in particular, in chimpanzee populations), but this probably occurs through a process that Tomasello and his colleagues call “emulation learning”: it is by looking at what their group members do that they discover, by themselves, individually, how these tools can be used. This may happen because they are simply attracted to a place where such practices can be discovered or possibly by understanding the intentions of their fellow group members. This is different from the “imitation learning” by human children in which practices are transmitted that are “opaque” in the sense that their practical value is not immediately clear.²⁵ This allows for a unique form of cultural progress because of the “ratchet effect”²⁶ in which cultural gains can be transmitted and thereby elaborated upon by later generations.²⁷ Tomasello estimates that the genetic difference between modern humans and their genetic ancestors may have been very small, but that this small change had far-reaching implications because it allowed for a new way of progressive learning and cultural adaptation.

A third difference may still need more research, but important comparative studies between human children and other primates suggest that the human species is “ultra-social.”²⁸ “[N]on-human primate (and other animal) culture is essentially individualistic, or maybe even exploitative.”²⁹ Only the human species has motivations and skills for “shared intentionality”—that is, humans will engage jointly in collaborative projects in which different individuals may be assigned different roles.³⁰

A different strand of research that underlines the crucial role of culture in human evolution is the study of the role of so-called “niche construction” in the evolutionary process.³¹ Different species do not just adapt to their environment through random genetic mutation and natural selection, as in “standard evolutionary theory.” Kevin Laland and others have argued about the need for an “extended evolutionary synthesis” in which other factors are considered essential for explaining the evolutionary process. A

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crucial element of this “extended evolutionary synthesis” is the role of niche construction. Species not only adapt to their environment, but they also adapt their environment through niche construction or “ecosystem engineering.” Well-known examples are earthworms, which change the soil structure, and beavers, which build dams altering the water systems in their habitat. These changes do not impact individuals and groups alone; they also influence habitats across generations.³² These newly formed habitats consequently form a new environmental factor that can feed back into the genetic development of species.

Niche construction is, therefore, far from unique to humans, but human niche construction has unique traits. The human ability to adapt the environment is not only passed on genetically, but also by cultural transmission.³³ This may strongly increase the speed of evolutionary development, given that cultural changes can happen at a much higher speed than genetic changes.³⁴ It also means that the human species can adapt to extremely different environments, from the arctic to the semi-desert and from atolls to rainforests. While their adaptability is mainly determined by cultural diversity and hardly or not at all by genetic variation, they do adapt to these environments to a significant extent by adapting the environments to themselves: by constructing igloos and pile-dwellings and by constructing rice paddies and fences to keep roaming predators out.³⁵

Human biological existence is therefore cultural through and through. “Nature and culture act as a synergy. If the human is like cake, culture is like the eggs, not like the icing—it is an inseparable part, not a superficial glaze.”³⁶ In the light of this, it makes sense to point with Philip Hefner to the uniqueness of the human species in theological terms as the “created co-creator”:³⁷ the God-guided evolutionary process envisaged the development of a species that is not exclusively bound by instincts, but has a certain freedom to contribute to the creation of their own environment and to the development of culture. In this way, *Homo sapiens* becomes a reflection of its Creator. Here we start using theological language that picks up elements that have long been part of theological discourse concerning the human being as created in the image of God. One prevalent interpretation specifically understands the creation of humankind in the image of God in terms of the cultural mandate: the calling to develop and care

for the earth and culture. Others may have a wider understanding of the image of God that also includes interhuman relationality and the invitation to relate to God, but that would still see the human call and ability to develop culture as a consequence and part of this broader understanding of the image of God.³⁸

Theological anthropology does not necessarily map one-to-one onto the biological sketch just given. We suppose, for example, that not every being called *Homo* in the biological sense is necessarily a human being created in the image of God in the theological sense. Something needs to be added, possibly a special act of creation, possibly an invitation and call by the Creator into the covenant that lifts this being out of its environment in another sense.³⁹ It is very hard—perhaps impossible—to determine what type of consciousness and cultural ability was needed for that to happen and when those conditions might have been in place.

