



## Article

*Naturalism and Design in Biology: Is Intelligent Dialogue Possible?*

# Naturalism and Design in Biology: Is *Intelligent Dialogue* Possible?

Walter R. Thorson



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*Seen as natural theology rather than science, "intelligent design" (ID) is not incompatible with a "naturalistic" approach to biology proposed earlier (cf. notes 1, 2 below). This paper develops ideas based on this understanding, emphasizing points of mutual agreement and some unresolved differences between the two perspectives. In particular, (1) negative critiques of mechanistic biological origins theories by ID proponents have scientific merit, needing serious consideration by opponents; (2) no a priori reason exists to favor a mechanistic natural philosophy of ultimate origins over other options (such as ID); and (3) more open dialogue can be mutually constructive for each side, if philosophically polarized positions do not make it impossible. However, (4) if ID is an idea with scientific implications, proponents need to show how it affects biology as a science (i.e. in "naturalistic" terms); (5) analogy with the history of physical science suggests a primary focus on origins questions is anomalous and inappropriate for biology at present; and (6) a naturalistic program, focused not on origins per se, but on the distinctive logical organization of biosystems, is directly relevant to scientific understanding.*

There are areas of common ground on which some proponents of "intelligent design" (ID) and theists who defend the historical policy of "naturalism" in science may carry on constructive dialogue about biology and biological origins—rather than argue diametrically opposed claims. As a scientist by background and experience, I am especially interested in promoting such dialogue because it may prove important for biology as a science. I believe "naturalism" in science is well justified on *theological* grounds, and have argued this in Part I of a tandem article in *PSCF*.<sup>1</sup> However, such a "naturalism" allows for new paradigms in biology which transcend the mechanistic and reductionist models characterizing physical science (see Part II).<sup>2</sup> Since my position occupies a kind of no-man's land between the ID

and traditional naturalistic camps, the option of dialogue rather than warfare is particularly attractive. It is a real option, given reasonable clarification of each side's fundamental aims and assumptions. This article discusses areas of common ground based on one such dialogue described below.

It is essential to clarify what is meant by "naturalism" and "intelligent design." There are definitions of each position inherently opposed to any version of the other. If "naturalism" means insisting on the mechanistic, reductionist world-picture physical science presupposes as a paradigm for all scientific explanation, it is hard to see how it can be reconciled to *any* notion of "ID." If "ID" means proposing, as a *scientific* paradigm for biology, an artificial "intervention" by an intelligent and external agent (in an otherwise mechanistic natural order), it is incompatible with *any* kind of "naturalism" in science—including the broader options for which I argue.

In theological terms, "naturalism" means that in science we *deliberately refrain* from using explanatory paradigms or concepts that appeal either to divine agency itself or to any direct surrogate for such agency.<sup>3</sup> This policy

**Walter R. Thorson** was professor of chemistry at the University of Alberta (1968–1994). A theoretical chemist, he applied quantum mechanics to small molecule dynamics and atomic collisions, and was elected a Fellow of the American Physical Society in 1987. He has a deep interest in the philosophy of science and related issues in theology, and is author of several articles on these topics in *PSCF* and elsewhere. He is an ASA Fellow, and was adjunct professor of philosophy of science at Regent College in Vancouver, BC for many years. Walter and his wife Mary now live near Sandpoint, Idaho. They have two children and four grandchildren. To contact Walter, mail correspondence to: PO Box 12, Kootenai, ID 83840 or email him: [wrmethorson@myyellowstone.net](mailto:wrmethorson@myyellowstone.net)

is historically well established. It originated with the rise of modern science in the sixteenth and seventeenth centuries—specifically, in the thinking of Boyle and others about the “mechanical philosophy” as a legitimate discourse intentionally separated from theology. Naturalism in physical science has been clearly vindicated by continuing success of that enterprise. From a theological perspective, deliberate exclusion of claims about divine agency from *science* emphasizes the *limits of scientific knowledge*—and of our creaturely reason which constructs it. This article gives no further justification for “naturalism” in science, *but takes it for granted*. The question then is whether such a policy in *science* permits constructive dialogue with any understanding of “intelligent design.” I suggest that it does.

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First, this theological definition allows “naturalism” much broader scientific scope. In particular, the mechanistic and reductionist paradigms proper to physical science do not exhaust its meaning. Previously I proposed a modified naturalistic paradigm appropriate to biological science.<sup>4</sup> I argued that biological systems differ from purely physical systems by possessing a logical organization toward *achievement of certain tasks or functions*. Scientific explanations and concepts in biology tacitly presuppose such logical organization as a *given*, whatever lip service is paid to beliefs about mechanistic explanations for it. I argued that this logical organization is *disjoint* from the mechanistic logic sufficient for explaining purely physical systems: i.e. while a “functional logic” is fully compatible with physical principles, it is not evidently derivable *from* them, either as a necessary consequence or as a result of combining physical necessity with statistically plausible initial conditions.

Such a claim is scientifically provocative, since it questions whether any purely physical model can explain biological organization. However, it is open to falsification by *scientific demonstration(s)* to the contrary. [A claim that *rules for the game of science* need changing is necessarily

tentative. I do not argue that everyone should stop playing according to the older, purely mechanistic rules.] I am *formally agnostic* on the scientific question of whether a purely physical explanation for biological organization toward function might be found. This is important because there are serious research programs modeling complex dynamical systems, which aim to derive just such explanations. These efforts should not be discouraged or devalued, since in any case they will yield information relevant to the question. Meanwhile, intuitive but informed judgments on the likelihood of their success are legitimate.

Even though tacit use of functional logic plays an important role in the design and explanation of research, there is an established philosophical prejudice among scientists that the mechanistic assumptions adequate to physical science will somehow be able to explain biological organization too.<sup>5</sup> Such philosophical bias is plain in works (especially on the theory of evolution) by well-known professional biologists.<sup>6</sup> Materialism is one of many philosophical beliefs scientists might use to inform their thinking about science, but there’s no clear philosophical reason for giving it *preferred* status—particularly for scientists who are theists.

