EVOLUTION AND THEOLOGY

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evolution

 By “evolution” I simply mean species becoming other species over time.

 The term can be used metaphorically for things other than organisms. You hear refer­ences to the evolution of the universe, and so on. But the evidence for evolution outside biology is not as firm as it is inside. I will restrict my comments to biological evolution.

 There are two basic alternatives to explain the plurality of types of organ­isms. The first is creationism; the second, evolution. Creationism has two varieties. There is simultaneous creationism, the idea that God created all species at the beginning and they have continued unaltered since. And there is sequential creationism, the idea that God created many species at the beginning but has intervened to cause others since, so a continuum of creative acts explains the variety in nature. Evolution, on the other hand, opts for a continuum of natural acts.

 Which of these explanations for the variety of species are we to accept? In law there are two standards of evidence. “Beyond a shadow of a doubt” is not used. Rather, civil cases use “a preponderance of the evidence” to establish a verdict (more than 50% of the evidence). Criminal cases use “beyond a reasonable doubt,” which studies have shown juries often take to mean around 75% of the evidence. In our inquiry as to whether evolution has occurred or not, I suggest we use the second standard, beyond a reasonable doubt.

 There are also two types of evidence in law cases: direct evidence and circumstantial evidence. Unfortunately, most evidence for evolution is cir­cumstantial. But that is understandable, since none of us was there when the dinosaurs, etc., began. There cannot have been direct witness of evolution prior to the beginning of humans (about 300,000 years ago). That al­most all the evidence for evolution is circumstantial is not necessarily a bad thing; after all, ballistics evidence is circumstantial; fingerprints are circumstantial. It frequently hap­pens that establishing a conclusion beyond a reasonable doubt can be done with circumstantial evidence alone. That most of the evidence for evolution is circumstantial should not deter us from determining the truth or falsity of the assertion that the variety of organisms is to be explained by evolution.

 So what is the evidence for evolution? I am going to proffer evi­dence from five biology-related subdisciplines to help us decide between creationism and evolution:

paleontol­ogy

biogeography

comparative anatomy

embryology

biochemistry

And I will conclude this introductory discussion of evolu­tion with a brief reference to direct evidence for evolution.

 The subdiscipline of biology is paleontol­ogy: the fossil record. It indicates that a wide variety of organisms has existed through­out the eons. (The solar system formed about 4.6 billion years ago; life began about 3.8 billion years ago.) Of all organisms whose fossils we see in the fossil record, 99% are ex­tinct. We also see order within the fossil record. We can date fossils themselves with radiocarbon dating (using 14C). We can also date rocks that fossils are found in using other radiometric me­thods: radium to lead, potassium to argon, and so on. The dates for the fossil record have over the last century become quite firm.

 The international group in charge of the time scale is the International Commission on Stratigraphy (a part of the International Union of Geological Sciences). The version of its time scale published in February 2017 is the basis of the chart below.

Geologic Time

(Numbers are millions of years.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| supereon\* | eons | eras | periods | epochs |
|  |  |  | Quaternary 2.58-present | Holocene 9640 BCE-present |
|  | Phanerozoic 541-present | Cenozoic66-present | Pleistocene 2.58-9640 BCE4 ages: (from *Wikipedia*)late, 129,000-11,700Chibanian, 770,00-126,000Calabrian, 1.8m-781 thGelasian, 2.588m-1.806m |
| Neogene 23-2.58 | Pliocene 5.333-2.58 |
| Miocene 23.03-5.333 |
| Paleogene66-23 | Oligocene 33.9-23.03 |
| Eocene 56-33.9 |
| Paleocene 66-56 |
| Mesozoic 251.9-66 | Cretaceous 145-66 |
| Jurassic 201.3-145 |
| Triassic 251.9-201.3 |
| Paleozoic 541-251.9(upper 358.9-251.9)(middle 419.2-358.9)(or lower 541-358.9)(lower 541-419.2) | Permian 298.9-251.9 |
| Carboniferous 358.9-298.9 |
| Devonian 419.2-358.9 |
| Silurian 443.8-419.2 |
| Ordovician 485.4-443.8 |
| Cambrian 541-485.4 |
| Pre-cambrian4600-541 | Proterozoic 2500-541 | Neoproterozoic 1000-541 | Ediacaran 635-541 |
| Cryogenian 720-635 |
| Tonian 1000-720 |
| Mesoproterozoic 1600-1000  |  |
| Paleoproterozoic 2500-1600 |  |
| Archean 4000-2500 | Neoarchean 2800-2500 |  |
| Mesoarchean 3200-2800 |  |
| Paleoarchean 3600-3200 |  |
| Eoarchean 4000-3600 |  |
| Hadean 4600-4000 |  |  |

\* An informal, nonscientific term.

 Primates, the order to which humans belong, appeared about 63 million years ago. Here is a classification of primates.

In the order *Primates* (c. 250 extant species) (c. 85 m[illion]), there are 2 suborders, which split c. 63 m.

