

CHAPTER 11

CONCLUSION

Charles Darwin and Asa Gray debated the implications of Darwin's theory of natural selection for the traditional design argument across a wide philosophical gulf that each only dimly apprehended. The vaunted post-Newtonian synthesis was slowly fracturing during the middle half of the nineteenth century. Its major scientific, philosophical, and theological assumptions were being challenged by a broad array of critics loosely united under the "positivist" banner and overwhelmed by an avalanche of empirical discoveries in natural history.

No discoveries were more significant in revealing the extent of this gulf than those touching on the origin, nature, and distribution of species that Joseph Dalton Hooker, Darwin, and Gray struggled with in the 1850s. As they probed for answers to the "species problem" they were compelled to re-examine the assumptions of the "ordinary" view of creation and the traditional design argument in light of their empirical discoveries. By the summer of 1859 Hooker was convinced, largely as a result of his own exhaustive study of the geographical botany in the southern hemisphere, that the "ordinary" view of immediate creation was theoretically bankrupt and that Darwin's theory of descent was the most credible scientific explanation available. While Hooker felt no conflict between Christianity and the origin of species by descent, Gray felt trapped. How, he implored Hooker, could he prevent

the relentless search for the physical causes of the origin of species from overwhelming his belief in God's perceptible activity in the world? How could he continue to believe that the world bore the indelible stamp of God's design if the origin and distribution of species were reduced to natural explanations? These haunting questions shaped his response to Darwin's challenge in *The Origin*.

When seen against the backdrop of the intellectual turmoil then swirling around him Gray's reviews of *The Origin* take on new shape. He was faced with a delicate task. On his right were those critics, typified by his colleague Louis Agassiz, who failed to appreciate the weight of the empirical evidence that Darwin had marshalled to support his derivative theory of the origin of species. On his left were those, like his friend and former student Chauncey Wright, who gleefully paraded Darwin's assaults on orthodox theological assumptions. How could he support Darwin against Agassiz without appearing to accept Wright's attack on orthodox theology?

It became clear to Gray that the only way he could insure that Darwin would receive a fair hearing in America was for him to gloss *The Origin* as a work that was fully in the mainstream of orthodox science and natural theology. While Darwin's arguments were in no sense physically demonstrated and sheltered several grave weaknesses, Gray maintained that Darwin had nonetheless established a credible scientific case for his hypothesis that species were genetically related to earlier species through a community of descent. Most importantly, although Darwin had not made his theism explicit, Gray offered that it was reasonable to assume that descent through natural selection was fully compatible with natural theology's claim that God's design

was evident in the organic realm. Descent could be harmonized with design by assuming that God had guided variations in ways that were beneficial to the organisms. Gray thereby "baptized" Darwin and transformed him into a respectably orthodox naturalist and theist. Not only were his reviews a persuasive *apologia* for Darwin's orthodoxy, they also reflected his own search for a satisfying answer to the troubling questions he had earlier posed to Hooker. By all accounts Gray's strategy succeeded admirably with the public. He soon discovered that it did not succeed with Darwin.

Gray's rhetorical power was more than matched by Darwin's dogged determination to uncover the mystery of the origin of species, whatever the consequences for orthodox science and theology. From the very first review that he saw, Darwin was impressed by how well Gray had articulated his views, exclaiming that Gray knew his book better than he did. He thanked Gray profusely for bravely standing by his side as his enemies poked, jabbed, and insulted him. At the same time he made it unmistakably clear early in their correspondence that he was not willing to play the traditional role Gray assigned him. He would not agree that his views were mere hypotheses; they belonged in the same rank as the theory of gravity and the undulatory theory of light. If these views were accepted as theories, despite lacking physical proof, so ought his views. They did, after all, explain many hitherto inexplicable phenomena, which is what theories were supposed to do. Although he did not intend to write atheistically, Darwin continued, he did not believe that natural selection could be reconciled with the traditional design argument. To accept Gray's

contention that God had designed each variation that occurred in nature, he asserted, would make his doctrine of natural selection superfluous. The stage was thereby set for an intense eight-year debate on the implications of Darwin's theory for the traditional design argument for God's existence and role in nature. Their debate featured far more depth, nuance, complexity, ambiguity, and insight than the prevailing picture of their encounter has suggested.

