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CREATION AND SCIENCE IN THE THEOLOGY OF JOHN CALVIN

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It is true that Copernicus, the canon of Frombork (Frauenburg), is never mentioned in Calvin's writings. But in a sermon on 1 Corinthians 10, the reformer explicitly warns against those who claim "that the sun does not move, and that it is the earth that moves and turns". He declares them to be possessed by the devil and attempting to "pervert the order of nature."[1] With these statements, the Geneva reformer shows himself to be a follower of the traditional Aristotelian-Ptolemaic model of the universe. Looking at the other reformers, this does not come as much of a surprise. Copernicus's magnum opus, *De Revolutionibus*, was printed in 1543 (the year of his death) with the help of the Wittenberg mathematician Georg Joachim Rheticus in the Lutheran town of Nuremberg; but this was by no means an indication that the Wittenberg Reformation had abandoned the geocentric model. Andreas Osiander, the Nuremberg reformer who wrote a preface to that edition, expressly wanted the Copernican theory to be understood as nothing more than a mathematical hypothesis. True, Melanchthon's son-in-law Caspar Peucer, who taught astronomy at the University of Wittenberg, advised his students to read

[1] Quoted in: Bouwsma, W.J., *John Calvin. A Sixteenth-Century Portrait*. Oxford: Oxford UP, 1989, p. 72.

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Copernicus in addition to advocates of the Aristotelian-Ptolemaic model. But Peucer himself remained a believer in the old model, just like Calvin.

1 Creation as mirror of God

When Calvin talks about the world, he talks about the world created by God. By observing creation itself, he states, it is possible to recognise God as the creator of the world. For God has revealed himself in building the world, and he continues to do so to this day, so that human beings cannot open their eyes without beholding him. He has imprinted into his works true markers of his glory, markers that are so clear and obvious that it becomes impossible for even the most close-minded persons to justify their ignorance of God. Because "wherever you turn your eyes, there is no portion of the world, however minute, that does not exhibit at least some sparks of beauty; while it is impossible to contemplate the vast and beautiful fabric as it extends around, without being overwhelmed by the immense weight of glory."[2] The "elegant structure of the world serv[es] us as a kind of mirror, in which we may behold God, though otherwise invisible."[3] To support these statements, Calvin refers to Hebrews 11:3 and Psalm 19:1: "The heavens declare the glory of God; the skies proclaim the work of his hands." The language of celestial bodies, known to all the peoples of the earth, bear witness to God so unequivocally that God cannot be unknown to any people, any nation. In Romans 1:19-20 – the classic quotation for natural gnosis – Paul expresses this notion even more clearly when he declares, "since what may be known about God is plain to them, because God has made it plain to them. For since the creation of the world God's invisible qualities—his

[2] Calvin, John, *Institutes* I, 5,1. [http://www.reformed.org/master/index.html?mainframe=/books/institutes].
[3] Ibid.

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eternal power and divine nature—have been clearly seen, being understood from what has been made, so that men are without excuse"[4]. This is a gnosis that is open to and can be expected of the uneducated, albeit of course it can be further deepened by astronomy, science, and medicine. For not only the nature surrounding human beings, but also human beings themselves are clear evidence of God's power, mercy and wisdom. Here, Calvin references the common Renaissance concept of human beings as microcosms. He criticises all those who attempt to supplant God as the creator by putting nature in his place. Above all, he attacks Epicurus and his followers because of their atomism and mechanism. In Calvin's view, the purely atomistic, causal-mechanical explanation of nature fails to account for its utility. Likewise, he attacks the materialistic tendencies in the psychology of Aristotelianism. The soul cannot be reduced to physical body functions. "What has the body to do with your measuring the heavens, counting the number of the stars, ascertaining their magnitudes, their relative distances, the rate at which they move, and the orbits which they describe?"[5] In Calvin's view, the intellectual capacities of human beings can only be explained by postulating an immaterial, spiritual soul that is immortal because of its immateriality and thus serves as further proof of God's existence. Calvin also rejects the suggestion of a "world soul" or the identification of God with nature, as argued by Lucretius, in favour of the notion that nature is the order posited by God. "Let each of us, therefore, in contemplating his own nature, remember that there is one God who governs all natures, and, in governing, wishes us to have respect to himself, to make him the object of our faith, worship, and adoration."[6]

[4] Cf. ibid.
[5] *Institutes* I, 5,5.
[6] *Institutes* I, 5,6.