*Strepsirrhini* (“wet-nosed”: lemurs [*Lemuriformes*] and lorises [*Loriformes*]) (c. 40 species)

*Haplorrhini* (“dry-nosed”: tarsiers [*Tarsiiformes*] and monkeys, apes, and humans [*Anthropoidea*])

 Old World monkeys (*Catarrhini* [prominent muzzles, nostrils facing downwards])

arboreal monkeys (c. 70 species)

terrestrial monkeys (c. 15 species): baboons, macaques

New World monkeys (*Platyrrhini* [nostril holes at sides of a low nose bump]) (c. 65 species) (c. 40 m)

apes and humans (*Homininae*). (25 m) There are 3 families.

*Hylobatini*: common gibbons (5 species) and siamang gibbons (1 species) (Asia) (20-15 m)

*Hominini*: great apes and humans

*Pongina*: orangutan (Asia) (1 species, 2 subspecies: Borneo, Sumatra) (arboreal)

*Hominia*

gorilla (Africa) (2 species, 2 subspecies)

genus *Homo* (chimpanzees and humans)

chimpanzee (Africa) (2 species: common and bonobo [“pygmy”])

humans (1 species)

 And here is the proposed evolution of apes and humans.

|  |
| --- |
|  |
|  |  |  |
|  63 millionOld World monkeys |  40 millionNew World monkeys |
|  |  |
|  17 million |
|  orangutans |  |
|  7 million |
| gorillas |
|  |  |
|  6 million chimpanzees |  6 millionhominina (subtribe): |
|  | *Australopithecus* (5-1.5 million)*Homo habilis* (2.5-1.5 million)*Homo erectus* (1.8 million-140,000)*Archaic Homo sapiens* (500-100,000) |
|  |
|  |
|  |  |
|  *Homo sapiens* *Homo sapiens* *Neanderthalensis* *sapiens*: humans  (250,000-35,000) (300,000-present) |

 The sequence of domains, kingdoms, phyla and so on in the fossil record is amazingly consis­tent. As Roger Lewin says in *Thread of Life* (written for the National Museum of Natural History), “nowhere do you find fossils out of place. You don’t see amphibians among the earliest trilobites, you don’t come across traces of reptiles side by side with the first amphibians, you never see fossils of mammals with those of the earliest reptiles.” He quotes paleobiologist Porter Tear: “this strict segregation or progression of fossils is found in rocks throughout the world; every time you go to look at fossil-bearing deposits you are testing that observation. Nobody has found a fossil that is out of place in the sediments, anywhere.”

 Look, for example, at the evolution of the horse. The earliest fossils we have are of *eohippus*, a genus (with only one species) that means “dawn horse.” It was like a small dog: it was of a similar size (1 foot tall at the shoulder), with paws, etc. You can follow its evolution up through the fossil record to the present-day horse. Think for a moment about the fact that, everywhere in the world where horse fossils are found, they are always found in the same order (excepting geological disruptions). One never finds an eohippus, the little dog horse, in strata above the modern-day horse. It is not a jumble; it is self-consistent. The same is true for primate evolution. One does not find gorillas lower in the fossil record than orangutans, or orangutans prior to monkeys, or humans prior to orangutans.

 The amazing consistency of the fossil record seems to me an indication more of the truth of evolution than of the truth of creationism. Throughout the fossil record everywhere in the world, early forms did not perdure to the present; and most species that became extinct were replaced by very similar but more elaborate forms.

 Paleontol­ogy, then is the first of the 5 subdisciplines of biology from which evidence for evolution may be derived. A second subdiscipline is biogeography. Where there are natural barriers to organisms interacting (rivers, mountains), one finds that the development of organisms within the isolated regions diverges. Paleobiogeography studies the distribution of species over millions of years. There is close continuity within isolated regions, and there is great diversity between isolated regions.

 One argument for evolution from biogeography has to do with primates. We all know that the western curve of Africa matches the eastern curve of south America; the two were at one time adjacent, and plate tectonics separated the two (about 140 million years ago). Similarly, on the eastern side of Africa, plate tectonics broke off and moved Madagascar to the side of the African continent (about 88 million years ago). Now consider the spread of primates in these three regions (South America, Africa, and Madagascar). Lemurs and lorises, which are rather like foxes running across the tops of branches, only exist in Madagascar. Old world monkeys, which have a catarrhine nose (with downward-pointing nostrils) and which lack a prehensile tail (one which can grab a branch just like hands and feet), are only in Africa. And new world monkeys, whose noses are a flat bump with side slits for nostrils and which have prehensile tails, are only in South America. This suggests to me that when Madagascar split off, there were only lemurs and lorises. At some point after 40 million BCE, monkeys evolved on the African continent, and that is why they don’t show up in Madagascar. Why are there no lemurs and lorises in Africa? Probably because the monkeys were more dominant and killed them off. And the differences between the monkeys of Africa and South America also seem explicable by descent with modification. Biogeography, then, is a second source of evidence for evolution.

 In addition to paleontology and biogeography, we have comparative anatomy as a third subdiscipline of biology. The vertebral column is very similar in cyclostamata (the most primitive living vertebrate), sharks, bony fish, amphibians, reptiles, birds, and mammals. Differences seem to depend on function and adaptation to problems in each organism’s environment. Consider, for example, mammal forelimbs. The design of the forelimb is structurally the same, bone for bone, in shrews, moles, bats, deer, horses, and humans. Yet the function of the forelimb varies from digging to running to flying to writing poetry. This functional variation is accompanied by differences in proportion, sometimes by fission or suppression of parts. Another aspect of comparative anatomy that argues for the existence of evolution is vestigial organs. Why do we have that coccyx at the bottom of our vertebrae?

