

## Chapter 2

# The Crux of a Darwinian Approach to Evolution

### Evolution—What Is It?

The search for the origins of religion to date has remained futile, or at the very least unsatisfactory, as either the definition and concept of religion used was unclear,<sup>1</sup> as it was never clarified what exactly was evolving—man or religion?,<sup>2</sup> or an outdated notion of evolution was used, as a teleological process, which can ultimately be traced back to Lamarck.<sup>3</sup> In addition, the issue is further complicated by the fact that many humanists are not even aware of the difficulty. So what then is evolution?

The biological evolution describes changes of organisms in the history of the earth, beginning with the first living organism. We cannot directly trace these changes, but merely reconstruct them based on processes observable today. Strictly

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<sup>1</sup>For example: Rossano, Matt J. (2010). *Supernatural Selection. How Religion Evolved*. Oxford: Oxford University Press.

<sup>2</sup>Kundt, Radek (2016). *Contemporary Evolutionary Theories of Culture and the Study of Religion*. London, Oxford, New York, New Delhi, Sydney: Bloomsbury.

Geertz, Armin W. (2015). Religious Belief, Evolution of. In: *International Encyclopedia of the Social & Behavioral Sciences*, Second Edition, pp. 384–395.

Feierman, Jay R. (2009). How Some Major Components of Religion Could Have Evolved by Natural Selection? In: Eckart Voland/Wulf Schiefenhövel (eds.) *The Biological Evolution of Religious Mind and Behavior*. Dordrecht, Heidelberg, New York, London: Springer, pp. 51–66.

<sup>3</sup>See, for example, Bellah, Robert N. (1964). Religious Evolution, in: *American Sociological Review*, Vol. 29, No. 3, p. 358 (pp. 358–374).

Bellah, Robert N. (2011). *Religion in Human Evolution. From the Paleolithic to the Axial Age*. Cambridge, Mass. and London: The Belknap Press of Harvard University Press.

speaking, evolution is “a story to explain what we observe. It is an explanation of the hierarchic encaptic system of species, in which some species seem to be closer related to each other than others.”<sup>4</sup> What we see today is in fact a hierarchical-encaptic system of similarities between these organisms: organisms can be assigned to groups based on their similarities, and these groups in turn can be integrated into groups on a higher level based on their respective similarities.<sup>5</sup> If one takes these groups and relates them to one another chronologically, the result is a picture of a complex, ramified tree, the tree of life. This genealogical tree can only be explained by the fact that the vast diversity of fossils and recent organisms known today ultimately all emerged from one principal form—and thus we are faced with the search for the mechanisms responsible for this process.

Famous natural scientists of the late 18th and early 19th centuries were preoccupied by this quest for the mechanisms responsible for the changes in species, which Lamarck thought to have answered with his hypothesis of transformation. Even though Lamarck’s theory was brilliant in some aspects and fully in line with his times—especially his notion of an automated process of increasing complexity—nevertheless it lacked strength especially when searching for the mechanisms of evolution, which Lamarck himself wanted to trace back to this automated perfectionism; he was unable to convince science in the long term. The British natural scientists Charles Darwin and Alfred Russel Wallace were ultimately responsible for the discovery of these mechanisms; in their famous joint paper of 1858, they recognised selection in the sense of a natural selection as the decisive mechanism for change.<sup>6</sup> The theory of natural selection only became popular, however, with Charles Darwin’s *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. Darwin primarily based his theory of a slow and natural change in species in the history of Earth on two factors: the variability of phenotypes as well as the preferential treatment of those individuals who demonstrate certain advantageous deviations from the norm by the process of a

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<sup>4</sup>„Evolution ist eine Geschichte, die wir erdacht haben, um das zu erklären, was wir beobachten. Es kann sich dabei um die Erklärung der Existenz von Fossilien handeln, die den heutigen Organismen unähnlich sind. Oder um eine Erklärung für das deutlich hierarchisch gegliederte System der Arten, in dem sich einige ‚näher‘ stehen als andere. Oder um Organe, die heute offensichtlich zu nichts gut und kaum anders zu interpretieren sind, als dass es sich um Spuren vorheriger evolutionärer Stadien handelt.“ Zrzavý, Jan, Hynek Burda, David Storch, Sabine Begall und Stanislav Mihulka (2009). *Evolution. Ein Lese-Lehrbuch*. Heidelberg: Springer Spektrum, pp. 8–9.

<sup>5</sup>The Swedish natural scientist Carl von Linné (1707–1778) in his seminal essay *Systema naturae* introduced a new type of classification into the field of zoology, which is based on a consistent subordination of categories of different grades. Jahn, Ilse and Schmitt, Michael (2001). Carl Linnaeus (1707–1778). In: Ilse Jahn and Michael Schmitt (eds.) *Darwin & Co. Eine Geschichte der Biologie in Portraits*. München: Beck, pp. 9–30.

