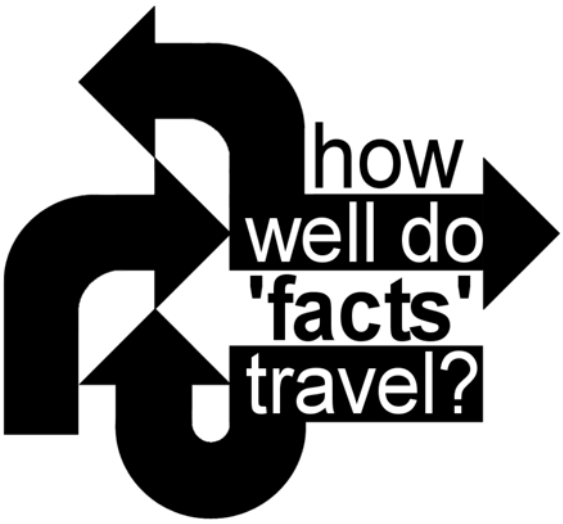
Working Papers on The Nature of Evidence:
How Well Do 'Facts' Travel?
No. 04/05

Moral Facts and Scientific Fiction: 19th Century Theological Reactions to Darwinism in Germany

Bernhard Kleeberg

Max Planck Institute for the History of Science, Berlin
Visiting Scholar to LSE January-Jul 2005

August 2005



“The Nature of Evidence: How Well Do ‘Facts’ Travel?” is funded by The Leverhulme Trust and the ESRC at the Department of Economic History, London School of Economics.

For further details about this project and additional copies of this, and other papers in the series, go to:

http://www.lse.ac.uk/collection/economichistory/

Series Editor:

Dr. Jonathan Adams
Department of Economic History
London School of Economics
Houghton Street
London, WC2A 2AE

Tel: +44 (0) 20 7955 6727
Fax: +44 (0) 20 7955 7730

Moral Facts and Scientific Fiction: 19th Century Theological Reactions to Darwinism in Germany[1]

Bernhard Kleeberg

Abstract

When the German translation of Darwin's *On the Origin of Species* was published in 1860, it intensified a conflict that German theologians had been fighting since the early 19th century. Arguments against the secular relativising or even thorough dismissal of the scientific, philosophical and social importance of the bible now had to be supplemented with arguments against the anti-teleological consequences of Darwin's theory. But though they all agreed in rejecting these consequences, German theologians considerably differed in respect to the epistemological status they granted to Darwinian and biblical accounts of man and nature. Whether they considered the truths of science and religion as corresponding, complementary, independent, or incompatible depended on their judgments on the relation between (scientific) facts, theories, and (cultural) convictions. These judgments were shaped in a specific way: Darwinism in Germany was mainly associated with Ernst Haeckel's monistic evolutionism that explicitly claimed to be science as well as a new religion. Furthermore, romantic and idealistic natural philosophy were very influential in developmental biology, bolstering anti-selectionist theories that were easier to reconcile with religion. Though literal interpretations of the scriptural account of nature became more or less abandoned by the end of the century, the theological interpretation of the relation between nature and scripture seems to have shifted towards positions either stressing incompatible epistemologies of belief, or the complementarity of moral and empirical knowledge. The theological discussions of what counted as a fact, and what was held to be convincing evidence to establish facts, sheds light on the distinction between explaining and understanding that would become a major issue in 20th century epistemology.

[1] I thank the "The Nature of Evidence: How Well Do 'Facts' Travel?" project, funded by the Leverhulme Trust and ESRC at the Economic History Department, LSE, for hosting me during this research period. This paper is the July 05-draft of a presentation at the conference ''Biblical hermeneutics and the study of nature. Some historical perspectives" (Ancaster, Ontario). Further references and a more extensive scholarly apparatus have been partially omitted in the present version. This paper is subject to revision, so please do not quote without the author's permission (kleeberg@mpiwg-berlin.mpg.de).

1. Introduction

> […] the banner of progressive Darwinists carries the words: 'Development and progress!' From the camp of the conservative opponents of Darwin you hear the call: 'Creation and species!' The gulf that divides the two parties is growing from day to day, every day new weapons pro and contra are pulled up; day by day broader circles are taken hold of by this enormous movement.[2]

When zoologist Ernst Haeckel used these words to describe the contemporary struggle of the world views at the 38th *Meeting of German Naturalists and Physicians* in 1863, Darwin's *Origin of Species* had been available to the German audience for three years – though not entirely: the translator Georg Heinrich Bronn omitted one significant passage from the last chapter: "Light will be thrown on the origin of man and his history."[3] Even so, the discussions about the descent of man could not be postponed. Not only did the same year see the translation of Thomas Henry Huxley's *Evidence to Man's Place in Nature*, but also published was *Lectures on Man*, by the radical Liberal Carl Vogt.[4] Vogt, who welcomed Darwin's theory of descent, was already a familiar figure to the German public, as he had been one of the two protagonists of the so called "materialism struggle." His writings had been harshly criticized by his fellow physiologist Rudolf Wagner, who called him a "frivolous

---

[2] Ernst Haeckel, "Über die Entwicklungstheorie Darwin's. Öffentlicher Vortrag am 19. September 1863 in der Versammlung Deutscher Naturforscher und Ärzte zu Stettin," in: *Gemeinverständliche Werke*, Vol. V, Leipzig und Berlin 1924, 18. This and all following translations are mine, B.K.

[3] Cf. Charles Darwin, *Über die Entstehung der Arten im Thier- und Pflanzenreich durch natürliche Züchtung oder die Erhaltung der vervollkommneten Rassen im Kampfe um's Daseyn*, ed. by Georg Heinrich Bronn, Stuttgart 1860. Concerning the choice of most of theologians discussed in this paper I am indebted to Jan Rohls, "Darwin und die Theologie. Zwischen Kritik und Adaption," MSS München 2003, 11 (forthcoming in: Kurt Bayertz/Walter Jaeschke (eds.), *Der Darwinismus-Streit*).

[4] Cf. Thomas Henry Huxley, ''Man's Place in Nature: On the Natural History of the Man-Like Apes" (1863), in: Ders., *Collected Essays*, 9 Vols., London 1894, Vol. 7; Carl Vogt, *Vorlesungen über den Menschen, seine Stellung in der Schöpfung und in der Geschichte der Erde*, 2 Vols., Gießen 1863.

materialist," as Vogt had not only regarded the activity of the soul as a mere function of nervous substance, but also claimed that God had been replaced by "blind, unconscious necessity."[5] In *Über Menschenschöpfung und Seelensubstanz* (1854), Wagner insisted on the sovereignty of religious doctrines in respect to science, warning of the moral consequences of materialism. He defended the idea of creation, the descent of man from Adam and Eve, the idea of a "substance of the soul," free will, and life after death.[6] Vogt reacted with a polemical publication titled *Köhlerglaube und Wissenschaft* that saw four new editions in 1855.[7] His articulate argument for anti-idealistic and atheistic consequences of science caused a big sensation and led to the emergence of even clearer polemic opposites within the public debates: materialism versus idealism, spontaneous genesis versus creation, atheism versus Christian faith, freedom versus authority, enlightenment versus obscurantism.[8] For the rest of the century, these opposites shaped all the discussions between science and religion and hampered efforts to reconcile biblical accounts of man and nature with the new Darwinian explanations of natural development and anthropology. Thus, when Darwin's theory was introduced to Germany, the theological audience was already struggling to fight off the secular relativization (or even thorough dismissal) of the scientific, philosophical and social importance of the bible, searching for

---

[5] Rudolph Wagner in the Augsburger *Allgemeine Zeitung*, September 1851, cit. from Andreas Daum, *Wissenschaftspopularisierung im 19. Jahrhundert*. *Bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Öffentlichkeit 1848–1914*, München 1998, 295. Cf. Carl Vogt, *Physiologische Briefe für Gebildete aller Stände* (1845), 3rd ed. Gießen 1861.

[6] Cf. Rudolph Wagner, ''[Menschenschöpfung und Seelensubstanz]," in: *Amtlicher Bericht über die Ein und Dreißigste Versammlung Deutscher Naturforscher und Ärzte zu Göttingen im September 1854. Erstattet von den Geschäftsführern derselben Baum / Listing*, Göttingen 1860, 15–22.

[7] Carl Vogt, *Köhlerglaube und Wissenschaft. Eine Streitschrift gegen Hofrath Rudolph Wagner in Göttingen*, Gießen 1855.

[8] Cf. Daum, Wissenschaftspopularisierung, 298f.

arguments to underpin its conception of reality and the moral and religious consequences it implied.

The necessity of dealing with these intellectual challenges was even more obvious, as other developments severely threatened the Christian churches. With the confiscation of a vast amount of church property during the early 19th century process of secularization, the political and economic influence of the churches had been severely weakened. Adding to this, since the 1820s Prussia had tried to further its influence on the local protestant denominations by creating the "Union of Prussian Regional Churches," prompting a reaction of the Reformed and Lutheran churches which ultimately led to a denominational splitting of German Protestantism:[9] When other German states made similar efforts, more and more so-called ''free churches" were founded in an attempt to establish independent and self-sustaining denominational communities.[10] These developments intensified in the 1860s and 1870s, when after the revolutions of 1848/49 most local rulers had made themselves head of the church, resulting in an immense heterogeneity of protestant German theology connected to different theological schools and local environments.[11] The situation of Catholicism had equally been affected by the secularization, but again differed considerably from that of the Protestant denominations. Catholicism took a new and thoroughly anti-liberal turn with Pius IX's return to Rome after the revolutions. Catholicism's inner struggle with modernism resulted in the publication of the *Syllabus Errorum* (1864), which condemned secular thoughts on nature and society; ranging from moral topics, political positions like communism, socialism and liberalism, to secular philosophical and

[9] Rohls, Protestantische Theologie, 602.