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2 True knowledge only through the scripture

Calvin leaves no doubt about his conviction that all of these insights are possible without the help of the written word. Indeed, every human being can attain this insight about God being the creator of the world simply through the observation of nature. The world reveals the power, the eternity, the mercy and wisdom of its creator; and it does so not only through the usual course of nature, but also through acts of God's providence. But even though God reveals himself in the world in this way, this does not lead to true gnosis as a rule, not even among the philosophers. For the "invisible Godhead is indeed represented by such displays, but […] we have no eyes to perceive it until they are enlightened through faith by internal revelation from God."[7] We may attain true gnosis, true knowledge of God not by observing the world, but only through the Scripture as the word of God. For "it is the proper school for training the children of God; the invitation given to all nations, to behold him in the heavens and earth, proving of no avail."[8] However, this means that scripture is the only way of attaining not only true gnosis, but also true knowledge about the world. "Hence God was pleased that a history of the creation should exist - a history on which the faith of the Church might lean without seeking any other God than Him whom Moses sets forth as the Creator and Architect of the world."[9] At the same time, this sentence clarifies the fact that in Calvin's time, the history of creation in Genesis 1 and 2 still was regarded as a unit, which was revealed to Moses by God. Calvin also thinks that he can calculate the time of creation based on temporal data given in the Holy Scripture: "[T]he present world is drawing to a close before it has completed its six thousandth year."[10] This first of all makes it clear that the world is not

[7] *Institutes* I, 5,14.
[8] *Institutes* I, 6.4.
[9] *Institutes* I, 14.1.
[10] Ibid.

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eternal, but has a temporal beginning. Questions such as why God did not create the world earlier are rebuked by Calvin with reference to Augustine, just like speculations about the infinity of space, which in his time had started to crop up already. Instead, he wants his description of the created world to operate within the limits given by the Mosaic history of creation. This means, then, that his concept of the world's origin is an entirely traditional one: the six days of creation.

This, however, represents a problem for Calvin. In the history of creation in Genesis 1, there is no mention of the creation of the angels, who nevertheless are an established presence throughout the Bible. Therefore, their creation should have been mentioned somewhere in Genesis 1. Accordingly, Calvin begins his description of the doctrine of creation with an explanation about why Genesis 1 is silent on the subject of the creation of angels, which is followed by his doctrine of the angels. Calvin sees the reason for not mentioning the angels in the need for accommodation - God's way of adapting his message to the recipients of the revelation as conveyed by Moses: "For although Moses, in accommodation to the ignorance of the generality of men, does not in the history of the creation make mention of any other works of God than those which meet our eye, yet, seeing he afterwards introduces angels as the ministers of God, we easily infer that he for whom they do service is their Creator. Hence, though Moses, speaking in popular language, did not at the very commencement enumerate the angels among the creatures of God, nothing prevents us from treating distinctly and explicitly of what is delivered by Scripture concerning them in other places."[11] According to this statement, then, the biblical history of creation in Genesis 1 leaves out the creation of angels because it focuses on the visible world that can be perceived by all human beings. By introducing the concept of accommodation, Calvin attempts to harmonise two divergent ideas. On the one hand, Calvin works under the premise that only

[11] *Institutes* I, 14,3.

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the history of creation as the revealed word of God provides information about the creation of the world. But on the other hand, as early as in the history of the fall of humankind in Genesis 3, the existence of Satan and other angels is presupposed as a matter of course, even though they have not been mentioned in the history of creation. Without going deeper into the when and how of their creation, Calvin only deals with their function in the *Institutio*. However, these remarks make up the major part of the doctrine of creation in his dogmatics, while only a negligible part is assigned to the visible world, apart from human beings.

3 The function of good and evil angels

Calvin comments on the subject of angels in such great detail in order to fight misconceptions such as Manichaeism, which elevates the devil as the creator of all evil to the position of a second God. Instead, Calvin invokes the Nicene-Constantinople creed, which sees God as the creator of not only all visible, but also all invisible things, including, of course, the angels. Thus, the angels are creatures and ministers of God. However, Calvin rejects all speculations about the when and how of their creation: "[T]o stir up questions concerning the time or order in which they were created […] bespeaks more perverseness than industry. Moses relates that the heavens and the earth were finished (Gen 2:1), with all their host; what avails it anxiously to inquire at what time other more hidden celestial hosts than the stars and planets also began to be?"[12] In his detailed description of creation, Calvin thus follows the hermeneutic rule to only look to the Scripture as God's revealed word. This is also why he rejects all speculations about the hierarchy of the angels, as found in Pseudo-Dionysius the Areopagite's work "On the Celestial Hierarchy", as pure drivel. After all, even though archangels are mentioned in some passages of the Bible, and the names "Michael",

[12] *Institutes* I, 14,4.