The Radical Dependence of Our Species on Parents and Caregivers

In 1940, the German philosopher and sociologist Arnold Gehlen published an influential philosophical reflection on human nature in the light of then recent biological studies: *Der Mensch: Seine Natur und seine Stellung in der Welt*.⁴⁰ Gehlen understood the uniqueness of humankind with a notion he borrowed from the philosopher Max Scheler as “*Weltoffenheit*,” openness to the world.⁴¹ In this book, he already touched upon a number of themes that we have encountered in the more recent studies about the role of culture in human evolution. The human being is different from other animal species in that all others have evolved to fit into a specific environmental niche. The other animals have both the physical equipment and the instinctive drives that make them highly adapted to specific environments, be it alpine highlands or tropical savannas, swamps or pacific atolls. Humankind is different in that it is not bound to a specific environment nor instinctively programmed to one specific way of life: humans can adapt to different environments. They are open to the world. They can develop culture, but, at the same time, they depend on it. Culture is essential to their biological make-up. “*Die Kultur ist also die ‘zweite Natur.’*”⁴²

Gehlen is an interesting source for the theme of original sin in that he points to a corollary of this openness to the world. Precisely because they are

“weltoffen,” humans are *“Mängelwesen,”* “needy beings” compared to other species; they are not naturally equipped to survive in a specific environment. Compared with other mammalian species, human offspring are extraordinarily dependent on their parents. A piglet doubles its birth weight in fourteen days, a foal in sixty days, a human baby only in 180 days.⁴³ Gehlen also points to other characteristics, such as the development of teeth and the phenomenon of puberty as signs of the postponement of adulthood. Related to this is the ability of human females, in particular, to live on after they have lost their fertility, thus giving them the ability to care for their young for a long period of time. This slow physical development and long dependence on care from parents and the wider community⁴⁴ is a necessary corollary of their “openness to the world.” Precisely because human beings are dependent on culture in order to survive, they can only survive after prolonged socialization in specific cultural expressions. Humans are unique animals in that they can survive in semi-desert and arctic tundra, in fishing villages and inner cities. Yet, they cannot survive anywhere without adequate socialization. Even if there are incidental stories of lost babies being cared for by wolves, it is hard to imagine that a group of such socialized humans would be able to form a biologically viable community. In order to survive, in order to live, in order to develop, we need to be socialized in a particular culture.

A related difference between humans and other primates is visible in the process of imitative learning. Human children tend to imitate parents and teachers even if they do not understand the meaning of the actions performed, in contrast to chimpanzees who often skip actions they recognize as irrelevant for an action they want to perform.⁴⁵ This suggests that the difference between humans and other primates may not be based on humans being more intelligent.⁴⁶ The decisive difference is that humans are more collaborative and more inclined and even hardwired to follow the example of their parents and educators. They are hardwired to follow “social conventions.” “If the glue of primate societies is individual social relationships, the super glue of human societies is generalized social norms.”⁴⁷ It is precisely these social habits that allow for the transmission of “linguistic symbols and other cultural conventions whose use cannot be discovered on one’s own”⁴⁸ and that are crucial for the “ratchet effect” characteristic of human cultural progress. As Tomasello observes,

Obviously some kind of social environment is also important in the ontogeny of other primate species for developing species-typical behaviors of all kinds, and cultural transmission may even play some role as well. But for humans the species-typical social environment is an absolute necessity for youngsters to develop the cognitive skills required for survival in many very different, and sometimes harsh environments that humans inhabit.⁴⁹

This far-reaching dependence on parental and communal care can contribute significantly to our understanding of original sin. If human offspring are so dependent on socialization by their community, they will necessarily inherit both stronger and weaker aspects, both good and bad, or even detestable aspects of the culture in which they are raised. Children are hardwired to trust their educators.⁵⁰ This is precisely why parents can do so much good and so much evil in the lives of their children. Growing up as a member of the human species necessarily means being socialized in one particular cultural expression of this culture, with the good and the bad. When we transpose this analysis from a biological into a theological key, we may conclude that some form of the doctrine of original sin is a close corollary (and, given the nature of our world, a necessary corollary) of the doctrine of the creation of humankind in the image of God. For human beings to be God’s created co-creator and capable of freedom in an open relationship with the world, they are necessarily dependent on a long and intense process of cultural socialization by their parents and community. This dependence compensates for the fact that they are not physically and instinctively hardwired to fit in a particular environmental niche and allows for the cultural formation needed to live in a specific cultural niche. Yet, they therefore inherit both the good and the bad symbolic representations of the world and customs of the particular culture in which they grow up. Sinful ideas and sinful habits are necessarily transmitted from one generation to another.