[10] Cf. Georg Froböss, "Lutheraner, separierte," in: *Realencyklopädie für protestantische Theologie und Kirche* [RE], ed. by Albert Hauck, Vol. 12, Leipzig, 3rd ed. 1903, 4.

[11] This is the so-called "High Episcopacy" [''Summepiskopat"] that existed from 1850 to 1918, since 1871 loyal to the German Kaiser; Cf. Froböss, Lutheraner, 17.

scientific views like pantheism, rationalism, materialism, and (especially) naturalism.[12] When several liberal professors of Catholic theology were excommunicated, conflicts with the government were inevitable, as they also served as civil servants. With the declaration of the pope's infallibility in 1870, these developments (between 1871 and 1887) culminated in the "Kulturkampf," with Prussia and the German Reich (under Chancellor Bismarck) trying to minimize the political and educational influence of Catholicism. The Protestants were also affected, as there was a tendency for all those who argued for the freedom of church, especially in respect of education, to be seen as "Ultramontanists."[13]

Above all others, it was Haeckel who polemicized against Ultramontanism and "dualistic theology" as the main enemies of evolutionary theory and the freedom of science.[14] But it is worth noting that even Haeckel, as the most prominent and widely read German "Darwinian" of the time, argued that Darwin's theory was nothing really new, but only furnished the existing developmental theories with yet another explanation. The novelty of Darwin's theory lay only in the idea of *natural* selection: Darwin had simply revived the Lamarckian theory of

---

[12] Naturalism was considered to be especially dangerous, forming an unholy alliance with ideas such as the separation of church and state, freedom of the press, freedom of conscience and the abolition of actions against critics of Rome. This new conservatism not only bred neo-scholasticism, but also led to the forming of opposition within German Catholicism, as liberal movements like "Old Catholicism" and some theological schools were also attacked. Cf. Jan Rohls, *Protestantische Theologie der Neuzeit*, Vol. 1: Die Voraussetzungen und das 19. Jahrhundert, Tübingen 1997, 601ff.

[13] Cf. Klaus Schatz, "Vatikanum I (1869–1870)," in: Theologische Realenzyklopädie 532–541, 536f.

[14] Though materialistic views about chance and necessity posed the most dangerous threats, even the concept of nature and man that had been put forward by popular romantic natural philosophy challenged religious standpoints, as their accounts of nature either banned God to a place at the beginning of creation following Deism, or banned him from nature at all as in the several pantheistic theories of the "natural whole" that had emerged since the late 18th century. Haeckel subscribed to all the key elements of pre-Darwinian materialist critique of religion: the biblical account of creation, the idea of the primordial couple Adam and Eve, the dogma of the constancy of the species, the possibility of a divine intervention in nature as acknowledged in the scriptural accounts of miracles, the divinity of Jesus and the existence of a supreme being itself.

descent, as his theory of natural selection provided a causal-mechanical basis that connected the transmutation of organic forms with the physiological functions of heredity and adaptation.[15] It was this alliance of Lamarckism and Darwinism that helped to "harmonically and thoroughly explain" the continuous progressive transmutation of species, and further helped to integrate "the totality of the series of phenomena of organic nature into a single great harmonic picture."[16] Following Goethe's pantheistic vision of a developing natural whole, for Haeckel the theory of natural selection provided a foundation for the integration of past and present, organic and inorganic, man and nature, and ultimately, even science and religion.[17] He thus proposed a concept of "natural theology," based on the equation *God = the law of causality*. Devoid of the "unworthy anthropomorphism" of conceiving God as an "aerial vertebrate," the law of causality served as an "infinitely more sublime image of God,"[18] determining the beauty, harmony and order of nature in its unity and development. Thus, though Monism cannot be understood as a form of natural theology in a strict sense, theological and teleological elements were still crucial to it: As there is no such thing as chance within Monism, all natural events point to the everlasting order of a steadily improving nature, guaranteed by necessity.[19]

Haeckel's juxtaposition of "development and progress" and "creation and species" was underpinned by a belief in progress that fit perfectly with the optimistic undercurrent of the mid-century liberal

---

[15] *Generelle Morphologie II*, 165f.; cf. ibid. 9 and 167: the theory of natural selection had put the theory of descent on an "unshakable mechanical basis."

[16] *Generelle Morphologie II*, 166f.

[17] *Natürliche Schöpfungsgeschichte*, 15.

[18] *Generelle Morphologie II*, 450f.

[19] This can be described as a secularized version of *providentia generalis* that remained characteristic up to his late writings on monistic philosophy, wherein he introduced his spinozistic concept of "god-nature" – "theophysis" – that exhibited all the transcendental qualities that the God of physicotheology had once owned.

bourgeoisie, as developmental thinking seemed to show that the defeat of 1848/49 was merely a minor setback in the universal and *necessary* line of progress.[20] When Haeckel called Monism "the new natural religion," he therefore claimed that (thanks to scientific progress) it had finally become possible to truly understand the "book of nature," that scientists had become the priests of this ultimate form of natural theology as opposed to "scholastic theology," able to solve the "riddles of the world" and understand the "true meaning" of nature. This "scientific religion" was able to re-enchant the world that materialists like Vogt had described as the outcome of blind chance and necessity – and could thus fill the growing gap that the pushing back of Christianity had opened up, providing a self-assuring world view. Faced with Monism, theology not only had to resist the implications of Darwin's theory for the organic world (the explanations of which could now solely be based on chance and causality) – it also had to establish arguments against an allegedly modern world view that viewed itself as a superior religion.

2. Historical criticism and speculative Christology

All these threats to religious sovereignty shaped theological reactions to non-Christian accounts of the bible. But there were also developments within theology itself that challenged the traditional role and interpretation of the bible, notably the emergence of the historical-critical method and its consolidation as a central part of biblical hermeneutics since 1800. When Kant, Herder and others had pointed to the importance of source-critique, the old doctrine of the inspiration of the bible could no

[20] Cf. Rolf Peter Sieferle, *Die Krise der menschlichen Natur. Zur Geschichte eines Konzepts*, Frankfurt/M. 1989; Frank Simon Ritz, ''Kulturelle Modernisierung und Krise des religiösen Bewußtseins. Freireligiöse, Freidenker und Monisten im Kaiserreich," in: Blaschke, Olaf / Frank-Michael Kuhlemann (Hg.), *Religion im Kaiserreich. Milieus, Mentalitäten, Krisen,* Gütersloh 1996, 457–473.

longer be easily upheld. The contents of the bible became conceived as largely historical, depending on the specific circumstances of the time it was compiled, the *hermeneutic* question about the ultimate meaning of scripture was substituted for the *historical* one about how it had originated as a text.[21] Nevertheless, as scripture was still held to contain the word of God, the dogmatic postulate and the historical axiom stood side by side and had to be reconciled. The solution that tradition suggested for this problem was the principle of accommodation, which since the church fathers had been understood as God's pedagogical attempt to ease reception of the divine message by accommodating it to the specific needs and apprehensions of the audience. This principle was modified in a crucial "historistic" way, when the possibility of different authors of the bible was introduced, culturally conditioned under different circumstances, arbitrarily altering the word of God. Regarding the biblical account of nature, this meant that incorrect depictions of reality might have been given, either due to the historical stage of scientific knowledge, or the biblical authors following the principle of accommodation. Consequently, this concept led some exegetes to a thoroughly historical interpretation of scripture, as Georg Heinrici bemoaned in an article on biblical hermeneutics in 1903.[22]

It was the liberal protestant theologian David Friedrich Strauss (who had studied with Friedrich Schleiermacher and Ferdinand Christian Baur), who became the epitome of this new kind of "unfaithful theology."[23] Stressing the historicity of the person "Jesus" and the hermeneutical

[21] This has mainly been the work of Siegmund Jacob Baumgarten's disciple Johann Salomo Semler, who had suggested that Jesus and the apostles formulated their teachings from a subjective point of view.

[22] Cf. Georg Heinrici, ''Hermeneutik," in: *Realencyklopädie für protestantische Theologie und Kirche*, ed. by Albert Hauck, 3rd ed. Leipzig 1903, 718–750, 737f.; Heinrici was professor for New Testament in Leipzig.

[23] Baur (1792–1860), founder of the "newer Tübingen school," dissolved the biblical narration and canon into a construction of primordial Christian history that is related to sacred history; cf. Thomas K. Kuhn, "Strauß, David Friedrich," in: TRE 241–246.

importance of the differentiation between ideal and literal meaning of the bible, Strauss (in his *Leben Jesu, kritisch bearbeitet* [1835-36]) introduced his "mythical approach" as continuation of the allegorical interpretation: the bible presents a mythology, "a kind of narration, covering primordial Christian ideas."[24] A "speculative de-mythologization" was to eliminate the mythological contents from the gospels in order to get to their real truth content. This truth he conceived as a unity of God and Man, not rooted in the historical Jesus, but in mankind.[25] Strauss advanced this approach in his *Christliche Glaubenslehre* (1840-41), introducing a "speculative Christology of mankind," a post-Christian religion of humanity that allowed for a reconciliation with Darwinism. His *Der alte und der neue Glaube* (1872)[26] can be regarded as the most elaborate adaptation of theology to evolutionism, and it is not surprising that he referred to Haeckel's "monistic religion" when outlining his "new religion": Not only did Strauss complement Haeckel and Huxley on their position about the first appearance of life on earth (for they had drawn anti-dualistic consequences), but also defended the idea of the descent of man from ape – with the same argument that Haeckel had used: it had to be regarded as an even higher accomplishment of man to have worked all

[24] David Friedrich Strauß, *Das Leben Jesu für das deutsche Volk bearbeitet*, Teil I–II, 8th ed. Bonn 1895, I, 75. I translated "Vorstellung und Begriff" with "ideal and literal meaning," a differentiation that was mirrored in the schools of supranaturalism (Hermann Olshausen) and rational-pragmatist approaches, which Strauß both radically criticized. He also questioned the appearance of "instances of reason" in history. Cf. Rohls, Protestantische Theologie, 604.