Arguments for a logic of function in biology were scientific in intention. This paradigm identifies a unique feature of biological organization, which (a) universally characterizes biosystem behavior; (b) appears logically independent of (not determined by) physical principles; and (c) can be described in “naturalistic” terms of reference, as an empirical aspect of the natural world. The idea is certainly not original. Critical thinkers like Michael Polanyi (“the logic of achievement”) and Walter Elsasser (“biotonic modes of behavior”) earlier noticed these same unique features,<sup>7</sup> and had also thought about them with similar naturalistic intentions. Their ideas remain apt to current issues in biology,<sup>8</sup> especially molecular biology.

On the other hand, questions of *biological origins* (and questions in *natural theology* related to these) are not immediate objectives of such a “naturalistic” enterprise. Such a policy is consistent with the historical tradition in physical science—a point discussed below. Physical *origins* were not part of the initial agenda of physical science—and only *became* a part, as overall coherence of the theory eventually demanded it.

I have argued elsewhere that “intelligent design”<sup>9</sup> is not a legitimate scientific agenda for biology, for *two* reasons: *Explicitly*, because it is not “naturalistic” as I argue science should be; and *implicitly*, because it focuses primarily on biological origins. Since critiques of chemical evolution by intelligent design proponents tacitly adopt the same mechanistic definition of “naturalism” as the work they criticize, their *positive* arguments for ID as a *non-naturalistic* alternative appear to question the value and legitimacy of the naturalistic tradition in science. In effect,



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arguments for ID might be caricatured: “Here ends the prospect of any naturalistic science of biology; we now resort to theological explanations as an alternative approach to that science.”

Of course, some people *do* argue for “intelligent design” in just this way. I am entirely opposed to their agenda; its goal isn’t very different from that of an older “creation science”—and in the long run is hostile to genuine scientific inquiry.

However, I think some proponents of “intelligent design” have a different aim. Their positive arguments address a *different philosophical question*—and do not seek to compete with a “naturalistic” biology such as I argue for. This different question belongs to *natural theology*, rather than science—and it is concerned with ultimate origins. Arguments for a “naturalistic” science of biology and arguments for intelligent design in relation to ultimate origins might then have very different aims, rather than being in direct conflict. Here I discuss this possibility, looking first at areas of common ground, and then at issues needing resolution.

Constructive dialogue on this point is particularly important for Christians primarily interested in biology as science. If a materialist world view hinders creative thinking about biology, Christians active in research can help erode its influence within the scientific community by thinking with more open horizons about scientific paradigms. The established habit of appealing to “evolution” as an *ultimate* explanation for the biological order is no more legitimate *scientifically* than appealing to “design”—and this philosophical bias in the scientific community should be recognized for what it is. Instead of simply dismissing arguments made from the perspective of intelligent design as entirely antithetical to science, Christian biologists might carry on an open dialogue with at least some advocates of ID, looking for insight on *scientific* issues. Such dialogue can be very fruitful if the intelligent design argument is understood as a valid response of natural theology to a widespread metaphysical bias favoring materialism—rather than as an explicit rejection of any “naturalistic” approach to biology.

### Negative Critiques of Mechanistic Origins Scenarios Are Valid Scientific Contributions.

Typically, arguments for intelligent design in biology begin with extensive negative critiques of purely mechanistic models for origins. The early book by Thaxton, Bradley and Olson<sup>10</sup> on the problem of “chemical evolution” (origin of the first primitive life forms) took this approach, and recent systematic treatments by Stephen C. Meyer<sup>11</sup> follow the same plan. (*If the mechanistic approach isn’t broken, why fix it?*) Meyer’s conclusion—that mechanistic origins scenarios for “chemical evolution” do not work (and probably *can’t* work)—is consonant with my reasons for proposing a modified “naturalism” in biology.<sup>12</sup> However, I approached the issue differently, by stressing the general *epistemic* inability of purely physical descriptions to explain actual biological organization.

I take Meyer’s negative critique as most representative for discussion here. [Other negative critiques by ID proponents are more oblique. For instance, Michael Behe’s approach<sup>13</sup> exhibits the characteristic “irreducible complexity” of biosystems, illustrating their logical organization *according to function* by some beautiful examples. He concludes from inspection of such examples that biological organization cannot be understood as the result of a purely mechanistic process, but does not consider alternative “naturalistic” ways of understanding it. Instead his argument moves directly to proposing “intelligent design” as a *scientific* conclusion regarding its origins. Another example is William Dembski’s largely mathematical arguments<sup>14</sup> based on notions of *information as analogical evidence for design*. These employ the “sieve” principle to eliminate mechanistic or random explanations for “specified complexity” (the sort of informational order seen in DNA, for example). While his discussion shows that such simple explanations cannot account for “information”<sup>15</sup> when it is recognized *as such*, his conclusion that *biological information has been injected from an outside source* cannot be justified by the purely formal and mathematical arguments used.]

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Meyer systematically examines the scenarios for “chemical evolution,” showing how mechanistic approaches lack the power to explain the origin of information needed for life even at its outset. He cites active research in the field, recording the persistent logical flaws and empirical inadequacies (sometimes recognized by the original researchers themselves) in the entire scheme of a chemical evolution based on physical necessity, chance, or a combination of the two. His balanced and critical review of the enterprise and its key failures is a valid scientific contribution, organizing a wide literature coherently with definite if negative conclusions. Meyer recognizes his conclusions are open to revision or disproof by further research. Finally, his evident competence in philosophical and logical analysis brings needed clarity to a good deal of fuzzy thinking in the original work. Those critically familiar even with the literature of physical science know how widespread such logical fuzz can be.

*Such negative critique constitutes valid science.* In the rush to judgment of arguments for design presented subsequently by ID proponents, secular and Christian critics seldom acknowledge this.

