

He then observes, that it is no uncommon thing to find, among numerous broods of pheasants reared by hand, some females, which, at the age of only four months, produce the brightest plumage of the male; and in two instances of birds shot in a wild state, the nest feathers had not been shed, proving them to have been birds of the year.

A partridge, having a white bar across the breast, and the first three primary feathers in each wing white, being opened, exhibited the same sort of organic disease; and from circumstances adduced, it appears that this was also a bird of the year.

All variations in plumage, however, are not traceable to this cause. In most of the excepted instances, however, the individuals are dwarf birds, and the author attributes their variety of plumage to defective secretion,—the effect of weakness.

When the sexual organs are artificially obliterated in the common fowl;—in the male bird, so soon as this operation is performed, he ceases to crow; the comb and gills do not attain their full size; the spurs remain short and blunt; and the feathers of the neck assume an appearance intermediate between the hackled appearance of the cock, and the ordinary web of the hen. The operation on the female being performed (by obliterating the oviduct), the ova cease to enlarge; she makes an imperfect attempt to crow; the comb increases in size; and short and blunt spurs make their appearance. The plumage also alters both in colour and form, and approaches that of the cock; and the bones of the lower part of the back never acquire that enlargement requisite for giving a proper breadth to the pelvis. In short, the two sexes by this process approximate so nearly in character, that it is frequently difficult to determine the sex.

In the case of hen-pheasants, they assume the plumage of the male at best but imperfectly, and it is probable that they do not live many years after the change.

The author concludes by regarding it as a general law, that where the sexes of animals are indicated by external characters, these undergo a change, and assume a neutral appearance whenever original malformation, subsequent disease, or artificial obliteration, has deprived these organs of their true influence.

*On the secondary Deflections produced in a Magnetized Needle by an Iron Shell, in consequence of an unequal Distribution of Magnetism in its two Branches. First noticed by Captain J. P. Wilson, of the Honourable East India Company's Ship Hythe. By Peter Barlow, Esq. F.R.S. Mem. Imp. Sc. Petrop. Read May 17, 1827. [Phil. Trans. 1827, p. 276.]*

Captain Wilson being engaged in the prosecution of Mr. Barlow's inquiries as to the laws of the deflection of a needle by an iron shell, had remarked, while in China, that when a magnetic needle was placed in the equator of an iron shell, though no deviation arose when the compass was in its natural state, yet when one end of the

needle was deteriorated, by touching it with the pole, of its own name, of a magnet, a deviation then arose; and communicating the facts to Mr. Barlow, he proceeded to investigate the laws and amount of the deviation so arising.

He distinguishes the action into three several cases:—

1st. When the needle is on any part of the magnetic meridian of the ball. In this case there is no deviation caused by the primary of the shell, nor any secondary deflection produced by deteriorating one pole of the needle.

2nd. When the needle is in the magnetic equator of the ball. In this case he observed, that whichever end of the needle is weakened approaches the ball.

3rd. In every other position, one branch of the needle is nearer to the centre of the ball than the other. Here it is observed, that if the near end is deteriorated, the needle approaches its natural magnetic situation; but if the more distant, then the reverse takes place; and this represents the general law of the phenomenon.

From this law, Mr. Barlow is led to the explanation of the facts, on the principle of induced magnetism in the shell; for in the second case above enumerated, the equilibrium of the needle is produced by equal and opposite repulsions on its equal and equally magnetized ends. When, therefore, the repulsion on one end is weakened by deteriorating that end, that on the other obtains the advantage, and the deteriorated end is drawn towards the ball.

In the general case, the reasoning is equally simple; and Mr. Barlow shows that its results are precisely those which observation affords.

These results he considers as decisive in favour of that theory which regards the magnetism of an iron shell as induced in it by the action of the earth.

He concludes this paper with an account of some experiments instituted for the purpose of determining numerically the amount of the secondary deflections, arising from a given extent of deterioration in the needles. This was estimated by the increase of the times of oscillation in the needle, freely suspended, and the deflections estimated by making the deviations produced by the shell in a series of situations all around it, in various planes; the results of which are stated in a table.

*On the Difference of Meridians of the Royal Observatories of Greenwich and Paris.* By Thomas Henderson, Esq. Communicated by J. F. W. Herschel, Esq. *Sec. R.S.* Read May 17, 1827. [*Phil. Trans.* 1827, p. 286.]

Mr. Henderson, in going over the calculations of the observations made by the Commissioners on the part of the British Board of Longitude and the French Ministry of War, for determining this element, in July 1825, detected an error of one second in the reduction of the observations made at the Royal Observatory at Greenwich, from