[25] Jesus was only part of the form, not the content of the idea of the divine man.

[26] Cf. David Friedrich Strauss, *Der alte und der neue Glaube. Ein Bekenntnis*, 5th ed. Bonn 1873. Strauß gave up his Hegelian approach after having read Darwin, Schopenhauer, Haeckel, Lotze and Hartmann. The controvercies about his works led to a stark intensification of scholarly attention towards primordial Christianity, sources for the life of Christ. After Strauß, an appropriation of the content of Christian belief without historical critique was no longer conceivable for systematic theology; cf. Kuhn, Strauß.

his way up the ladder of evolution.[27] The development of Strauss' ideas is an excellent example for the secularization of biblical hermeneutics, dismissing all but historical-critical approaches, that is, the historization of scripture leading to an interpretation of the bible as a mythological narration just like *any* other religious mythology. The stress he put on the historical development of religion stemmed from a Hegelian background, but was very easy to reconcile with Darwinism on the basis of the common progressive developmental thinking. So in the end Strauss proposed a monistic religion very much like Haeckel's, merging theology with Darwinism.[28] Though his writings alienated him from protestant orthodoxy and led to him losing his job as professor of dogmatics in Zürich, after Strauss' *Life of Jesus* all the different schools of theology from the mid 19th century onwards had to deal with the question of the historical development of religion and of the bible in particular. Thus they were familiar with the arguments against faith, which often were based on a strong bias towards the historical-critical method.

3. Exclusive alternatives: Conservative theological reactions to Darwinism

Provoked by the polemical position of Haeckel and his followers, many theologians did not follow Strauss' speculative Christology, but openly denied the possibility to reconcile Darwinism and Christian religion.[29] The influential neo-Lutheran theologian Christoph Ernst

[27] Strauss, Der Alte und der neue Glaube, 138; On Haeckel's position cf. Bernhard Kleeberg, *Theophysis. Ernst Haeckels Philosophie des Naturganzen*, Köln/Weimar 2005.

[28] With the prevailing of development over creation and constancy of species, Darwinism furthermore had underpinned a monistic natural religion, reintroducing natural deities, which spiritualistic and dualistic religions had excluded: Cf. Der Alte und der neue Glaube, 120–123 and 143; Rohls, Darwin und die Theologie, 13.

[29] Cf. Rohls, Darwin und die Theologie, 11.

Luthardt argued that Darwinism misconceived the qualitative difference between man and animal, the huge gap that divided them: reason.[30] Whilst creation and the constancy of species were warranted by scripture and Christian tradition, and the latter could even be observed, the transmutation of species or even their common descent could not be empirically confirmed. As one of the main protagonists of the "Erweckungsbewegung," Luthardt nevertheless was mainly concerned with religious practice, to which the aims of biblical hermeneutics would have to be adjusted. Following different epistemologies, science and religion could live side by side, if the natural sciences refrained from interfering with religious issues, to which they had been encouraged by the "Kulturkampf" that was not only directed against Rome, but against certain religious principles that were common to Christianity.[31] A similar point of view was held by the conservative apologetic and biblical realist Robert Benjamin Kübel, for whom the direct creation of man was undisputable: for if the human spirit was a vital power deriving from God, man's first appearance could never be explained by immanent natural development; man was created by a "specific act of God," an "immediate, personal interference by God *ad hoc*."[32] Kübel distinguished between the scientific and the theological content of the bible, but did not argue for them relying on different epistemologies – the biblical account of creation causally explained the origins of nature just like science explained natural development.[33]

---

[30] Christoph Ernst Luthard, *Apologetische Vortraege über die Grundwahrheiten des Christentums,* Leipzig 1864, 12th to 14th edition Leipzig 1897, 85.

[31] Chr. E. Luthardt, *Wirkungen des Kulturkampfes* (1880); cf. Rohls, Darwin und die Theologie, 14.

[32] Kübel, "Apologetik," in: Otto Zoeckler (ed.), *Handbuch der theologischen Wissenschaften in encyclopaedischer Darstellung*, Vol. 3, 2nd ed., Munich 1883, 252; cit. from Rohls, Darwin und die Theologie, 15.

[33] Kübel, Apologetik, 245; cit. from Rohls, Darwin und die Theologie, 15.

A very interesting example which below will be considered at some length is that of the leading conservative Lutheran Otto Zöckler.[34] In his *Theologia Naturalis*, published in the same year as the German translation of the *Origin*, Zöckler picked out materialists as the primary foes of a revelatory natural theology, unaware that at the same time, a new and powerful theory was emerging that thoroughly strengthened their counterarguments. But though materialism gained strength in practical life, Zöckler regarded it as "scientifically totally dead," rendering its further abatement unnecessary: natural theology would simply take away the weapons of materialism – "sensual things" and "evidences of experimental science" – and "integrate the naturalistic element," fighting "carnal realism" with the "pneumatic realism of scripture."[35] The *Theologia Naturalis* aimed at the "verification of the fundamental consilience of the book of nature and of revelation,"[36] trying to conceive God from nature without following the principles of a *theologia rationalis* or any kind of scientific perception of God solely from nature. It was to be based on revelation, on the principle of a "hopeful expectation" of the coming of the realm of Christ:

> It does not refer to a perception of God based on exploration and consideration of objective nature (the whole visible world of creatures, macrocosmic as well as microcosmic): but only to the constricted opinions and judgments of the 'natural' man about God and divine things; to the whensoever unnatural, mostly even

[34] Cf. Rohls, Darwin und die Theologie, 13.

[35] Cf. Otto Zöckler, Otto, *Theologia Naturalis. Entwurf einer systematischen Naturtheologie vom offenbarungsgläubigen Standpunkte aus*, Frankfurt/M. et. al. 1860, 281ff., Zöckler cites Erdmann, *Entwicklung der deutschen Spekulation seit Kant*.

[36] Ibid., III. He regarded this consilience as the task of a "science that does not rely on phantasmagoric ideas or abstract arbitrary combination but on objective necessity, based on the historical developments of the church and its theology," thus forming "the third and equally important factor of the Christian doctrine besides the teachings of faith and morality […]." Ibid., IV, (the German term "Kombination" also denoting "reasoning").

> contra-natural ideas of the naked and isolated human mind, averted from divine light.[37]

At best, these opinions are those of the faithful mind, based on scripture, church-doctrine and inner experience, as the unaided mind is not capable of true knowledge.[38] Accordingly, natural theology follows the doctrine of *credo ut intelligam* in order to "illustrate the book of revelation by means of the book of nature, and to interpret the latter with help of the former."[39] This can be achieved by natural theology helping science to "see God and his finger in *all* creatures, to see through the mantle of the natural organism into the invisible wheelwork of eternity that is hidden behind it […]."[40]

Zöckler's negative account of unaided human perception and rationality corresponds with a contempt for the world, necessitated by the principle of *hopeful expectation*, that calls for a positive-anagogical comparison between this world and the insinuations of revelation.[41] The method of natural theology is to progress from an analogical-symbolical to an anagogical-typical consideration of nature. It relies on the immediate

---

[37] Ibid. 2; "exploration and consideration" translated from "Begründung und Betrachtung"; cf. V and 1f.

[38] Though natural knowledge and immediate experience of nature are of some importance, it is "almost unnatural to want to know God from other sources adequately and to worship him from other principles than his own and immediate declarations in revelation." (ibid., 6) Natural theology even less can be compared to natural religion, as it is held by the English rationalists, whether understood as deism, naturalism, pantheism or polytheism.

[39] Ibid., 6. Natural revelation is only a "preliminary and shadowy step," natural theology extends and elucidates the biblical and ecclesiastical teaching of faith, enlightens the theology of sentimental experience and fulfils the philosophical-propaedeutic aim of natural theology.

[40] Ibid., 277. Natural theology is related to natural philosophy, as both rely on the analogy between the microcosm – man – and the macrocosm – nature, as Zöckler points out in reference to Gotthilf Heinrich Schubert (279f.).

[41] Hopeful expectation always has to be combined with fear of the last judgment and is never to forget that true freedom can only be achieved through the catastrophes of the apocalypse (ibid., 195–199).

tie between nature and scripture in biblical imagery, symbolism and metaphorical language as the "sometimes objective, sometimes absolute norms and tests for the interpretation of nature."[42] He thus demands scientific explanation of nature to follow principles of biblical hermeneutics, detecting sensually unperceivable patterns of natural symbolism that correspond to types of symbolical, allegorical and parabolical representations used by God, Jesus, the prophets or apostles.[43] This "positive criticism of biblical symbolism" results in the insight that "[a]ll natural beings in their innermost divinely determined essence exactly match with the symbolism of holy scripture," the essence of all natural creatures being their eschatological and teleological character, revealed by "biblical physics."[44] The natural sciences only help to extend the biblical symbolism to all the natural things (that were unknown or do not appear in scripture), and help to find a way through the labyrinth of nature, especially if they are based on "exact empirical observation and diligently conducted experiments."[45] Thus, biblical physics is the crucial next step in understanding the true essence of natural beings, science only providing a peripheral knowledge of them,

[42] Ibid., 203; Biblical language has not, like Johann Jacob Schleiden thinks, created *aesthetical* symbols for the inapprehensible (200ff.).

[43] Ibid., 204ff. Symbols are used to represent something that cannot be sensually perceived (metaphors, tropes, analogies), allegories being symbols transformed into actions (descriptive), parables being salutary stories (narrative). Types refer to time, are "prophetic symbols" (210f.). The symbolic use of natural beings in scripture helps to judge them according to aesthetic or religious-ethical criteria, so that their "absolute or religious value" can be grasped, their "true place and meaning/importance within the whole of the realm of God is unveiled." (ibid., 213).

[44] Ibid., 220. The "Typik" of the biblical history of revelation and the teachings of the sacraments reveals the absolute ends of natural beings: this is the finalistic or eschatological meaning and determination of creatures (224f.); cf. 228ff.

