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## Purpose in the Living World? Creation and Emergent Evolution and Signature in the Cell: DNA and the Evidence for Intelligent Design (Book Reviews)

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to heterosexuality, while 38-45% demonstrated positive change away from homosexuality on a scale from exclusive homosexuality to bisexuality to exclusive heterosexuality. Change in sexual orientation did occur for some, and the process showed no deleterious psychological consequences, either for those experiencing change or not.

The final two chapters discuss the implications of the findings. The fact that one-third actually “failed” at the attempt implies that Christian therapy is not a magic potion instantly curing all who seek reorientation. On the other hand, the overall results demonstrate very convincingly that for some, change is possible, especially for those highly motivated and supported to do so. Jones and Yarhouse conclude, “We found empirical evidence that change of homosexual orientation may be possible through involvement in Exodus ministries, either (1) in the form of an embrace of chastity with a reduction in prominence of homosexual desire, or (2) in the form of a diminishing of homosexual attraction and an increase in heterosexual attraction with resulting satisfactory heterosexual adjustment” (364).

There are several limitations to the study, many of which are honestly highlighted by Jones and Yarhouse. The final sample of 73 was significantly fewer than the 300 for which they were hoping, and the loss of one-third of the original 98 at the three-year mark is disappointing. However, this is not atypical for longitudinal research. Another issue for which many will cry “foul” is that the funding for the study was provided by Exodus International—the umbrella organization of the very ministries that were providing the therapy under investigation. In order to dispel accusations of conflict of interest, Jones and Yarhouse transparently go into painstaking detail—almost too much—throughout the 414 pages of the book. The reason the results are tough to wade through is that raw counts rather than percentages are displayed in many of the tables. Although a long read for a research study, it is the first of its kind and will no doubt prove itself to be an influential work in the field.

How has the professional community responded to the Jones and Yarhouse study? One positive indication is that they were selected to present the results of a three-year follow-up (indicating continued change for those

in the original study) at the August 2009 meeting of the American Psychological Association (APA) in Toronto, Canada. Ironically, however, at the same conference just three days before their presentation (which was scheduled on the final conference day—Sunday—at 8 a.m.), the APA governing council adopted a resolution reaffirming the position that therapeutic efforts to help homosexuals desiring to change are not effective and that such therapy should be avoided because it may be harmful. This mixed reception for Jones and Yarhouse’s work indicates a long road ahead. I am reminded that physicist Max Planck once said, “A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.”<sup>4</sup> Although many in the professional establishment are ignoring contrary findings, there is hope for paradigm change ahead if this type of careful inquiry continues to be carried out.

### Endnotes

1. *American Psychiatric Association (2008). Therapies Focused on Attempts to Change Sexual Orientation (Reparative or Conversion Therapies)*. Arlington, VA: Author. [Retrieved from [www.psych.org/Departments/EDU/Library/APAOfficialDocumentsandRelated/PositionStatements/200001a.aspx](http://www.psych.org/Departments/EDU/Library/APAOfficialDocumentsandRelated/PositionStatements/200001a.aspx).]
2. *American Psychological Association. (2008). Answers to your questions: For a better understanding of sexual orientation and homosexuality*. Washington, DC: Author. [Retrieved from [www.apa.org/topics/sorientation.pdf](http://www.apa.org/topics/sorientation.pdf).]
3. In order to allow for comparison with a national sample, Jones and Yarhouse used the same questions used in the National Health and Social Life Survey (NHSLs), which is a well-regarded national survey of adult sexual history and behavior.
4. Jones and Yarhouse, 364.
5. See Max Planck, *Scientific Autobiography and Other Papers*, trans. F. Gaynor (New York, 1949), 33-34.

Klapwijk, Jacob, *Purpose in the Living World? Creation and Emergent Evolution*. Cambridge: Cambridge University Press, 2008. 311 pages, ISBN-978-0-521-72943-7.

Meyer, Stephen C., *Signature in the Cell. DNA and the Evidence for Intelligent Design*. New York: HarperCollins Publishers, 2009. 611 pages, ISBN-978-0-06-147278-7.

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In the seemingly endless stream of books that deal with the so-called creation-evolution debate, one might question the value of reading about yet two more in this area. However, by comparing and contrasting these two books, I

hope to show that they both address a fundamental concept that is often overlooked in this debate, namely that living things have properties which cannot be reduced to physical laws. While both authors argue for this irreducibility in

living things, Jacob Klapwijk includes it in his acceptance of evolution, arguing that the special properties of living things arise by *emergence*. Although Klapwijk makes many helpful points in his book, I am not convinced by his argument. It is Meyer who shows that evolutionary emergence cannot happen spontaneously because living things contain biological information that is evidence of Intelligent Design (ID). I find this argument to be persuasive.

