There are more important phenomena that Darwinism needs to account for that speak against its orientation. Cambridge paleontologist Simon Conway Morris, the very paleontologist who presented and analyzed the Burgess Shale fossils, is responsible for the concept of ‘convergence’ which he mainly outlined and defended in his book *Life’s Solution: Inevitable Humans in a Lonely Universe*. Convergence names how biological organisms that are only distantly related develop the same or analogous systems.\(^{30}\)

The most famous example of such a common development is, of course, the eye. Eyes have developed several times by several different creatures that only are remotely connected and have, as far as things go, very different genomes and phenotypes. Morris suggests that convergence occurs because there are only a “finite set of natural forms that will recur and over again anywhere in the cosmos where there is carbon-based life” (*LS* 11). Convergence is an indisputable aspect of life itself and something confirmed by several empirical examples. From distinct and different pathways, life ends up coming to the same endpoint over and over again.

Morris suggests that this repetition of similar life sys-

tems suddenly developing in varying contexts might simply be due to life sharing “one code” (LS 21). Morris is not willing to argue that the genetic code characterizing life on Earth is “the best possible code,” but admits that this code has been astonishingly effective at producing a diversity of life forms (LS 18). Morris is skeptical that such a code can be the “product of selection,” but it is not clear how selection could not be again anything more than a tautology such that this code survived because it survived (LS 18). It also presupposes that there were multiple other self-reproducing codes that somehow did not survive or that, from a chemical viewpoint, several different permutations were being attempted in some primordial soup. Just generating one code seems amazing. There are millions possible. To suggest that others were competing seems to simply project back onto a hypothetical primordial soup mechanisms that only work on life itself and may not have any true explanatory power.

Morris persuasively argues that if chance truly governed the development of life forms, then we would expect life to go in endless different directions and not keep returning to the same solutions over and over again (LS 121). Morris believes one has to relegate chance to the sidelines when explaining how, for instance, E. Coli “learns to get to grips with maltose,” although he still seems to think that it is selection of the most adaptable things that leads to convergence at this point (LS 121–122). But adaption via selection works only in ever changing environments. Certainly on this planet, there are only so many environmental types, and they repeat themselves. But this view would say that life will converge on the same things in the same environments such that the seeming randomness of the sequence of local environments (if it is truly random, given Gaia’s systematicity) would overlap with the finite capacities of life itself. One should, then, only see functional convergence but not the use of the same chemical apparatus and the same systems. If environmental changes were truly random along with life’s internal development, then one should not ex-
pect to see convergence. One would see totally indiscriminate results.

Keep in mind that these environments are mainly made up of life itself. And environments are not determinative. Creatures in varying biospheric niches also demonstrate convergence. Convergence is not about the same stressors and environmental issues leading to the same solutions as such. Hugh Ross notes how chameleons and some fish have similar eyes, skin, and tongues and yet live in totally different conditions.\(^{31}\) Totally random development and evolution would also have to include a lot of devolution in it, but we do not see it and, rather, see multiple examples where—from one creature to another—clear systems develop without setback. Robert Wright in his *Non-Zero: The Logic of Human Destiny*, for instance, notes how, from early humanoids to humanity, one sees brain sizes growing at a rapid pace without any interruptions.\(^{32}\)

One of the main Darwinist responses to convergence is to insist that evolutionary events are singular and irreversible. One does not see lizards turning back into fish. First, humans do turn into fish when they create sperm, etc. But the idea of singular events only means that the development of life has directionality. It actually counts against Darwinism—with its mechanisms of blind natural selection and random mutation—that life does not backtrack, as that would show it is much more contingent and random. However, selection can only select something. In this way, it would have to be something more profound, like code itself, that offers up things to be selected. It is the code that is then pushing things in one direction more so than selection. Homeotic genes, for instance, may tell us how embryos should develop or may be the first set of directions leading to all biological structures.