[45] Ibid. 243; cf. 239–248. Zöckler then goes on to re-interpret traditional proofs of God: His approach lifted philosophical arguments that cannot get beyond the prove of the "possibility and probability" of God's existence to new heights – to an "empirical (relative) certainty" that is extended further and further, the more knowledge about nature is [scientifically] gained (303; proofs: 310–362).

serving theology: Natural hermeneutics follows the principles of biblical hermeneutics.[46]

In 1877/79 Zöckler published his study on the *Geschichte der Beziehung zwischen Theologie und Naturwissenschaft* which should serve as a helpful means for biblical hermeneutics concerning aspects of the mosaic account of creation and the comparative history of religion.[47] Zöckler opens his introduction with a reference to Karl Ernst von Baer, founding father of embryology in the 1820s to 1850s, and still a highly renowned biologist, whose theory of ontogenetic development (amongst others) Haeckel had incorporated.[48] Von Baer rejected Darwinian theory and saw a possibility to reconcile science and religion, as science could never provide answers to the ultimate questions of life. He was sympathetic with the mosaic charter of creation, as the origin of man from earthly dust if understood as "earthly substance" presented a "truth that science has not gone beyond."[49] At a time when Darwin's and Haeckel's theories had already become very popular and the Kulturkampf was in its

[46] Zöckler's account of nature heavily draws on the work of the natural philosopher Gotthilf Heinrich von Schubert, who followed Alexander von Humboldt's differentiation between two forms of perception of nature – the sober scientific "day-view" on individual natural phenomena and the "night-view" of nature, the dreamy contemplation of nature hinting to the divine *oeconomia naturae*. Schubert's dualistic epistemology of nature was a romanticized version of natural theology. Nevertheless, Zöckler's references to romantic natural philosophy does not follow the mutual dependence of the epistemologies of belief and aesthetics on the one, and of scientific knowledge on the other hand, but states a hierarchy between the two: Religious knowledge about the essence of nature is the ultimate aim of studying nature, scientific knowledge only a starting point. Cf. Gotthilf Heinrich von Schubert, *Ansichten von der Nachtseite der Naturwissenschaft*, 3rd ed. Stuttgart 1835; in his *Spiegel der Natur; ein Lesebuch zur Belehrung und Unterhaltung*, Erlangen 1845, Schubert interprets instinct as a "divine drive" (23–36), speaks of the harmony and plenitude of nature (10, 545f.) and the "almighty creator" behind it (540, 545).

[47] Cf. Otto Zöckler, *Geschichte der Beziehungen zwischen Theologie und Naturwissenschaft mit besondrer Rücksicht auf Schöpfungsgeschichte,* 2 Vols. , Gütersloh 1877/1879, Vol. I, 7.

[48] Cf. Karl Ernst von Baer, *Entwicklungsgeschichte der Tiere*, 220; Haeckel, Generelle Morphologie der Organismen II, 11.

[49] Karl Ernst von Baer, *Studien aus dem Gebiete der Naturwissenschaften*, Petersburg 1876, Vol. 2, 465, cited in Zöckler, Geschichte der Beziehungen, Vol. 1, VII.

final phase, this reference to von Baer served Zöckler as an example for a peaceful coexistence of science and religion, which in the course of the Kulturkampf was increasingly deemed impossible. But though Zöckler held the "Darwinistic-monistic doctrine" to be the malady of the times,[50] he appreciated the implicit teleology of universal progressive development. To him, natural progress corresponded to the development of the church, and to the history of exegesis.

Zöckler's reference to the relation between biblical exegesis and the "rational progress of knowledge" does not only acknowledge scientific progress[51] – it also hints to the dependence of exegesis on the peculiar knowledge and world views of the time: A *historistic* perspective on the interpreters of scripture has to be taken up, as their Christian faith did not put them outside the specific world views of their time. Still the consequences that Zöckler drew from the necessity of applying historical critical methods to scripture differed from those of Strauss, as he conceived historical developments as a part of divine eschatology. Biblical hermeneutics has to analyze the relation between the (active) *accommodation* of the word of God and the (passive) *adaptation* of the prevalent patterns of thought: the history of exegesis shows that the biblical account of the world might not only have been consciously and deliberately altered in order to enhance its comprehensibility – it also necessarily cannot provide empirical knowledge of man and nature beyond the scientific development of the time. Though scripture provides eternal truths about the essence of natural things, these truths always appear in a specific historical form which organically develops in relation to the stages of history. With this, Zöckler seems to present a

[50] Geschichte der Beziehung, Vol. 2, V and 730; Darwin himself had been different in that he granted the possibility of a creation on the very beginning of life; cf. Rohls, Darwin und die Theologie, 13.

[51] "The big main epochs of the development of astronomical, physical-geographical and ethical-psychological world views within the church are mirrored in the accounts of the commentators of the genesis […]." (ibid., Vol. 1, 8).

Christianized Hegelian theory of development, wherein exegesis corresponds directly to the enfolding of salvation history. Science, defined as the experimental and descriptive investigation into nature, is also part of this history: the scientific-utilitarian revolution of the late 18th century corresponds to a stage in salvation history, as the biblical promise of man's mastery over nature is now finally achieved.

Even though Zöckler regards Darwin's theory as part of this historical development (as it strengthens the idea of progress and undermines polygenetic theories that oppose the monogenetic descent from Adam and Eve),[52] he thinks it wrong in respect to the (common) descent of the organic world and in questioning the exceptional position of man. It is this picture of man that reveals the influence of Darwinism if compared with Zöckler's later writings: in his *Theologia naturalis* man is still the *imago dei*, but Zöckler outlines a theory of degeneration, claiming that racial differences are the product of moral imbrutement.[53] This idea of a direct influence of the spiritual state upon the material constitution of animals and men gains importance in Zöckler's article on "man" for the *Realencyclopaedie fuer protestantische Theologie und Kirche* in 1903, leading to a thoroughly anti-darwinian theory of speciezation by moral decay. By then, neolamarckist, neovitalistic and other non-Darwinian theories had gained more and more ground, stressing the teleology of natural processes.[54] Thus, it had become much easier to challenge the alleged truth of the theory of descent by referring to opposing

---

[52] Cf. ibid, 779.

[53] Cf. Zöckler, Theologia naturalis, 584, 587ff., referring to Schubert, Carus, Bruno, Böhme, Oken, and others; on morphology: 593–604; on the *imago dei*: 604–614. Still the materialistic deification of the substance of the visible cosmos in Bruno's enthusiastic pantheism had nothing to do with the present evolutionary theory (734–740). Original sin resulted in the "clouding and weakening of the higher cognitive faculties" (630, 627ff.). In some cases God's punishment had even led to a degeneration and imbrutement as in lycanthropy.

[54] Cf. Peter J. Bowler, *The eclipse of Darwinism. Anti-Darwinian evolution theories in the decades around 1900*, Baltimore (Md.) et. al. 1985.

interpretations of empirical data.[55] Just as the Darwinists constantly spoke of the "dogma of creation" or the "dogma of the constancy of species" as opposed to true scientific knowledge, Zöckler now calls the theory of descent the "Darwin-Haeckel-Dogma," or the "ape-origin-dogma."[56] The modern theory of descent only *used* "certain experiential statements" from embryology, palaeontology and practices of breeding in a way that suggested a gradual evolution of man from the apes. While early developmentalists had speculated on this hypothesis without "scientific solidity," the modern evolutionists only gave it a "scientific coating."[57] He harshly judged the Darwinist "Hypothesengebäude" to be a "chain of pseudo-arguments," "scientifically untenable," and "pathological," as it lacked the support of *observed evidence*.[58] Following an epistemology that bases truth on observation and experiment, Zöckler made use of the weakness of evolutionary theory in this respect – for even until the late twentieth century it was "merely" an historical science –[59] to point out the

[55] Zöckler referred to philosophical traditions and to the conclusions of modern comparative studies of religion to back the ultimate authority of scripture. Cf. Otto Zöckler, "Mensch," in: *Realencyklopädie für protestantische Theologie und Kirche*, ed. by Albert Hauck, Vol. 12, Leipzig, 3rd ed. 1903, 616–629, 617: "On the one hand man is a natural, on the other a spiritual being; in man, the realm of nature comes to an end of its development, but in him at the same time a thoroughly new sphere of reality enfolds: The realm of humanitarianism, of humanity."

[56] Cf. Zöckler, Mensch, 619f.; Especially the ''dogmatic-orthodox" ultramontane priests would spurn ''our fact-based scientific convictions," as Haeckel remarked in a letter to his parents: *Entwicklungsgeschichte einer Jugend. Briefe an die Eltern 1852/1856*, ed. by H. Schmidt, Leipzig 1921, 46 (17. 6. 1855). Haeckel calls every opposing statement a dogma – the "dogma of the absolute difference between inorganic and organic matter" (Generelle Morphologie I, 165f.), the "teleological and dualistic dogma" (ibid. II, 263), the "dogma of free will" (ibid. I, 99; Welträtsel, Volksausgabe, 12), etc.

[57] Zöckler refers to Lamarck, Lord Monboddo, Lorenz Oken as the early, to Darwin, Thomas Henry Huxley, Lubbock, E.B. Tylor, Haeckel, Oskar Schmidt, Schaafhausen, Caspari and others as the modern evolutionists. "But as impressive as some of this sharp-wittedly constructed and audaciously piled up construct of hypotheses [Hypothesengebäude] might seem to be: it cannot be adjudicated more than an ephemeral meaning." Zöckler, Mensch, 618.

[58] Ibid., 619f., referring to anatomical differences between humans and apes.

[59] Cf. Ernst Mayr, *The Growth of Biological Thought. Diversity, Evolution, and Inheritanc*e, Cambridge (Mass.)/London 1982, 71–73; idem, "Cause and Effect in Biology," in: *Science* 134 (1961), 1502.

