

in the domestic state, the animals will have changed the form, habits, and instincts of their race. Like the goose, they lose the power of flight, by the increased size of their abdomen, and the diminished power of their pectoral muscles; and other parts of their body are altered to suit this conformation. All their habits change; they lose the caution and sense of danger which, in their native state, they possessed. The male no longer retires with a single female to breed, but becomes polygamous, and his progeny lose the power and the will to regain the freedom of their race. The swan, the noblest of all the water-fowls, becomes chained, as it were, to lakes and ponds, by the mere change of his natural form."

The common poultry of the farm-yard have undergone great changes in form and habits by domestication. In a state of nature they possess considerable power of flight, and perch among the elevated branches of trees, an instinct which domestication does not wholly subdue, as fowls invariably prefer roosting on objects above the surface of the ground, although it is difficult for them to attain even a moderate height. This is occasioned by the increase of their abdominal viscera, and the posterior enlargement of their bodies. The breast becoming wider, and the neck shorter, the wings are unable to bear the increased weight of their bodies, so that they almost lose the power of flight, and become so entirely changed, both in conformation and habits, as to render it difficult to say from what specific stock they have been derived.

Temperature is an agent of great power in modifying the forms and habits of animals. The covering of quadrupeds consists of hair, with an undergrowth of wool or down mixed with it. In warm countries the latter is scarcely at all developed, and the animal is thinly covered with long hairs. In countries possessing an extreme climate the covering of animals undergoes great seasonal changes;—the downy matter or fur increases as the rigour of winter advances, thus serving as a protection against extreme cold. The sheep is an animal which seems peculiarly to belong to temperate regions, where it produces a thick, heavy fleece; whereas, in hot countries, it produces scarcely any wool, and in rigorous climates the wool is not only of a coarse texture but is intermixed with long hair. The covering of animals acts as a non-conductor of heat, and powerfully assists the respiratory and digestive organs in maintaining, under all the changes of climate, the natural temperature of the body. It is said, that dogs, taken from a cold to a warm country, frequently lose not only their fur but their hair also, and become as naked as the skin of the elephant.

We will draw this article to a close in the words of the author to whom we are greatly indebted for the materials of this series of papers. "Sim-

ilar to the effects of temperature is that of humidity, the hair becoming longer and more oily in the moister countries. Even within the limits of the Islands, the ox of the western coasts, exposed to the humid vapours of the Atlantic, has longer hair than the ox of the eastern districts. Even the effect of continued exposure to winds and storms may modify parts of the animal form. There are certain breeds of gallinaceous fowls which are destitute of the rump, so called. Most of the common fowls of the Isle of Arran, on the coast of Scotland, have this peculiarity. This little island consists of high hills, on which scarcely a bush exists to shelter the animals which inhabit it from the continued gales of the Atlantic. The feathers of a long tail might incommode the animals, and therefore we may suppose they disappear; and were peacocks to be reared under similar circumstances, it is probable that, in the course of successive generations, they would lose the beautiful appendage which they bring from their native jungles.

"The effects, likewise, of altitude are to be numbered amongst those which modify the characters of animals. In general, the animals of mountains are smaller and more agile than those of the same species inhabiting plains. In man, the pulse increases in frequency as he ascends into the atmosphere, so that, while at the level of the sea the number of beats is 70 in a minute, at the height of 4000 feet the number exceeds 100. The air being rarer, a greater quantity of it must be drawn into the lungs to afford the oxygen necessary to carry off the excess of carbon in the system. But gradually, as man and other animals become naturalized in an elevated country, the digestive and respiratory organs, and with these the capacity of the chest and abdomen, become suited to their new relations. Humboldt remarks on the extraordinary development of the chest in the inhabitants of the Andes, producing even deformity; and he justly observes, that this is a consequence of the rarity of the air, which demands an extension of the lungs.

"The effects of use or exercise, in modifying certain parts of the animal form, have been referred to. The limbs of many animals inured or compelled to speed become extended in length, as of the dogs employed in the chase of the swifter animals. The limbs of an animal deprived of the means of motion become feeble and small, as the wings of domesticated birds. In the natural state, the cow has a small udder, yet sufficient to contain the milk which her young requires; in the domesticated state, by milking her, the organ becomes enlarged, so as to contain a quantity of milk beyond what the wants of her own offspring demand. Nor are the characters thus acquired confined to the individuals on which they have been impressed, but may be transmitted to their