In philosophy and history of science, it is recognized that destructive analysis of work premised on an inadequate or mistaken scientific paradigm forms an important part of science. In *Personal Knowledge*, Michael Polanyi<sup>16</sup> certainly recognized destructive analysis as an important tool in science, even though he was more interested in the synthetic and tacit role played by creative imagination in forming new paradigms. Historian of science Thomas Kuhn<sup>17</sup> similarly identified the use of negative analytical critique as part of the process by which “normal science” gives way to a “scientific revolution.” Critics of ID (especially its Christian critics) should either (a) recognize the scientific merit of negative reviews like Meyer’s—or else (b) present substantive scientific arguments refuting them. In science, valid criticism of mistaken views may come from any rational source—and is likely to be most needed just when an inadequate paradigm is nearing collapse. Rather than simply close ranks against philosophically unpopular outsiders, astute scientists might see the appearance of sound negative arguments from them as a sign that new insight is probably needed.

**Philosophical Belief Frameworks and Science: ID as Natural Theology/Philosophy**  
Proponents offer the intelligent design hypothesis as a positive response to negative scientific conclusions about mechanistic accounts of biological origins. Their critics claim that ID itself is not a scientific hypothesis—and my tandem essay agreed.<sup>18</sup> However, *natural theology* is also a legitimate discourse about creation and scientific knowledge, distinct from science proper. It is *not* committed to “naturalistic” presuppositions, being implicitly theological in both its content and aims. “Intelligent design” is a

legitimate concept in natural theology. As such, it might indirectly influence thinking about scientific problems.

Some fruitful recent dialogue with Dr. Meyer has clarified this and related points.<sup>19</sup> After affirming (a) that his *negative critique* of mechanistic origins theories is valid science, I asked him how he would respond to the claim, (b) that his *positive* argument for ID (as “inference to the best explanation for the origin of biological information”) is a *natural theological* response to the situation described by the negative critique. Somewhat to my surprise, Meyer readily granted this claim. However, he suggested I should in turn agree that (c) Darwinian insistence that mechanistic accounts of biological origins have an exclusive priority is *not* itself scientific, but is really an argument about ultimate origins belonging to the same *genre* as arguments for design. My tandem PSCF essay made essentially this same point. Meyer prefers to describe this *genre* by the term “historical sciences.”<sup>20</sup> I prefer to use the term “natural theology” (or perhaps “natural philosophy”)—and to reserve the name *science* for those enterprises which are deliberately “naturalistic” as defined above. This *semantic* difference should not obscure our essential agreement that discussion of ultimate origins questions is a discourse distinct from a legitimately “naturalistic” science.

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It seems that Meyer and I both understand design, not as a working hypothesis in science proper,<sup>21</sup> but as a reasonable answer to a different kind of question, concerned specifically with the ultimate origins of things. We further agree that a dogmatic materialism giving exclusive priority to mechanistic scenarios for biological origins is also not scientific, but a deliberately *anti-theological* answer to the same kind of question.

Different emphases and some unresolved issues remain. Meyer argues strongly that there is a “soft,” highly permeable membrane between what constitutes science proper and sets of broader philosophical beliefs that support and



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inform scientific thinking. He is also more optimistic than I am that thinking with the specific presupposition of ID can stimulate scientific insights. While I agree with him that traffic can and does occur across this membrane, I tend much more to stress the importance of its *intentionally and carefully limited permeability* – and to be more critical as a scientist, asking what ID as currently formulated can contribute to a “naturalistic” biological science.

Meyer agrees that some kind of modified “naturalism” in biology might be justified on terms such as I have argued previously<sup>22</sup> – aiming to describe created things in their own internal terms of reference, and making no claims about divine agency. Such a project is not necessarily in conflict with his concerns about ultimate origins issues, especially as it has no immediate or strict agenda regarding origins.

This is a somewhat different understanding of what ID means than many of its critics assume. In particular, Meyer clearly argues that “intelligent design” is primarily concerned with a question about the ultimate origins of created things, and not the inductive, descriptive and “law-like” explanations of natural phenomena that concern science proper. (He also claims that ideas like ID could influence scientific thinking constructively, and certainly there are no rules against that.) It is not clear that all proponents of ID would agree with this view of its aims.

In any case, an important point emerges from this discussion: We need to recognize that a variety of philosophical contexts may sustain and inform science – and that there is no real justification for the priority currently given by both secular culture and the established public community of science to a materialist, reductionist world view. It is no more “scientific” than its philosophical competitors (e.g., various forms of pantheism or theism, including the kinds of theism in which “intelligent design” is a key idea). The mere fact that physical science can’t address questions outside its own very limited paradigm says nothing about either the legitimacy or the validity of broader world views – or the scientific paradigms they might sponsor. Nor are there established formal canons of philosophical principle or

method, a priori to scientific enterprise itself, which can establish such priority or preference.<sup>23</sup>

#### **Constructive *Scientific* Dialogue Is Blocked by Strongly Polarized *Philosophical* Positions.**

Extreme positions on “naturalism” and “intelligent design” are mutually incompatible. Polarizing argument around the claims of either leads to conflict rather than scientific insight. Historically, the ID position has emerged as a reaction to an extremely limited understanding of what naturalism means (i.e. materialism, mechanism, reductionism). Oddly, many ID proponents and most of their naturalistic opponents *share* this understanding as their only point of agreement – and then seek *philosophical* arguments to justify oppositely polarized positions.

ID proponents who believe that a naturalistic science can only be mechanistic and reductionist (i.e. like physical science) will tend to insist on a philosophical remake of science that rejects any form of naturalism, rather than seeking alternatives more consistent with the scientifically fruitful past as I advocate here. This view is very clear both in the writing of Phillip Johnson,<sup>24</sup> who has played a seminal role in the ID movement, as well as in works by well-known ID proponents (e.g., William Dembski<sup>25</sup> and to a lesser extent Michael Behe<sup>26</sup>).