"insurmountable flaws" of the theory of descent.[60] Any alleged similarities between man and animal had to be dismissed as mere "products of imagination," invented to fit in with the "scientific novel" of Darwinism, instead of relying on "sober observation."[61] In the end, Darwinism, according to Zöckler's regained self-confidence, turns out to show all the features of literary imagination: it is constructed as tantalizing narrative based on imagination, a "fiction" as opposed to the "facts" that support the biblical account of nature.

In contrast, the biblical account of the unity of mankind deriving from Adam and Eve rested on empirical evidence – "physiological facts," "morphological observations," and linguistic as well as archaeological support.[62] Psychological and moral evidence also confirmed the propositions of scripture, and in addition implied how racial differences were initiated: races were thoroughly similar in their capacity to take part in the higher tasks of reason, "even with races that have become more primitive in the course of the millennia so that the sparkle of divine light of

[60] "It constructs a vast amount of genealogic relations and transmutations of organisms for the sake of certain analogies, without a single case of definitive and lasting transmutations of an organic species into another having ever been observed for sure." Zöckler, Mensch, 620. "Empirical observation never has shown anything else than constant species," whilst the biblical "every creature after its kind" is being warranted by the living creatures as well as the "geological facts of primitive times."

[61] Zöckler, Mensch, 621. To underpin his position, Zöckler refers to French physiology (seminalistic school), and German Darwin-critics (Driesch, Gustav Wolff, Haacke, Fleischmann). Of interest were also those theories that try to mediate between Darwinism and biblical theism, especially Wallace's 'Beiträge zur Theorie der natürlichen Zuchtwahl', 1870, where he explains the origin of man as the outcome of "divine selection." Zöckler points to Rudolf Schmid, *Die Darwinschen Theorien und ihre Stellung zur Philosophie, Religion und Moral*, Stuttgart 1876.

[62] Cf. Zöckler, Mensch, 622f.: Monogenism in its "strong and biblical sense" is warranted by "physiological facts" like reproduction, duration of pregnancy, etc. Archeology and history of religion equally proved monogenism. In respect to the monogenetic descent of man from the primordial couple Zöckler nevertheless argues self-contradictorily, eclectically using arguments from Darwin and Haeckel in order to support the biblical position, condemning the Swiss Zoologist Louis Agassiz for his polygenetic theory, whom he just had referred to as "one of the considerate critics of Darwinism" (621).

dignity has vanished nearly totally."[63] The general notion of linear phylogenetic development was wrong, he stated, pointing to the synchronicity of the asynchronal: highly as well as very poorly developed cultures coexisted throughout history. If different stages of history can simultaneously occur, the same holds true for stages of natural development, thus man and early animals could have been created at the same time. Still, Zöckler's extensive references to ethnographic and historical evidence necessitated at last an adaptation of biblical chronology to prehistory: "Conventional opinion about the antiquity of man according to the bible holds that he is nearly six-thousand years old, if there have been four-thousand years in between the creation of Adam and the birth of Christ […]. But with a time-span this short the supposition of the primordial unity of mankind hardly corresponds."[64] Even if he does not follow the time-dimensions that pre-historic anthropology proposed, as "until today she has no criteria for reliable temporal judgments,"[65] Zöckler tries to reconcile these time-dimensions with biblical chronology: the biblical account of natural history cannot be wrong itself, but the metaphorical (anagogical) language used might be specific for the time when it was compiled.[66] A historical critical approach is thus to frame biblical chronology[67] and to investigate into the biblical authors' mystic

---

[63] Ibid., Mensch, 624. Zöckler's usage of the term "millennia" indicates that he does not follow a literal interpretation of biblical chronology.

[64] Ibid., 624.

[65] And there was "no reliable geological chronometer yet": ibid., 625f. Zöckler points to struggles about chronology within prehistoric anthropology, there were only "vague speculations without solid scientific value," as even opponents of biblical chronology stated, and even Charles Lyell had to revise his "overbold speculations" about early man several times (in the different editions of his 'Geological evidences of the antiquity of man', 1864ff.).

[66] Due to the mystical relevancy of the number "10" for the authors of the bible, he argues, "The bible allows for an age of mankind several millennia higher than commonly acknowledged." (ibid., 625).

[67] Ibid. 624f.: As the variations of the biblical numbers in the *Septuaginta* showed (which add a 1000 years to biblical chronology), the system of biblical chronology is unreliable "in itself," Zöckler cites Th. Chalmers (1814) "The sacred writings do not fix

allusion to the number “10” in order to unveil the real meaning of the chronology of the creation: 6 days multiplied by the number “10” = 60,000 years. Within this newly established time frame, he asserts a *direct causal effect* of original sin onto the development of mankind, reconciling pre-historical and morphological evidence and scripture: the Fall of Man had an “accelerating effect” on the diversion of the originally united mankind into different races, this “influence of the principle of sin or the spirit of Cain” not having been taken into account by some naturalistic anthropologists who believe in “myriads of years” of development.[68] The “principle of sin” gains the status of an additional factor at work in evolution as a process that can directly be intervened and directed by God.

This dualistic and teleological interpretation of development could be linked to the recent outcomes of experimental embryology: The idea of a concerted influence of material and non-material factors was familiar to Zöckler, as it had been reintroduced by neovitalistic theories in order to explain peculiarities in embryogenetic development: Experiments had shown in the 1890s that the prevailing mechanistic theory of development failed to explain the teleomorphic character of organismic differentiation processes. Neovitalistic authors like Hans Driesch thus launched a non-material “additional factor” that supposedly led organismic developments towards their intended *teloi*, claiming to adhere solely to the scientific authority of empirical experiments.[69] With Driesch and others, the

---

the antiquity of the globe.” As accounts from Egypt and Babylon showed that these cultures are about 4000 years old, the “overall time-span of the pre-christian ages of mankind seems to be one or two thousand years longer at least.”

[68] Ibid. 624, referring to Gen 11, 1ff. and 1. Jo 3, 12ff.

[69] Cf. Hans Driesch, *Analytische Theorie der organischen Entwicklung*, Leipzig 1894. The ideal of a scientific epistemology based on experiments had been put forward by Claude Bernard, *Introduction à l’étude de la médicine expérimentale*, Paris 1865, albeit with an explicitly anti-theological direction: ‘‘Die experimentelle Methode ist die Methode der Wissenschaft; sie verkündet die Freiheit des Geistes und des Gedankens. Sie wirft nicht nur das Joch der Philosophie und Theologie ab, sie duldet auch nicht die

explanatory “gap” in mechanistic approaches could now be filled by an immanent principle of organic formation or even a transcendent principle like divine interference. Encouraged by these new findings about ontogenetic development, conservative Protestant theologians like Zöckler ultimately dismissed Darwinism, holding that the biblical references to nature and man were correct, even if they had to be interpreted with care, as revealed meaning differed from literal meaning. Science might be able to deliver empirical knowledge about nature, but this knowledge had to be interpreted and warranted in order to be understood; it only forms the first step in the process of gaining knowledge. As human reason since the Fall was flawed, the only way to come to a correct interpretation of empirical facts – the next epistemological step – was by way of revelation. Other interpretations of the same data provide wrong answers, for they lack this divine help; even though they work on the same level of interpretation, their means are insufficient. Without the help of the redeemer, knowledge cannot be gained, and no religion of humanity can ever prevail over the “blood-dripping specter of nihilism.”[70]

4. Complementary relations of science and religion in liberal Protestant theology

Within the wide spectrum of theological positions further approaches can be found. One of the most elaborated attempts to reconcile theory of creation and theory of descent was undertaken by Rudolf Schmid. As Jan Rohls has pointed out, Schmid declined materialistic interpretations of nature, but nevertheless was convinced not to

---

persönliche Autorität in der Wissenschaft.“ (cit. from the German transl. Leipzig 1961, 69).

[70] Zöckler, Mensch, 629; I translated “dead orthodoxy of the letter” for “tote Buchstabenorthodoxie.”

be in conflict with Darwin when integrating causal development into a teleological theism.[71] In his *Die Darwin'schen Theorien und ihre Stellung zur Philosophie, Religion und Moral* (1876), he maintained that the "absolute peace" between the "freedom of scientific investigation" and the "unwithered maintenance of religious properties" was due to "one function of the mind directly depending on the other."[72] Science and religion formed an epistemological whole of complementary knowledge, each a supplement to the other.[73] Similarly the liberal Swiss theologian Heinrich Lang in 1873 argued that religion and the natural sciences should not mutually restrict their explanations, for there was a unity of mind and matter in God.[74] This idea of an epistemological unity of knowledge had been one of the main principles of pre-Darwinian natural philosophy, a principle to which the romantic followers of Schelling as well as the experimental empiricists in the tradition of Kant and Fries had subscribed: whether the knowledge of nature with Goethe was build upon the mutual relation of analysis and synthesis, with romantic naturalists like Carl Gustav Carus on the juxtaposition of oppositions, or on the complementary supplementation of aesthetics and science like in Humboldt's *Kosmos* and in idealistic morphology up to (and including) Haeckel – arguments like these served to integrate dualistic approaches by declaring them two sides of the same coin.

In order to recharge the allegedly "cold" and "meaningless" findings of natural science, the aesthetics of nature often took the place of religion,

---

[71] Rohls, Darwin und die Theologie, 16.

[72] Rudolf Schmid, *Die Darwin'schen Theorien und ihre Stellung zur Philosophie, Religion und Moral*, Stuttgart 1876, VIf.; engl. translation 1883; on Schmid and Lang cf. Rohls, Darwin und die Theologie, 15f.

[73] Schmid, *Die Darwin'schen Theorien,* 236; Religion would have to expel accommodated scientific ideas, if these were proven wrong, just as science would have to do concerning the religious insights it had picked up. Schmid thought of religious and scientific truths as following the same procedures of warranting, because belonging to the same overall truth – God.