Jacob Klapwijk is a Dutch philosopher in the Reformational tradition of Dooyeweerd and Vollenhoven and an emeritus professor of the Free University in Amsterdam. He writes this book to offer a broader philosophical reflection on evolution, from the Reformational perspective. Stephen Meyer is an American philosopher of science with a background in geophysics. His book is an autobiographical account of his journey to understand more about the mechanism of the origin of life from non-life. While both authors are Christians, the nature of each of their books is different. Klapwijk argues explicitly from a Christian perspective, but Meyer wants his arguments for ID to be seen as scientific instead of religious, so he intentionally avoids religious arguments.

### Purpose in the Living World?

#### Creation and Emergent Evolution

Klapwijk's argument is the following three points, which I will address in turn:

- (1) Evolution is based on facts, "facts as hard as nails" (2).
- (2) The world, particularly the living world, functions at multiple levels, each with its own set of laws or principles that cannot be reduced to lower levels.
- (3) Therefore, these levels must have emerged as organisms evolved.

Though Klapwijk accepts evolution, he does not present detailed arguments but accepts the conclusions of the mainstream scientific community. To a certain extent this acceptance is understandable, given that Klapwijk writes from a philosophical position and not a scientific one. However, he does acknowledge difficulties in the evolutionary scenario, particularly in the origin of life,<sup>1</sup> only to ignore those difficulties by stating that evolution happened anyway (225 and elsewhere). Further, his use of the word *facts* in his discussion of evolution shuts down debate even though he is aware of the challenges that exist. It is surprising that Klapwijk uses the term *facts* since philosophers do not speak of *facts* in science but of *data* and interpretations of those data.<sup>2</sup>

Although Klapwijk accepts that evolution occurred, he does reject *Darwinian* evolution, which is an "aimless process of development" (6), driven purely by chance. On the contrary, Klapwijk affirms God's sovereignty over the creative process, including evolution. It is in this sense that the word *purpose* in the book's title is meant.

The second part of Klapwijk's argument concerns the

stratification that exists in creation. Living things conform to *biotic* laws, such as reproduction and homeostasis, which cannot be reduced to physical laws. While the biotic domain is found in all living things, Klapwijk argues that plants have yet another level, namely a *vegetative* domain, associated with growth and development. Animals have yet another level, the *sensitive* domain, while humans have a *mental* domain (117), which can be further subdivided.<sup>3</sup> Klapwijk makes several points about these different levels. First, he points out that each level is dependent on lower level functions but cannot be reduced to them. That is why one cannot describe life or its origin using merely physical descriptions. Living things have separate sets of laws or principles. Klapwijk also shows how lower levels are subservient to higher levels; e.g., physical processes are controlled by biotic functions in living organisms, and the biotic laws in turn are subservient to sensitive functions in animals. I agree with these points and find them helpful in understanding the relationships among the different levels.

As an aside, while Klapwijk does not list the carrying and transmission of information as one of the biotic functions, I see them as a vital aspect of biotic function. The cell's information is the cell's identity. It's not the physical components of the cell that are important to reproduce; these are continually recycled anyway. It's the cell's information that is maintained and reproduced through the information stored in its DNA sequence and many other factors that regulate how the information on the DNA is expressed.<sup>4</sup>

While I find Klapwijk's argument for stratification helpful, I also have some points of disagreement. Klapwijk argues that the biotic domain is characterized by self-organization and spontaneous self-regulation (107). While there is self-organization and self-regulation in cells, I'm not sure I would call them *spontaneous*, which to me is a property of a physical and not a biotic domain. The scientist in me sees *spontaneous* as involving a change from a high energy state to a low energy state, which living things do only when they die. Living things remain in a higher energy state, interacting with their environment to do so. As I will describe later in the context of Meyer's book, these properties of self-organization and self-regulation are regulated by the information contained in the cell.

Klapwijk's categorization of single-celled organisms as being merely biotic and not vegetative also does not fit with what we find in creation. Bacteria do not exist as single cells but in populations, often forming biofilms, generally with other species of bacteria and microorganisms.<sup>5</sup> These biofilms have much different properties from individual cells, including growth and differentiation, so I would argue that bacteria *collectively* have a vegetative function as well. There are many examples of endosymbiosis between single-celled organisms and animals (think of our own digestive systems and those of cows) that also undermine this distinction between levels and functional domains in the living world.