Darwin set a stiff challenge for Gray. He had been brooding over the deficiencies of the design argument since he first encountered William Paley's *A View of Christian Evidences* as a set text while a student at Cambridge University. Traditional interpretations have assumed that Darwin's attack on the design argument was aimed at undermining the evidences for supernatural design that Paley and the natural theology tradition had put forward. Such interpretations miss a crucial point. A close study of Darwin's transmutation notebooks and his long discussion with Gray reveals that his critique of design went considerably beyond challenging the sufficiency of Paley's evidences. In fact, Darwin paid scant attention to "evidences" of design. He rather probed deeply into the fundamental assumptions of the post-Newtonian synthesis that shaped the traditional design argument to reveal a host of questionable assumptions, illogical entailments, and faulty conclusions. By the time he read Gray's orthodox construction of his views Darwin had long since spun out of the orbit of natural theology and into a resolute metaphysical commitment to the unbreakable continuity and uniformity of Nature.

Darwin's flirtation with materialism and positivism in his transmutation

notebooks led him to subvert the metaphysical assumptions about God that sustained the design argument. Traditional natural theology assumed the non-material reality of the "will," both human and divine. Darwin had a novel response. He mused that if our notion of "will" was produced by "fixed laws of organization," then humans believed in God, not on the basis of any alleged evidence for his independent existence, but because that was the way their brains functioned. Humans were then guided, not by the will of God, or even their own "free" will, but by their desires, appetites, and environmental constraints. It followed that Nature itself was similarly guided. What good would evidences for the existence of God be in a metaphysic that attributed all such beliefs to illusions cast by our brains?

Furthermore, Darwin urged, any appeal to the will, plan, purpose, or desire of God as an explanation for the wonder, order, and adaptations in nature was meaningless as well as pointless. It was ridiculous, Darwin exclaimed, for John Macculloch, a prominent proponent of the design argument, to argue that God, for example, gave baby chicks hard beaks so that they could break out of their shells when the reality was that those with weak beaks inevitably lost out in the struggle for existence. No God was needed to plan this or any other eventuality. All adaptations, no matter how marvelous, Darwin argued, could more reasonably be explained as the consequence of the working of higher, grander, and simpler laws yet to be discovered. All such pious appeals to an illusory God's design simply covered human ignorance of complex natural processes, Darwin concluded.

Most versions of the design argument assumed an analogy between the works

of art and the works of nature. Both, the argument ran, showed evidence that they were designed by Mind or Intellect. Darwin rebutted this assumption by arguing for a complete identity between human artifacts and natural objects. Following his claim that Mind was the name given to certain physiological functions, Darwin claimed that the works of both humans and nature were produced by similar invariable laws of organization, not the Will of God. So much for any analogy between God and the world.

Darwin finally tackled the central Newtonian assumption that the universe, being composed of passive matter, was unable to move itself. It, therefore, needed an external agent to move it. Natural theologians, following Newton's example, quickly declared that God was that external agent; God caused all movement, change, and novelty in nature. Darwin realized that for his attack on the design argument to succeed he needed an immanent alternative to this external God. He needed a natural mechanism that explained the appearance of order and design in Nature. He found three plausible alternatives ready at hand. Adam Smith, the famous Scottish moralist, gave him the example of a self-regulating social system in which order was spontaneously created by the instinctive actions of individuals pursuing their own interests. No longer was it necessary for governments or God to interfere in the workings of society to create order since order was produced by self-regulating immanent social laws. Darwin next transformed Malthus's geometric law of population growth into a continually active immanent "force, like a hundred thousand wedges" that inexorably destroyed those individuals that failed to adapt themselves to

their environments. Finally, Darwin discovered a group of medical writers imbued with German romanticism who were frustrated by the inability of the passive Newtonian universe to explain what they experienced as a dynamic world that was full of life. They countered that nature possessed its own inherent powers of spontaneous movement and activity. Darwin speculated that with these immanent powers of action it was no longer necessary to appeal to an external God as the source of all change, movement, and order in nature. With these three sources of inspiration Darwin slowly worked out his natural explanation for the source of order and design in nature. The "Sagacious Being" of his "Sketch of 1842" was gradually transformed into Natural Selection in *The Origin*. He had finally transferred all of the attributes of an external Deity to an immanent lawful process of Nature. The final gaps in the continuity and uniformity of Nature had been closed.

