

every winter, many millions of square miles of water are frozen, some idea may be obtained of the enormous number of those forms which are annually called into existence. If, as we suggest, there be a transition from apparently lifeless crystalline forms to living vegetable and animal forms, then some correspondence in point of numbers must be looked for between the former and the lower species of the latter. This is exactly what we find. As the same laws govern the vegetable and animal kingdoms, there is no need to deal with both in this essay. We will take the latter, as it is the more closely connected with the evolution of man.

Very few persons are aware of the enormous number of simple animal organisms which the earth presents evidence of having produced. The chalk beds, which cover a huge area, are composed almost entirely of animal remains. Almost all the limestone rock in the world is built up of the same material. In many places the sands of the sea-shore are almost wholly the remains of shell-fish. It will be remembered that in marching across the Egyptian deserts our soldiers were almost blinded by the sand which every breeze drove in clouds. But ordinary sand, which is powdered rock, could not be blown so easily. The sand of the desert, like that of some parts of the sea-shore, is really the remains of shell-fish. All this will help to convey some idea of the prodigious number of simple organisms which this earth has produced. The number, in fact, was, and still is, so great that it is impossible for all to find food. The moment food became scarce, there began among the creatures affected what is known to Science as the struggle for existence. Each was endowed with the instinct of self-preservation. Each would live if he could, but all could not live. Each strove against its neighbors, and at this stage the struggle often took the shape of cannibalism. All were not built exactly alike. The differences of structure were minute, but the slightest advantage in strength or activity gave its possessor an advantage in the struggle for existence. The creatures which were least able to cope with the difficulties around them perished, while those who were best able to do so survived. This result, common enough today, is known to Science as the survival of the fittest.

TRANSMISSION OF PECULIARITIES

The organisms which survived the struggle for existence were the fittest because of certain peculiarities of structure which gave them an advantage over their competitors. They either possessed organs which the others did not possess, or else they possessed similar organs of superior development. There is in nature a law which may be called the law of the Transmission of Peculiarities, which sends such endowments down to posterity. This law is well known to stock-breeders, and bird and dog-fanciers. If, for instance, a man wishes to breed a pigeon to win a prize in a show, he must first ascertain the "points" which are valued by those who act as judges in such matters. If he can find a male and a female bird possessing the coveted peculiarities he may breed a winner; but if he cannot find such, he stands little or no chance of accomplishing his purpose. The same statement holds