[74] Heinrich Lang, *Die Religion im Zeitalter Darwins*, 1873.

alluding to nature's beauty, harmony and order in a kind of secularized argument from design. Beauty, it was often argued, opened up a way of intuitive understanding of the ultimate meaning of nature, thus being the second access to knowledge. These ideas, prominent among the followers of Schleiermacher in liberal Protestantism, not only prevailed in most of the liberal theologies of the late 19th century, but were de-secularized to a physicotheological mutuality of science and religion. Just as some English theologians had less problems with coming to terms with Darwinism because of the common roots in William Paley's natural theology, many liberal German theologians shared with German biologists the common tradition of idealism and romanticism. If biologists therefore did not openly challenge Christian religion as such – like Haeckel and his followers did – their positions could often easily be reconciled with religion, especially if they came from morphology, a discipline with a disposition towards teleological explanations.

When Schmid in *Das naturwissenschaftliche Glaubensbekenntnis eines Theologen*[75] 1906 proposed a teleological interpretation of nature, he, like Zöckler and many others, was encouraged by the return of Lamarckist and vitalist scientific approaches since the 1880s. His attempt to combine theology with vitalism *and* the theory of descent was not too peculiar, as indeed many followers of Darwin now held teleological positions. By now, it had also become convenient to refer to the second most outstanding father of the theory of natural selection, Alfred Russell Wallace. At the end of the 1880s, Wallace had reintroduced a theistic notion to his interpretation of nature, speaking of a "spiritual essence" and an "unseen spiritual universe" in order to explain the higher faculties of man and to fight off ideas of a blind necessity ruling nature.[76] He had no

[75] Schmid, *Das naturwissenschaftliche Glaubensbekenntnis eines Theologen*, Stuttgart 1906, 79f.

[76] Cf. Alfred Russell Wallace, *Darwinism. An Exposition of the Theory of Natural Selection with some of its Applications*, London 1889, 474: "The special faculties we

problems with integrating religion and evolutionary theory, providing this was only in terms of a general providence (as opposed to direct interference).[77] Just like Wallace, Schmid based his concept of an interdependency of science and religion, reason and faith, on the idea of an underlying plan of nature, yet he regarded religion as superior to science, claiming that in the end general providence would lead to mind prevailing over matter. He conceived the agency of this plan as an immaterial and external force that affected nature, ultimately part of the divine plan.[78] If teleology as the crucial principle of any kind of religion could be saved or even integrated with Darwinism, religion and science could peacefully coexist. The inner meaning of the account of creation and other biblical references to nature in the end being nothing more than its teleological structure, biblical hermeneutics in this respect had to reject any kind of literal interpretation of scripture.

---

have been discussing clearly point to the existence in man of *something which has not derived from his animal progenitors* – something which we may best refer to as being of a *spiritual essence* or nature, capable of progressive development under favourable conditions." It was the outcome of ''workings of a higher nature which has not been developed by means of the struggle for material existence"; cf. 477f.: "As contrasted with this hopeless and soul-deadening belief [i.e. ''*that we are but products of the blind eternal forces of the universe*"], we, who accept the existence of a spiritual world, can look upon the *universe as a grand consistent whole adapted in all its parts to the development of spiritual beings capable of indefinite life and perfectibility*. To us, the whole purpose, the only *raison d'être* of the world […] was the development of the human spirit in association with the human body. From the fact that the spirit of man – the man himself – *is* so developed, we may believe that this is the only, or at least the best, way for its development;" / ''We thus find that Darwinian theory […] lends a decided support to, *a belief in the spiritual nature of man*. It shows us how man's body may have been developed from that of a lower animal form under the law of natural selection; but it also teaches us that we possess intellectual and moral faculties which could not have been so developed, but must have had another origin; and *for this origin we can only find an adequate cause in the unseen universe of Spirit*."

[77] Cf. Alfred Russell Wallace, ''Creation by Law," in *The Quarterly Journal of Science* IV (1867), 471–488, 473: He believed ''that the universe is so constituted as to be self-regulating; […] and that this adjustment necessarily leads to the greatest possible amount of variety and beauty and enjoyment, because it does depend on general laws, and not on a continual supervision and re-arrangement of details. As a matter of feeling and religion, I hold this to be a far higher conception of the Creator and of the Universe than that which I must call the 'continual interference hypothesis.'"

[78] Schmid, *Die Darwin'schen Theorien,* 256f.; cf. Rohls, Darwin und die Theologie, 16.

5. The uncertainty of knowledge and the certainty of belief

Another very interesting figure is the protestant theologian Emil Pfenningsdorf, who recommended his popular bestseller *Christus im modernen Geistesleben* (1899) as a guide through the ‘‘times of uncertainty," a means to fight the growing number of anti-Christian intellectual currents in the "severe struggle for weltanschauung."[79] Pfenningsdorf has a thoroughly positive view on science: The 19th century is the century of new scientific insights and enormous technical progress, the century in which man fulfils God's command to be the master over nature to a new extent. Accordingly, the "deep breach" between the sciences and Christianity is not the result of science as such, but of new false beliefs in the autonomy of man and nature, which led to immorality and arbitrary action. These beliefs are based on the materialist conviction that the universe is ruled by blind chance and necessity. The latest example for the new scientific religion was Monism. In particular, it was Haeckel's *Welträtsel* that had put forward an unacceptable account of religion and scripture, condemning the canonical gospels without any "scientific thoroughness," "clear reasoning," proofs, or substantiation.

This critique is very illuminating, for it points to the epistemological values that Pfenningsdorf holds to be relevant in science *and* religion: thoroughness, accuracy, necessity of proofs and rational justification. But unlike science, only religion is able to bridge the gap between creative and sentient man and cold and insentient nature, because it is – in this respect similar to art – based on personal experience.[80] Following the

---

[79] Emil Pfenningsdorf, *Christus im modernen Geistesleben. Christliche Einführung in die Geisteswelt der Gegenwart. Der gebildeten evangelischen Jugend und ihren Freunden dargeboten* (1st ed. 1899), 10th ed. Schwerin 1907, Vorwort 1st ed., v, viif.; cf. Ibid., 19f.: in the 18th and 19th century there had been tendencies to get rid of the traditions of Christianity and build up a "natural religion," solely dependent on the ideas of God, freedom and immortality, which could be inferred rationally. But this "alleged religion [is] but philosophy," without prayers as communication between God and man, without conciliation or salvation.

[80] Ibid., 2.

Lutheran systematic theologian Martin Rade, Pfenningsdorf differentiates between the "sensible, perceivable, impersonal" objects of the sciences and the "personal" and "invisible" objects of religion. Science deals with the sensual and quantifiable world, whilst religion is linked to the "invisible spiritual world […] behind, above and within the visible world."[81] It is useless to try to find the "soul with a scalpel," as physiologist Rudolf Virchow once stated, as belief "is not to doubt the not to be seen."[82] On this basis, he thought it a "delusion" to suppose that *science* would ever contradict *belief*.[83] Only the materialistic interpretation of Darwin's theory would create this antagonism, as would a "mechanical interpretation of holy scripture,"[84] that is, a literal exegesis as opposed to the spiritual and moral interpretation that serves the elevation of humanity.

Due to their different objects, science and religion followed different epistemologies. The Christian searches for the aim of things, ultimately looking for the "meaning" of life and death – a question that science is unequipped to answer satisfactorily.[85] Science, on the other hand, investigates the causes of phenomena, explaining them by (experimentally) reference to other known phenomena. Yet, as Pfenningsdorf has it, science and religion "both are based on facts". The

---

[81] Ibid., 32.

[82] "Nichtzweifeln […] and dem, was man nicht siehet." "Holy scripture" was clear in that point: God is a spiritual being, "invisible and thus forever concealed from the unhallowed curiosity and the vain conceit of knowledge [Wissensdünkel], […] but willing to reveal himself to the penitent and pure hearted." Ibid., 32f.

[83] Cf. ibid., 28 and 32: "Natural science and Christianity are no opposites!," headline of the chapter. Rade was influential as the editor of the journal "Christliche Welt" and assistant editor of the *Zeitschrift für Theologie und Kirche*. Pfenningsdorf refers to some other writers that hold the same position, mainly Eberhard Dennert, *Bibel und Naturwissenschaft*; *Christus und die Naturwissenschaft*, 1904; *Die Weltanschauung des modernen Naturforschers*, 1906. Furthermore to M. Rade, *Die Religion im modernen Geistesleben*, Freiburg 1898; Schmidt, *Naturwissenschaftliches Glaubensbekenntnis eines Theologen*, 1906; Th. Kaftan, *Der christliche Glaube im geistigen Leben der Gegenwart*; Romanes, *Gedanken über Religion*, 1900; Teichmüller, *Religiöses Wissen*, 1906.

[84] Cf. ibid., 28.