In its strongest form, such rejection asserts that biological information (what Ernst Mayr calls “the genetic program”)<sup>27</sup> has been generated by an intelligent agent’s “intervention” in an otherwise mechanistic (and lifeless) physical order. Both Johnson and Dembski’s arguments suggest this view, and certainly much popular writing and talk about ID takes this position explicitly.<sup>28</sup>

Debate between Howard Van Till and proponents of ID bears primarily on this conception of ID.<sup>29</sup> In his arguments for a “Robust Formational Economy Principle” (RFEP),<sup>30</sup> Van Till *appears* to be arguing also that the physical order necessarily contains the seeds of the biological order within itself – not only as scientifically plausible, *but as entailed in a sound theology of creation*. However, the issue is more complex because Van Till really argues *against* the “interventionist” view just described.

First, Van Till, like myself, is committed to “naturalism” in science: that is, (a) we *do not* believe that divine agency (whether described as “intervention” or “directly controlling the creation process”) can be *identified as such* by mundane scientific inquiry<sup>31</sup>; and (b) we *do* believe that legitimate explanatory paradigms in science should deliberately avoid appeals to divine agency or surrogates for it. If “intelligent design” really means claiming we can detect “divine intervention” (or some unspecified external agency as a surrogate for it), in an otherwise perfect but lifeless physical order, *or* as the proximate cause of further innovation in an existing but more primitive biological order, I agree with Van Till in rejecting such ideas as both scientifically *and* theologically inappropriate. But perhaps there are ways of looking at the problem that recognize the essentially *innovative* aspect of biological creation without abandoning a legitimate naturalism.

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For example, the “fully gifted” creation Van Till argues for might only be *scientifically intelligible* as a hierarchy of logically distinct levels or *orders of being and meaning*; in fact, that idea has a rich and legitimate historical and theological tradition behind it. Insofar as I relate the creation account of Genesis 1 to these issues, it seems to me that Genesis describes God as introducing *just such radical novelty in the orders of being* on the successive days of creation. *Since the entire narrative presents God as the only purposive agent*, we could hardly call such innovation an “interference” or “intervention.”

Second, I am not sure Van Till really intends to exclude the possibility of logically distinct levels of meaning – or at least his *argument* doesn’t exclude it.<sup>32</sup> The “RFEP” rightly argues *against* the notion of a *scientifically detectable divine intervention or agency*. It is true that Van Till’s emphasis on

the adequacy of *physical structures and forms* might suggest he further argues *for* the adequacy of a reductionist, mechanist approach to biology – and his ID opponents seem to understand him and the “RFEP” in this way. No one in this debate argues that the physical order is *incompatible* with biological organization; but some of us *do* argue that physics probably cannot provide concepts adequate to *understanding* that organization. In other words, the real problem is not metaphysical or theological, but *epistemological* – and, eventually, *scientific*. Fruitful dialogue will be possible to the extent that each side finds common ground for it. Intelligent design advocates gain nothing by rejecting a suitably grounded “naturalism” *unless their agenda insists on the “interventionist” thesis as a scientific claim*. Each side is entitled to pursue the question on the terms it sees fit; but then it surely goes without saying that *each side must respect the other’s arguments and deal with them on their scientific merits*.

Conversely, theists who believe that “naturalism” is exhaustively defined by the mechanistic presuppositions of physical science – and hence that biology *will* prove to be derivable logically as some complex result of physics – make dialogue with *any* version of ID impossible if they claim this belief has independent philosophical or theological foundations. There is no basis for completely rejecting the design argument if it is seen as *natural theology*, or for the gratuitous hostility toward legitimate *scientific* critiques of purely mechanistic theories of evolution, which is sometimes shown by theists who still think such mechanistic ideas adequate.<sup>33</sup> Questions relevant to biology – and particularly to the status and meaning of “evolution” as an idea in biology – need to be discussed as problems in science, not as issues entailing irreconcilable world views. Because science is our creaturely response to a contingent creation, theological justification for its presuppositions (e.g., “naturalism”) needs no appeal to metaphysical arguments. Although scientific inquiry is probably inherently committed to a realist epistemology of some kind, disjoint levels of discourse in our logical understanding of creation are not incompatible with that commitment; we need to read the “book of nature,” form appropriate ideas in response, and not be unduly obsessed with the demand for a unified theory of everything – at least to begin with.

Finally, while science may influence our metaphysical views (and physics obviously has done so), there is no *epistemological* ground for making the traffic into a closed loop: i.e., no particular metaphysical view should have determining power in forming epistemic judgments about scientific paradigms. Our metaphysical views are notoriously subject to change as scientific knowledge changes. (Hence, for example, it may be interesting, but is not essential, to discuss unspecifiable elements in a scientific account of the world which provide opportunity for both creaturely and divine agency from the viewpoint of metaphysics or natural theology.<sup>34</sup> Of course, all such philosophical



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questions are as open to dispute and various resolutions, as the scientific questions on which they may bear.)

#### A “Logic of Function” Paradigm in Biology Is Compatible with Biological Evolution.

As suggested previously,<sup>35</sup> an embodied logic of function in biosystems is quite consistent with the scientific hypothesis of biological evolution, at least in a “weak” sense:

1. Major evolutionary change and a general increase in diversity of life-forms over geologic times (macro-evolution of species) clearly *has* occurred. The fossil record provides definite evidence for this—even if it does not unequivocally support a gradualist model.

2. Biological descent from a common biological ancestor or ancestors is a fruitful and powerful working hypothesis in which both natural selection and genetic mutation play significant roles. The claim that mutations occur entirely at random has *not* been proved.

The hypothesis of biological evolution in this “weak” sense has clear scientific merit, especially as an organizing scheme for understanding diversity, classification and complexity of living things. (This remains the case, in spite of the well-known difficulties of its justification on the basis either of sufficient mechanisms or paleontological evidence—which have led some critical commentators to observe that in practice the theory is not really open to falsification.)

A useful “naturalistic” paradigm should not tear down what has already proved constructive to understanding. The functional logic paradigm is essentially neutral in this respect. Thinking within a new paradigmatic framework may eventually suggest better ways to frame questions about evolutionary processes — *not to deny that they occur*.

Openness toward evolution is also important for another reason: If we are now only at the beginning of a true *biological* science (as the proposal of a biological organization based on function implies), the situation posed for the future is highly unspecified—just as it was for physical science at its beginning. Let’s examine this point further.

