Darwin on Explaining Adaptation and Evolution without Design

“The old argument from design in nature, as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection has been discovered. . . . There seems to be no more design in the variability of organic beings and in the action of natural selection, than in the course which the wind blows. Everything in nature is the result of fixed laws.”

Letter, Charles Darwin to Asa Gray, 22 May 1860:

With respect to the theological view of the question; this is always painful to me.– I am bewildered.– I had no intention to write atheistically. But I own that I cannot see, as plainly as others do, & as I sh’d wish to do, evidence of design & beneficence on all sides of us. There seems to me too much misery in the world. I cannot persuade myself that a beneficent & omnipotent God would have designedly created the Ichneumonidae [parasitic wasps] with the express intention of their feeding within the living bodies of caterpillars, or that a cat should play with mice. Not believing this, I see no necessity in the belief that the eye was expressly designed. On the other hand I cannot anyhow be contented to view this wonderful universe & especially the nature of man, & to conclude that everything is the result of brute force. I am inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance. Not that this notion at all satisfies me. I feel most deeply that the whole subject is too profound for the human intellect. A dog might as well speculate on the mind of Newton. – Let each man hope & believe what he can.–

Certainly I agree with you that my views are not at all necessarily atheistical. The lightning kills a man, whether a good one or bad one, owing to the excessively complex action of natural laws,— a child (who may turn out an idiot) is born by action of even more complex laws,— and I can see no reason, why a man, or other animal, may not have been aboriginally produced by other laws; an & that all these laws may have been expressly designed by an omniscient Creator, who foresaw every future event & consequence. But the more I think the more bewildered I become, as indeed I have probably shown by this letter.

Letter, Charles Darwin to Sir John Herschel, 23 May 1861:

The point which you raise on intelligent Design has perplexed me beyond measure; & has been ably discussed by Prof. Asa Gray, with whom I have had much correspondence on the subject.– I am in a complete jumble on the point. One cannot look at this Universe


with all living productions & man without believing that all has been intelligently
designed; yet when I look to each individual organism, I can see no evidence of this. For,
I am not prepared to admit that God designed the feathers in the tail of the rock-pigeon to
vary in a highly peculiar manner in order that man might select such variations & make a
Fan-tail; & if this be not admitted (I know it would be admitted by many persons), then I
cannot see design in the variations of structure in animals in a state of nature,— those
variations which were useful to the animal being preserved & those useless or injurious
being destroyed.³

Letter, Charles Darwin to Asa Gray, 5 June 1861:
Sir J. Herschel . . . in his new Edit. of his Physical Geography . . . has note on the origin
of species, & agrees to certain limited extent; but puts in a caution on design, so much
like yours that I suspect it is borrowed.— I have been led to think more on this subject
of late, & grieve to say that I come to differ more from you. It is not that designed
variation makes, as it seems to me, my Deity “Natural Selection” superfluous; but rather
from studying lately domestic variations & seeing what an enormous field of undesigned
variability there is ready for natural selection to appropriate for any purpose useful to each
creature.⁴

Letter, Charles Darwin to Asa Gray, 17 September 1861:
Your question what would convince me of Design is a poser. If I saw an angel come
down to teach us good, & I was convinced, from others seeing him, that I was not mad, I
shd. believe in design.— If I could be convinced thoroughly that life & mind was in an
unknown way a function of other imponderable forces, I shd. be convinced.— If man was
made of brass or iron & no way connected with any other organism which had ever lived,
I shd perhaps be convinced. But this is childish writing.—

I have lately been corresponding with Lyell, who, I think, adopts your idea of the
stream of variation having been led or designed. I have asked him (& he says he will
herafter reflect & answer me) whether he believes that the shape of my nose was
designed. If he does, I have nothing more to say. If not, seeing what Fanciers have done
by selecting individual differences in the nasal bones of Pigeons, I must think that it is
illogical to suppose that the variations, which Nat. Selection, preserves for the good of
any being, have been designed. But I know that I am in the same sort of muddle (as I have
said before) as all the world seems to be in with respect to free will, yet with every
supposed to have been foreseen or preordained.⁵

³ Charles Darwin to Sir John Herschel, 23 May 1861, Letter 3154, Darwin
Correspondence Database, http://www.darwinproject.ac.uk/entry-3154.

⁴ Charles Darwin to Asa Gray, 5 June 1861, Letter 3176, Darwin Correspondence
Database, http://www.darwinproject.ac.uk/entry-3176.

⁵ Charles Darwin to Asa Gray, 17 September 1861, Letter 3256, Darwin Correspondence
Database, http://www.darwinproject.ac.uk/entry-3256.
Extract from the “Concluding Remarks” in Charles Darwin’s *The Variation of Plants and Animals under Domestication*, in which he gives the argument that has “never, as far as I can see, been answered.”