[85] Ibid., 33f.

epistemological status of material scientific and mental religious facts is the same, as in both cases there is "no effect without a cause". Though "mental Facts" like the spreading of Christianity and witnesses of Christian faith (the bible, prayers, sermons, and the churches) were constituted by thoughts, feelings, fears, and hopes, it would be a sign of "stubborn plumpness" to restrict the term "facts" to the material world: "These mental facts i.e. to think, to feel, to fear and to hope are at least as certain as the so-called material ones".[86] This line of reasoning is revealing, displaying an amalgam of Platonic-Augustinian thoughts and modern neurophysiological insights: since the early 19th century, physiological concepts on the subjectivity of perception had evoked epistemological uncertainties that scientists tried to dissolve by either assuming an innate natural knowledge like Haeckel and others, or by enforcing a "mechanical objectivity" that tried to push back the flawed human element in research.[87] When prominent physiologist and Emil Du Bois-Reymond put forward his formula of scientific agnosticism "ignoramus et ignorabimus" in 1872,[88] it perfectly met the needs of apologetics. They alluded to his statements about the insurmountable limits of scientific knowledge which Du Bois-Reymond conceived to be the consequence of the narrowness of the senses, the limits of reason, and the inexhaustibility of the world. Reason could never grasp the "riddles of the universe," as every answer only led to more questions – and it was precisely this "inexhaustibility of the world that is a sign of its

[86] Ibid., 35.
[87] Cf. Daston/Gallison, "Mechanical Objectivity." B. Kleeberg, ''Vor der Sprache. Naturalistische Konzepte objektiver Wahrnehmung," in: Fabio Crivellari et. al. (eds.), *Die Medien der Geschichte. Historizität und Medialität in interdisziplinärer Perspektive*, Konstanz 2004, 85–108.
[88] "We do not know and will not know." Cf. Emil Du Bois-Reymond, *Über die Grenzen der Naturerkenntnis*.

divine origin."[89] Pfenningsdorf linked this position to the ideas of Gustav Theodor Fechner, who from his research on the physiology of aesthetic perception drew dualistic consequences that followed in the tradition of the neo-platonic differentiation between *mundus intelligibilis* and *mundus sensibilis*.[90] Citing Fechner, Pfenningsdorf regarded the appearance of objects in the perceptionally restricted human mind as a "weak reflection of the rich variety of the external world."[91] This epistemological uncertainty has important consequences for the status of belief in contrast to knowledge: even in everyday life all knowledge rests on belief. Due to the physiology of the senses, human perception cannot obtain true knowledge from empirical evaluation. As there is no ultimate certainty about the world, all knowledge is based on trust. While Christian belief can unite individual facts to a harmonic whole, science only explains mechanical connections. Following the philosopher Rudolf Hermann Lotze, Pfenningsdorf now describes natural laws as scientific *constructions* to explain the uniformity of natural phenomena and processes. These constructions are but unconfirmed speculation, unless they are understood as "tools in the hand of a higher being."[92] Following from that, as science only knows the intermediate but never the last and ultimate causes, it cannot pose any statements about divine interference in natural processes – only the "faithful human" discerns the glory of God in nature.[93]

---

[89] Ibid., 39. On the "Welträtsel," he cites Du Bois-Reymond's "ignoramus and ignorabimus" (37). Despite the immense growth of knowledge, every new answer only led to thousands of new questions: "wir sind umringt von Geheimnissen" (28).

[90] Cf. Gustav Th. Fechner, *Die Tagesansicht gegenüber der Nachtansicht* (1879), 2nd ed. Leipzig 1904.

[91] Cf. Pfenningsdorf, Christus im modernen Geistesleben, 36f.

[92] Pfenningsdorf, Christus im modernen Geistesleben, 42. It would be wrong to mistake natural laws as the ordering force itself, putting them in place of God – an implicit critique of Haeckel's equation of God and the law of causality.

[93] Ibid., 44.

This line of thought affects the interpretation of biblical wonders. As God doesn't break his own laws,[94] miracles are consistent with them, and it is only flawed human reason that cannot explain them. The miracles of revelation are not arbitrary but a necessary part of the divine salvation management.[95] God can interfere with nature by adding a new cause to the natural process, which in the case of miracles is a "spiritual-personal" cause. Though he thus might have saved the biblical account of miracles, Pfenningsdorf rejects a literal reading of scripture. Of course, the scientific knowledge of the biblical writers is outdated today, just as present scientific knowledge one day will be obsolete: the bible should not be misused to answer scientific questions.[96] The chapters of the Genesis do not aim at a scientific explanation of the world, but simply announce who created the world and why: God, not "blind coincidence."[97] The bible reveals all the general characteristics of nature which science eventually comes to agree with. This even holds true for Darwin's theory,[98] and Pfenningsdorf compliments Darwin on his theory of natural selection as the first attempt to "explain the miraculous variety of the living without consulting the creative power of God."[99] Judged on scientific grounds, Darwin's theory is justified. Darwin never attempted to explain anything

[94] Ibid., 44.

[95] Ibid., 46. Miracles do not break with the laws, but "miraculously use them," and even Darwin needed the idea of miracles to explain the first appearance of life, as Pfenningsdorf states (ibid., 44f.) with neovitalist Johannes Reinke, *Welt als Tat*, 481.

[96] Ibid., 51f., citing Kepler.

[97] Ibid., 51. "The world is his work and his revelation as well," pointing towards the highest revelation: Christ. "The Human being is the crown of creation […]," the *imago dei*: "These are the eternal truths" of the biblical creation account.

[98] Ibid., 52. He refers to Darwin, Haeckel, Reinke, Oskar Hertwig, Hamann, Chwolson, Brass, Paulsen, Adickes, and to the theologians Dennert, Franke, Loofs, E. Hoppe, Otto.

[99] Ibid., 53. "Wir leugnen also nicht den Einfluss jener Darwinschen Grundsätze auf die organische Welt. Aber wir leugnen ihre *schöpferische* Kraft." (66) The teleological forces of organisms had been implemented by the creator, every higher development of life being a result of divine influence, especially the emergence of man. Haeckel's missing link, the "pithecanthropus" found by Eugene Dubois, "consists merely of a skullcap, thighbone and a molar, – all the rest is Haeckel's phantasy!" (67)

beyond the realm of the empirical things, only the “German materialists” used his theory to revitalize their position.[100] But the idea of development itself could already be found in the bible, as creation was not one single act, but a stepwise progressive creation. Whilst the most recent scientists had pointed to teleological forces as necessary preconditions for development, only outdated theories like that of the “development-fanatic”[101] Haeckel, still believed in an immanent natural development.[102] As science only dealt with the visible world, Haeckel could not give any scientific answers to questions about the existence of God, his atheism being merely belief.[103] While Monism opposed the fundamental facts of nature and mental life,[104] the biblical account of the qualitative difference between animal and man was based on facts, as not only his mental side – language, science, art, and religion – but also its material side was rightly considered with the allusion to man having been formed from clay: “One should not press the claim too far. After all, we can always take clay to mean ‘organic material’ or ‘animal substance.’ This is why it is always true that whilst man is, on the one hand, earth from earth, on the other, he is spirit from God.”[105] With this statement, Pfenningsdorf clearly dismisses

[100] Cf. ibid. 54f., referring to Ludwig Büchner’s *Kraft und Stoff* and to Haeckel. Darwin in his autobiography even had claimed to be a theist.

[101] Ibid., 55. He condemns Haeckel’s “frivolous and ignorant account of Jesus in the ‘Welträtsel’,” alludes to the fraud of embryonic pictures in the *Natürliche Schöpfungsgeschichte*: he is “a fanatic, making use of every possible means to prove his dogmatic position.” (56) Pfenningsdorf harshly criticizes Haeckel’s “monistic religion” as an “atavistic relapse in the religious development” (58).

[102] Ibid., 52f.; he refers to v. Baer, Reinke, Romanes, Wallace, Bunge, Wolf, Driesch and “many other younger scholars,” the elder view of Haeckel already being obsolete.

[103] Cf. ibid., 60f., Monism is sheer “phantasy,” “Begriffsdichtung.”

[104] Cf. ibid., 61. In contrast, Wallace in his book on the “position of man in universe,” had stated that organic life probably only occurred on the earth, making it the center of the universe on these grounds. “No wonder all great astronomers without exception have been faithful men and have with awestruck marvel spotted the world-mechanist behind the grand mechanism of the earth, whose aims in the end lay far beyond all mechanical connections of the physical world.” (63).

[105] “Man darf diesen Ausdruck nicht pressen. Wenn man will, mag man sich darunter ‘organische Materie’ oder ‘tierische Substanz’ vorstellen. Wahr bleibt es deshalb

any literal interpretation of the bible, but upholds its fundamental concept of life to be empirically correct: “Christian Belief completes the theory of development,”[106] and whoever believes in the literal meaning of the bible without believing in Christ is a “buchstabengläubiger Pharisäer.”[107] The knowledge about nature that scripture offers is not on direct display, neither is the historical truth of its parts. The ultimate meaning of the bible lies in its aim to arouse faith. And in that, it depends on belief in Christ.

6. Diverging epistemologies of belief: morals, meaning and teleology

Albrecht Ritschl, professor in Göttingen and as a Unionist very influential in Prussian church politics, also claimed that biblical hermeneutics ultimately had to be based on the belief in Christ and on moral practice. He sharply differentiated between religion and metaphysics and science, as it related to the realm of morality. Just like the natural world itself, the whole biblical account of creation had to be interpreted as a “relative necessity,”[108] a means to the end of improving human morality. For Ritschl and his school of thought, it was not sufficient to just regard the bible as revealed, as “only the interpreted books [of the bible] can lay the grounds for a dogmatic or positive knowledge of

---

immer, dass der Mensch nach der einen Seite seines Wesens ‘Erde von Erde’, nach der andern aber Geist aus Gott ist.” Ibid., 68f. Pfenningsdorf alludes to the argument from design and all its classical examples: the watchmaker, the works of art, order and harmony, abundance etc. All these could not be explained by blind coincidence and mechanical causes, but were ruled by final causes, proved especially by the progressive development of the organic world (69f.).

[106] Ibid., 72.

[107] Cf. ibid. 299, 297.

[108] Cf. Albrecht Ritschl, *Die christliche Lehre von der Rechtfertigung und Versoehnung*, Vol. 3, 4th ed., Bonn 1895, 266: “Die gesammte Welt also ist aus dieser Ruecksicht, als die Bedingung des moralischen Reiches der geschaffenen Geister, durchaus Schöpfung Gottes zu diesem Zweck.”