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"Gabriel" and "Raphael" are also mentioned, it is hardly possible to draw any conclusions about the angels' hierarchy or number from these scraps of information. Instead, Calvin is content with the biblical description of the function of the angels: heavenly spirits that serve as ministers to God, obeying his orders and revealing him to the world. Therefore, they can (among other designations) also be identified as gods, "because the Deity is in some measure represented to us in their service, as in a mirror."[13] They mainly serve to protect us, and this applies to all angels – therefore, Calvin rejects the question of whether every individual believer has been assigned one individual guardian angel, declaring this enquiry useless and impossible to answer with the help of the Bible. Calvin does, however, hold on to the existence of angels as spirits with their own being, and thus as immaterial substances, against the Sadducean notion "that by angels nothing more was meant than the movements which God impresses on men, or manifestations which he gives of his own power."[14]

Calvin does not doubt the existence of evil angels any more than the existence of good ones, since the Bible mentions a multitude of evil spirits that vex humankind. The lord of the evil spirits is the Satan or the devil, who, contrary to the Manichean premise, is not a Godlike, uncreated, evil primordial being, but a fallen creature of God. As Calvin states, "this malice which we attribute to his nature is not from creation, but from depravation. Every thing damnable in him he brought upon himself, by his revolt and fall."[15] Calvin's aim is to defend the goodness of creation despite the existence of evil angels led by Satan, and he can only succeed by adopting the traditional premise of a fall of the angels initiated by Satan. At the same time, he is well aware of the fact that the Scripture does not mention the fall of the angels any more than it men-

[13] *Institutes* I, 14,5.
[14] *Institutes* I, 14,9.
[15] *Institutes* I, 14,16.

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tions their creation. But he finds an explanation for this omission as well. Since "these things are of no consequence to us, it was better, if not entirely to pass them in silence, at least only to touch lightly upon them. The Holy Spirit could not deign to feed curiosity with idle, unprofitable histories. Therefore, instead of dwelling on superfluous matters, let it be sufficient for us briefly to hold, with regard to the nature of devils, that at their first creation they were the angels of God, but by revolting they both ruined themselves, and became the instruments of perdition to others."[16] Calvin refers to 2 Peter 2:4 for an explanation: "For […] God did not spare angels when they sinned, but sent them to hell, putting them into gloomy dungeons to be held for judgement." However, Satan actually is subject to God's authority, so that his rebellion against God implies that God permits it, especially since Satan has already been defeated in Christ. As with the good angels, Calvin's thoughts here have an entirely realistic bent. He therefore rejects the notion "that devils are nothing but bad affections or perturbations suggested by our carnal nature"[17] as unbiblical. Satan and the evil spirits must really be sentient, intelligent spirits. Otherwise, statements such as 2 Peter 2:4 would be nonsensical: "For […] God did not spare angels when they sinned, but sent them to hell, putting them into gloomy dungeons to be held for judgement."

Only after he has dealt with the creation of angels and the fall of Satan and his followers, Calvin turns to the visible creation, which he sees as a *theatrum*, a glorious theatre. He explicitly refers to the comments on the six days of creation in Genesis 1 written by Basil of Caesaera and Ambrose. "From this history we learn that God, by the power of his Word and his Spirit, created the heavens and the earth out of nothing; that thereafter he produced things inanimate and animate of every kind, arranging an innumerable variety of objects in admirable order, giving

[16] Ibid.
[17] *Institutes* I, 14,19.

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each kind its proper nature, office, place, and station; at the same time, as all things were liable to corruption, providing for the perpetuation of each single species, cherishing some by secret methods, and, as it were, from time to time instilling new vigor into them, and bestowing on others a power of continuing their race, so preventing it from perishing at their own death."[18] This means that Calvin argues for the constancy of the species, which God created as distinct and independent from each other. But it is not his intention to describe the creation of the world in detail in the *Institutio*. For this purpose, he refers to the Mosaic history of creation: "I have no intention to give the history of creation in detail, it is sufficient to have again thus briefly touched on it in passing. I have already reminded my reader, that the best course for him is to derive his knowledge of the subject from Moses and others who have carefully and faithfully transmitted an account of the creation."[19] This means, however, that we must turn to Calvin's comment on Genesis 1 in order to find out more about his concept of nature.

4 The story of the seven days creation

In the introduction to his commentary on Genesis, we again encounter Calvin's basic premise that God's wisdom, power and mercy are reflected in the miraculous construction of the world. It is for this reason, says Calvin, that Moses begins his book with the history of creation. Calvin refutes the critical question of how Moses could have known about the creation of the world when he was not an eyewitness and could not have read about it in other books, with the notion that Moses had been informed about it by God himself. "For he does not put forward divinations of his own, but is the instrument of the Holy Spirit for the publication of those things which it was of importance for all men to

[18] *Institutes* I, 14,20.
[19] Ibid.

