

**Stephen C. Meyer**

***Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design***

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Stephen Meyer's previous book, *Signature in the Cell*, sought to show that evidence for an Intelligent Designer is written into life's genetic code. Now this philosopher of science turns his eye to the Cambrian 'explosion' – the diversification of complex animal life some 500 million years ago. He contends that the major animal groups (phyla) arise suddenly, without the intermediate forms or ancestors that natural selection would predict. On this basis, he discounts natural selection as an explanation for the origin of complex body plans (without denying it a role in post-Cambrian history). Instead, Meyer contends that information was added by an intelligent agent, through an unspecified process that we cannot directly observe. Unfortunately, both his central tenets meet with substantial difficulties.

Firstly, Meyer constrains the Cambrian explosion to a geologically brief five million year spell. This figure comes from a twenty-year-old study that revised the date at which the explosion began (72). The reader is not told that the *end* of the explosion was re-dated soon afterwards, restoring its length to a more conventional 25 million years. Meyer substantiates this 'five million year' illusion by highlighting a detail from a separate study (73) – but ironically, the study itself explicitly states a 25 million year long explosion.

Secondly, Meyer defines a 'phylum' in a fundamentally confusing way – despite the elegantly lucid alternative expressed in one of his key references (Budd & Jensen 2000, *Biol. Rev.* 75). Put succinctly, every member of a phylum must possess all features of the phylum's characteristic body plan. For example, membership of Phylum Onychophora – the rainforest-dwelling 'velvet' worms – is restricted to organisms that possess differentiated jaws, slime glands, stubby telescopic legs with flexible feet, *and* claws with a cone-in-cone construction. The earliest fossils that exhibit this complete body plan are a mere 40 million years old, which provides a date for the origin of the phylum. Yet Meyer includes superficially similar Cambrian fossils – lobopodian worms (pl. 8–10) – within this phylum, stretching the group's apparent 'origin' back 470 million years to the Cambrian period.

This is a mistake. Some lobopodians represent ancestors (or more accurately 'great-aunts') of onychophorans; others share many features with Phylum Arthropoda and are intermediate between, or even ancestral to, both these phyla. This is not the only example – the Cambrian fossil record contains countless other taxa that exhibit incomplete precursors of modern body plans. By shoehorning these ancestors into the groups themselves, Meyer both obscures the beginnings of the modern phyla and deprives the term 'phylum' of any useful meaning. His approach obscures the incremental nature by which modern body plans arose, and falsely implies that today's phyla appeared, fully formed, in the Cambrian.

Meyer concludes that "vast amounts of new functional or specified information" (168) appeared in a geologically short 'explosion', and infers that this information can only have arisen through outside intervention. To assess his claim it would be necessary to calculate the maximum rate at which 'specified information' might naturally arise. Alas, as Meyer offers no way to quantify 'specified information', his hypothesis cannot be falsified and thus lies outside the (Popperian) domain of science.

Meyer's otherwise engaging and highly readable background on the origin of animal diversity is undermined by selective representations of the literature and persistent conceptual misunderstandings. This is not to belittle his laudable search for signs of the supernatural in the natural world: we know that God made the earth and all that is on it (Neh. 9:6). He also holds creation together (Col. 1:17), whether that manifests itself in the provision of rain, the growth of grass, or the feeding of animals (Ps. 147:8–9). Under the uniformitarian approach that Meyer advocates (393), the present is the key to the past; if natural explanations suffice to describe God's ongoing involvement with creation, could they also account for the origins of animal diversity?

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