

## CORRESPONDENCE WITH CHARLES DARWIN

DANA TO DARWIN

"NEW HAVEN, February 5, 1863.

"The arrival of your photograph has given me great pleasure, and I thank you warmly for it. I value it all the more that it was made by your son. He must be a proficient in the photographic art, for I have never seen a finer black tint on such a picture.

"I hope that ere this you have the copy of the *Geology* (and without any charge of expense, as was my intention). I have still to report your book [*The Origin of Species*] unread; for my head has all it can now do in my college duties.

"I have thought that I ought to state to you the ground for my assertion, on page 602, that geology has not afforded facts that sustain the view that the system of life has been evolved through a method of development from species to species. There are three difficulties that weigh on my mind, and I will mention them:

"1. The absence, in the great majority of cases, of those transitions by small differences required by such a theory. As the life of America and Europe has been with few exceptions independent, one of the other, it is right to look for the transitions on each continent separately. The reply to this difficulty is that the science of geology is comparatively new and facts are daily multiplying. But this admits the proposition that geology does not yet afford the facts required.

"2. The fact of the commencement of types in some cases by their higher groups of species instead of the lower,—as fishes began with the selachians, or sharks, the highest order of fishes, and the ganoids, which are above the true level of the fish, between fishes and reptiles. In the introduction of land plants, there were acrogens and conifers and intermediate types, but not the lower grade of mosses, seemingly the natural stepping-stone from the seaweeds. The species, *Lepidodendra*, *sigillarids*, are examples of those intermediate or comprehensive types with which great groups often began, and seem to explain the true relations of such types; but they were not transitional forms in the system of life, but rather the commencing forms of a type. If I advocate your