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know."[20] But the history of the creation of the world has been spread through oral tradition as well. From Adam, the first human being, it was handed down to subsequent generations; and to protect it from distortion, Moses wrote it down on God's behest. It already becomes clear in the introduction to his commentary that Calvin, entirely in keeping with the ancient and medieval commentaries on the six days of creation, views the world as finite and adheres to a geocentric model of the world. Here, he writes: "[T]he circuit of the heavens is finite, and […] the earth, like a little globe, is placed in the centre."[21] Calvin thus rejects the notion of infinite space as well as that of infinite time.

Turning to the interpretation of the individual verses of Genesis 1, Calvin integrates the concept of creation from nothing, a *creation ex nihilo*, which actually had been established a lot later, into the history of creation. Indeed, the Hebrew term for "create" does not signify the shaping of an already existing material. Here, Calvin eliminates the idea of an eternal, shapeless material, which he rejects as erroneous and pagan. In the beginning, God created the heavens and the earth, which means that he called into being the whole chaotic mass, the basic substance of the whole world. This becomes especially clear considering that water, over which the Spirit of God is hovering, is mentioned immediately afterwards. The Spirit of God hovering over the waters signifies that "this mass, however confused it might be, was rendered stable, for the time, by the secret efficacy of the Spirit."[22] True, "we now behold the world preserved by government, or order."[23] But before the world was put into order through natural laws, when it was still in the state of sheer chaos, it could only be preserved by the efficacy of the divine Spirit. In his interpretation as a whole, Calvin intends to point out the world's complete

[20] J. Calvin, *Commentary on Genesis*. Transl. J. King. **[**http://www.iclnet.org/pub/resources/text/m.sion/calvgene.htm**]**
[21] Loc.cit. 11.
[22] Loc.cit. 12.
[23] Ibid.

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dependence on God. This also shows in his interpretation of the fact that the creation of light is mentioned at the very beginning, even before the sources of light, sun and moon, are created. Calvin explains this as follows: "It did not, however, happen from inconsideration or by accident, that the light preceded the sun and the moon. To nothing are we more prone than to tie down the power of God to those instruments the agency of which he employs. The sun and moon supply us with light: And, according to our notions we so include this power to give light in them, that if they were taken away from the world, it would seem impossible for any light to remain. Therefore the Lord, by the very order of the creation, bears witness that he holds in his hand the light, which he is able to impart to us without the sun and moon."[24] Calvin strictly adheres to the concept of the six days of creation and rejects the idea that Moses could have split one act of creation into six days of work. This is another instance of God's accommodation to the mental capacities of human beings. The creation of the world occurs in stages in order to capture our attention.

Calvin identifies the work of the *second day*, the firmament in the midst of the waters, with the circle of air settling all around the world. He interprets the water above the firmament, which is being separated from the water below the firmament, as clouds that menacingly hover above us in the air, and yet leave us space for breathing. Here, too, he points out the dependence on God: "We know, indeed that the rain is naturally produced; but the deluge sufficiently shows how speedily we might be overwhelmed by the bursting of the clouds, unless the cataracts of heaven were closed by the hand of God."[25] Calvin does attribute the rain to the usual natural order, but this order can be overthrown by God at any time, as the Flood has shown. Likewise, the fact that we live on dry land can only be explained through God's miraculous intervention,

[24] Loc.cit. 18f.
[25] Loc.cit. 20.

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which caused the water on earth to collect in specific places. Then, on the *third day*, the earth received seeds and sprouts from God, so that the bare, infertile ground could bloom with life. Here, too, Calvin's main concern is to show the dependence on God. After all, herbs and trees are mentioned before the creation of the sun and the moon. Calvin explains this as follows: "We now see, indeed, that the earth is quickened by the sun to cause it to bring forth its fruits; nor was God ignorant of this law of nature, which he has since ordained: but in order that we might learn to refer all things to him he did not then make use of the sun or moon."[26] From this, the deeper meaning of the history of creation can be deduced: "that we may learn from the order of the creation itself, that God acts through the creatures, not as if he needed external help, but because it was his pleasure."[27] That which we perceive as the order of nature, e.g. propagation, thus is a direct result of God's will alone. It therefore is not an order immanent to nature itself.

This dependence on God also shows itself in the case of light, which at first lay scattered about on the first day of creation and was tied to carriers of light only on the *fourth day*. In this way, the ruling order of nature is established with the sun supplying the light of day and the moon and stars shining by night. In this way, the astronomical day that includes day and night is created. From that moment on, the sun and the moon provide signs, times, days and years. With its increasing proximity to the earth, the sun not only serves to warm up the land and thus to stimulate the natural growth process, but also to divide time into months and years. Especially in this regard, Calvin expressly points out that "Moses does not speak with philosophical acuteness."[28] He does not want to make a scientific statement about how big the sun or how small the moon is. "For as it became a theologian, he had respect to us rather

[26] Loc.cit. 21.
[27] Ibid.
[28] Loc.cit. 23.