<sup>6</sup>Darwin, Charles; Wallace, Alfred Russel (1858). *On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection*, *Zoological Journal of the Linnean Society* 3: 46–50, doi:[10.1111/j.1096-3642.1858.tb02500.x](https://doi.org/10.1111/j.1096-3642.1858.tb02500.x), retrieved 14 January 2007.

continuous selection. Here, with the expression of a “struggle for existence”, Darwin describes the individual’s fight for survival, but emphasized that he understood the expression in a purely metaphorical sense and in no manner wanted it to be misunderstood as a fight of everyone against each other.<sup>7</sup> Instead, the imbalance between a large number of descendants and the available resources, a phenomenon evident especially in nature, plays an important role which ultimately leads to the death of numerous individuals. For Darwin, such causes are the limited amount of food, the competition between competing species, the climate, and especially predators who can decimate a species. The constant fight for survival must lead to the death of those varieties of a species who are the least adapted to their environment. In addition to natural selection, Darwin emphasised the aspect of a sexual selection, in contrast to Wallace. This he understands as a competition of same-sex individuals within a species for a suitable sexual partner, which leads to a selection of certain characteristics and therefore to a significant change in their habitus.<sup>8</sup> Only those individuals can procreate and successfully pass on their characteristics to the next generation who are the most successful in the daily competition for limited resources such as sustenance, sexual partners, nesting, and accommodation. This selection must lead to changes in the habitus of any species when measured over a long period of time (Fig. 2.1).

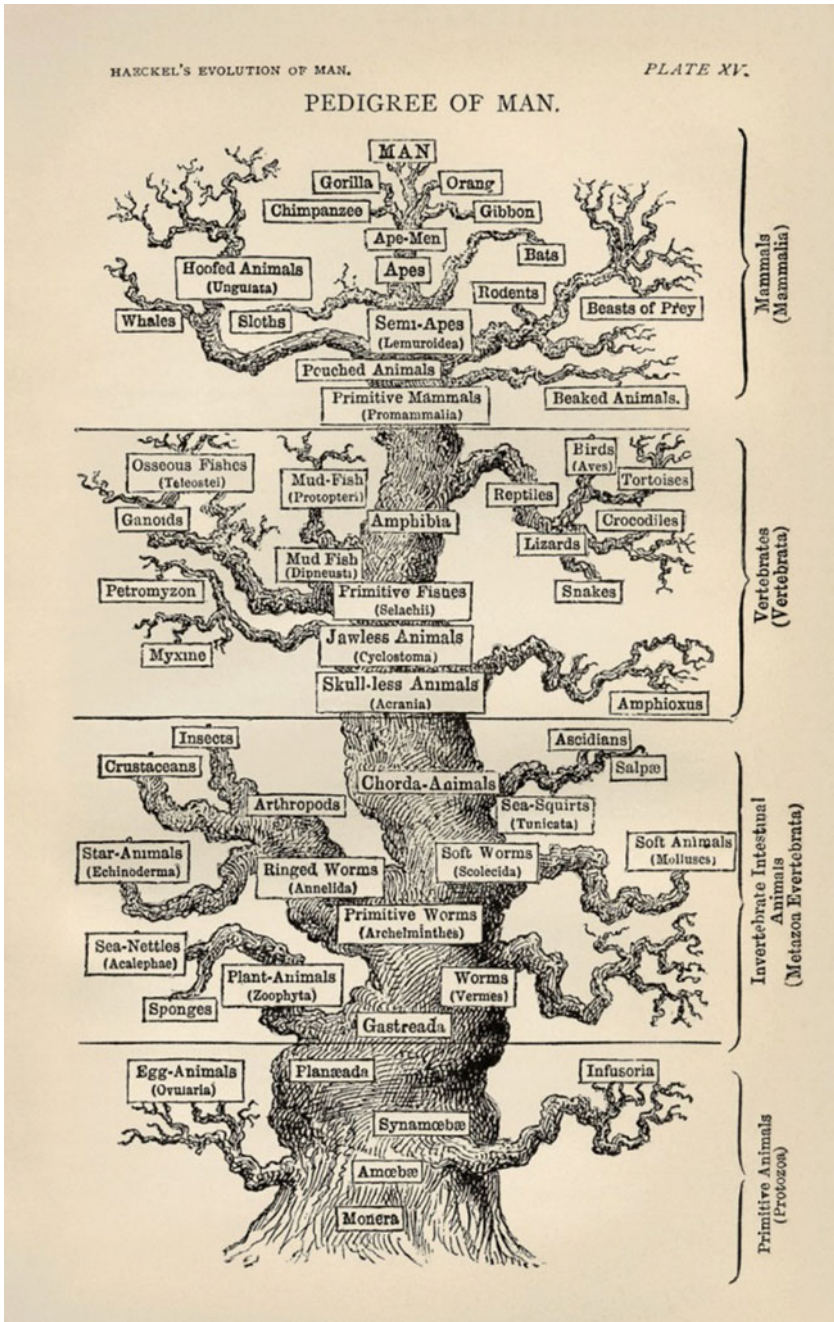
In connection with selection and its influence on the change of species, Darwin also referred to the question of a possible development of increasing complexity of organisms in the course of earth’s history. On account of the importance of this question especially in regards to the possible transference of the biological account onto social and religious development and the consistent misinterpretation of the qualitative features of evolution it is worth reproducing the entire passage:

The ultimate result [of natural selection] is that each creature tends to become more and more improved in relation to its conditions. This improvement inevitably leads to the gradual advancement of the organisation of the greater number of living beings throughout the world. But here we enter on a very intricate subject, for naturalists have not defined to each other’s satisfaction what is meant by an advance in organisation. Amongst the vertebrata the degree of intellect and an approach in structure to man clearly come into play..... If we take as a standard the amount of differentiation and specialisation of the several organs in each being when adult, (and this will include the advancement of the brain for intellectual purposes), natural selection clearly leads towards this standard: for all physiologists admit the specialisation of organs, inasmuch as in this state they perform their functions better, is an advantage to each being; and hence the accumulation of variations tending towards specialisation is within the scope of natural selection. On the other hand, we can see, bearing in mind that all organic beings are striving to increase at a high ratio and to seize on every unoccupied or less well occupied place in the economy of nature, that

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<sup>7</sup>The idea of the *survival of the fittest* goes back to Herbert Spencer, as could be shown in Chap. 1. It is therefore Herbert Spencer and not Charles Darwin and his theory, who is responsible for the so-called Social Darwinism!

<sup>8</sup>This aspect is decisive in connection with the origins of religion, specifically in reference to ranking.



**Fig. 2.1** The genealogical tree of man according to Haeckel (1874). It is clear that also Haeckel, despite being an enthusiastic follower of Darwin, misunderstood the evolution of man as the result of a teleological development

it is quite possible for natural selection gradually to fit a being to a situation, in which several organs would be superfluous or useless: in such cases there would be retrogression in the scale of organisation.<sup>9</sup>

Darwin knew what he was talking about. A precursor to his *Origins of species* was a large systematic study of the Cirripedia, in the subphylum Crustacea, which in the course of evolution not only returned to a sessile way of life but also simplified themselves—including those forms amongst whom the male adult, reduced only to his reproductive organs, lives inside the female as a parasite.<sup>10</sup> Darwin's carefully developed and convincing argument should suffice to halt any fantasies of an increasingly complex development of the organic world once and for all. Nevertheless, even today teleological notions can be found in works such as Pierre Teilhard de Chardins' (1881–1955) *The Phenomenon of Man*,<sup>11</sup> and also the famous biologist Bernhard Rensch was convinced of such a development in the course of phylogeny, without being able to name any criteria for such a development.<sup>12</sup>

Even though evolution of living nature originated with simple forms which eventually, although apparently still during the Precambrian Era,<sup>13</sup> began to differentiate, still it remains impossible to recognise a principle of evolution either in this increasing differentiation or in an increasing complexity. The conquest of earth by animate beings must instead be understood as a process in whose course the organisms continuously made better use of adaptive zones, step by step. Initially, these were the oceans in which the creatures slowly began to occupy the various ecological niches and thereby exhausted the entire spectrum of life from the single-cell organism through to the highly complex arthropods, mollusca, and vertebratae. Subsequently, with the conquest of the continent, several phyla

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<sup>9</sup>Darwin, Charles (1872). *The Origin of Species by Means of Natural Selection*, 6th edition. London: John Murray, pp. 85–86.

<sup>10</sup>“I have lately got a bisexual cirripede, the male being microscopically small & parasitic within the sack of the female... I tell you this to boast of my species theory, for the nearest & closely allied genus to it is, as usual, hermaphrodite, but I have observed some minute parasites adhering to it, & these parasites, I now can show, are supplemental males, the male organs in the hermaphrodite being unusually small, though perfect and containing zoosperms: so we have almost a polygamous animal, simple females alone being wanting. I never should have made this out, had not my species theory convinced me, that an hermaphrodite species must pass into a bisexual species by insensibly small stages; & here we have it, for the male organs in the hermaphrodite are beginning to fail, & independent males ready formed.” quoted from: Clark, Ronald W. (1984). *The Survival of Charles Darwin. A Biography of a Man and an Idea*, New York: Random House, pp. 54–55.