 Embryology is also used as an argument for evolution. If you look at small fetuses of various mammals—let’s say fish, salamander, turtle, chicken, hog, calf, rabbit, man—they are very similar, in fact impossible to tell apart at the earliest stage except by a specialist. But then they increasingly diverge. E.H. Haekel in the early 1890s came up with his law of biogenesis: “Ontogeny recapitulates phylogeny,” which is fun to say. Ontogeny is the development of the individual; and phylogeny is the evolution, over millions of years, that led to the individual. For example, every terrestrial invertebrate embryo for the past 300 million years has developed a set of gill slits. So did you. That is about as good evidence for evolution as one could wish for.

 A last subdiscipline is comparative physiology. Physiology studies parts of organisms; comparative physiology compares those parts among diverse organisms.

 Here is an interesting example: an antigen antibody reaction. Edward O. Dodson has noted (*Evolution*: *Process and Product*. New York: Reinhold, 1960. 58) that, “if serum from an animal immunized against human blood were divided among five tubes, and serum added from man, an anthropoid ape, an old-world monkey, a new-world monkey, and a lemur, the amount of precipitate formed would also decrease in that order. Thus, the results of serological tests support the theories of relationship which were originally based upon comparative morphology. . . . [This] is exactly what would be expected on the basis of Darwin’s theory that similar species have been formed by descent with modification from a common ancestor.” Evolution has so effectively organized all of the data of physiology that it could be argued that its ability to organize literally millions of pieces of data is itself a physiological argument for its truth.

 The evidence I have presented so far—from five subdisciplines of biology: paleontol­ogy, biogeography, comparative anatomy, embryology, and comparative physiology—is circumstantial evidence. But has evolution ever been witnessed? Because direct evidence would be awfully nice. Adding it would significantly bolster the argument for evolution.

 Actually, there is direct evidence. Here is a famous example. In London throughout the 1800s, as the Industrial Revolution flourished, the bark of white birches turned black from pollution (soot). Biologists noticed by the end of the century that the nun moth, which had been white at the beginning of the century, had turned black. Why was that? Presumably it was because birds more easily picked off the white ones against the black background of the bark.

 That is an example of micro-evolution, the alteration of a characteristic of an organism. What about macro-evolution, going from one species to another? In 1967 Saul Spiegelman experimented with a bacteria phage, a virus that eats bacteria. When he allowed this virus to replicate with no selective pressures, the population did not change: what he had after a number of generations of replication was essentially the same as at the beginning. But then he put on a selective pressure: he decreased the time available for replication, from 20 minutes to 5 minutes, incrementally over 75 generations. Now a species of the virus came to the fore, and other species of the virus died out. The species that survived replicated 15 times as rapidly as the parental species. Spiegelman applied other pressures (for example, adding different compounds); and over many generations, different species of virus emerged.

 As for the mechanism by which evolution has occurred, according to the modern evolutionary synthesis of the 1930s and 1940s, which is still accepted (in amended form), it is a matter of mutation of genes and natural selection. The International Human Genome Sequencing Consortium estimates that there are about 80,000-100,000 human genes, including around 20,000 protein-coding genes—a surprisingly low number. We share 98.8% of our genes with chimpanzees, 98% with gorillas, 97% with orangutans, and so on.

 So: all of the types evidence we have presented for evolution converge upon a single conclusion: evolution explains many facts about the interrelations among organisms. From this point on, I shall assume that evolution is true.

 I am happy to report that , with my conclusion, I am in good company. John Paul II enunciated the same conclusion in 1996: “Today new knowledge has led to the recognition of the theory of evolution as more than a hypothesis. The convergence, neither sought nor fabricated, of the results of work that was conducted independently is in itself a significant argument in favor of evolution.”

theology

 So much for the first of the terms in the title of this document, “Evolution.” Now let’s turn to the second term, “Theology.”

 At first glance, evolution seems to contradict Christian doctrines (teachings), and in four ways.

 One area of concern is the historicity of Adam. We know that Gen 2:7 says, “then the Lord God formed man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.” Not in just that verse but throughout Gen 2-3, Adam and Eve appear as individual characters. Paul in the New Testament seems to agree. He says in Rom 5:14-17, “death reigned from Adam to Moses . . . 15 the many died through the one man’s trespass . . . 17 because of the one man’s trespass, death reigned through that one . . .”

 Augustine, more than anyone else in the early centuries of the Church, opted for a very literal reading of the opening narratives of Genesis. Thus he comments: “man made from the slime of the earth, having a human body, was placed in a corporal paradise . . . he was a man in the literal sense of the word. A man who lived a number of years, and who when he had begotten numerous posterity, died like other men though unlike the others he was not born of parents but was taken from the earth.” This Augustinian interpretation of Gen 1-3, a very literal interpretation, became standard throughout the middles ages and into the modern period. Hence, the council of Trent, for example (1545-64), said in its *Decree on Original Sin*, “the first man Adam transgressed the commandment of God in paradise.” Sounds like the historicity of an actual Adam is asserted.