#### The History of Physical Science Offers a Constructive Analogy for the Present Situation.

In its weak form, the hypothesis of evolution has played and continues to play an important constructive role in biology. However, many major concerns of biology (especially its modern developments in molecular biology, biochemistry, immunology and genetics) pose specific logical questions to which “evolution” so far offers no particular scientific answer. Prominence given to “evolution” as a *mechanistic* key to all explanation in biology seems premature in this context. If “ID” is offered as a *different* key for the same task, its anomalous and inappropriate character for that purpose is even more obvious to most scientists. I believe an analogy with the history of physical science offers helpful insight here.

In arguing for the “mechanical philosophy” in the seventeenth century, Robert Boyle certainly had explicitly theological beliefs about origins, presupposing divine purpose, agency and design in creation. However, he understood that the mechanical philosophy is a useful limited discourse for which those concepts are neither necessary nor particularly constructive. Physical origins were not part of the initial agenda of physical science—and only became a part later, when overall coherence of the theory demanded it.

Imagine we were living (say) in the eighteenth century, at a time when the initial successes of Newtonian mechanics were clearly established in relation to such problems as planetary motions under gravity, and its relevance to problems of terrestrial mechanics was beginning to be recognized. While we might well believe such a “naturalistic” science could tackle applications of physical theory to specific aspects of the world, many of us would still have considered an argument for design as “inference to the best explanation” for the *origins* of the physical order—and both Boyle and Newton *did* think about creation in just this way. Although some took the success of a mechanistic science to be evidence for an atheistic world view, or for assuming that the universe and its matter/energy were eternal and *without any origin*, many scientists then and through much of the history of physics continued to believe in *design as sound natu-*

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*ral theology*, the best explanation for the *ultimate origin* of the physical order. Attempts to construct and develop cosmological theories, starting from early ideas such as Laplace's nebular hypothesis (*circa* 1800) and still later, more elaborate synthetic hypotheses about stellar and galactic origins and evolution, were understood as legitimate and potentially fruitful enterprises. Nevertheless for most scientists these ideas had very limited relevance to the philosophical question of ultimate beginnings.

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In the meantime, development of a naturalistic physical science continued, effectively including more and more aspects of the physical universe and facing up to the odd but curiously solvable problems such systematic exploration posed. By the mid-twentieth century it began to emerge (to everyone's surprise) that the "problem of origins" might have a *naturalistic* solution. Eventually, that solution, worked out more coherently, entailed not only a picture of our universe at the largest physical scale, but its intimate, necessary connection to specific field-theoretic models of fundamental particles and their physical interaction, separate lines of thought and evidence being tightly linked in the standard cosmological model or "big bang" scenario.<sup>36</sup>

While we should surely exercise caution in arguing a direct correspondence between the picture of origins given by the naturalistic standard cosmological model and biblical accounts of God's creation "in the beginning," striking similarities cannot be ignored, and have deeply influenced some scientists active in cosmology. More important, there is a kind of *complementarity* between the naturalistic picture of origins, and "the inference to design as the best explanation" for ultimate origins of our universe. What we have learned about the world from a naturalistic physical science has in the end *reinforced* the rather different kind of understanding of its meaning and origins to which "the inference to design" had pointed long before<sup>37</sup> – not finally discredited it.

This surprising outcome was certainly not guaranteed by the process of scientific inquiry or its terms of reference. Beliefs about origins neither served as the fundamental framework determining new concepts in physics – nor did they suggest problems for such concepts to explain. (For example, the cascade of important discoveries which began with construction of classical electromagnetic theory in the second half of the nineteenth century, and moved toward both quantum theory and general relativity, was almost always set in context of scientific world views in which it did not matter very much whether the material universe had always existed or in what fashion it began – even though some visionaries recognized that evidence to that question might perhaps be entailed in future scientific discovery.)

A modified "naturalistic" paradigm for biology proposes we learn to think in its terms of reference about various existing forms and behavior in biological systems – *without having any immediate or explicit agenda regarding ultimate origins*. This does not mean that the set of questions posed by the thesis of biological evolution is irrelevant to biology, but that answers proposed to them should not rigorously control our methodology and concepts from the outset. If a more definite set of questions and problems bearing on biological change and biological origins eventually emerges from such inquiry, a more convincing "naturalistic" theory of biological origins might instead reshape the meaning of "evolution." If the history of physics offers a relevant analogy, *origins* arguments and concerns should not have a rigorously determining role in thinking about biology now. As Francis Bacon pointed out long ago, arrogant confidence in our rational powers hinders humility in reading the book of nature.

Conversely, if "intelligent design" also offers distinctive *scientific* implications for biology, then it is very important for its proponents to show how it sponsors new paradigms constructive for further understanding and development of a biological theory of things *as they now are* – not purely as an answer to origins questions now inaccessible to science. I prefer to think of ID as a complementary *natural theology*, not as science – and therefore as quite compatible with an appropriate "naturalism" in biology. But the issues certainly need continuing dialogue – once we can agree on common grounds for it. ✦

## Notes

<sup>1</sup>W. R. Thorson, "Legitimacy and Scope of 'Naturalism' in Science: Part I. Theological Basis for a 'Naturalistic' Science," *Perspectives on Science and Christian Faith* [this Journal: hereafter abbreviated as *PSCF*] 54 (March 2002): 2–11.

<sup>2</sup>W. R. Thorson, "Legitimacy and Scope of 'Naturalism' in Science: Part II. Scope for New Scientific Paradigms," *PSCF* 54 (March 2002): 12–21.