Morris believes convergence minimizes the role of

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chance to such a degree that he wonders at what point ("ape, mammal, fish, worm, or even single cell") something "humanoid" in character becomes "inevitable" (LS 234). For example, the fossil and biological evidence shows us "vertebrates converge in various ways on the mammal" and that legs are "highly probable" (Morris even sees parallel trajectories towards limbs in "Devonian fish") (LS 234). As we already saw, McGhee wants to say that convergence itself will be part of a biological picture that allows for the same kind of predictability we have in other scientific fields. Morris only allows for retrodiction. But that is mostly because he does not highlight the role of the genomic code. Morris's own findings show that evolution is not as open-ended as Darwinists would like. Morris suggests that—if there is only a finite set of biological forms possible, and life keeps arriving at them repeatedly—there might be an "eternal return" of the same forms the longer life develops and survives (LS 297). History will then become a matter of déjà vu more so than it already has as it goes on (only the current and ongoing mass extinction of species might prevent that or the development of a new code and new life such as robotic life). Given that Darwinism states that natural selection works on unpredictable and singular events, there should not be such convergence. Morris suggests two main mechanisms for understanding convergence: attractors and physical constraints (LS). Convergence shows us how we are "in a constrained world, where all may not be possible" (LS 298). Morris contends that there might simply be certain physical laws of matter and chemistry that make only some types of carbon-based life possible. It would then not be a matter of a code playing itself out as much as the pressures and forces of the material world itself that play the fundamental causal role. This view certainly argues a view of life that sees it as non-contingent and non-random. But things like gravity probably only put a ceiling on things (how tall animals will grow, for instance) rather than actually shaping life itself in its particularity. It is programming that delimits possibilities.
As for ‘attractors,’ this seems to be a metaphor gone awry. With magnets, there is clearly an attracting force, but what would be the material attracting force here? Gravity attracts things to the earth, given its size, but it remains unrevealed how there is something pulling out eyes over and over again from biological flesh. The fact that convergence shows that the “replaying of the evolutionary tape” will have the same “predictable results” seems to be best explained by looking for the underlying rules in the genetic code itself and in the system it articulates in its iteration, rather than by positing ‘attractors’ that can only be detected in their effects (and for whom there is no material force detectable). Attractors simply become another name for an Aristotelian final cause. If a particular algorithm leads to the same numbers emerging as a result from it, are the numbers then attractors or the final causes of the algorithm? I do not think so.

The idea of an attractor returns us to Aristotle’s acorn, which is attracted and directed by the final end and cause of the oak tree. It is a view that precisely ignores our new knowledge of how in the acorn itself we have a code that explains how the acorn unfolds in time into an oak. If one has rules iterating themselves, one does not have a need for attractors here. The development, then, is connected to the rules themselves and is intrinsic to them. But rules do not arise out of non-rules or out of the elements rules are made of. At some level, rules themselves are programmed in. Thus, we do not have to imagine some substantial form of oak-ness existing somewhere that haunts and dominates the process. The counter to seeing biological phenomena as contingent is not Aristotelianism.

The idea of convergence in and of itself undermines the idea that any contingencies that do occur in the history of life can ultimately prevent the same life forms from emerging by some other pathway: “contingencies of biological history will make no long-term difference to the outcome” (LS 328). This means we should stop seeing improbabilities (like the origin of life) as improbabilities and rather as out-
comes of some process that is being played out in the history of life itself. Morris does not dismiss that life itself may have been created and programmed precisely with a code that enables convergence and explains it. He notes the dependence of life “on a handful of building blocks,” how life takes functional pathways despite the overwhelming number of other physical possibilities, the manner in which pathways not taken would be deleterious for the life form, the emergence of complexity through the permutation of the same, basic underlying code, the existence of both amazing and beautiful diversity along with convergence, and that consciousness would, itself, be an inevitable result along with all the others (LS 329). Of course, Morris (unlike me) is completely agnostic: “For some it will remain as the pointless activity of the Blind Watchmaker, but others may prefer to remove their dark glasses. The choice, of course, is yours” (LS 330). While we agree that convergence would not prove the existence of God (only ontological/modal proofs do that), it does add weight to seeing life as programmed.

