

that rich and abundant food, given during youth, tends by some direct action to make the head broader and shorter; and that poor food works a contrary result. He lays much stress on the fact that all wild and semi-domesticated pigs, in ploughing up the ground with their muzzles, have, whilst young, to exert the powerful muscles fixed to the hinder part of the head. In highly cultivated races this habit is no longer followed, and consequently the back of the skull becomes modified in shape, entailing other changes in other parts. There can hardly be a doubt that so great a change in habits would affect the skull; but it seems rather doubtful how far this will account for the greatly reduced length of the skull and for its concave front. It is well known (Nathusius himself advancing many cases, s. 104) that there is a strong tendency in many domestic animals — in bull- and pug-dogs, in the niata cattle, in sheep, in Polish fowls, short-faced tumbler pigeons, and in one variety of the carp—for the bones of the face to become greatly shortened. In the case of the dog, as H. Müller has shown, this seems caused by an abnormal state of the primordial cartilage. We may, however, readily admit that abundant and rich food supplied during many generations would give an inherited tendency to increased size of body, and that, from disuse, the limbs would become finer and shorter.¹⁸ We shall in a future chapter see also that the skull and limbs are apparently in some manner correlated, so that any change in the one tends to affect the other.

Nathusius has remarked, and the observation is an interesting one, that the peculiar form of the skull and body in the most highly cultivated races is not characteristic of any one race, but is common to all when improved up to the same standard. Thus the large-bodied, long-eared, English breeds with a convex back, and the small-bodied, short-eared, Chinese breeds with a concave back, when bred to the same state of perfection, nearly resemble each other in the form of the head and body. This result, it appears, is partly due to similar causes of change acting on the several races, and

¹⁸ Nathusius, 'Die Racen des Schweines,' s. 71.