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than to the stars."[29] According to Calvin, Moses speaks as a theologian and not as an astronomer. "Nor, in truth, was he ignorant of the fact, that the moon had not sufficient brightness to enlighten the earth, unless it borrowed from the sun; but he deemed it enough to declare what we all may plainly perceive, that the moon is a dispenser of light to us. That it is, as the astronomers assert, an opaque body, I allow to be true, while I deny it to be a dark body."[30] As a theologian, Moses wants to be understood by the uneducated, common man and therefore focuses on sensual perception, which is open to everybody. He elucidates on the universally understood uses of the sun and the moon for humankind and refrains from providing scientific information about the astronomical world. Thus he seems to think of the moon as a source of light, the second biggest after the sun, even though Saturn, which appears to be smaller because of its distance from the earth, is really bigger than the moon. But this does not mean that Moses is a bad astronomer – Calvin is only interested in differentiating the functions of theology and astronomy. Theology is not responsible for astronomy as such, even if the latter does not contradict the former. Rather, he writes about astronomers: "Nevertheless, this study is not to be reprobated, nor this science to be condemned, because some frantic persons are wont boldly to reject whatever is unknown to them. For astronomy is not only pleasant, but also very useful to be known: it cannot be denied that this art unfolds the admirable wisdom of God. Wherefore, as ingenious men are to be honoured who have expended useful labour on this subject, so they who have leisure and capacity ought not to neglect this kind of exercise. Nor did Moses truly wish to withdraw us from this pursuit in omitting such things as are peculiar to the art […]."[31]

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[29] Ibid.
[30] Ibid.
[31] Ibid.

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On the *fifth day*, God creates birds and fishes, adding to their creation his blessing and his mission: "Be fruitful and multiply!" But the reproduction of fowl and fish is different from that of trees and plants in that it occurs through the process of procreation. Calvin interprets the bible passage in question to mean that not only the fishes, but also the birds were created out of the water. On God's behest, then, the dead matter brings forth life as the water gives birth to fishes and birds. In contrast to creation from nothing, this means that the species are shaped from matter that had been created from nothing. The same concept applies to the creation of land animals on the sixth day, which also are not created from nothing, but formed from the earth. When the passage states that God created every one of these animals according to their kind, it points towards the permanent differentiation of the species that are preserved through procreation. This again makes clear that Calvin believes in the constancy of the different species as created by God. But at the same time, his interpretation of the history of creation in Genesis 1 shows that he does not pursue a specifically cosmological interest. He does not want to compile an encyclopedic record of the created natural world. What really, truly interests him about the history of creation is, above all, the creation of human beings. For Calvin, this represents the culmination of the history of creation; for humankind is God's most important work.

What Genesis 1 has to say about the creation of human beings on the *sixth day* is also influenced by God's accommodation of human beings: when the passage states that God had been deliberating with himself when it came to the creation of human beings, this does not mean that God at that time started to think about what form he wanted to give to human beings. "[J]ust as we have before observed, that the creation of the world was distributed over six days, for our sake, to the end that our minds might the more easily be retained in the meditation of God's works: so now, for the purpose of commending to our attention the dig-

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nity of our nature, he, in taking counsel concerning the creation of man, testifies that he is about to undertake something great and wonderful."[32] For "man is, among other creatures a certain preeminent specimen of Divine wisdom, justice, and goodness, so that he is deservedly called by the ancients 'mikrokosmos', 'a world in miniature.'"[33] Calvin, who also starts his remarks on the subject in the *Institutio* with the description of human nature in the primal state before the fall, adheres to the traditional notion that a human being consists of a soul and a body. This means that his anthropology is influenced by Platonism, which is obvious already in his definition of the soul. The soul can also be called "spirit" and is characterised as "an immortal though created essence, which is [man's] nobler part."[34] More precisely, the soul is an autonomous entity independent from the body, as Calvin demonstrates in his interpretation of the Paulinian differentiation between flesh and spirit. He substantiates this hypothesis with the human likeness to God postulated in Genesis 1:27. "For though the divine glory is displayed in man's outward appearance, it cannot be doubted that the proper seat of the image is in the soul."[35] As Ovid notes, their upright posture separates human beings from animals; but this external characteristic only serves to manifest the image of God which is localised on the inside. Calvin attributes the fact that Genesis 1 uses two different terms for "image" ("*zelem*" and "*demut*", which the Vulgata translates as "*imago*" and "*similitude*") to the Hebrew style. They are synonyms. Thus, he rejects the traditional interpretation that the *imago* refers to the fundamental substance of the soul while *similitudo* represents certain qualities of the soul. Instead, the Bible passage in question means the following: "God having determined to create man in his own image, to remove the obscurity which was in this terms adds, by way of explanation, in his likeness, as if he had said, that

[32] Loc.cit. 25.
[33] Ibid.
[34] Inst. I.15.2.
[35] Inst. I.15.3.