<sup>3</sup>Of course, the concept of "a direct surrogate for divine agency" is not sharply defined. From a theological point of view, many useful scientific concepts are *indirect* or *attenuated* surrogates for divinely

given order or divine agency: for example, as was pointed out by a nineteenth century theologian, the useful notion of “laws of nature” is just such a surrogate concept, since the order to which we refer in using this term is a *given* reality, not derivable from more elementary assumptions; “laws of nature” are really “customs of God.” In general, a *direct* surrogate for divine agency would be any idea or explanatory concept which (a) likewise appeals to a given, not further explained reality, but *also* (b) deliberately draws attention to natural theological inferences or implications. In spite of disclaimers by some proponents of “intelligent design,” I maintain that, as currently used, the idea is a direct surrogate for divine agency—and that *inference to a natural theological conclusion is the primary intention of those who argue positively for it.* [But I also argue that such ideas or inferences are legitimate, reasonable and justified in the non-naturalistic context of *natural theology.*]

<sup>4</sup>Thorson, “Legitimacy and Scope of ‘Naturalism’ in Science: Part II.”

<sup>5</sup>This assumption is clearly implied in a “strong” version of the hypothesis of evolution (which may be called “extreme Darwinism”). A metaphysical world view restricted to the physical world as the only ontological reality ultimately lies behind strong assertions that *random mutation plus natural selection* (usually linked to some form of *gradualism*) must be able to account for the present variety and complexity of biological forms.

<sup>6</sup>Richard Dawkins’ books (*The Blind Watchmaker*, *The Selfish Gene*, *Climbing Mount Improbable*) clearly exhibit this bias; Dawkins is not a professional biologist, but a faithful spokesman for the extreme Darwinist position. But see works by professionals, such as: G. Gaylord Simpson, *The Meaning of Evolution* (Reprinted; New Haven, CT: Yale University Press, 1990); Jacques Monod, *Chance and Necessity: Essay on the Natural Philosophy of Biology* (New York: Random House Publishers, 1972); Melvin Calvin, *Chemical Evolution* (Oxford, UK: Oxford University Press, 1969); Ernst Mayr, *What Evolution Is* (New York: Basic Books, 2002); —, *Evolution and the Diversity of Life* (Cambridge, MA: Harvard University Press, 1976); R. C. Lewontin, *Genetic Basis of Evolutionary Change* (New York: Columbia University Press, 1974); —, *Biology as Ideology: The Doctrine of DNA*, 3rd ed. (New York: Perennial-Harper-Collins, 1993); Stephen J. Gould, *The Structure of Evolutionary Theory* (Reprinted; Cambridge, MA: Harvard University Press, 2002); T. Dobzhansky, *Evolutionary Biology* (New York: Plenum Press, 1976); —, *Genetics and the Origin of Species*, S. J. Gould, ed. (Reprinted; New York: Columbia University Press, 1982). Whatever merits these works have, their authors all presuppose a priori that a mechanistic, reductionist science provides an adequate basis for explaining biological origins and development. This long set of citations is necessary if tedious evidence to my point; some respondents to my March 2002 *PSCF* essays suggested my criticisms of “extreme Darwinism” failed to distinguish science from mere *scientism*. Proponents of “intelligent design” who have advanced serious negative criticisms of reductionist scenarios for chemical and biological evolution can bear ample witness to the power of such prejudice in stifling worthwhile discussion and instead responding with a *hermeneutic of suspicion* toward their critiques.

<sup>7</sup>See, e.g., Michael Polanyi, *Personal Knowledge: Toward a Post-Critical Philosophy* (London, UK: Routledge and Kegan Paul, 1958), Part IV, chap. 11, sections 1–3; and Walter M. Elsasser, *The Chief Abstractions of Biology* (Amsterdam, Netherlands: North Holland Publishing Co., 1975).

<sup>8</sup>In his most recent book about evolution and biology (*This is Biology: the Science of the Living World* [Cambridge, MA: Harvard University Press, 1997]), Ernst Mayr argues for an understanding of biology which he calls “organicism.” According to Mayr, “organicism” accepts the *operational* fact of a logic in biology distinct from physics and not obviously reducible to it (Mayr’s favorite expression for this logic is “the instructions from the genetic program”); on the other hand, it appeals to the extraordinarily fuzzy idea of “emergence” as a reason to claim that the existence of this higher logic somehow has a purely *mechanistic* explanation. Mayr’s argument is profoundly flawed at this point. Like a good positivist, he strictly denies the possibility that objectively real principles are embodied

in this operational logic—and calls both Polanyi and Elsasser “vitalists” because they accepted such an objective reality; and he very carefully avoids facing up to the fact that this logic is universally concerned with *function* or *achievement* (concepts which must remain meaningless for a strictly mechanistic science). But “the genetic program” is patently organized toward such limited *goals*; hence, a kind of creaturely *telos* is indeed manifest in living organisms—and has scientific importance. (I stressed in “Legitimacy and Scope of ‘Naturalism’ in Science: Part II” that the descriptive language and assumptions of research in modern biology tacitly presuppose logical organization in terms of function as a given and indispensable fact). “Organicism” attempts to avoid these hidden implications in current scientific work while justifying the covert use of such logical reasoning. I can see no epistemological basis for this position, even though it rationalizes the exploration of the same functional logic I argue for as a paradigm.

<sup>9</sup>Cf. my essays, “Legitimacy and Scope of ‘Naturalism’ in Science: Part I” and “Part II”; further see Responses to these essays and my Replies to Respondents, *PSCF* 54 (March 2002): 22–46.

<sup>10</sup>Charles B. Thaxton, Walter L. Bradley and Roger L. Olsen, *The Mystery of Life’s Origin: Reassessing Current Theories* (New York: Philosophical Library, Inc., 1984). While details of some arguments offered by these authors on ideas of “chemical evolution” current at the time have since been validly criticized, the overall negative critique they offered still has some scientific merit.

<sup>11</sup>Stephen C. Meyer, “DNA by Design: An Inference to the Best Explanation for the Origin of Biological Information,” *Rhetoric and Public Affairs* 1, no. 4 (1998): 519–55; Stephen C. Meyer, “Evidence for Design in Physics and Biology: From the Origin of the Universe to the Origin of Life,” in *Science and Evidence for Design in the Universe* (San Francisco: Ignatius Press, 2000), 53–112. See also —, “DNA and Other Designs,” *First Things*, no. 102 (April 2000): 30–8. I stress that in all these citations Meyer has given a *substantial and scientifically valid negative critique* of “chemical evolution” theories. Meyer’s *positive* arguments for design in either physics or biology in these articles are not directly pertinent to their citation here.