By time that he engaged Gray on the compatibility of descent and design Darwin had all of the pieces of his attack on the philosophical and theological assumptions of the design argument in place. He was fully prepared to combat Gray's most persuasive arguments and confound him with additional questions of his own.

Darwin's most effective counter-offensive throughout his debate with Gray was to press home the ambiguities and expose the inconsistencies present in the design argument. The logic of his commitment to the continuity and uniformity of nature shaped his entire attack. Darwin laid out a stark choice for Gray: either he must believe that every contingency and every variation was designed by God or he must give up the belief entirely. Now Gray surely did not believe, Darwin chided, that

God had designed the many obvious evils in the world, whether cats playing with mice, lightning killing a man standing under a tree, or thousands of eggs dying before they were fertilized. But if Gray conceded that these incidents were not designed by God, how would he explain them? And how would he distinguish between those incidents that were designed and those that were not? But if God did not design every contingency Darwin saw no reason why he had to believe that God designed any particular contingency, whether the first birth of an organism or the marvelous structure of the eye.

It was equally untenable, Darwin charged, to believe that God had designed every contingency in the universe when it was well-known that humans had consciously chosen to breed their livestock to accentuate certain characteristics. God surely did not ordain that the tail feathers of the rock-pigeon would vary in a certain way to please the future whimsy of pigeon fanciers. It was far more reasonable to assume that the feathers of pigeons varied in response to human choices according to invariable laws. Did God really preordain his own "cream-jug nose"? By what necessity was he compelled to believe that God had designed the peculiarities of each organism when it was becoming increasingly clear, from numerous converging lines of empirical studies, that organisms gained their adaptations slowly over time in response to environmental pressures?

Darwin's most effective piece of evidence in support of this line of reasoning was his conclusion that the wonderful adaptations of the orchid had resulted, not from God's repeated intervention, but from the gradual way that its basic structures were

modified over time in response to its changing conditions of life. Darwin maintained that nothing compelled *this* variation rather than *that* variation in the orchid's structure to occur. Some variations were subsequently selected for their usefulness in the survival of an organism; most others died off. None were preordained by God.

Darwin exploited a further ambiguity in the meaning of design by distinguishing between *purpose as function*, as in a physiological process or structure, and *purpose as intention*, as in the final goal that functions served. These distinct meanings had compromised many arguments for design. How many lofty claims had been made about the divine plans behind this or that function only to have them subsequently refuted by closer study? Darwin claimed that it was possible to study the physiological function of the various parts of an organism without paying any attention to whether those functions realized any Divine purpose or design. That was precisely what he did in his botanical studies. He could study how twining plants functioned without worrying about any alleged providential goal toward which that plant was striving. If the distinction between function and goal could be maintained, Darwin reasoned, it would then be impossible to infer Divine purpose from any organic function.

As Darwin relentlessly pressed Gray with the logical implications of these faulty views of design, he found himself ensnared in contradictory positions of his own. The most important was his temptation to equate the lawful behavior of physical objects, like solar systems and rocks, with all other forms of lawful behavior, including especially the behavior of organisms. Physical laws had become the

paradigm for all scientific laws. Darwin shared this assumption with the natural theologians. Yet as committed as Darwin was to discovering the deterministic laws that governed all organic phenomena, he was equally committed to exposing the myriad contingencies that shaped the life of all living things. Variations were, after all, crucial to his theory. He struggled with the false choice offered by natural theologians: either the world was created by design or by chance. Since chance was irrational, the only alternative was a world created by design. And that Designer was God. Darwin needed contingencies that were not preordained that yet conformed to lawful processes. It seemed to him that the more he stressed the laws governing organisms, the more he was driven to acknowledge God as the Designer of those laws, while the more he stressed the contingencies that shaped nature, the more he was compelled to admit a large role for chance and accident. He found neither alternative acceptable; he needed laws that were not designed and contingencies that were not accidental. No wonder he was in a quandary. In 1860 Darwin could only lamely "look at everything resulting from designed laws, with the details, whether good or bad, left to the working of what we may call chance."