 Closer to our time, Pius XII, in *Humani generis* (1950), said, “Original sin proceeds from a sin actually committed by an individual Adam and through which generation is passed on to all and is in everyone as his own.” Finally, the revised *Catechism of the Catholic Church* (1997) says in section 399, “Adam and Eve lost the grace of original holiness.” It says in section 404, “By yielding to the tempter Adam and Eve committed a personal sin, but this sin affected the human race that they would then transmit.”

 So there is the first problem: Catholic doctrine seems to assert the historicity of Adam. But in evolution, you can’t find an Adam, at least not the one described in the traditional, theological understanding of Gen 1-3.

 A second aspect of Christian doctrine that seems contradicted by evolution is what are called “the preternatural gifts.” Preternatural gifts are privileges that God presumably gave the first couple in their nature. These gifts were not super-added to their nature (in which case they would be called “supernatural”); but God elevated their nature in such a way that they had these special characteristics (hence they are “preternatural”). Augustine thought that man in paradise was endowed with all sorts of privileges. He never experienced the revolt of the senses, he possessed wonderful knowledge, he enjoyed great freedom, he was virtually an immortal. At the time of scholasticism in the high middle ages, in the 1200s for example, it had been established that there were 4 of these preternatural gifts that Adam and Eve enjoyed.

integrity: their reason was always in control of their senses and emotions, so that they were integrated

infused knowledge: God infused knowledge into Adam and Eve so that they knew things they had not learned through their senses

impassibility: *passio* means to suffer; so impassibility is inability to suffer

immortality: the last and most important preternatural gift

The fourth gift, immortality, was based on Gen 2:17, in which God says to Adam, “but of the tree of the knowledge of good and evil you shall not eat, for in the day that you eat it you shall die.” In Gen 3:4, the serpent says to the woman, “you will not die.” The serpent slyly contradicts God about whether Adam and Eve will die or not; but the serpent agrees with God that Adam and Eve are, before the fall, immortal. In Gen 3:17-19, God again affirms their immortality: “Because you have . . . eaten of the tree . . . 19 By the sweat of your face you shall eat bread until you return to the ground, for out of it you were taken; you are dust, and to dust you shall return.”

 Augustine struggled mightily against a heresy called Pelagianism. It claimed that you can be sinless by your own efforts: just you try hard enough; you don’t need grace. Augustine triumphed over Pelagianism: in 418, a Council of Carthage promulgated a canon—a firm affirmation—that says: “Whoever says that Adam, the first man, was made mortal, so that whether he sinned or did not sin he would die in body, that is, he would go out of the body, not as the merit of sin or by reason of nature, let him be anathema.”

 So we have two aspects of Catholic doctrine that need reconciling with evolution: the historicity of Adam, and the preternatural gifts.

 A third aspect of Christian doctrine that seems to be contradicted by evolution is a universal fall. That is to say, not just a fall of mankind but a fall of the universe. This seems to be indicated in the Eden narrative. Gen 2:8-9 says, “And the Lord God planted a garden in Eden, in the east, and there he put the man whom he had formed. 9 Out of the ground the Lord God made to grow every tree that is pleasant to the sight and good for food . . .” Now that is before the biting of the fruit. After the disobedience, Gen 3:17-19 describes a very different situation: “cursed is the ground because of you; in toil you shall eat of it all the days of your life; 18 thorns and thistles it shall bring forth for you; and you shall eat the plants of the field. By the sweat of your face you shall eat bread . . .” It sounds like the fall was not just of Adam and Eve, but of their circumstances as well. Paul interpreted the narrative similarly. In Rom 8:20-21 he says, “for the creation was subjected to futility . . ., in hope 21 that the creation itself will be set free from its enslavement to decay . . .”

 A forth area of Christian doctrine that seems contradicted by evolution is the way in which original sin is transmitted. Prior to Darwin, there was an evolutionary theorist, Jean Baptiste Lamarck, who in 1800 proposed the idea that species diverge because acquired characteristics of parents are passed on to their progeny. So if I lift a lot of weights, I will look like a body builder, and my bodybuilding physique will to some extent be passed on to my children; it will be easier for them to become bodybuilders, and so on down the line. Darwin himself, although in *Origin of Species* he emphasized more the idea of natural selection, numerous times agrees with this theory that acquired characteristics can be passed on. But the modern evolutionary synthesis does not agree: acquired characteristics such as a bodybuilder’s physique cannot be passed down genetically.

 Genes were unknown both to Lamarck and to Darwin. It was not until 1876 that biologist Oscar Hertwig, looking through a microscope, discovered meiosis, the fact that germ cells (sperm and eggs, or gametes) split into two, each of which has chromosomes of the parent cell. Once that was discovered, you could no longer have inheritance of acquired characteristics, because apparently the only thing that gets passed down to your children is the data that is in the germ cells. (We now know about epigenetics, the passing on of non-genetic information in germ cells as well; but that information does not include acquired characteristics.) The difficulty is that a personal sin by the individual man Adam is an acquired characteristic. If an acquired characteristic cannot be passed down, then Adam cannot have passed down sinfulness to his progeny. How, then, can it be, as the Council of Trent said in 1546, that original sin is transmitted by propagation, not by imitation?