<sup>12</sup>Thorson, “Legitimacy and Scope of ‘Naturalism’ in Science: Part II.”

<sup>13</sup>Michael J. Behe, *Darwin’s Black Box: The Biochemical Challenge to Evolution* (New York: The Free Press, 1996). Although Behe’s book uses scientific instances to support an argument in natural theology (for “intelligent design”), the instances of biological organization he describes in detail clearly illustrate the fact that the organizing logic needed to explain them is concerned with *function* rather than mechanism as such. “Irreducible complexity” is a scientifically meaningful concept because it describes a system which is logically unitary or simple with respect to a performed function, but unintelligibly complex when viewed only in terms of its mechanistic components. As Behe regularly points out both in his book and in replies to critics, the claim that a system is “irreducibly complex” is open to empirical falsification (particularly in the case of the “molecular machines”). Not one of Behe’s critics has undertaken that challenge directly. The long argument of Kenneth R. Miller for “evolution” [see “Legitimacy and Scope of ‘Naturalism’ in Science: Part II,” p. 21, note 15; and note 33 below] does not invalidate “irreducible complexity” as a scientific idea, but only Behe’s use of that idea to argue for inference of design as a divine *intervention* in nature.

<sup>14</sup>William A. Dembski, *Intelligent Design* (Downers Grove, IL: Intervarsity Press, 1999). In commenting on Dembski’s arguments in relation to *negative critiques* of mechanistic scenarios for generating information, I have ignored Dembski’s claims about a *positive* agenda for “intelligent design” as a *scientific idea*. In my view, these positive claims have never been demonstrated. So far, Dembski’s idea of “intelligent design” seems opposed not only to naturalism as currently understood in physics, but also to any modified “naturalism” in science—even on the theological terms I propose.

<sup>15</sup>I pointed out in “Legitimacy and Scope of ‘Naturalism’ in Science: Part II” that “information” is in the eye of the beholder, shown for example by the *weather* as an “information-rich” but still merely mechanical system. Mathematical assessments of the amount of

information in a system do not therefore demonstrate that its organization has a positive scientific *meaning* not credibly explained by a null hypothesis. They do have some merit in negatively eliminating trivial mechanistic or statistical explanations, such as the two extreme cases of determinate order or randomness which Dembski discusses in his book.

<sup>16</sup>M. Polanyi, *Personal Knowledge: Toward a Post-Critical Philosophy*, Parts I–III; especially Part I, chap. 4 and Part III, chap. 8.

<sup>17</sup>Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago, IL: University of Chicago Press, 1970). Cf. esp. chaps. VI–IX.

<sup>18</sup>Thorson, "Legitimacy and Scope of 'Naturalism' in Science: Part I" and "Part II."

<sup>19</sup>Meyer and I were joint lecturers and discussion participants (together with Loren Wilkinson and Rikk Watts of Regent College) in a one-week seminar course on "Perspectives on Creation, Evolution and Design," held June 10–14, 2002, at Regent College in Vancouver, BC, Canada. No formal written proceedings have been published or authorized by Regent College in connection with the course, and informal reports such as the dialogue described here must be considered private communications. I have tried here to represent accurately the points of mutual agreement or consensus between us, though of course they are presented here in relation to my own concerns.

<sup>20</sup>Meyer says he classifies both Darwinism and design as theories within the *historical sciences* "because it is the job of such sciences to reconstruct the causes of past events." Since theories in the historical sciences often have broad philosophical or theological implications, he concedes that science-based design arguments can be considered a kind of natural theology. However, he would prefer to classify them as works of historical science – based on the methodological similarity they share with Darwinist and other forms of evolutionary argument.

<sup>21</sup>What I here call "science proper," Meyer calls "nomological or inductive sciences," and he uses the term "historical sciences" for what I have here called "natural theology" (see also note 20 above). These semantic differences do indicate some potential divergence in our respective views.

<sup>22</sup>Thorson, "Legitimacy and Scope of 'Naturalism' in Science: Part I" and "Part II."

<sup>23</sup>See, for example, arguments of Del Ratzsch, "Design: What Scientific Difference Does it Make?" [an unpublished essay, presented in a lecture by Ratzsch (Dept. of Philosophy, Calvin College) at Whitworth College, Spokane, WA (April 2002); Ratzsch has kindly provided me the text of his paper]; see also Stephen C. Meyer, "The Scientific Status of Intelligent Design: The Methodological Equivalence of Naturalistic and Non-Naturalistic Origins Theories," in *Science and Evidence for Design in the Universe*. While I disagree at some points with Meyer's arguments, his claim that scientific methodology has no *formal principles* which rule out design a priori is valid.

<sup>24</sup>See citations to Phillip Johnson's works in my essay, "Legitimacy and Scope of 'Naturalism' in Science: Part I," p. 10, notes 1, 9; and in Donald Yerxa's historical account, "Phillip Johnson and the Origins of the Intelligent Design Movement," *PSCF* 54 (March 2002): 47–52.

<sup>25</sup>Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution*.

<sup>26</sup>William A. Dembski, *Intelligent Design*.

<sup>27</sup>See note 8 above.

<sup>28</sup>The irony in such an "interventionist" paradigm for ID, taken to its extreme, is that it seems to presuppose the adequacy of a purely mechanistic physical order to sustain the ability of the injected information to meet the challenges facing biological existence—a new kind of Deism, perhaps? Of course such a paradigm is made to order to argue for the essential fixity of biological species, rather than for any form of macro-evolution.

