to Gulls, though many have been kept in the Zoological Gardens and in the old Surrey Gardens, no instance was known before the year 1848 of their coupling or breeding; but since that period the herring gull (*Larus argentatus*) has bred many times in the Zoological Gardens and at Knowsley.

There is reason to believe that insects are affected by confinement like the higher animals. It is well known that the Sphingidæ rarely breed when thus treated. An entomologist[60] in Paris kept twenty-five specimens of *Saturnia pyri*, but did not succeed in getting a single fertile egg. A number of females of *Orthosia munda* and of *Mamestra suasa* reared in confinement were unattractive to the males.[61] Mr. Newport kept nearly a hundred individuals of two species of Vanessa, but not one paired; this, however, might have been due to their habit of coupling on the wing.[62] Mr. Atkinson could never succeed in India in making the Tarroo silk-moth breed in confinement.[63] It appears that a number of moths, especially the Sphingidæ, when hatched in the autumn out of their proper season, are completely barren; but this latter case is still involved in some obscurity.[64]

Independently of the fact of many animals under confinement not coupling, or, if they couple, not producing young, there is evidence of another kind that their sexual functions are disturbed. For many cases have been recorded of the loss by male birds when confined of their characteristic plumage. Thus the common linnet (*Linota cannabina*) when caged does not acquire the fine crimson colour on its breast, and one of the buntings (*Emberiza passerina*) loses the black on its head. A Pyrrhula and an Oriolus have been observed to assume the quiet plumage of the hen-bird; and the *Falco albidus* returned to the dress of an earlier age.[65] Mr. Thompson, the superintendent of the Knowsley menagerie, informed me that he had often observed analogous facts. The horns of a male deer (*Cervus canadensis*) during the voyage from America were badly developed; but subsequently in Paris perfect horns were produced.

[60] Loudon's 'Mag. of Nat. Hist.,' vol. v., 1832, p. 153.

[61] 'Zoologist,' vols. v.-vi., 1847-48, p. 1660.

[62] 'Transact. Entomolog. Soc.,' vol. iv., 1845, p. 60.

[63] 'Transact. Linn. Soc.,' vol. vii. p. 40.

[64] *See* an interesting paper by Mr. Newman, in the 'Zoologist,' 1857, p. 5764; and Dr. Wallace, in 'Proc. Entomolog. Soc.,' June 4th, 1860, p. 119.

[65] Yarrell's 'British Birds,' vol. i. p. 506; Bechstein, 'Stubenvögel,' s. 185; 'Philosoph. Transact.,' 1772, p. 271. Bronn ('Geschichte der Natur,' Band ii. s. 96) has collected a number of cases. For the case of the deer, *see* 'Penny Cyclop.,' vol. viii. p. 350.