

same way as those of the wild boar.

The historical development of antlers in the deer tribe is very marked. While the group was still young and dominant, with the open grass-clad tertiary plains all before it, and with plenty of elbow room to spread and multiply, it had as yet no weapons of offense of any kind. But as the races grew thicker and more numerous, and as space failed the younger generations—for deer, like men, are subject to the inexorable logic of the Malthusians—the fathers of the herd began to fight among themselves for the possession of the does, and only the strongest survived to become the parents of future deerkind. Butting naturally produces hard bosses or protuberances of some sort; and in the ancestral deer these protuberances took the shape of bony projections on the forehead. Again, those deer which had the most marked and most pointed projections would best vanquish their rivals, and so fare best in the struggle for the hinds. Their descendants would inherit their peculiarities with more or less variation; and would similarly be selected by the law of battle in accordance with their fighting powers and the fitness of their weapons.

Now this probability, set forth *a priori* by Mr. Darwin, exactly tallies with the geological record, as interpreted by M. Gaudry and Professor Boyd Dawkins. The very vague and unspecialized deer of the lower miocene period had no antlers at all; they were somewhat like musk-deer without the tusks, or like young fawns in their first summer. But in the mid-miocene, antlers make their first appearance as mere short pointed knobs; next, they develop a single side tine; and in the upper miocene they come out as fully evolved as in our modern species. Every intermediate stage can be traced between the mere nascent boss like that of a budding roe in our own day, and the many-branched headpiece of the exist-

ing reindeer. Indeed, one late tertiary species had a pair of wonderfully intricate antlers which far surpassed in complexity those of any living elk; but, like many other highly specialized creatures, this over-developed type seems to have fallen a prey to the great extinct carnivores of the same period. Before the advent of man, many such high types existed, and they may perhaps have been partly destroyed by his monopolizing all the most open and desirable plains as his special hunting grounds. For we now know that man is certainly a quaternary, and probably a tertiary genus as well; and, even in his lowest and humblest form, his intelligence must have made him from the very first a dominant race and the real lord of creation.

It is interesting to note, too, that the historical evolution of antlers in the deer tribe is exactly paralleled by the modern evolution of antlers in every individual red deer. In the first year a stag has no horns at all, and is technically known as a calf. In his second year he puts forth a pair of rounded bosses, and is therefore called a knobber in the slang of the gillies. With his third year the knobs fall off, and are replaced by longer horns, called dags, while the stag himself is now known as a brocket. Thus, year after year, the growing deer reproduces one stage after another of the ancestral development, till at length the top of the horn expands into a broad crown, and the beast is then finally dubbed a hart or "stag of ten," from the number of tines on each of his antlers. It would be quite possible to pair the cast horns of each year tolerably exactly with corresponding adult horns from the successive tertiary strata. Every deer in fact recapitulates in his own person the whole evolution of his race, the antler of each successive year being different, not only in size, but in form and arrangement as well, from those of all previous seasons.