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he would make man, in whom he would, as it were, image himself by means of the marks of resemblance impressed upon him.[36] But human beings are created in God's image for the sake of their souls, which are defined by reason; and thus the likeness to God that is rooted in the rational soul extends to every aspect of the superior position of human beings among all the other kinds of living things. "Accordingly, by this term is denoted the integrity with which Adam was endued when his intellect was clear, his affections subordinated to reason, all his senses duly regulated, and when he truly ascribed all his excellence to the admirable gifts of his Maker."[37] According to Calvin, knowledge, righteousness and holiness are among these gifts characterising human beings in the primordial state. He expressly rejects the idea that human likeness to God is found in the dominion bestowed on human beings, instead of in the rational soul endowed with these gifts. Instead, he explicitly refers to Plato, who recognises God's likeness in the immortal soul. The soul, which is defined by reason and volition, is incorporeal, but it resides in the body, over which it rules.

With the advent of human beings, the work of creation has come to its end. When it says in Genesis 2:2 that God rested on the *seventh day*, it might appear as if now, after he has finished creating the world, he leaves it to its own devices. But Calvin does not share this opinion. In his commentary on Genesis, he writes: "The question may not improperly be put, what kind of rest this was. For it is certain that inasmuch as God sustains the world by his power, governs it by his providence, cherishes and even propagates all creatures, he is constantly at work."[38] The fact that God is the creator of the heavens and the earth thus also means that their perpetual preservation is attributed to his actions. But neither does God's resting mean that God has stopped creating new species.

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[36] Ibid.
[37] Ibid.
[38] Calvin, John, *Commentary* (note 20), 31.

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"[I]t is to be observed, that in the works of the six days, those things alone are comprehended which tend to the lawful and genuine adorning of the world. It is subsequently that we shall find God saying, 'Let the earth bring forth thorns and briers,' by which he intimates that the appearance of the earth should be different from what it had been in the beginning. But the explanation is at hand; many things which are now seen in the world are rather corruptions of it than any part of its proper furniture. For ever since man declined from his high original, it became necessary that the world should gradually degenerate from its nature. We must come to this conclusion respecting the existence of fleas, caterpillars, and other noxious insects. In all these, I say, there is some deformity of the world, which ought by no means to be regarded as in the order of nature, since it proceeds rather from the sin of man than from the hand of God. Truly these things were created by God, but by God as an avenger."[39] Thus, God's resting means that the creation of the world has been finished in the sense of being perfected. God's initial plan of the world as a work of art has been realised. Speaking of God's resting thus only serves "to express the perfection of the fabric of the world; and therefore we must not infer that God so ceased from his works as to desert them […]."[40] Thus Moses here portrays God as an artist, architect and rich house father who did not cease his efforts until his work was perfect and complete. Nature in its present state, on the other hand, is the result of the fall of humankind. God's resting thus does not mean that God has withdrawn from the world after its creation.

5 Providence is God's constant presence in his creation

On the contrary: in the *Institutio*, the doctrine of creation is followed by the doctrine of providence, which begins with the sentence: "It were

[39] Loc.cit. 32.
[40] Ibid.

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cold and lifeless to represent God as a momentary Creator, who completed his work once for all, and then left it. Here, especially, we must dissent from the profane, and maintain that the presence of the divine power is conspicuous, not less in the perpetual condition of the world then in its first creation."[41] Providence is an essential complement to creation. Calvin decidedly rejects the idea that God indeed created the world, but that the preservation and guidance of creation can be traced to a power that God had endowed the world with during its creation. "[F]aith must penetrate deeper. After learning that there is a Creator, it must forthwith infer that he is also a Governor and Preserver, and that, not by producing a kind of general motion in the machine of the globe as well as in each of its parts, but by a special providence sustaining, cherishing, superintending, all the things which he has made, to the very minutest, even to a sparrow."[42] Therefore, God's providence excludes random chance and coincidence. Even inanimate objects cannot work their God-given power unless they are steered by God. Thus, all created things are merely instruments of God's work, which means that he can suspend their usual effects with the help of miracles. When it says in Joshua 10:13 that the sun stood still on Joshua's orders, this miracle is supposed to show that the sun does not rise and fall every day because of a blind natural law. In the commentary about this particular passage, Calvin writes: "When, without hesitation, he opens his mouth and tells the sun and the moon to deviate from the perpetual law of nature, it is just as if he had adjured them by the boundless power of God with which he was invested. Here, too, the Lord gives a bright display of his singular favour toward his Church".[43] This means that God's providence does not mean that he leaves everything to a constant law of nature, but that it is rooted in his omnipotence. Therefore, it is inadmissible to at-

[41] *Institutes* I, 16,1.
[42] Ibid.
[43] Calvin, John, *Biblical Commentaries*. Transl. J. King [http://www.sacred-texts.com/chr/calvin/cc07/index.htm].