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 Well, the evidence looks grim to be able to reconcile evolution with Christian doctrine. But if both Christian doctrine and evolution are true, then the truths in both areas must be capable of reconciliation. As Pope Leo XIII said (in the encyclical *Providentissima Deus*, 1893): “there can never indeed be any real discrepancy, between the theologian and the scientists. If dissention should arise between them, here is the rule laid down by St Augustine for the theologians. “Whatever they [the scientists] can reasonably demonstrate to be true of physical nature we must show to be capable of reconciliation with our scriptures.”” Ernan McMullen, a priest, professor of philosophy, and director of a history-of-science program at the University of Notre Dame, said in 1985: “when an apparent conflict arises between a strongly supported scientific theory and some item of Christian doctrine, the Christian ought to look very carefully at the credentials of the doctrine. It may well be when he does so the scientific understanding will enable the doctrine to be reformulated in a more adequate way.” Or more simply, as John Paul II put it, “truth cannot contradict truth.” Scientific truth and theological truth have to be reconcilable in some way. If both evolution and original sin are true, and I believe them to be so, then they must be reconcilable.

 So what about the statements in Gen 1-3 about the historicity of Adam—that he was made out of mud, and so on? Advances in understanding how to interpret the opening chapters of Genesis have helped to reconcile the evolutionary picture with the idea of an historical Adam.

 Here is Pope Pius XII’s encyclical *Divino afflante Spiritu* (1943): “the ancient peoples of the East, in order to express their ideas, did not always employ those forms or kinds of speech that we use today, but rather those used by the men of their times and countries.” The Pontifical Biblical Commission in1948 added: “the question of the literary forms of the first 11 chapters of Genesis is quite complex. One can neither deny nor affirm their historicity taken as a whole.” Charles Hauret, a French scripture scholar, in 1965 noted that “The Church has never thought it necessary to settle the question of the historical character of Genesis 2 and 3, by her authority.”

 These statements suggest that there is latitude on the part of exegetes, interpreters of the Bible. They have the opportunity to decide on a case-by-case basis what in those early chapters is to be kept as historical and what is to be assessed as unhistorical, as figurative. Joseph Ratzinger, before he became Pope Benedict XVI, addressed this matter of distinguishing historical fact from figurative imagery. As he said in *In the Beginning* . . . *A Catholic Understanding of the Story of Creation and the Fall*: “the essence of an image consists in the fact that it represents something. It points to something beyond itself.” He goes on to propose an instance of distinguishing substance from image: “the serpent serves as a symbol of the attraction of Canaanite religions, the Israelites in contrast to the God of the covenant. It is with Israel’s temptation in mind that Holy Scripture portrays Adam’s temptation and in doing so the nature of sin in every age.”

 But what about Paul? In Rom 5 he seems to argue for a literal understanding of those early chapters; Rom 5 seems to support a literal understanding of original sin. But that is not necessarily the correct reading of Paul. In Rom 1-4, Paul establishes that both Jews (who have the Mosaic law) and gentiles (who lack the law but have natural law in their hearts) are nevertheless sinners. In Rom 5-8, he discusses the new life in Christ. That is the primary topic, the context for his comments about Adam. Adam is not referred to for his own sake but is only referred to as a contrast to Christ. Rom 5:12-21 are referred to as the Adam-Christ typology. Typology means the association of a thing—not a word, but an event, institution, or person—earlier in the Bible to another thing later in the Bible. That is what Paul is up to here. Paul even uses the Greek word *typos*, from whence we get the word “typology,” in Rom 5:14: “Adam, who is a pattern [*typos*] of the one who is to come.” He always uses *typos* to mean pattern or model. His reference to Adam is in the context of his primary point that Christ offers salvation despite the fact that we are all sinners. His emphasis is not on Adam. Here is Rom 5:15-21:

But the free gift is not like the trespass. For if the many died through the one man’s trespass, much more surely have the grace of God and the gift in the grace of the one man, Jesus Christ, abounded for the many. 16 And the gift is not like the effect of the one man’s sin. For the judgment following one trespass brought condemnation, but the gift following many trespasses brings justification. 17 If, because of the one man’s trespass, death reigned through that one, much more surely will those who receive the abundance of grace and the gift of righteousness reign in life through the one man, Jesus Christ. 18 Therefore just as one man’s trespass led to condemnation for all, so one man’s act of righteousness leads to justification and life for all. 19 For just as through the one man’s disobedience the many were made sinners, so through the one man’s obedience the many will be made righteous. 20 But law came in, so that the trespass might increase, but where sin increased, grace abounded all the more, 21 so that, just as sin reigned in death, so grace might also reign through justification leading to eternal life through Jesus Christ our Lord.

Back and forth, he swings from Adam in the past to Christ in the present: for former brought death, the latter brings life. The purpose in mentioning Adam is not to discuss Adam, but to contrast him to Christ.