<sup>11</sup>Teilhard de Chardin, Pierre (1959). *The Phenomenon of Man*. New York: Harper Perennial 1976.

<sup>12</sup>Rensch, Bernhard (1972). *Kultureller Evolutionismus*. In: Ritter, Joachim (ed.), *Historisches Wörterbuch der Philosophie* 2. Darmstadt: Wissenschaftliche Buchgesellschaft, pp. 835–886.

<sup>13</sup>Schopf, J. William; Kudryavtsev, Anatoliy B.; Czaja, Andrew D.; Tripathi, Abhishek B. (5 October 2007). “Evidence of Archean life: Stromatolites and microfossils”. *Precambrian Research* (Amsterdam, the Netherlands: Elsevier) 158 (3–4): 141–155.

accomplished the decisive step into a new adaptive zone, in which in turn again all possibilities were realised, from the simple to the complex organic structures. The conquest of air space meant another step, accomplished first by the arthropods (insects) and subsequently by the vertebratae (birds and bats).

## The Origin of Species

Although Darwin succeeded in explaining the change in species with his theory of natural selection, as each generation of a group produces more individuals than are able to procreate, he could not keep his promise to explain *the origin of* [new] *species*. This instead was accomplished by his congenial contemporary and co-author Alfred Russel Wallace. Already in his famous essay of 1858 (part of the Joint Paper), Wallace could for the first time conclusively answer the question of how independent species can originate from varieties. According to Wallace, varieties differ from the principal form both in their habitus as well as in their behaviour. These small differences however are still sufficient to allow the varieties to be more or less successful under accustomed circumstances. According to Wallace's understanding, the issue of nutrition here plays a decisive role. Those varieties who can solve the issue of sustenance more successfully than others will always have a certain advantage over other varieties, and fewer of their descendants will die. As the size of a population is governed by its ability to source for food and not by its ability to procreate, the more successful variety will proliferate to the disadvantage of the weaker forms. Should now the environmental conditions change, for example through a shortage of food, individuals of all varieties will die, and the less successful even more so, so that ultimately all lesser varieties including the principle form will have become extinct. Only the successful variety can survive. If the food situation should then ameliorate itself, the surviving variety can increase again until it reaches the size of the initial population. In this manner, the variety finally replaces the original phenotype and represents the new. The repetition of this process over a long period of time leads to a progressive development of species and increasing deviation from the principle forms.<sup>14</sup> As Wallace demonstrates, not only was the variety not a fixed unity, but neither was the principle form; instead they were changeable in regards to their form and extent. It was thus Wallace who with his empirically proven theory of the tendency of species to change supplied the concept for an impartial analysis of the criteria, the

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<sup>14</sup>Wallace, Alfred Russel (1858). On the Tendency of Varieties to Depart Indefinitely from the Original Type, In Darwin, Charles und Alfred Russel Wallace, On the tendency of species to form varieties; and on the perpetuation of varieties and species by natural means of selection. J. Proc. Linn. Soc. London, Zoology 3, pp. 53–62.



**Fig. 2.2** Alfred Russel Wallace (© The Darwin-Wallace celebration held on Thursday, 1st July 1908, by the Linnean Society of London)



characteristics, the terminology, and the definition of forms. Just as pervasive as his research into the concept of forms is the discovery of the function of isolation mechanisms, as he described them for the first time in his article *On the law which has regulated the introduction of new species*. Without the presence of isolating mechanisms, a speciation, i.e. the disintegration of a species into several subsidiary species, is not possible. Even though Charles Darwin could also demonstrate the change of species over time, he could not produce a convincing analysis of the problem of the duplication of species, a shortfall which can be traced back to Darwin's lack of appreciation for the essence of the species (Fig. 2.2).

However, this means that in contrast to all higher taxonomic entities such as group, family, rank, or class (which all represent a system of staggered similarity), the species is a natural entity which plays a decisive role for the process of evolution. They are not only types or varieties of a group of individuals similar amongst themselves who change in the course of evolution, but it is the **species** which plays the decisive role for evolution as the **naturally evolving unit**.

The same principle applies to any other evolving system, thus also for a description of the change of religions as evolution. It remains important, however, as has already become clear in the discussion of Bellah's notions of *religious evolution*, to identify correctly the naturally evolving unit.