I would argue further that *all* mature<sup>6</sup> living organisms have a sensitive domain. Bacteria are certainly sensitive to

their environment—indeed, Jacob and Monod (mentioned several times in the book) received their Nobel prize for elucidating the mechanism by which bacteria respond to a change in their nutritive environment. The phenomenon of quorum-sensing allows bacteria to communicate with each other to ensure coordinated responses in a culture. The single-celled alga *Euglena* has a light-sensitive spot, which allows it (with its flagellum) to respond appropriately to light. Plants are likewise sensitive to their environment, including systemic responses to infection and changes in photoperiod. Klapwijk acknowledges these types of responses but claims (216, 217) that only animals have a sensitive function because only they have nervous and endocrine systems. It is true that the cognitive abilities which higher animals have is not found in plants or single-celled animals, but such cognition is not likely to exist in insects or most invertebrates either.<sup>7</sup> Even though insects and worms have nervous and endocrine systems, they don't really have a brain, having a loose cluster of neuron cell bodies instead.

The third point of Klapwijk's argument deals with the emergence that he claims occurs in evolution. Klapwijk claims that emergence is not an explanatory theory but a theoretical framework (118). Perhaps, but that doesn't help us understand the concept any better, nor does it convince the skeptical reader of its occurrence. If one cannot demonstrate *how* it works, how can one deduce *that* it occurred without begging the question? Klapwijk's arguments seem to be derived merely because he accepts the "facts" of evolution. In contrast, I would argue that *no* origin of life research has clearly demonstrated that life has emerged from non-life. The existence of emergence becomes even less likely the more scientists study the "lower" forms of life and realize that they too have higher-level functions.

Before moving on to Meyer's book, I want to make two additional comments. In his discussion of emergence, Klapwijk (225ff) describes the sequence of the emergence of the higher domains over evolutionary time. He expresses appropriate caution about whether each step of emergence happened relatively quickly or gradually (but favors the former). He describes first the emergence of the biotic domain (bacteria), then the vegetative (plants), then the sensitive (animals). However, this sequence is inconsistent with what we see in the fossil record, where animals appear long before plants.<sup>8</sup> To be sure, photosynthetic bacteria and algae do appear before animals, but Klapwijk does not include them as having vegetative functions. Thus Klapwijk's sequence of emergence is inconsistent with the timing of the evolutionary sequence that he espouses.

Finally, I want to comment on Klapwijk's characterization and criticism of the theory of ID. It can be difficult to characterize a particular position when its various proponents make different and potentially conflicting arguments. Klapwijk is right to criticize reductionistic arguments made by ID proponents. However, the reductionism of many in the ID community shouldn't be surprising, given that the rest of the scientific community is also by and large

reductionistic. Similarly, Klapwijk is correct in opposing any attempts to use ID to support natural theology, the view that the findings of science present evidence for God.<sup>9</sup> However, Klapwijk characterizes ID as a God-of-the-gaps argument (25), which points to God's action *only* where scientific explanations are lacking. By doing so, Klapwijk is turning ID into a religious argument, which is not the claim made by most ID proponents. Thus calling ID a God-of-the-gaps argument is a straw man because ID proper deals with the scientific evidence for design in the universe.

### **Signature in the Cell: DNA and the Evidence for Intelligent Design**

As its subtitle implies, Meyer's book argues in favor of ID, which pits him against Klapwijk, although the two do not address each other's work. This book is somewhat longer than Klapwijk's, but its focus is narrower, concentrating primarily on the cell and the transition from non-life to life. The book is an autobiographical account (longer than it needed to be, but still an easier read than Klapwijk's), in which Meyer concludes that living things contain complex *specified* information and that there is no natural means of acquiring this information, hence his argument for intelligent design. In chapter 4, Meyer elaborates on what he means by complex specified information. He explains that in information theory, *Shannon* information (named after the information theorist Claude Shannon) is directly related to complexity. The more complex an arrangement is, the more Shannon information it contains. On the other hand, specified information is more than Shannon information because it prescribes a function. For example, the letters and spaces in the sentence you are presently reading contain the same amount of Shannon information that they would have if they were arranged randomly. However, the *specified* information in the two sets of letters and spaces (hopefully!) is quite different because one conveys information and the other doesn't. Meyer goes on to explain that a cell's complexity involves not only specified information encoded in the DNA but also a processing system to interpret that information in order for that cell to survive and reproduce. Meyer examines and eliminates several possibilities that have been proposed for the source of this specified information. In chapter 10 he explains that the minimum amount of information needed for a living cell is far too much for it to have arisen by chance. Another possibility is that chemical or physical laws may exist to produce the necessary information, but he shows this to be impossible in chapters 11-13. Computer programs have been designed to simulate the emergence of specified complexity, but Meyer shows how they too require input of information (besides the obvious fact that information is needed to design the computer programs in the first place).

