

breeding as freely as the common kinds within a year after their importation from the upper Nile. The guinea-fowl, an aboriginal of the hot and dry deserts of Africa, whilst living under our damp and cool climate, produces a large supply of eggs.

Nevertheless, our domesticated animals under new conditions occasionally show signs of lessened fertility. Roulin asserts that in the hot valleys of the equatorial Cordillera sheep are not fully fecund;⁷⁰ and according to Lord Somerville,⁷¹ the merino-sheep which he imported from Spain were not at first perfectly fertile. It is said⁷² that mares brought up on dry food in the stable, and turned out to grass, do not at first breed. The peahen, as we have seen, is said not to lay so many eggs in England as in India. It was long before the canary-bird was fully fertile, and even now first-rate breeding birds are not common.⁷³ In the hot and dry province of Delhi, as I hear from Dr. Falconer, the eggs of the turkey, though placed under a hen, are extremely liable to fail. According to Roulin, geese taken to the lofty plateau of Bogota, at first laid seldom, and then only a few eggs; of these scarcely a fourth were hatched, and half the young birds died; in the second generation they were more fertile; and when Roulin wrote they were becoming as fertile as our geese in Europe. With respect to the valley of Quito, Mr. Orton says:⁷⁴ "the only geese in the valley are a few imported from Europe, and these refuse to propagate." In the Philippine Archipelago the goose, it is asserted, will not breed or even lay eggs.⁷⁵ A more curious case is that of the fowl, which, according to Roulin, when first introduced would not breed at Cusco in Bolivia, but subsequently became quite fertile; and the English Game fowl, lately introduced, had not as yet arrived at its full fertility, for to raise two or three chickens from a nest of eggs was thought fortunate. In Europe close confinement has a marked effect on the fertility of the fowl: it has been found in France that with fowls allowed considerable freedom only twenty per cent. of the eggs failed; when allowed less freedom forty per cent. failed; and in close confinement sixty out of the hundred were not hatched.⁷⁶ So we see that unnatural and changed conditions of life produce some effect on the fertility of our most thoroughly domesticated animals, in the same manner, though in a far less degree, as with captive wild animals.

It is by no means rare to find certain males and females which will not breed together, though both are known to be perfectly fertile with other males and females. We have no reason to suppose that this is caused by these animals having been subjected to any change in their habits of life; therefore such cases are hardly related to our present subject. The cause apparently lies in an innate sexual in-

⁷⁰ "Mém. par divers Savans," Acad. des Sciences, tom. vi., 1835, p. 347.

⁷¹ Youatt on Sheep, p. 181.

⁷² J. Mills, 'Treatise on Cattle,' 1776, p. 72.

⁷³ Bechstein, 'Stubenvögel,' s. 242.

⁷⁴ 'The Andes and the Amazon,' 1870, p. 107.

⁷⁵ Crawford's 'Descriptive Dict. of the Indian Islands,' 1856, p. 145.

⁷⁶ 'Bull. de la Soc. d'Acclimat., tom. ix., 1862, pp. 380, 384.