Christianity."[109] Yet biblical hermeneutics were not to be constrained by ecclesiastical laws or specific dogmatics, especially if these were subject to historical change: the sole and indispensable prerequisite was moral practice, as other criteria for the right interpretation differed from denomination to denomination. The biblical account of creation accordingly was to be understood as a moral narrative, residing on a different explanatory level than the one relevant in science: though the divine creation of nature is an apodictic truth, this kind of true knowledge cannot be warranted, proved, or challenged by any means or methods familiar from the sciences, but only in respect to the morality as the divine *telos* of the bible. Biblical hermeneutics hence ultimately had to follow along the lines of tropological (and allegorical) exegesis. With this approach, Ritschl opened up the possibility of preserving a biblical truth that could not be confronted by any of the new insights of the natural sciences in general, or the theory of descent in particular. But what might seem to have been a successful apologetic strategy concerning the interpretation of scripture, in the end only led to shifting the struggle between science and religion to a different field of discussion: Ritschl's biblical hermeneutics ultimately relied on the idea of divine teleology. Scientific knowledge not only was very heterogeneous – it could not provide answers to ultimate questions. Yet any interpretation of scripture that stressed the metaphorical character of biblical references to nature would have to be based on a minimum common denominator: the ultimate meaningfulness of nature. Biblical hermeneutics was to correspond to a kind of natural hermeneutics that detected the numinous element in the empirical world. Maybe it is due to the fact that the monists did exactly the same when trying to establish a world view that was supposed to be capable of answering ultimate questions about the "riddles of the universe" that the

[109] Ibid., II, 5.

struggle about the correct interpretation of nature increasingly turned out to be a struggle between different *epistemologies of belief*.[110]

So, for instance, Ritschl's disciple Max Reischle, professor for practical theology in Giessen, followed the idea of a subordination of nature to a practical moral goal. He stated that evolutionary theory could only be true if it could be fitted into a universal teleological frame. The theory of development would have to accept the answer to the question which it itself cannot give: every causal development was but a realization of a divine aim as *causa finalis* as well as starting point for all orders of causality.[111] This idea opened up the possibility of integrating the natural sciences into the general frame of a religious worldview. Christianity demanded them to subordinate empirical explanations to its framework – the idea of development would have to be seen as part of a process of divine teleology. The current evolutionist interpretation of natural development as a progress towards more and more perfection indeed fitted well to this idea. This becomes even more evident from Ritschl's disciple Rudolf Otto, professor for systematic theology in Göttingen. In his *Naturalistische und religioese Weltsicht* (1904) Otto claimed that here was a fundamental difference between science and religion, the first referring to immanent causes in nature, the second referring to divine purposes, realized in nature. When he dismissed Darwinism, it was not because of the idea of development itself, but due to Darwin's description of development as contingent and undirected: Darwin's theory "is only downright anti-theological in that it is anti-teleological."[112] In contrast, Otto

[110] Thus the defense of a Christian picture of nature against a "naturalistic world view based on Darwin's evolutionary theory became the ultimate concern of Protestant German theology around 1900." Rohls, Darwin und die Theologie, 17.

[111] Max Reischle, *Christentum und Entwicklungsgedanke. Hefte zur Christlichen Welt 31,* Leipzig 1898, 16; cf. Rohls, Darwin und die Theologie, 16f.

[112] Accordingly, he differentiated between Darwin's theory of development on the one hand, and the theories of Leibniz, Kant and especially of Goethe, Schelling and Hegel, which all had used the concept of development to establish the unity of nature. Rudolf

conceived development as a teleological process: “According to its idea and essence every higher stage up to man has to be considered as a total realization of what had already been implemented at the lowest level as something potential.”[113] Development was only a “creative reorganization,” not a descent from the lower level in a passive process of adaptation by natural selection. Not surprisingly, Otto preferred neo-Lamarckist theories, as they proposed an active process of adaptation. And again, like most of his fellow theologians, Otto referred to Driesch and his idea of the “entelechia”[114] – a term for the power that directed the developmental potentiality of organic systems, already implemented at their origin.[115] This *entelechia* Otto interpreted as a natural purpose, the natural world being a purposeful process, culminating in a being of conscious willing. Christian religion helped to understand this purpose as divine: God had not created a finished world, but a world coming into being, he had set the world as “will to mind.”[116] With this allusion to divine providence, Otto could in the end preserve the biblical idea of unique and completed creation, as the constancy of the species could be interpreted as the constancy of the *telos* of species.[117] Otto’s concept favours the

---

Otto, *Naturalistische und religioese Weltsicht* (1904), 3rd ed. Tübingen 1929, 107; cf. Rohls, Darwin und die Theologie, 17.

[113] “Der Idee und dem Wesen nach ist jede höhere Stufe, und schliesslich der Mensch die volle Verwirklichung dessen, was schon auf unterster Stufe in der Potenz gesetzt war.” Otto, Naturalistische und religioese Weltsicht, 98.

[114] Ibid., 130, 210 (Driesch).

[115] Cf. Hans Driesch, *Analytische Theorie der organischen Entwicklung*, Leipzig 1894, 157, 162.

[116] Gott “…baue sie [i.e. the world] nicht als fertige, sondern als werdende. Er baue sie nicht wie ein Haus, sondern pflanze sie wie eine Blume im Samenkorne, damit sie wachse von Stufe zu Stufe zu vollerem Dasein sich aufringe, wo sie, im kreatürlichen Abbilde, im freien und vernünftigen der Persönlichkeit fähigen Geiste ihren Daseinszweck verwirkliche.” Otto, *Naturalistische und religioese Weltsicht*, 282; cit. from Rohls, Darwin und die Theologie, 18.

[117] Again referring to Driesch, he states: “Dasselbe, was einerseits ein Gefüge von Ursachen und Wirkungen ist, wird von innen her verständlich al seine Ordnung von Zwecken und Mitteln. Zwecke, Entelechien, Ideen herrschen und bestimmen den Ablauf” (ibid., 210).

idea of the realm of the sciences comprised within a realm of theology. Faith is important not only in order to make scientists understand their objects, but also provides the teleological background to questions of teleonomic development that sciences themselves try to explain.

Common to all the discussed theological reactions to Darwinism is the emphasis on the teleology of nature. Though some authors conceived the realm of faith as something thoroughly different from science as it mainly dealt with moral practice, the intellectual and practical-ethical pressure of scientific progress was strong enough to necessitate comments on the scriptural account of nature. By the end of the 19th century, more or less all German theologians dismissed literal interpretations of the bible. Based on the insights of historical-critical exegesis, they proposed metaphorical readings of scripture that maintained allegorical, tropological, and anagogical interpretations. But they tended to a tropological understanding, as the struggle between science and religion increasingly clarified that the main distinction between the two lay in science explaining the structures and functioning of nature, and religion providing its meaning. The normative consequences of the new naturalism inspired by Darwin's theory were held to be fatal, so the meaning of nature became the starting point for the defence of Christian morality. The importance of teleology in this respect was obvious, as human actions could only be judged on basis of human purpose.

Even though the teleological structure of human action was only exported to the realm of nature, the scientific discourse of the late 19th century allowed for these interpretations, some of which were even state of the art. Indeed, the scientific mainstream could serve very well to underline a teleological picture of the world, as not only embryology, but most parts of palaeoanthropology and evolutionary theory were dominated by openly teleological positions, ranging from distinct vitalism,

orthogenesis-theory, “activist” theories of neo-Lamarckism to idealistic, pantheistic, energetic and other accounts of development. Most theologians referred to these approaches to underline what they regarded as the main fundament of Christianity, the idea of a *telos* of nature that lay in a second (spiritual / mental) realm. Thus the struggle of the worldviews to a certain extent was a struggle between dualistic and monistic views of nature. The second realm opened up the possibility of a higher force guiding nature, and therefore reinforced the crucial doctrine of man as the *imago dei* situated within a meaningful universe. Hence it was not the interpretation of the bible that the theologians cared about most – they all more or less acknowledged the historical relativity of the knowledge the bible presented about the empirical world – but having gradually narrowed down their understanding of the range of scriptural facts in the course of the 19th century (from nature to the organic world, to man and finally human action and morality), with dualism and teleology the very fundaments of their faith were being attacked.

In the course of their attempts to defend these basic principles, some of the authors used arguments that, stripped of their Christian background, seem to be very “modern”: methodological objections against the possibility of merely quantitative accounts of nature and human beings, arguments hinting to the constructivist character of scientific accounts of nature, to the hermeneutical difference between explaining and understanding (especially in regard to the difference between human action and natural events). The more the gap between science and humanities widened, biblical hermeneutics as a theory in the academic discipline of theology, being a part of the humanities, could be related to the more general hermeneutic approaches in philosophy that stressed the sole competence of humanities for questions of meaning. These aimed at understanding the human perspective of the world. This contemporary distinction of the natural and the social sciences in regard

to their different explanatory aims, objects and methods plays at least an implicit role in the debates about science and religion. It seems as if it was the “imperialist rhetoric” of the sciences, their positivist claim to explain everything, that necessitated a response. The ironic thing is that it is precisely the teleological undertones of these all-embracing interpretations of nature, the attempt to apprehend ultimate meaning of nature through quantitative empirical facts, that necessitated Christian apologetics. If the theologians were willing to abandon the idea that scripture gave a correct account of the objects of the sciences, biblical hermeneutics could retreat to the standpoint of the humanities in general, yet retain relevance in the field of morality.

LONDON SCHOOL OF ECONOMICS
DEPARTMENT OF ECONOMIC HISTORY

WORKING PAPERS IN: THE NATURE OF EVIDENCE: HOW WELL DO "FACTS" TRAVEL?

For further copies of this, and to see other titles in the department's group of working paper series, visit our website at:
http://www.lse.ac.uk/collections/economichistory/

01/05: Transferring Technical Knowledge and innovating in Europe, c.1200-c.1800
Stephan R. Epstein

02/05: A Dreadful Heritage: Interpreting Epidemic Disease at Eyam, 1666-2000
Patrick Wallis

03/05: Experimental Farming and Ricardo's Political Arithmetic of Distribution
Mary S. Morgan

04/05: Moral Facts and Scientific Fiction: 19th Century Theological Reactions to Darwinism in Germany
Bernhard Kleeberg