

temperature in deep water to a like extreme degree. These abnormal temperatures are dependent upon the present distribution of sea and land; and I have already shown that we have evidence of many oscillations, in modern times geologically speaking, which must have produced totally different conditions of temperature over the same area. Accepting, as I believe we are now bound to do in some form, the gradual alteration of species through natural causes, we must be prepared to expect a total absence of forms identical with those found in the old chalk, belonging to groups in which there is sufficient structural differentiation to require or to admit of marked variation under altering circumstances. The utmost which can be expected is the persistence of some of the old generic types, and such a resemblance between the two faunæ as to justify the opinion that, making due allowance for emigration, immigration, and extermination, the later fauna bears to the earlier the relation of descent with extreme modification.

I have already mentioned that one of the most remarkable differences between the recent Atlantic chalk-mud and the ancient white chalk is the total absence in the latter of free silica. It would seem, from the analysis of chalk, that silicious organisms were entirely wanting in the ancient cretaceous seas. In the chalk mud, on the other hand, silica is found in abundance, in most specimens to the amount of from 30 to 40 per cent. A considerable portion of this is inorganic silica—sand; and its presence is doubtless due to the circumstance that our dredgings have hitherto been carried on in the neighbourhood