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tribute worldly events to stellar constellations and comet sightings with the help of astrology, because the movements of the stars and the appearance of comets themselves are dependent on God's will "[…] the providence we mean is not one by which the Deity, sitting idly in heaven, looks on at what is taking place in the world, but one by which he, as it were, holds the helms and overrules all events."[44] God's providence, then, is not mere prescience, but an action that also implies the dominion over the efficacy of the individual creature. Therefore, nothing happens by chance. Individual natural events, too, are effects of God's special providence. This position differs from the Stoic dogma that everything is subjected to *fatum* or *heimarmene* in that it does not attribute everything that happens to a causal nexus imminent to nature, but instead to God's wisdom and power. Calvin reconciles this God-given determinism with the notion of contingency in the following way: "though all things are ordered by the counsel and certain arrangement of God, to us, however, they are fortuitous, [because] the order, method, end, and necessity of events, are, for the most part, hidden in the counsel of God, though it is certain that they are produced by the will of God, they have the appearance of being fortuitous, such being the form under which they present themselves to us […]."[45] This means that all the changes in the world are hidden effects of God's wisdom, power and will. Even though they may be contingent in their own nature, they are still necessary, because God has decided for them to happen.

6 Calvin paved the way for Christian physics

By now it should have become clear that Calvin, despite his fundamentally positive attitude towards astronomy as a helpful tool in discovering the divine wisdom in creation, does not consider a purely scientific

[44] *Institutes* I, 16,4.
[45] *Institutes* I, 16,9.

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approach to the natural world to be sensible. In his view, this approach leads to misinterpretations, which can be avoided by focusing on the biblical history of creation. It is hardly surprising, then, that works are produced in Calvin's sphere of influence that take the Scripture as a basis for general physical models dealing with the origin and nature of the heavens and the four elements. In 1576, twelve years after Calvin's death, the *Physice Christiana sive de rerum creaturum origine et usu disputatio* was published in Lyon. It was written by Lambert Daneau, a Frenchman who taught at the Academy of Geneva at the time. The rationale for establishing this specifically Christian, i.e. biblical, model of physics is based on the idea that God, like every artist, would be best equipped to explain his own work, and that he does so in the Scripture. Therefore, physics must be based on the Scripture, or more precisely, on the history of creation. Calvin's influence on Daneau is clearly shown when the latter explains that the causal research of pagan physics remains stuck with a power immanent to nature, while Christian physics advances all the way to God as the origin of all things.[46] Therefore, only Christian physics fulfils the proper purpose of nature observation, i.e., to lead human beings to attain true knowledge of God, since it understands the natural world as a manifestation of God's power, wisdom and eternity. Daneau refutes the Aristotelian definition of physics as the science of being as being as long as it is in motion, stating that this would mean that invisible objects like angels could be the subject of physics. Instead, he defines physics as the science of corporeally and spatially limited things that can be perceived by the senses.[47] The world, which is only one, is the sum of all visible things, whose species have been created by God as independent from each other. Daneau defends the finiteness and spatial limitation of the world with the argument that other-

[46] Bizer, E., *Frühorthodoxie und Rationalismus*, Zürich 1963, 34f.
[47] L. Danaeus, Physice Christiana sive de rerum creatarum origine et usu disputatio, 3. Ed., Geneva 1580, 53.

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wise, there would be two infinities – God and the world. In all probability, Daneau states, the world is the shape of a sphere, because that is the most perfect geometric form. That it is created also implies that it has a temporal beginning and will have a temporal end, thus, that it is not eternal. According to Daneau, it is even possible to establish the date of creation with the help of the Scripture – in 1575, when he wrote his book, he calculated the age of the world to be 5555 years. Its creator is God alone, who creates it from nothing. Plato's *Timaios* is invoked as extra-biblical testimony that the sole reason for the creation is not any lack on God's part, but God's goodness and his will to bestow it unto others. The purpose of the world is the glorification of God, insofar as the whole of creation praises its creator as an expression of God's power, wisdom and goodness.