Understanding Original Sin

In the last section of this article, we would like to explore some further implications of this theoretical framework for the interface between the doctrine of original sin and human evolution. It seems to us that this cultural understanding of the transmission of sin is fruitful for the theological understanding of the doctrine of original sin on at least four counts.

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In the first place, and possibly most significantly, it provides an answer to the theodicy question that has been haunting the doctrine of original sin. Why would a good God create a world in which remote ancestral sins could have such disastrous consequences for their offspring? At least part of the answer may be that inheriting sinful cultural practices is, in this world, a necessary corollary of the development of human freedom, of the greatness of humankind as created in the image of God as God's created co-creator. It may even be the case that it is a necessary corollary of the other crucial aspect of human freedom: the ability to freely relate to the Creator himself and freely respond to God's offer of love. One may, of course, wonder whether God might not have created a world that did not have this characteristic, but it is clear that such a world would be very different from the world in which we live. God could not just change the inheritance factor while keeping the rest of the world as we know it intact. Such a world would be so different that the question whether such a world would be a better one might be impossible to answer from our finite creaturely perspectives. Furthermore, in such a world human beings would have radically different identities. Can I rationally wish for a world in which I myself with my current identity would not exist?⁵¹

This understanding of the doctrine of original sin therefore implies a particular stance in a longstanding debate in the Reformed tradition concerning the relationship between original guilt and original corruption. Are all human beings corrupted as a consequence of the "immediate" imputation of Adam's sin to his offspring as in the scholastic Reformed tradition that originated with Théodore de Bèze, 1519–1605? Or is Adam's guilt "mediately" imputed to Adam's offspring because of their own sins which are unavoidable because of the inheritance of Adam's corrupted nature as in Josué de La Place, c. 1596–c. 1655, and the seventeenth-century theology from Saumur, and probably from John Calvin and Jonathan Edwards?⁵² The cultural inheritance theory would most naturally be linked to the latter position. The wider theological arguments surrounding this debate are outside the scope of this article.

In the second place, the coevolution of culture and the human biological constitution does allow for an understanding of how sinning can become "second nature" for all human beings, while maintaining that it is not part of God's good creation. Human beings

are necessarily cultural and therefore exist without inheriting sinful culture from their parents, yet the concrete shape of this culture is not part of their created being. Being created as a cultural being is itself part of the greatness of what it means to be human and part of God's good creation, thus avoiding Manichaean tendencies. The cultural understanding of original sin therefore differs in important respects from the one developed by Patricia Williams. Williams explains original sin with the help of sociobiology and sees the doctrine of original sin as a theological interpretation of the biological fact that human selfishness is part of our biological inheritance and encoded in our genes inherited from a prehuman history.⁵³ The cultural inheritance approach to original sin locates sin more strongly on the cultural side of the coevolution of genes and culture, thus locating sin in human action and history rather than in what is given with creation.

More reflection is needed on the question of whether certain biological drives and instincts inherited from our prehuman past, such as the egocentric desire for survival at the expense of others, count as being sinful and are morally reprehensible. This question falls beyond the scope of this article, but two initial considerations are in order. A first consideration that needs to be taken into account with regard to this question is that the drives inherited from our prehuman past do not all point in the same direction. Some seem to hinder the development of moral attitudes; others seem to support them, such as the biological instinct to take care of our offspring and of other group members, which may play a role in the development of altruism.

A second consideration relates to the moral nature of these biological drives. The intrinsic fallibility of our drives does not yet count as sin. Karl Rahner's distinction between different aspects of the theological notion of "concupiscence" is helpful. The fundamental desires that are part of our human history are not in themselves sinful, even if they need to be "mastered" in order to prevent them from leading us into sin. These biological drives only become sinful when they become integrated in a personal response to a God-given moral order.⁵⁴ It is the integration of these desires in a life characterized by a sinful rejection of God that makes them count as sin, and the solidification and accumulation of this rejection in human cultural history that counts as original sin.⁵⁵

In the third place, this understanding of original sin answers the constant worry about older formulations of original sin involving imitation or cultural transmission that have been associated with Pelagius and later forms of semi-Pelagianism. This view has, in various ways, been condemned by the orthodox tradition, because it does not take seriously the fact that we are not just free imitators, but that humankind is enslaved to sin, bound by sin. "Original sin is transmitted with human nature, 'by propagation, not by imitation.'"⁵⁶ In these newer understandings, cultural transmission does not happen by simple imitation. Human beings are entirely dependent on cultural socialization by and in the communities in which they grow up and are therefore indeed enslaved to these cultural forms.