 So who was Christ? That will determine for us what Paul means in this context by Adam, since Adam is the contrast to Christ. For Paul in this passage, Christ is a corporate personality, i.e., he is one personality, but he incorporates others as well. (The phenomenon of corporate personality occurs in a number of times in scripture.) Christ is a strictly individual man, but at the same time he epitomizes in himself and personifies all of mankind as saved. Since Adam is the type (earlier person) to Christ as antitype (later person), Paul is thinking of the first man as a corporate personality also, but one representing all of us so far in as we are all sinners.

 Also concerning Paul, at one point in Rom 5:12 Paul uses the Greek conjunction *eph hō* (ἐφ᾽ ᾧ). Here is the sentence: “sin came into the world through one man, and death came through sin, and so death spread to all because [*eph hō*] all have sinned . . .” When Greek *eph hō* was translated into Latin, it was translated *in quo*, “in whom,” so that the meaning Augustine took from this verse was, “and so death spread to all *in whom* all have sinned.” You can see how this idea of Adam as a causative agent of all sinfulness that followed him could be read from that translation. However, we have known for centuries that that is an incorrect translation. *Eph hō* means “because.” So what this verse is really saying is that death spread to all because all have sinned. In other words, the majority of exegetes today, Catholic or Protestant, understand *eph hō* to be a reference to personal sin. Adam’s was a personal sin, but ours have been personal sins, as well as the sins of all the individuals between then and now.

 Stanislaus Lyonnet, a Jesuit at the Gregorian University in Rome in 1956, put out a very famous article in which he proved that the word “sin” in Rom 5:12 (Greek *hēmartia*) actually does mean to sin in a real, active sense. And the word prior to that verb is *panta*, “all.” All have sinned. So this is a reference to personal sin.[[1]](#footnote-1)

 Well, what about Trent? Trent sounded pretty literalistic in its interpretation. But Church historians have gone back and examined the records of Trent, which met from 1545 to 1564. What they have discovered are some very interesting things. Korsmeyer says, “The historical nature of Adam and Eve was not defined at the council of Trent but assumed.” Alfred Vannesta says, “The question of the historicity or non-historicity of the account of the fall did not even cross the minds of the conciliar fathers.” In the 16th century, everyone, Catholics as well as reformers, considered naively that things had occurred historically as they were presented in Genesis.

 The Council of Carthage in 418 had stated in its first canon that it is incorrect to say that Adam would have died naturally, had he not fallen. But that canon did not received papal approval even in Augustine’s day.

 The canon of the Council of Carthage was also available to the fathers at the Council of Trent a thousand years later (1545-63). But we know from the records of the fathers that they avoided mentioning it. In fact, a high-flown and angelic picture of the preternatural gifts circulated among the Tridentine fathers. They could have incorporated it into their document on original sin, but they chose to leave it out.

 So we have a couple of alternatives. One I will call the moderate right position, and one I will call the moderate left position.

 The moderate right position admits that Genesis 3, the fall narrative, is symbolic in nature. (That interpretation is now well accepted among Catholic exegetes and it is gradually becoming recognized by the mass of Catholics.) But nevertheless there was an Adam. And in some way, what he did has affected what has come after. I call this the “moderate right position” because this is the more conservative of the two options that seem available to Catholic theology today. Cardinal Ratzinger seems to be in this camp when he wrote his 1985 book (*In the Beginning*) that “the wisdom literature already reworks the theme of the genesis narrative and they do not stick to the old images such as the seven days.” The Pontifical Biblical Commission accepts that these are symbolic narratives: “they relate in simple and figurative language adapted to the understanding of less developed people the fundamental truth presupposed by the economy [plan] of salvation.”

 When that comment was published in 1948, exegetes afterwards—in the 1950s, 1960s, and 1970s—tried to determine exactly what are the fundamental truths presupposed for the economy of salvation. Various lists were proposed, and they all stuck somewhat closely to the narrative. Here for example is the Charles Hauret’s conclusions: “Here is what you should keep from the narrative, the unity of the human race, the original happiness, the integrity and immortality, a precept given by God to man to be obedient, its transgression through persuasion by the devil, the promise of a future redeemer.” Well, that keeps a lot from the early narratives. But Hauret has eliminated a few things. We no longer have the magic fruit. We no longer have the talking snake. Those he would consider surface details, dispensable details. But the moderate right position retains much of the tradition, literal interpretation, without opting for fundamentalism (where *everything* in the narrative is historical).

 The moderate left also says that Gen 3, the fall narrative, is symbolic. But it claims that Adam is not historical. G. Ernest Wright has said, for example, that “The parabolic aim in Genesis 3 is so obvious that for a parallel one might turn to the parables of Jesus.” In the same way that the story of the prodigal son is told in order to communicate fundamental truths important to our salvation, so the early chapters of Genesis are intended to provide fundamental truths necessary for our salvation. Also in the moderate-left camp is Charles Sommer: “the story requires a mythic rather than an historical interpretation. Since it is myth, the sin committed by the man and woman is one that functions as a type for sin in general as opposed to describing a specific event occurring at a specific time in the past. While the text does not preserve an original event, it does provide the reason why all individuals require salvation.”