**No evolution without a naturally evolving unit, without an analogy for the biological species!**

## The Concept of Species and Evolution

A century after Wallace, the prominent evolutionary biologist Ernst Walter Mayr (1904–2005) recognised the tremendous importance of the concept of species. Mayr had begun his career as a biologist when experimental genetics had discovered the process of mutation and thus believed to have found the cause for changes even beyond the boundaries of each species. However, evolutionary biologists had disregarded the basic principles of inheritance, which had already been published in the works of Gregor Mendel and August Weismann.<sup>15</sup> Within the framework of sexual reproduction, the parental hereditary factors, or genes, do not mix like liquids during the process of fertilisation, but instead both parental partners contribute a set of genes which in turn form the chromosomes of the new individual and determine its phenotype. In the subsequent generation, this diploid chromosome set is once again split during the formation of new egg or semen cells, and here the genes of the previous generation are divided randomly. Through this process, no offspring created through sexual reproduction is the exact image of his parents, but the product of a new, unique arrangement of half of the respective parental hereditary dispositions. Thus, not only is the contribution of both sexes equal during reproduction, but simultaneously it becomes a fact that each new organism created through sexual reproduction is unique—because the genetic material of the parents is combined differently each time. Simultaneously, the extant organisms represent only a fraction of the theoretical combinations, so that evolution of life on earth is a historically unique process which cannot be repeated.

However, this also means that creatures of any species are never represented by an individual or an ideal type, but that instead the entire genetic property of a population determines the genetic achievement and adaptation potential of the species. Species, thus, are not, as the biologist and father of modern taxonomy Carl von Linné (1756–1778) surmised, groups of individuals similar amongst themselves (typological species concept), but “groups of actually or potentially interbreeding natural populations which are reproductively isolated from other such groups.”<sup>16</sup> Species therefore are “reproductive communities. The individuals of a species of animals recognize each other as potential mates and seek each other for the purpose of reproduction ... The species is also an ecological unit that, regardless of the individuals composing it, interacts as a unit with other species with which it shares the environment. The species, finally, is a genetic unit consisting of a large, intercommunicating gene pool, whereas the individual is merely a temporary vessel holding a small portion of the contents of the gene pool for a short period of time. In each new generation, a population’s genes are mixed anew and passed on to the

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<sup>15</sup>Mendel, Gregor(1995). *Versuche über Pflanzenhybriden*. Zwei Abhandlungen 1866 und 1870, ed. by Erich von Tschermak-Seysenegg, Frankfurt am Main: Verlag Harry Deutsch.

Weismann, August (1892). *Aufsätze über Vererbung und verwandte Fragen*, Jena: Fischer.

<sup>16</sup>Mayr, Ernst (1973 [1963]). *Animal Species and Evolution*. Fifth edition. Cambridge, Mass.: The Belknap Press of Harvard University Press, p. 19.



individuals in unique combinations. It is this individual which has to prove itself in the selection.”<sup>17</sup>

To summarise: the biological theory of evolution is based on three principles, which in modern terminology can be formulated as follows: the individuals of a population differ amongst each other in numerous features; phenotypes proliferate in various degrees of success dependant on the conditions of the respective milieu; aptitude is inheritable and passed on from one generation to the next. Evolution thus is a two-stage-process: “The first step consists of the production of variation in every generation, that is, of suitable genetic or phenotypic variants that can serve as the material of selection, and this will then be exposed to the process of selection. This first step of variation is completely independent of the actual selection process, and yet selection would not be possible without the continuous restoration of variability.”<sup>18</sup>

This process, the purely random production of individuals with different combinations of characteristics inherited from the grandparent generation, makes evolution blind. Evolution therefore cannot purposefully react to possible environmental changes. Merely the competition for resources, the struggle for existence, ultimately allows those individuals who have adapted best to increase in disproportionate numbers over the long term.

Thus far the characteristics of the biological evolution—simultaneously also the basis of a general theory of evolution which comprises the gradual change of any system with memory, i.e. the ability to save information and pass it on to the next generation. For each possible evolving system, therefore, it is mandatory to pinpoint first the evolving unit in order to specify in more detail the evolutionary factors.

## Religion and the Naturally Evolving Unit

Before we progress, however, perhaps a brief look back to the results of the previous discussion: religions and their changes play an important role in the history of man, and research is accordingly focused on the question of the origin and evolution of religions. At some point in the course of phylogeny, man learnt not only to produce tools but he also discovered interaction with supernatural entities—with all inherent positive and negative consequences. The cultural evolution joins the biological, influences the biological fitness, and ultimately replaces the biological evolution in the course of phylogeny. Religion can also have a considerable impact on the biological fitness of a group, according to the evolutionary biologist Richard Dawkins.<sup>19</sup> If religion is analysed in this context, as part of human behaviour, it

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<sup>17</sup>Mayr, Ernst (1973 [1963]). *Animal Species and Evolution*. Fifth edition. Cambridge, Mass.: The Belknap Press of Harvard University Press, p. 21.