On the one hand, this approach to original sin does justice to the fact that sin, in general, and original sin, in particular, is not only a qualification of personal choices and personal attitudes. Sin is also an aspect of cultures and societies that enslave individuals. Sin has a structural component. Yet, at the same time, it would be superficial to understand sin as primarily located in cultures and societal structures of which individuals are merely victims. Because human beings are socialized into the cultural value system of their community, they assimilate this sin into their very being, which only exists as a symbiosis of nature and nurture. It is anchored in their fundamental outlook on life (the way they symbolically organize reality), in the way they structure their deepest desires, and in the way they develop their characters.

Culture, however, is not simply an evil straightjacket in which we are trapped. On the one hand, every particular culture in which people find themselves, in this age, is a deeply interwoven tapestry of both good and evil.⁵⁷ We inherit both great gifts and important weaknesses, both evil inclinations and restraining strictures from our cultural ancestors. This is the complex reality from which the theological questions surrounding "Christ and culture" issue and with which the question of cultural contextualization deals. On the other hand, every particular culture is, again, in different forms, a mixture of both bondage and freedom, of both limitations and opportunity.⁵⁸ In concrete culturally shaped communities, individuals always have varying degrees of freedom and independence to choose from the different traditions at hand which allow for creative innovation. This is

what allows for cultural development, for good and for evil. The doctrine of original sin does not mean that human beings have no freedom whatsoever and that nothing good is left in the nature-culture continuum. It does mean, however, that left to their own devices and apart from grace, human beings will not be able to develop healthy cultures that allow any individual, let alone all, to fully flourish and embrace the love of their Creator.

In the light of the questions that have recently been raised at the interface of human evolution and the doctrine of original sin, this theory of cultural transmission has, in the fourth place, the advantage in that it allows for a transmission of sin that moves both downward through the generations and sideways through human communities. This is important given the strong scientific evidence that there never was a single human pair from whom all current human beings are descended. Extrapolation from the DNA in the current human population suggests that there was a population bottleneck of at least ten thousand individuals.⁵⁹ How might a first sin in such a community be decisive for the entire human population so that all came to share in the consequences of this first sin? This is a particular problem for the realist understanding of the propagation of sin, since all human descendants can no longer be supposed to share their sinful nature with the first human being in the realist sense that all Adam's descendants were "in his loins" and therefore fell with him. In this respect, both federalism and the cultural model for the human race have an advantage, because they allow for the propagation of sin both vertically and horizontally through the human community. One might conceive of a first individual or couple of a broader human population who became aware of God's calling and were therefore, by definition, the first who could be called "human" in the theological sense. They were therefore, by definition, the first human beings who *could* sin⁶⁰ and from them a sinful attitude to life spread out both vertically and horizontally, potentially together with the consciousness of God, so that for all others—apart from this first person, couple, or community—consciousness of God was from the very first instance tainted by a consciousness of sin and guilt.⁶¹

Conclusion

Given both the recentness and the speed of new discoveries and theories in human evolution and the

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profound questions they raise for the doctrine of original sin, it is too early and would be unwise to settle on the “best” theological theory that helps us understand the doctrine of original sin in the light of these discoveries and theories. This engagement will raise major issues, and patience may be a crucial theological virtue in addressing them. This article has, however, intended to show that this engagement should not be conceived only in terms of a one-directional development that puts traditional doctrines under increasing pressure. These developments will also allow for new creative insights and engagement. In particular, we have argued that the new understanding concerning the coevolution of genes and culture allows for new insights into the doctrine of original sin, primarily by strengthening an older so-called cultural understanding of the unity of humankind presupposed in the doctrine of original sin.⁶² ❀