Now, some might say here that not all life has the same code as each genome is different. But look at cellular automata. One can have different sets of rules such that one has several variations. But, in each variation, one sees similar patterns emerge despite being based on different rules. For example, in John Conway’s Game of Life artificial life simulator, one sees ‘guns’ and ‘space ships’ despite two different automata having different sets of rules. They are all parts of the same programming. We then see how two different sets of rules for how to play this cellular automata game come up with convergent forms. This is analogous to two creatures having different genomes and having similar forms, such as the eye. The difference in the genomes should not lead us to say the programming is not involved in the same way that we would not say the difference between Game of Life cellular automata 23 and 36 means something other than the program rules lead to the phenomena. 23 and 36 are simple variations on the same pos-
sibility space, given that they take place in the same grid and have the same general language for articulating their directions.

This would, then, be an explanation for homology. Homology simply names the structural affinities between systems in different creatures. One does not need the same exact code to get the same structure, in the same way that one does not need the same exact code in two ‘Game of Life’ automata for both to produce the ‘glider’ pattern. Here, from 0/1 and rules for operating on 0/1, we see the transformations of things—their evolution. These entities are always a relation between squares that are filled and those that are not. Structural homology thereby does not force one to refer even to a common ancestor—only to the same programming language. Many like to point out how, in frogs and humans limbs, digits grow in two different ways and yet look similar. This view does not rule out another level wherein there is symbiogenesis in which wholes merge with wholes. Such units are then plugged one into the other, but that might mean we have to look for the code for how such elements and patterns emerge at a different level than at the level of the genome alone.

Viewing code as crucial also reduces the issue of natural selection, as natural selection is not of primary importance: given the code, we will get similar results and convergence. In fact, if homologous structures were due just to the Darwinian mechanisms of natural selection and random mutation, homologous structures should be only controlled by the exact same coding, since such random occurrence should not occur twice.

There is also no persuasive reason that environmental forces will lead to two distinct creatures coming up with similar structures, much less many, in common. Creatures would simply each come up with unique and unheard of solutions. But we see that in Australia there are all sorts of marsupials, when we do not find them elsewhere. For this reason, just because two creatures do not need identical coding to come up with homologous features, it does not
mean that it is precisely the code that is at work. I do not deny that creatures might have common ancestors. Chimps have many genes in the exact same order as we do, in the same places in the genome, with the same mutations recorded in it (*EE 71*). When we see such similar highly improbable sequences in two creatures that have such close similarity at the level of coding, it is likely that it is due to inheritance from a common source. But common ancestry, given a common programming language, need not be the only or even main explanation for structural affinities. As Jonathan Wells notes, we need a different way to explain homology, since the way Darwinism does is merely tautological: Homology is said to come from common ancestry, but homology proves common ancestry.\(^{33}\) Wells also argues that if we put automobiles (Corvettes from different years) alongside each other, we would see obvious homology, but, as Wells notes, that is due to intelligent agents designing them.\(^{34}\) However, as many have noted, we are talking about machines that make other machines, just as Von Neumann’s universal constructor did. Notice the difference between explaining such features using code (which is ultimately numbers, letters, differential relations, rules, etc.) and explaining things using a Platonic essence or Aristotelian substantial form that determines things by way of a final cause. In this way, there is no conflict between saying things are the result of code and that code is inherited and passed along from common sources.

At the same time, we will need to explain how the same code can lead to two different results in two different life forms. The same gene can play a key role in producing different structures. There need not be full correspondence between structure and gene. A gene, as we have said, is a subroutine. But, as we will see, such subroutines may only operate on rules that lead to other rules operating at a later


\(^{34}\) Wells, *Icons of Evolution*, 68–70.
point (I will return to this issue when discussing parallel processing). Having the same subroutine at the beginning may not, then, have to lead to the same result. One needs to look at the overall digital framework. But just having random point mutations, for instance, is unlikely to lead to the same or even similar structures. Additionally, a number of chemical processes do originate independently in various life forms. This means that the code itself is being assembled into place at the molecular level the same way by different pathways. There is convergence at the level code as much as at the level of phenotypes. The permutation of the letters at the level of the code as life itself develops leads to the same instructions appearing. Many would say this seems simply to be a result of random shuffling, given that this code only has four basic elements. But its sequential convergence should be surprising, given that that number of base pairs in humans is in the billions, and one here is talking about entire regions of genetics and strings of proteins with the same amino acid or nucleotide arrangement.