<sup>18</sup>Mayr, Ernst (1988). *Toward a New Philosophy of Biology. Observations of an Evolutionist*. Cambridge Mass. and London: The Belknap Press of Harvard University Press, p. 98.

<sup>19</sup>Richard Dawkins (1976). *The Selfish Gene*. Oxford: Oxford University Press.

becomes a human characteristic relevant for selection, i.e. for his evolution. The problem raised here is of course highly interesting and has produced impressive results in the scientific field,<sup>20</sup> but does not grasp the dynamic of the change of religions themselves. If however the focus is to determine trends in the development of religion (which we have to do in the search for the origins of religion and religions), then the evolution of man with his characteristics cannot be the central focus of the investigation, but instead it must be religion itself—focus must be the evolution of religions!

Yet if religions themselves evolve, as already postulated correctly and forcefully by Robert Bellah, the next step must therefore be the search for the naturally evolving unit.

Let us here take a step back to biology. Ernst Mayr highlighted the connections between the species as evolving unit and the evolutionary process. Accordingly, a species is not characterised by the fact that the corresponding examples are similar to one another (we also know of poly-typical species), but rather because the individuals **recognise** themselves as part of the same species. Ultimately, the recognition and acceptance of the Other as potential and actual partner for reproduction makes clear that a species is first of all a reproductive community.

The same concept applies to the many historical and more recent religions, let us call them a religio-species. Here again, it is not the resemblance of as many features as possible which decides if people recognise each other as part of the same religious community. Let us take, for exemplary purposes, a highly simplified form of Judaism: neither a certain habitus (shtreimel or kippah, sidelocks, caftan) nor the acceptance of authoritative religious texts (the Talmud, which is rejected by Karaite Judaism), and not even the belief in the existence of God are decisive! Instead, Judaism defines itself as a community of faith with a common destiny, even including atheistic Jews. Jewish atheists thus see themselves as being a part of Judaism and distinguish themselves from non-Jewish atheists. We see that also in the distinction of the individual religions, the relevant factor is again not the highest possible resemblance within the individual religion, but in contrast the strict boundaries to the competing religion. The definition follows that:

Religion as a natural, systematic unit can be understood as a well-adapted and well-aligned complex of belief ideals and actions. Religions as systematic units are defined by a strict demarcation and not by differences in features and characteristics, i.e. they are defined by their relationship to other groups not belonging to the same religion (isolation), and not by the relationships of individuals with the same religious affiliation. Religions thus are not random, coincidental aggregates of individuals whose religious convictions and actions are demonstrated through superficially similar symbols, but they are entities in which the affiliated individuals recognise themselves as belonging to the same religious community.

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<sup>20</sup>Geertz, Armin W. (2015). Religious Belief, Evolution of. In: International Encyclopedia of the Social and Behavioral Sciences, Second Edition, pp. 384–395.

Eckart Voland/Wulf Schiefenhövel (eds.) (2009). The Biological Evolution of Religious Mind and Behavior. Dordrecht, Heidelberg, New York, London: Springer.

The respective environment exerts selective constraints onto these entities and forces the individual religions to adapt, thus enforcing a change. Referring back to the discussion above, Åke Hultkrantz had already described this process for the natural, and Robert Bellah for the social/political and economic environment, neither however reaching a satisfactory conclusion in regards to the evolving unit.

Consequently, only one question remains, namely the problem of information transfer from one generation to the next, or expressed differently: how does the memory of our system “religion” actually function?

## Heredity

In the field of biology, we know that information is saved in the genetic make-up and transferred onto the next generation—following familiar, highly complex mechanisms. However, we see a different case of information transfer for a cultural rather than biological inheritance, the laws of which had been discovered by the population geneticist Luigi Luca Cavalli-Sforza (\*1922) in the course of his research into the connections of genetic and linguistic kinship of different peoples.<sup>21</sup> According to Cavalli-Sforza, the cultural information is in principle subordinate to the same mechanisms as the biological information inscribed on genes. While the genome however is transmitted by means of reduplication and transfer from generation to generation, the cultural information is conveyed by the nerve cells within the brain of one individual to the other, in the course of which deviations within the information transfer and information conversion can lead to variations.<sup>22</sup> While the direction of the genetic information transfer is dependent on coincidence (in the new combinations of the parental genes), cultural changes are possible also as deliberate and goal-oriented innovations. Information through communication (verbal communication and imitation) is the medium with whose help cultural knowledge is transmitted. Here, hunting techniques and production of tools belong just as much as ethical demands and social norms, but also aesthetic understanding, art, narrative tradition, and possibly religious tradition; even Cassirer’s “symbolic forms” language, mythical thought, and phenomenology of realisation are subject to the cultural evolution and in turn influence, through a retrospective effect on cognition, the development of man.<sup>23</sup>

As Cavalli-Sforza could show using empirical research, in the history of mankind cultural knowledge was for centuries transferred almost exclusively in a

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<sup>21</sup>Cavalli-Sforza, Luigi Luca (2000). *Genes, Peoples, and Languages*. New York: North Point Press.

