

of the dog during several generations. A few years ago a case occurred on an estate near Jena, in which by a careless slamming of a stable door the tail of a bull was wrenched off, and the calves begotten by this bull were all born without a tail. Of late years observations on the same phenomena in dogs, cats, and mice, which confirm the above statements, have been communicated by five different investigators. These are certainly exceptional cases; but it is very important to note the fact, that under certain unknown conditions such violent changes are sometimes transmitted in the same manner as many diseases.

In very many cases the change which is transmitted and preserved by adapted transmission is constitutional or in-born, as in the case of albinism mentioned before. The change then depends upon that form of adaptation which we call the indirect or potential. A very striking instance is furnished by the hornless cattle of Paraguay, in South America. A special race of oxen is there bred which is entirely without horns. It is descended from a single bull, which was born in 1770 of an ordinary pair of parents, and the absence of horns was the result of some unknown cause. All the descendants of this bull produced with a horned cow were entirely without horns. This quality was found advantageous, and by propagating the hornless cattle among one another, a hornless race was obtained, which at present has almost entirely supplanted the horned cattle in Paraguay. The case of the otter-sheep of North America forms a similar example. In the year 1791 a farmer, by name Seth Wright, lived in Massachusetts, in North America; in his normally formed flock of sheep a lamb was suddenly born with a surprisingly long body and very short and crooked legs. It