Having eliminated natural sources of specified information, Meyer, in chapter 15, argues that the best explanation for its source is intelligent design. The next question to address is the adequacy of ID to produce

specified information. To do this, Meyer makes an analogy with humans, whose intelligence permits them to generate specified information (329). Thus for Meyer, intelligent design is the best explanation for the source of the information found in the cell.

I must admit that it is at this point that I become less comfortable with Meyer's argument. I agree that chance and physical or chemical laws cannot produce specified complexity. I also agree that humans can produce such complexity. It's pulling these two statements together to say that living things show evidence of intelligent design *analogous to what humans do* that makes me somewhat wary. The obvious question that an ID critic would ask is, "But *how* did such a designing intelligence introduce specified information in the formation of life?" I have not seen a satisfactory answer from the ID camp at this point, but the response would be that ID is merely establishing that there is evidence for ID; the mechanism is a separate question. One could propose many possible mechanisms. Did God at some point suspend his usual "laws of nature" in the evolution of the first living cell to bring in specified information? Or did God instantly create living things out of nothing, complete with specified information? These are unsatisfactory questions for many theistic ID opponents (including Klapwijk), who hold to the concept of methodological naturalism, the idea that God used only natural processes in creation.

I have two comments in response to these concerns. First, note that the argument has now become a religious argument, but ID claims to be a scientific argument. To be sure, there are religious implications of ID, but they are separate from the question of the scientific evidence for design. Indeed, Meyer's chapter 18 is devoted to the argument that ID is scientific, not religious. Second, I agree that methodological naturalism is a useful working model, necessary in *experimental* science (my students may not invoke miracles for the results of their experiments) but also useful in *historical* science, the study of past processes including evolution. However, to say that methodological naturalism *must* be true seems to be telling God how he must have created. I'm not prepared to take that step. Yet after all this, there remains the unanswered question of how the specified information in living things came to be. Just as Klapwijk's assertion of emergence is unsatisfying without a mechanism, so too is the claim for specified complexity without a mechanism.

Before I conclude this review, I would like to try to tie together Meyer's concept of specified information with Klapwijk's concept of emergence. Although Meyer does not address the higher levels that Klapwijk describes, I believe that specified information also applies to these higher levels. This can be illustrated in embryonic development, where we *do* find emergence. A single-celled human zygote has merely a biotic function (although it does interact with its surroundings), but as it divides and forms an embryo, we see the emergence of different tissues (vegetative), a nervous

system (sensitive), and consciousness (mental). But this is not the emergence that Klapwijk describes in the evolutionary scenario. Here we have the information already expressed in the zygote, which is used for the development of the mature individual. Unlike the evolutionary sequence, the developmental emergence sequence is highly prescribed and tightly regulated.

In summary, Klapwijk accepts evolution but also argues for the stratification of living things, which lead to his argument for emergence in evolution. By contrast, Meyer argues that the emergence of specific information found in the cell could not have happened by evolution but is evidence for intelligent design. I agree that there are irreducibility and stratification in creation, particularly between life and non-life. But the emergence of new levels does not just happen; it requires information. Without this information, Emperor Emergence still has no clothes.

### Endnotes

1. Theistic evolutionists like Francis Collins and Simon Conway Morris do, as well. Klapwijk explicitly rejects the label of "theistic evolutionist" (36), but it is not clear to me what his exact position is, since he accepts evolution and is obviously a theist. It may be the reductionistic perspective of theistic evolutionists that Klapwijk rejects.
2. Even scientific data are collected in a context of worldviews and presuppositions.
3. In this stratification Klapwijk follows in the tradition of Dooyeweerd, although to my knowledge the latter did not describe a vegetative domain. See: <http://www.dooy.salford.ac.uk/aspects.html> for more details.
4. The burgeoning field of epigenetics studies how the environment affects our biology, i.e. how gene expression is affected by experiences.
5. This is why the standard method of culturing pure strains of bacteria to study them tells us little about how they normally function.
6. I will point out later how different levels may emerge in embryonic development.
7. Cephalopods like the octopus and squid are notable exceptions to this generalization.
8. Genesis 1 does describe the creation of plants before animals, but Klapwijk does not hold that this chapter is an historical record of creation in the modern scientific sense (30).
9. Incidentally, Klapwijk cites the J.M. Templeton book on page 26, but this book and the Templeton Foundation do *not* support the concept of ID.