<sup>22</sup>Skirms, Brian (2010). *Signals. Evolution, Learning, & Information*. Oxford: Oxford University Press, pp. 61–62.

<sup>23</sup>Cassirer, Ernst (1995). *Zur Metaphysik der symbolischen Formen*. Nachgelassene Manuskripte und Texte. Ed. by John Michael Krois. Hamburg: Meiner.

vertical fashion from parents to children. Consequently, cultures changed only very slowly under stable environmental conditions. Under these circumstances, as a rule we see that only when groups see themselves challenged by a change in the natural, economic, or social environment do they tend towards a higher degree of variety, meaning they see themselves forced to behavioural changes which are reflected in, and influence, their world view.

In the course of history however, the horizontal flow of information, i.e. the transmission of information between members of the same or subsequent generation, has grown in importance and surpassed the vertical. Impressive examples for the meanwhile decisive importance of the horizontal transmission of information is on the one hand education through a third party, such as in schools, on the other hand the mass media; in both cases, the vast amount of information transmitted is much higher than would have been possible between parents and children.

Ultimately, it is the manner of information transfer that decides the dynamic of the flow of information. A largely vertical flow from parents to child, or adults to a small group of children, as practiced even today in band-societies, is more prone to strengthen conservative tendencies, while a horizontal transmission of information opens itself up for change and innovation.

At this point the difference of inheritance between culture and biology becomes clear: culture can react to environmental changes immediately and more directly. Thus the changes occurring through communication are much more hardy than those changes evoked through the slower, biological reproduction, and that is the reason why the cultural evolution in terms of its repercussions on human existence has surpassed the biological evolution.

However, in terms of the possible changes of the individual religions we must highlight an important caveat, whose importance in connection with the deliberations concerning evolution is frequently overlooked, and which must equally apply to the evolution of religion: the search for the basic raw material of the evolution. Evolution can only work with extant material, evolution can only modify previously existing characteristics, but it cannot create anything new. Thus if evolution in an extreme case has manoeuvred itself into a corner through overspecialisation, an organism cannot react to environmental changes and the species must die out. We see this in human evolution, in the case of the robust Australopithecines (today a *Paranthropus*) who reacted to the increasing aridity of the African savannah by adapting their jaws (a strong dental set to chew hard-shelled foods), and then with an increasing humidity had become inferior to the gracile Australopithecines and became extinct. Other characteristics are senselessly carried through the generations and only emerge as useful hundreds of generations down the line, offering evolution a further platform. Expressed in the words of Ian Tattersall: “We are all built on modified versions of a template ultimately furnished us by an ancient ancestor”.<sup>24</sup> The same applies to the cultural evolution, including religions and the

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<sup>24</sup>Tattersall, Ian (2012). *Masters of the Planet. The Search for our Human Origins*. New York: Palgrave Macmillan, p. XX.

corresponding rituals. Here as well nothing new is invented, but the extant cultural-religious inheritance is modified in the course of generations and adapted to the changing social conditions; occasionally old traditions and customs are carried over—rituals for example, such as the Agni-ritual described by Frits Staal, no longer understood in modern India, as well as sacrificial customs in Ancient Greece which did not correlate with the ancient form of religious worship: a sacrificial cult on the basis of a gift exchange would have been expected, whereas instead the sacrifice as part of the ritual corresponded to the primordial sacrifice of foragers.<sup>25</sup>

Religions thus do not evolve freely, nor are they guided towards a certain direction by a religious mastermind in order to adapt to the contemporary requirements, but instead they have to revert back to their stock of ancient traditions for every desired renewal, which is then modified, perhaps weighted differently, and interpreted anew in a different context in order to survive in the struggle for existence, i.e. in the competition of religious providers.<sup>26</sup>

## The Evolution of Religions

To summarise: the evolution of religions describes the changes of religions in the course of history, beginning with the first, possibly rudimental religion to the complex theological and ethic religions of our modern times. While we can trace these historical changes with the help of records and other writings, and can even see the changes during our modern times in real time (on account of the alacrity of cultural heredity), we can only reconstruct events for prehistoric and protohistoric times by using the processes we can witness today). The evolution of religions is a justified theory developed in order to explain what we observe with the help of scientific terminology. This could be an explanation for the clearly hierarchical system of religions, in which some are more closely related than others. Or for the contents, dogma, or elements of a cult which today are incomprehensible and cannot be interpreted in any other way than as traces of previous evolutionary stages. What we see today is in fact an hierarchical-encaptic system of similarities between religions—religions, just like organisms, can be divided into groups on account of their similarities, whereby subsequently these groups, on account of their respective similarities, can be combined to groups of a higher level. If we take these groups and organise them chronologically, we recognise a tree of life for the system

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<sup>25</sup>Meuli, Karl (1946). *Griechische Opferbräuche*. In: *Phyllobolia* (Festschrift Peter von der Mühl), pp. 185–288. Basel, Switzerland; reprinted in Karl Meuli. *Gesammelte Schriften*, vol 2. Basel, Switzerland: Schwabe, pp. 907–1021.

