

to the size, vigour, and fertility of their offspring; so, on the other hand, certain other changes in the conditions of life cause sterility; and as this likewise ensues from crossing much-modified forms or species, we have a parallel and double series of facts, which apparently stand in close relation to each other.

It is notorious that many animals, though perfectly tamed, refuse to breed in captivity. Isidore Geoffroy St.-Hilaire⁹ consequently has drawn a broad distinction between tamed animals which will not breed under captivity, and truly domesticated animals which breed freely — generally more freely, as shown in the sixteenth chapter, than in a state of nature. It is possible and generally easy to tame most animals; but experience has shown that it is difficult to get them to breed regularly, or even at all. I shall discuss this subject in detail; but will give only those cases which seem most illustrative. My materials are derived from notices scattered through various works, and especially from a Report, kindly drawn up for me by the officers of the Zoological Society of London, which has especial value, as it records all the cases, during nine years from 1838-46, in which the animals were seen to couple but produced no offspring, as well as the cases in which they never, as far as known, coupled. This MS. Report I have corrected by the annual Reports subsequently published up to the year 1865.¹⁰ Many facts are given on the breeding of the animals in that magnificent work, 'Gleanings from the Menageries of Knowsley Hall,' by Dr. Gray. I made, also, particular inquiries from the experienced keeper of the birds in the old Surrey Zoological Gardens. I should premise that a slight change in the treatment of animals sometimes makes a great difference in their fertility; and it is probable that the results observed in

⁹ 'Essais de Zoologie Générale,' 1841, p. 256.

¹⁰ Since the appearance of the first edition of this work, Mr. Selater has published ('Proc. Zool. Soc.,' 1868, p. 623) a list of the species of mammals which have bred in the gardens from 1848 to 1867 inclusive. Of the Artiodactyla 85 species have been

kept, and of these 1 species in 1·9 have bred at least once during the 20 years; of 28 Marsupialia, 1 in 2·5 have bred; of 74 Carnivora, 1 in 3·0 have bred; of 52 Rodentia, 1 in 4·7 have bred; and of Quadrumana 75 species have been kept, and 1 in 6·2 have bred.