 Let me conclude with a final quotation from John Paul II: “We should speak of several theories of evolution depending upon the various philosophies on which it is based; hence the existence of materialist and spiritualist interpretations.” He argues that “theories of evolution which in accordance with philosophies inspiring them consider the spirit as emerging from the forces of living matter or as a mere epiphenomenon of matter are incompatible with the truth about man, nor are they even able to ground the dignity of the person.” The dignity of the person is especially important for Catholic moral theology and, within it, social justice teachings. But a spiritualist interpretation of evolution, one that allows for providential guidance of the Universe as it moves through time, is reconcilable with Catholic doctrine.

Bibliography

Scripture quotations are from the New Revised Standard Version updated edition.

Aquinas, Thomas. *Summa Theologica*. Trans. Dominicans of the English Province. New York: Benziger Bros., 1947-48.

Bell, Elizabeth A., et al. “Potentially Biogenic Carbon Preserved in a 4.1 Billion-year-old Zircon.” *Proceedings of the National Academy of Sciences* 112 (19 Oct. 2015) 14518-21.

Blatty, William Peter. *Legion.* New York: Simon and Schuster, 1983.

Brown, Raymond E., SS. *The Sensus Plenior of Sacred Scripture*. Baltimore: St Mary’s UP, 1955.

Byrne, Richard W. “The Misunderstood Ape: Cognitive Skills of the Gorilla.” *Reaching into Thought*: *The Minds of the Great Apes*. Ed. Anne E. Russon, Kim Bard, and Sue Taylor Parker. Cambridge: CUP, 1996.

*Catechism of the Catholic Church*.

Congregation of the Doctrine of the Faith. *Catechism of the Catholic Church*. 1994. 2nd ed. Trans. National Conference of Catholic Bishops. Vatican City: Libreria Editrice Vaticana, 1997.

Davidson, Robert. *Genesis 1-11*. Cambridge Bible Com­mentary. Cam­bridge: CUP, 1973.

“Definition of Biochemistry.” *Wikipedia*. 30 July 2011. 1 Aug. 2011. Web.

“Definition of Physiology.” *Wikipedia*. 24 July 2011. 1 Aug. 2011. Web.

Denzinger, Henry, and A. Schönmetzer, eds. *The Sources of Catholic Dogma*: *Documents of the Roman Pontiffs and of the Councils*. 1854. In *Welcome to the Catholic Church*. Gervais: Harmony Media, n.d. (software). (Welcome reproduces Herder and Herder’s 1957 ed. of Denzinger.)

Dubarle, A.-M., OP. *The Biblical Doctrine of Original Sin*. Trans. E.M. Stewart. London: Geoffrey Chapman; New York: Herder and Herder, 1964. (*Le peche originel dans l*’*Ecriture*. Paris: Cerf, 1958.)

“Fossil.” *Wikipedia*. 2 June 2010. Web. 12 June 2010.

Gaul, Cyril. *Rome and the Study of Scripture*: *A Collection of Papal Enactments on the Study of Holy Scripture Together with the Decisions of the Biblical Commission*. 1919. 7th ed., rev. and enl. Ed. Conrad Louis, OSB. St Meinrad IN: Grail, 1962.

Hauret, Charles. *Beginnings*: *Genesis and Modern Science*. Trans. John F. McDonnell. 2nd rev. ed. Dubuque: Priory, 1964. (*Origines de l*’*univers et de l’homme*: *d*’*abres la Bible* (*Genese I-III*). Paris: Gabalda, 1950.)

Hawkes, Jacquetta. *Man on Earth*. New York: Random House, 1954.

Hedges, S. Blair, and Sudhir Kumar. *The Timetree of Life*. New York: OUP, 2009. Timetree.org. N.d. 24 July 2009. <http://www.timetree.org/book.php>.

Hrdy, Sarah Blaffer. *The Woman That Never Evolved*. Cambridge: Harvard UP, 1981.

Hudson, Winthrop S. *American Protestantism*. Chicago History of American Civilization, ed. Daniel J. Boorstin. Chicago: U of Chicago P, 1961.

International Commission on Stratigraphy. “International Chronostratigraphic Chart.” *Stratigraphy*.*org*. Feb. 2017. 26 July 2017. Web.

International Theological Commission. “Communion and Stewardship: Human Persons Created in the Image of God.” *La Civiltà Cattolica* 4 (2004) 254-86.

International Union for Conservation of Nature Species Survival Commission. *2004 IUCN Red List of Threatened Species*: *A Global Species Assessment*. Ed. Jonathan E.M. Baillie et al. Gland, Switzerland, and Cambridge: IUCN, 2004. *IUCN*. 2004. 6 Sept. 2009. <http://data.­iucn.org/dbtw-wpd/edocs/RL-2004-001.pdf>. Table 2.1.

“Jean-Baptiste Lamarck.” *Wikipedia*. 12 Aug. 2009. 13 Aug. 2009. Web.

John Paul II. *Truth Cannot Contradict Truth.* Address to the Pontifical Academy of Sciences, 22 Oct. 1996.

Judson, Olivia P. “The Energy Expansions of Evolution.” *Nature Ecology and Evolution* 1.6 (28 Apr. 2017). 20 May 2017. Web.