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Notes

- ¹Alister E. McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology*; The 2009 Gifford Lectures (Louisville, KY: Westminster John Knox Press, 2009).
- ²John Polkinghorne, *Science and Providence: God’s Interaction with the World* (London: SPCK, 1989), 28–30.
- ³John Calvin, *Institutes of the Christian Religion*, 2 vols., trans. Henry Beveridge (1559; Grand Rapids, MI: Eerdmans, 1983), 2.2.11.
- ⁴Gerrit C. Berkouwer, *De zonde II. Wezen en verbreiding der zonde. Dogmatische studiën* (Kampen: Kok, 1960), 270ff, translated as Gerrit C. Berkouwer, *Sin* (Grand Rapids, MI: Eerdmans, 1971), 424ff.
- ⁵Berkouwer, *De zonde II*, 210; and Berkouwer, *Sin*, 427.
- ⁶“[D]e zin der imputatie (van schuld)” (Berkouwer, *De zonde II*, 242) has been translated as having “the meaning of an ‘imputation of guilt’” (Berkouwer, *Sin*, 461) but can also mean “the reason for the imputation of guilt,” which adds an extra layer of meaning to the original Dutch text.
- ⁷Ralph Wendell Burhoe, “The Source of Civilization in the Natural Selection of Coadapted Information in Genes and Culture,” *Zygon* 11, no. 3 (1976): 263–303.
- ⁸Philip J. Hefner, *The Human Factor: Evolution, Culture, and Religion* (Minneapolis, MN: Fortress Press, 1993).
- ⁹For a number of scenarios, see Denis Alexander, *Creation or Evolution: Do We Have to Choose?* (Oxford: Monarch Books, 2008), 235–39; 254–56.
- ¹⁰See, for example, Dennis R. Venema, “Genesis and the Genome: Genomics Evidence for Human-Ape Common Ancestry and Ancestral Hominid Population Sizes,” *Perspectives on Science and Christian Faith* 62, no. 3 (2010):

- 166–78; and Nicolas Ray, “Les origines de l’humanité: l’apport de la génétique,” in *Adam, qui es-tu?: Perspectives bibliques et scientifiques sur l’origine de l’humanité*, ed. Lydia Jaeger (Paris: Excelsis, 2013), 89–109.
- ¹¹William H. Durham, *Coevolution: Genes, Culture, and Human Diversity* (Stanford, CA: Stanford University Press, 1991).
- ¹²Benno van den Toren, “Distinguishing Doctrine and Theological Theory: A Tool for Exploring the Interface between Science and Faith” (forthcoming); and Benno van den Toren, “Not All Doctrines Are Equal—Configuring Adam and Eve,” *BioLogos* (blog entry), February 17, 2014, <http://biologos.org/blog/not-all-doctrines-are-equalconfiguring-adam-and-eve>.
- ¹³Berkouwer, *De zonde II*, 248ff; and Berkouwer, *Sin*, 466ff.
- ¹⁴Philip J. Hefner, “Culture Is Where It Happens,” *Zygon* 40, no. 3 (2005): 523.
- ¹⁵Arnold Gehlen, *Der Mensch: Seine Natur und seine Stellung in der Welt* (1940; Wiesbaden: Akademische Verlagsgesellschaft Athenaion, 1978), 20, 33ff, translated as Arnold Gehlen, *Man, His Nature and Place in the World* (New York: Columbia University Press, 1988).
- ¹⁶Michael Tomasello, “The Ultra-Social Animal,” *European Journal of Social Psychology* 44, no. 3 (2014): 187–94; and Michael Tomasello, “Human Culture in Evolutionary Perspective,” in *Advances in Culture and Psychology*, vol. 1, ed. Michele J. Gelfand, Chi-yue Chiu, and Ying-yi Hong (New York: Oxford University Press, 2011), 6–22.
- ¹⁷Hefner, *The Human Factor*.
- ¹⁸Burhoe, “The Source of Civilization in the Natural Selection of Coadapted Information in Genes and Culture,” 276.
- ¹⁹*Ibid.*, 282.
- ²⁰William H. Durham, *Coevolution: Genes, Culture, and Human Diversity* (Stanford, CA: Stanford University Press, 1991), 9, italics added.
- ²¹Terrence William Deacon, *The Symbolic Species: The Co-evolution of Language and the Human Brain* (New York: W.W. Norton, 1997).
- ²²*Ibid.*, 39–40.
- ²³*Ibid.*, 84ff.
- ²⁴Michael Tomasello, “The Human Adaptation for Culture,” *Annual Review of Anthropology* 28 (1999): 509–29.
- ²⁵G. Gergely and G. Csibra, “Sylvia’s Recipe: The Role of Imitation and Pedagogy in the Transmission of Cultural Knowledge,” in *Roots of Human Sociality: Culture, Cognition and Interaction*, ed. Nicholas J. Enfield and Stephen C. Levinson (New York: Berg Publishers, 2006), 229–55.
- ²⁶Tomasello, “The Human Adaptation for Culture,” 512; compare Tomasello, “Human Culture in Evolutionary Perspective.”
- ²⁷Whiten et al. give an overview of recent studies in this area that suggest that the contrast between emulative learning in primates and imitative learning in human children is not as sharp as Tomasello suggested, yet these studies do not undermine the fundamental thesis that “our species has acquired more refined capacities for both higher fidelity imitation and cumulative cultural learning” (Andrew Whiten et al., “Emulation, Imitation, Over-Imitation and the Scope of Culture for Child and Chimpanzee,” *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, no. 1528 [2009]: 2427).
- ²⁸Tomasello, “The Ultra-Social Animal.”
- ²⁹Tomasello, “Human Culture in Evolutionary Perspective,” 5.
- ³⁰*Ibid.*, 6.

