

early precipitation. We find other traces in the conglomerates embraced in the old Eozoic rocks. We even find traces in the slaty character of many of the pebbles, since much alumina and silicate of alumina must have been liberated in the progress of the chemical conflict, as already explained. So when, at the end of the Eozoic *Æon*, vast beds were upraised which stand to our times, they were not the first land, but only the first land which has survived to the human era.

XL. THE WORLD WITHOUT A BACKBONE.

REIGN OF INVERTEBRATES.

WE have followed the train of events down to a time when the work of the geologic forces had become settled to the tenor which was to be maintained through all the later *æons*. Uplift, erosion, sedimentation are the key-words to the physical history of the world; and these all express mere sequences of a more fundamental action, COOLING. We are now contemplating the world as it existed during the *æon* designated Eozoic. I think, for reasons already stated, that even then some areas of sea-bottom had been upraised to serve as sources for the clearly fragmental materials laid down to become Eozoic rocks. Where those crumbling lands were located, we can not well conjecture. There may have been clear, sun-lighted cliffs, beaten at times by dripping rains, corroded by breaking waves—all as in the human epoch. The same mineral substances resisting the agencies of destruction; the same quality of sun-light, the same breeze blowing up from the sea, the same ceaseless roar of the battle along the beach. But it was a reign of the physical forces alone. The wide sea was without a tenant; there were no bleached shells strewn along the beach. No shrub contended with the surf for the possession of the sandy foothold; and no tree, however humble, held safer possession of the sparse soil gathered in the chinks of the knotted cliffs. There was no form of living creature seeking the ends of its being over all the