In the second part of his *Christian Physics*, Daneau deals with the nature of created things, following the progression of the biblical story of creation as the work of six days. Here, he defines nature as the power bestowed on every species at the time of their creation that enables every individual thing to actualise its specific purpose or destiny. However, this means that Daneau shares the teleological concept of nature found in the Aristotelian *Physics*. Like Calvin, Daneau differentiates between the light created by God in the beginning and the luminary celestial bodies that were only created on the fourth day. On the second day, God created the space between heaven and earth, thereby separating the celestial from the terrestrial waters. The space in between itself is filled with aqueous and gaseous bodies. Above it expands the ether, beyond which lies the heaven of the blessed, the empyreum. Daneau pays special attention to the terrestrial waters with its peculiar sea creatures, praising it as a special theatre of the divine miracles of creation. In contrast, the firm land, the earth populated by birds and land creatures, has been created for the sake of human beings and for their use. Daneau assumes that the earth is positioned at the centre of the cosmos. In his

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view, it also can be clearly deduced from the Scriptures that the earth, unlike the sky, does not move. Since creation progresses from the less perfect to the more perfect, the celestial bodies are only created on the fourth day after the plants. They are creatures and not gods. But they consist of a special material, of heavenly matter. They are not themselves sources of light, which has been created before them, but instead they are vessels in which God collects the light. Since they are arguably more perfect that the plants on earth they must belong to a more perfect sphere, which does not consist of the four elements, but of ether. Due to its god-given power, the ether is continuously moving, while the planets also have their own individual movements. The starry sky does not only bear witness to God's honour, but also serves as a secondary cause for the cycle of growth and decay on earth. Daneau's *Christian Physics* ends with the creation of animals.[48]

Daneau is by no means the only scholar whose concept of nature is based on or influenced by the history of creation. A very similar approach can be found in the works of Girolamo Zanchi, who dedicated the third part of his *De Religione Christiana Fides* to the six days of creation. The work was published in 1585 in the Palatine town of Neustadt, where Zanchi taught at the Reformed Casimirianum during Heidelberg's intermediate Lutheran phase. Although Zanchi is an Aristotelian, he develops his doctrine of creation as an interpretation of Genesis 1 with corresponding additions like the ones that can be found in Calvin's work. The first part deals with the creation of invisible things, i.e., the angels; the second part is about the visible creation; and the third part is concerned with humankind in it primordial state before the fall. Zanchi shares Daneau's opinion that physics is a part of theology. After all, theology observes God through his works, among which are the creation and preservation of the world. Zanchi also agrees with Daneau on the concept of nature. He views the nature of a natural thing to be the power

[48] E. Bizer (note 45), 42ff.

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that works within the thing itself. This is the Aristotelian concept of nature, since Aristotle regards nature as the power immanent in individual things, by which objects are either in motion or at rest.[49] In Zanchi's view, this is not only taught by Aristotle, but also by Moses. Nothing makes human beings realise God's immeasurable power, wisdom and goodness more clearly than this power residing in things. Zanchi assumes that Moses and Aristotle basically agree in their concept of the world, apart from Aristotle's belief in the eternity of the world. Otherwise, however, both hold the view that the search for causes leads, by way of the inner causes of things, to the first cause, which is God; and that there is an upward progression in the order of things from the less perfect to the more perfect.[50] An attempted synthesis of Mosaic history of creation and Aristotelian physics is also obvious the identification of water, above which God's spirit is hovering, as the first matter which, according to Zanchi, God had created out of nothing. Like the works of Calvin and Daneau, Zanchi's doctrine of creation shows an obvious Aristotelian influence despite its general basis in the biblical history of creation, and despite criticism of some of Aristotle's concepts, such as the premise of the world's eternity and the number of the spheres. But for Zanchi, as for Aristotle, Calvin and Daneau, earth is a body positioned at the centre of the world.

With his representation of the world based on the history of creation, Calvin did not only pave the way for Mosaic or Christian physics. Two years after Daneau's work was published, the Calvinist Guillaume De Salluste Du Bartas published his epic *La Sepmaine Ou Création Du Monde*. By 1632, the work had seen more than fifty editions. It was immediately translated into German, Latin, English and Dutch. It is a cosmological didactic poem, it follows the history of creation in its structure but also integrates the entire body of scientific knowledge of the

[49] Zanchi, H, *Opera theologica*, Geneva 1618/19, Vol. 3, p. 219.
[50] Cf. ibid., p. 222f.

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time. Here, the Creator-God becomes an epic hero, and the depiction of the creation turns into a cosmological encyclopedia. Still, this poetic interpretation of the Calvinist doctrine of creation, much like Calvin's works themselves, moves entirely within the boundaries of the old world model and rejects the Copernican system.