Korsmeyer, Jerry D. *Evolution and Eden*: *Balancing Original Sin and Contemporary Science*. New York: Paulist, 1998.

Lack, David. *Evolutionary Theory and Christian Belief*: *The Unresolved Conflict*. London: Methuen, 1957.

Lampe, G.W.H., and K.J. Woolcombe. *Essays on Typology*. London: SCM; Napierville IL: Allenson, 1957.

Levie, Jean, SJ. *The Bible*, *Word of God in Words of Men*. New York: Kenedy, 1958. (*La Bible*, *parole humaine et message de Dieu*. Paris: Desclée de Brouwer, 1958.)

Lewin, Roger. *Thread of Life*: *The Smithsonian Looks at Evolution*. Washington: Smithsonian, 1982.

Maher, Michael, MSC. *Genesis*. Old Testament Message 2. Wilmington: Glazier, 1982.

Napier, J.R., and P.H. Napier. *The Natural History of the Primates*. Cambridge: MIT, 1985.

National Conference of Catholic Bishops Ad Hoc Committee on Biblical Fundamentalism. *Pastoral Statement for Catholics on Biblical Fundamentalism*. Washington: National Conference of Catholic Bishops, 1987.

“No­ble Gas.” *Wikipedia*. 13 May 2018. 23 May 2018. Web.

Pius XII. *On Humankind* (*Humani generis*) 12 Aug. 1950. *New Advent*. 2001. Web. 14 Feb. 2001.

Pontifical Biblical Commission. *The Interpretation of the Bible in the Church*. Rome: Vaticana, 1993.

“Process Theology.” *Wikipedia*. 14 May 2018. 24 May 2018. Web.

“Radiometric Dating.” *Wikipedia*. 6 Oct. 2009. Web. 14 Oct. 2009. Web.

Ratzinger, Joseph (later Benedict XVI). *In the Beginning*: *A Catholic Understanding of the Story of Creation and the Fall*. Huntington IN: Our Sunday Visitor, 1990.

“Reasonable Doubt.” *Wikipedia*. 20 Aug. 2009. Web. 23 Aug. 2009. Web.

Rondet, Henri, SJ. *Original Sin*: *The Patristic and Theological Background*. Trans. Cajetan Finegan, OP. Staten Island: Alba House, 1972. (French: *Le péché originel dans la tradition patristique et théologique*. Paris: Librairie Fayard, 1967.)

Sommer, Charles. *The Sin in the Garden*: *The Narrative of Genesis 3*. Washington DC: Catholic University of America, 2004. Master’s thesis.

*Teaching about Evolution and the Nature of Science*. National Academy, 1998. 17 June 1999. <www.nap.edu/readingroom/books/evolution98/contents.html>.

Tennyson, Alfred. *In Memoriam*. 1850. 5th ed., 1851. Boston: Knight and Millet, 1901. *Archive*.*og*. 23 May 2018. Web.

Trooster, Stephanus. *Evolution and the Doctrine of Original Sin*. Trans. John A. Ter Haar. Glen Rock NJ: Newman, 1968.

Tudge, Colin. *The Time before History*: *5 Million Years of Human Impact.* New York: Simon and Schuster, 1996.

Urry, Lisa A., Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Jane B. Reece. *Campbell Biology*. 11th ed. Hoboken: Pearson Higher Education, 2016.

Vatican II. *Dei Verbum* (*Dogmatic Constitution on Divine Revelation*). 1965.

Vawter, Bruce, C.M. *On Genesis*: *A New Reading*. Gar­den City: Doub­leday, 1977.

Vawter, Bruce, CM. *A Path Through Genesis*. 1955. New ed. New York: Sheed and Ward, 1973.

Walker, J.D., and J.W. Geissman. “2009 GSA Geologic Time Scale.” *GSA Today* (Apr./May 2009): 60-61. *Geological Society of America*. 8 Apr. 2009. 7 June 2009. <http://www.geosociety.org/sci­ence/timescale/timescl.pdf>.

Wright, G. Ernest. “The Nature of Man: An Exposition of Genesis 3.” In Harrington, John B., ed. *Issues in Christian Thought*. New York: McGraw-Hill, 1968. 82-90. (An excerpt from: Wright, G. Ernest. *The Rule of God*. Garden City: Doubleday, 1960.)

Zimmer, Carl, and Douglas J. Emlen. *Evolution*: *Making Sense of Life*. 2nd ed. New York: Macmillan Higher Eucation—Freeman, 2016.

Zimmerman, Anthony, STD. *Evolution and the Sin in Eden*: *A New Christian Synthesis*. Lanham: UP of America, 1998.

1. Lyonnet, Stanislas. “Le péché originel et l’exégèse de Rom. 5, 12-14.” *Recherches de science religieuse* (1956): 63-84. See also: Lyonnet, Stanislaus. “Le sens de Eph’ ô en Rom. 5,12 et l’exégèse des Pères Grecs.” *Biblica* (1955): 436-56. See also: Lyonnet, Stanislas. “Péché originel.” *Dictionnaire de la Bible*, *Supplement*. 1964. Vol. 7 cols. 334-61. [↑](#footnote-ref-1)