Staal, Frits (1989). *Rules Without Meaning: Ritual, Mantras, and the Human Sciences*. New York: Lang.

<sup>26</sup>Wunn, Ina (2016). The Crux of a Darwinian Approach on Evolution: What is Evolution, and what did evolve? In: Gerald Hartung/Matthias Herrgen (Eds.) *Interdisziplinäre Anthropologie*, Jahrbuch 03/2015: Religion. Wiesbaden Springer: pp. 83–98.

of religions. This tree of life can now be explained by the fact that the vast number of known historical and extant religions ultimately all stem from the one, or from a very few, principle form(s)—which remain to be discovered.

The shape of such a search for the principle form becomes clear from the above-mentioned characterisation of the process of religious evolution. We cannot search for arbitrary possible appearances of the religious in each and every period of prehistory, as in the approach of the author of one of the first comprehensive works of prehistorical religions, Joseph Maringer—his conclusion was a potpourri of unrelated, frequently fantastic customs and traditions, of which a cult of cave bears and notions of rebirth from the womb of Mother Earth were the more harmless varieties.<sup>27</sup> Equally impossible is the reconstruction of religion's origins, specifically a prehistoric religion, exclusively of those processes which are part of the human psyche or cognition and explain why humans tend towards religious thought and behaviour at all.

In order to prevent misunderstandings: this does not imply that the appropriate research in the field of cognitive science of religion, neurotheology, or evolutionary psychology of religion are superfluous or unable to offer results, but it does mean that these sciences in and of themselves are not sufficient to answer conclusively and satisfactorily the question of the origins of religions and the subsequent evolution of religions as historical events.<sup>28</sup>

So what does this mean for the search for the origins of religion? Let us go back to our hierarchic-encaptic system of religions, in which the individual religions are assigned to groups based on their graded similarities, whereby certain characteristics have proven taxonomically more important than others.<sup>29</sup> We are now able to search for these taxonomically relevant features of the religions in question. This means that the material available, our religio-fossils, must be analysed specifically for these features, which then in turn, evaluated by comparison with other religions, can take their place in our tree of life desideratum.

It is a reflection of the nature of this search that the tree of life cannot be complete but that instead it will resemble, similar to the tree of life for prehistoric man, a patchwork rug in which individual aspects can suddenly highlight and explain the reconstructed development. Many a culture, which in our presentation is genetically related to a cultural precursor or descendant, can strictly speaking only be integrated into the larger religious development with a dotted line, broken up by at least one, if not more question marks. Here and there, especially concerning the

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<sup>27</sup>Maringer, Johannes (1960). *The Gods of Prehistoric Man*. London: Weidenfeld & Nicolson.

<sup>28</sup>See as well Witzel, Michael (2012). *The Origins of the World's Mythologies*. New York: Oxford University Press, pp. 22–24.

<sup>29</sup>In contrast to the theory of *Kulturkreis* of Fritz Graebner and Bernhard Ankermann, who have produced a comprehensive catalogue of characteristics and attempted to determine similarities, i.e. cultural relationships, with the help of a process of pure subtraction. Father Wilhelm Schmidt, S. V.D., employed the same method, resulting in the first impressive attempt to construct a tree of life of religions. Schmidt, Wilhelm, S.V.D. (1912). *Der Ursprung der Gottesidee. Eine historisch-kritische und positive Studie. 1. Historisch-kritischer Teil*. Münster: Aschendorf.



beginnings of religion's development, disjunctive places of discovery are evaluated and their findings generalised. The fact that realistically only the rough outlines of an early religion can be demonstrated, whose contours in some cases were filled in differently in life, is a drawback which cannot be fully avoided if one is reliant on fossils—and our prehistorical religions are just that!

In sum: having formulated the problem of our research question—we are searching for the origins of religions, specifically the first religion whose evolution we can trace and comprehend—and having clarified the appropriate scientific-theoretical background—focus on evolutionary events which follow clear rules—we can now proceed to the next phase, the search for answers of questions posed at the outset:

When did religion come into being?

Why did religion come into being?

Ancestors, Territoriality, and Gods

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Wunn, I.; Grojnowski, D.

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