... The fluctuating, and, as far as we can judge, never-ending variability of our domesticated productions,—the plasticity of almost their whole organisation,—is one of the most important lessons which we learn from the numerous details given in the earlier chapters of this work. ...  

Few men at the present day will maintain that animals and plants were created with a tendency to vary, which long remained dormant, in order that fanciers in after ages might rear, for instance, curious breeds of the fowl, pigeon, or canary-bird. ...  

In accordance with the views maintained by me in this work and elsewhere, not only the various domestic races, but the most distinct genera and orders within the same great class,—for instance, whales, mice, birds, and fishes—are all the descendants of one common progenitor, and we must admit that the whole vast amount of difference between these forms of life has primarily arisen from simple variability. To consider the subject under this point of view is enough to strike one dumb with amazement. But our amazement ought to be lessened when we reflect that beings, almost infinite in number, during an almost infinite lapse of time, have often had their whole organisation rendered in some degree plastic, and that each slight modification of structure which was in any way beneficial under excessively complex conditions of life, will have been preserved, whilst each which was in any way injurious will have been rigorously destroyed. And the long-continued accumulation of beneficial variations will infallibly lead to structures as diversified, as beautifully adapted for various purposes, and as excellently co-ordinated, as we see in the animals and plants all around us. Hence I have spoken of selection as the paramount power, whether applied by man to the formation of domestic breeds, or by nature to the production of species. I may recur to the metaphor given in a former chapter: if an architect were to rear a noble and commodious edifice, without the use of cut stone, by selecting from the fragments at the base of a precipice wedge-formed stones for his arches, elongated stones for his lintels, and flat stones for his roof, we should admire his skill and regard him as the paramount power. Now, the fragments of stone, though indispensable to the architect, bear to the edifice built by him the same relation which the fluctuating variations of each organic being bear to the varied and admirable structures ultimately acquired by its modified...

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Some authors have declared that natural selection explains nothing, unless the precise cause of each slight individual difference be made clear. Now, if it were explained to a savage utterly ignorant of the art of building, how the edifice had been raised stone upon stone, and why wedge-formed fragments were used for the arches, flat stones for the roof, &c.; and if the use of each part and of the whole building were pointed out, it would be unreasonable if he declared that nothing had been made clear to him, because the precise cause of the shape of each fragment could not be given. But this is a nearly parallel case with the objection that selection explains nothing, because we know not the cause of each individual difference in the structure of each being.

The shape of the fragments of stone at the base of our precipice may be called accidental, but this is not strictly correct; for the shape of each depends on a long sequence of events, all obeying natural laws; on the nature of the rock, on the lines of deposition or cleavage, on the form of the mountain which depends on its upheaval and subsequent denudation, and lastly on the storm or earthquake which threw down the fragments. But in regard to the use to which the fragments may be put, their shape may be strictly said to be accidental. And here we are led to face a great difficulty, in alluding to which I am aware that I am travelling beyond my proper province. An omniscient Creator must have foreseen every consequence which results from the laws imposed by Him. But can it be reasonably maintained that the Creator intentionally ordered, if we use the words in any ordinary sense, that certain fragments of rock should assume certain shapes so that the builder might erect his edifice? If the various laws which have determined the shape of each fragment were not predetermined for the builder's sake, can it with any greater probability be maintained that He specially ordained for the sake of the breeder each of the innumerable variations in our domestic animals and plants;—many of these variations being of no service to man, and not beneficial, far more often injurious, to the creatures themselves? Did He ordain that the crop and tail-feathers of the pigeon should vary in order that the fancier might make his grotesque pouter and fantail breeds? Did He cause the frame and mental qualities of the dog to vary in order that a breed might be formed of indomitable ferocity, with jaws fitted to pin down the bull for man's brutal sport? But if we give up the principle in one case,—if we do not admit that the variations of the primeval dog were intentionally guided in order that the greyhound, for instance, that perfect image of symmetry and vigour, might be formed,—no shadow of reason can be assigned for the belief that variations, alike in nature and the result of the same general laws, which have been the groundwork through natural selection of the formation of the most perfectly adapted animals in the world, man included, were intentionally and specially guided. However much we may wish it, we can hardly follow Professor Asa Gray in his belief "that variation has been led along certain beneficial lines," like a stream "along definite and useful lines of irrigation." If we assume that each particular variation was from the beginning of all time preordained, the plasticity of
organisation, which leads to many injurious deviations of structure, as well as that redundant power of reproduction which inevitably leads to a struggle for existence, and, as a consequence, to the natural selection or survival of the fittest, must appear to us superfluous laws of nature. On the other hand, an omnipotent and omniscient Creator ordains everything and foresees everything. Thus we are brought face to face with a difficulty as insoluble as is that of free will and predestination.