- ³¹Kevin Laland et al., "Does Evolutionary Theory Need a Rethink?" *Nature* 514, no. 7521 (2014): 161–64.
- ³²F. John Odling-Smee, Kevin N. Laland, and Marcus W. Feldman, *Niche Construction: The Neglected Process in Evolution* (Princeton, NJ: Princeton University Press, 2003).
- ³³K. N. Laland, J. Odling-Smee, and M. W. Feldman, "Cultural Niche Construction and Human Evolution," *Journal of Evolutionary Biology* 14, no. 1 (2001): 22–33; and Odling-Smee, Laland, and Feldman, *Niche Construction*, 239ff.
- ³⁴Laland, Odling-Smee, and Feldman, "Cultural Niche Construction and Human Evolution," 31.
- ³⁵There is, of course, a measure of genetic adaptation to different physical habitats, most visible in darker skin-color in populations living near the equator. That cultural adaptation to environments trumps genetic adaptation is apparent in the fact that people with darker skin color have moved to cooler climates and those with lighter color have moved to tropical zones, and that both groups have been able to adapt relatively easily to this new physical environment.
- ³⁶Jonathan Marks, *What It Means to Be 98% Chimpanzee: Apes, People, and Their Genes* (Berkeley, CA: University of California Press, 2003), 177.
- ³⁷Hefner, *The Human Factor*, 23ff.
- ³⁸See, for example, Henri Blocher, *In the Beginning: The Opening Chapters of Genesis* (Downers Grove, IL: InterVarsity Press, 1984), 90; and Charles Sherlock, *The Doctrine of Humanity* (Downers Grove, IL: InterVarsity Press, 1996).
- ³⁹Compare Alexander, *Creation or Evolution*, 236–37.
- ⁴⁰One reason why Gehlen has received relatively little attention in the English-speaking world may be that he was tainted by his membership in the NSDAP before the war and his opportunistic rise up the academic ladder in the place of others who lost their jobs under the Nazi government. We should be worried about some racist implications he draws from his biological observations (Gehlen, *Der Mensch*, 112–13). These do not, however, necessarily follow from these observations. If Tomasello ("The Human Adaptation for Culture") and Gergely and Csibra ("Sylvia's Recipe") are right that only a small genetic difference might have been the occasion for a radical distinction between humans and the rest of the animal world (humans' ability to develop a progressive culture), then biological differences between human races would be nonconsequential for human identity.
- ⁴¹Compare Wolfhart Pannenberg, *Anthropologie in theologischer Perspektive* (Göttingen: Vandenhoeck & Ruprecht, 1983), translated as Wolfhart Pannenberg, *Anthropology in Theological Perspective* (Philadelphia, PA: Westminster Press, 1985) for an exploration of the theological potential of this notion of "Welttoffenheit."
- ⁴²Gehlen, *Der Mensch*, 38.
- ⁴³*Ibid.*, 103.
- ⁴⁴We add "the wider community" because biological descent is not the decisive factor. Children can also be raised by adoptive parents or adoptive communities.
- ⁴⁵Andrew Whiten et al., "Imitative Learning of Artificial Fruit Processing in Children (*Homo sapiens*) and Chimpanzees (*Pan Troglodytes*)," *Journal of Comparative Psychology* 110, no. 1 (1996): 3–14; compare, Katherine Nagell, Raquel S. Olguin, and Michael Tomasello, "Processes of Social Learning in the Tool Use of Chimpanzees (*Pan Troglodytes*) and Human Children (*Homo sapiens*)," *Journal of Comparative Psychology* 107, no. 2 (1993): 174–86.