<sup>29</sup>See Mark Discher, "Van Till and Intelligent Design," *PSCF* 54 (December 2002): 220–9; Howard J. Van Till, "Is the Creation a 'Right Stuff' Universe?" *PSCF* 54 (December 2002): 230–9; and Discher's reply, "Is Howard Van Till's Response to 'Van Till and

Intelligent Design' the 'Right Stuff'?" *PSCF* 54 (December 2002): 240–8. The real issue between scientists like Van Till and myself, and many proponents of "ID," is their refusal to take seriously the strong theological grounds for "naturalism" in science—and the resulting confusion about what may have legitimate scientific meaning. Discher criticizes philosophical inconsistencies in Van Till's formal position, but avoids this essential issue. Discher is correct in asserting that whatever decidable questions ID may raise about biology must be settled empirically, i.e. the resolvable problems *are* scientific. However, his arguments are *misleading* by failing to make any distinction between ID as *natural theology*, and the (completely unsubstantiated) claim that ID is a *scientific hypothesis* with specific scientific consequences. Discher's "ID scientists" ready to realize this claim so far do not exist.

<sup>30</sup>For a good summary of what Van Till means by the "RFEP," see Van Till's citations to his own essays on that and related subjects in his recent *PSCF* response, "Is the Creation a 'Right Stuff' Universe?" p. 239, note 22. Continuing debate between Van Till and especially William Dembski on the version of ID Dembski argues for is also relevant to this discussion.

<sup>31</sup>In this connection, see my essay "Fingerprinting GOD? Divine Agency and 'Intelligent Design,'" in *CRUX* XXXVI, no. 2 (June 2000): 2–9. I argue in particular that divine agency is not knowable *as such* by *mundane rational inquiry*, which all scientific inquiry necessarily is—because of its universal accessibility to all human beings without their repentance.

<sup>32</sup>Private correspondence with Van Till confirms that he does *not* wish to exclude from science the possibility of logically disjoint but naturalistic accounts of biological organization like those I have proposed. Van Till's understanding of the "RFEP" therefore would concede that a purely mechanistic account of biology may *not* be scientifically adequate—and a corresponding need for philosophically richer terms of reference for a "naturalistic" biological science. Some critics have misunderstood Van Till's arguments about the RFEP on just this point.

<sup>33</sup>Debates between Kenneth R. Miller and various proponents of ID often seem to reflect such gratuitous rejection of any possible validity in ID (even as natural theology), and a corresponding unwillingness to consider the valid science contained in negative critiques of mechanistic evolutionary theories offered by Behe, Meyer and some others. See Kenneth R. Miller, *Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution* (New York: Harper Collins Publishers, 1999); more particularly, see ongoing debate between Miller and others about the notion of "irreducible complexity" in relation to both design, and to evolution as process [much of this debate has appeared in public lectures (unpublished) and commentary is available on the Internet]. Miller seems to think that the good evidence for "evolution" as developmental process in a rather weak sense also invalidates any critique of *purely mechanistic theories* of that process. *But this is an ellipsis in reasoning*. If (as I suggest might be the case) the historical process of "evolution" is also the history of a heuristic development of a functional logic in and by living things, following crucial events not fully determined by *physical* causality, then "evolution" in the weak sense (which Miller's arguments support) is the very process by which "irreducible complexity" has emerged. Nothing in Miller's arguments shows that "irreducible complexity" itself is a scientifically meaningless or invalid concept. On the contrary, such complexity shows the relevance of the functional logic paradigm to biology.

Willem Drees' response to my *PSCF* essay ["Can We Reclaim One of the 'Stolen Words'?" *PSCF* 54 (March 2002): 24–5] seems to link my claim that a purely mechanistic explanation of biological organization is unlikely (and that a logic of function needs to be considered instead as a naturalistic but *non-physicalist* paradigm for biology), with a refusal on my part to "accept evolutionary biology as scientifically adequate." I show that no such refusal is entailed on p. 32 (under A "Logic of Function" Paradigm). The considerable scientific evidence in support of the hypothesis of evolution in the "weak" sense does *not* also suffice to show that

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purely physicalist explanations will eventually provide an adequate *scientific* understanding of biological organization (unless one believes a priori that the terms of reference for physical science exhaust the meaning of "scientific"). Since Drees has often defended the philosophical idea that the physical world is the only *ontological* reality, he has some a priori commitment to the view that a mechanistic theory of evolution must necessarily be adequate, too. I happen to think the matter is at least an open question scientifically, but that does not mean I am "seeking support for faith in marginal if not even mistaken science," as Drees incorrectly asserts.

<sup>34</sup>In recent books on science/theology dialogue and particularly in relation to the question of divine agency, John C. Polkinghorne and others have argued that there must be "open places" in the physical specifiability of the world which "permit" a kind of divine agency distinct from that manifest in physical causality. While I do not intend any particular critique of such ideas, they present entertaining speculations in natural theology and/or metaphysics. From a natural theology perspective, the notion of a functional logic embodied in biological systems is compatible with at least some perspectives implicit in Polkinghorne's view of "creation as kenosis." It implies a kind of *telos* is resident in creation itself, entailing its own legitimate freedom—not just a *telos* imposed on it by divine fiat. See: John C. Polkinghorne, "God in Relation to Nature," in *The 1998 Witherspoon Lecture* (Princeton, NJ: The Center of Theological Inquiry, 1998); cf. also J. C. Polkinghorne, ed., *The Work of Love: Creation as Kenosis* (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co., 2001), esp. the essay by Polkinghorne; and a few related comments by other contributors to that work.

<sup>35</sup>Thorson, "Legitimacy and Scope of 'Naturalism' in Science: Part II."

<sup>36</sup>See Joseph Silk, *The Big Bang*, rev./updated ed. (New York: W. H. Freeman & Co., 1989). For a closer account of the relation to fundamental particle physics, see also Steven Weinberg, *The First Three Minutes: A modern view of the Origin of the Universe*, 2d ed. (New York: Basic Books, 1993); and Frank E. Close, *The Cosmic Onion: Quarks and the Nature of the Universe* (Reprinted 1984, 1985, 1986 with minor additions; New York: American Institute of Physics, 1983).

<sup>37</sup>See Owen Gingerich, "Is the Cosmos All There Is?" in *Reflections 5* (Spring 2002): 2–23.



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