By 1868 he had devised a more sophisticated understanding of the choice between chance and design in his stone-house analogy. In that analogy Darwin distinguished between laws governing the fracturing of a rock face and the subsequent ways that an architect used those stone fragments to build a house. Darwin claimed that it was a fallacy to argue that their subsequent use in building a house was the reason why those *these* particular stones fell down the cliff. Nothing compelled the

architect to choose *these* stones rather than *those* stones from the pile for his house. It was the architect's purpose that determined how those stones would be used, not any predetermined divine plan. In the same way Darwin claimed that the laws that governed the variations in plants and animals must be distinguished from the subsequent uses or disuses to which those variations were put by the organism. Proponents of the design argument conflated these two independent lines of inquiry by insisting that one could know the reason why a particular variation occurred by referring to the uses to which it was subsequently put. On the contrary, Darwin claimed, only those particular variations that were found to be useful to an organism's survival were preserved; those that were not were destroyed. Such was natural selection. He concluded that in the face of this distinction it was no longer credible to infer divine purpose from any variation or adaptation that occurred in Nature. All variations were produced through the complex intersection of numerous natural laws. Only their use or function in the life of an organism could be known with any certainty.

At the same time Darwin admitted several times throughout his debate with Gray that he was in a muddle over design. His muddle was created by driving his commitment to the uniformity and continuity of nature over received philosophical and theological assumptions to their often contradictory conclusions. He felt the powerful attraction of the view that the universe, especially human consciousness, had been intelligently designed, yet he found no evidences of particular design that he could not immediately refute. But then what were the implications of an omniscient God

foreseeing every contingency? Such questions were too profound for him, he lamented. They were as deep as the conflict between free will and necessity, the origin of evil, and predestination. Indeed, they were, and were rooted in the same tendency to press the mechanical analogies of the Newtonian paradigm to their logical, but unlivable, conclusions.

Gray had no effective answer to any of Darwin's philosophical criticisms of design. All of his elaborate effort to defend the claim that *Natural Selection [was] not Inconsistent with Natural Theology* had been for naught. Though he dimly apprehended it, he failed to fully comprehend the significant point that Darwin was working within an alternative scientific and philosophical framework that was at daggers point to his own natural theological understanding. He continued to believe that their debate was about the evidence for design, one's obligation in the face of that evidence, and what strategies were most effective in harmonizing descent and design. Perhaps he had not offered the most persuasive evidence. Perhaps Darwin had not considered all possible ways of viewing the evidence. And all the while Darwin had abandoned the metaphysical framework in which such appeals once made sense. Gray, following the natural theology tradition, contributed to his own grave weakness by understanding God's relationship to the creation as analogous to the way the efficient cause of Newtonian physics was related to its effects. Darwin's commitment to the uniformity of nature ran roughshod over that analogy.

No wonder that Gray felt a "cold chill" when Darwin confronted him with the claim that no prior intention could be inferred from a present function in any

organism. No wonder that Gray had no answer to Darwin's stone-house analogy. The best that he could muster was the conviction that, *granted a Designer*, the world must somehow show evidence of design. With that move Gray abandoned the empirical bedrock of the design argument and took refuge in his personal faith that God existed. In his long debate with Darwin over design Gray was finally driven to the discomfiting conclusion that only by a sheer act of will could he resist the relentless drive of Darwin's assumptions to close all breaks in the iron-clad continuity and uniformity of Nature that would give the God of the natural theology tradition "room" to act. Although Darwin had scuttled his natural theological assumptions in their private correspondence, Gray continued an active public campaign for the next twenty years until his death to demonstrate that Darwin's theory of descent was compatible with Christian orthodoxy. He never seemed to grasp the significant role that Darwin's philosophical commitments made in his theorizing or how deeply flawed the design argument in any form was as an apologetic strategy in orthodoxy's debate with the new Positivist philosophy.