- ⁴⁶Tomasello, "Human Culture in Evolutionary Perspective," 30.
- ⁴⁷*Ibid.*, 20; compare p. 28.
- ⁴⁸*Ibid.*, 28.
- ⁴⁹*Ibid.*, 38.
- ⁵⁰Gergely and Csibra, "Sylvia's Recipe"; and Giacomo Rizzolatti, "Imitation: Mechanisms and Importance for Human Culture," *Rendiconti Lincei: Scienze Fisiche e Naturali* 25, no. 3 (2014): 285–89.
- ⁵¹The last question sharpens and reformulates the more general issue in this thesis in terms of a nonidentity theodicy as it is developed by Vincent Raphael Vitale, "Horrendous Evils and the Ethical Perfection of God" (PhD diss., University of Oxford, 2012).
- ⁵²See David Llewellyn Jenkins, *Saumur Redux: Josué de La Place and the Question of Adam's Sin* (Norfolk, VA: Leaping Cat Press, 2008).
- ⁵³Patricia A. Williams, "Sociobiology and Original Sin," *Zygon* 35, no. 4 (2000): 783–812.
- ⁵⁴Karl Rahner, "Zum theologischen Begriff der Konkupiszenz," in *Schriften zur Theologie*, vol. 1 (Einsiedeln, Zürich, Köln: Benziger, 1954), 377–414, translated as Karl Rahner, "The Theological Concept of *Concupiscentia*," in *Theological Investigations*, vol. 1 (London: Darton, Longman and Todd, 1974), 347–82.
- ⁵⁵Denis Edwards, *The God of Evolution: A Trinitarian Theology* (Mahwah, NJ: Paulist Press, 1999), 65–66.
- ⁵⁶Catholic Church, *Catechism of the Catholic Church* (New York: Doubleday, 1995), #419; compare with Williams, "Sociobiology and Original Sin," 802.
- ⁵⁷Edwards, *The God of Evolution*, 68.
- ⁵⁸Compare with Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge* (Garden City, NY: Doubleday, 1966), 69.
- ⁵⁹Venema, "Genesis and the Genome."
- ⁶⁰Keith Ward, *Religion and Human Nature* (New York: Oxford University Press, 1998), 161.
- ⁶¹This, of course, leaves the problem of how the sinfulness of such a community might spread to other humans, if there were from the very beginning human communities that lived separated from each other (as the early existence of communities in Australia suggests). In this respect, the federal approach seems to have an advantage, because God's decree is by itself considered sufficient to bind the entirety of humanity to the deed of one individual.
- ⁶²The question of original sin is also related to other doctrines, such as the doctrine of the sinlessness of Christ, which need further exploration, but fall outside the scope of this article. If original sin is inherited culturally through socialization and enculturation in a human community, it suggests that Jesus Christ must have inherited a sinful nature from his mother and adoptive father, which goes against the dominant tradition in western theology. There has, however, been a significant minority tradition that suggests that Christ's sinlessness does not consist in having a nature untainted by sin, but in an ability to resist the sinfulness he inherited. See Edward Irving, *The Orthodox and Catholic Doctrine of Our Lord's Human Nature* (London: Baldwin & Cradock, 1830); Karl Barth, *Die Kirchliche Dogmatik* 1/2, *Die Lehre vom Wort Gottes* (erster Band, zweiter Halbband) (Zollikon: Verlag der Evangelischen Buchhandlung, 1938); and Colin Gunton, "Two Dogmas Revisited: Edward Irving's Christology," *Scottish Journal of Theology* 41, no. 3 (1988): 359–76.