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part is of a nearly uniform whity brown colour with greyish tips to the hairs, whiter beneath, and with a small, round, white dorsal spot.

III. *The lower jaw not known.*

4. *Dendrohyrax Blainvillei*, Gray, Hand-list, pl. xi. fig. 3.

Orbit incomplete behind; intermaxillary bone square, truncated behind; lower side of orbit much produced, with a thick, rounded edge and a large concavity on the underside, as in *D. dorsalis*.

Africa.

XVIII.—*On Sexual Variations in the Nestling-Plumage of the Booted Eagle* (*Nisaetus pennatus*). By HOWARD SAUNDERS, F.Z.S. &c.

THE ordinary adult plumage of the Booted Eagle is so well known that it is unnecessary to do more than remark that the upper parts in general are of an umber-brown, whilst the underparts are of a buff or creamy white, sometimes deepening into fawn-colour, and with striations more or less distinct down the shafts of the feathers of the throat, breast, abdomen, and flanks. That this plumage is common to both sexes has been abundantly proved by numerous carefully sexed specimens obtained of late years from various localities between Spain on the west and India on the east. But with regard to the plumage of the immature bird there has existed some difference of opinion, although most naturalists have stated that it has the underparts of a dark colour. Mr. R. Bowdler Sharpe, in his recently published 'Catalogue of the Accipitres in the British Museum,' p. 254, describes the underparts of the young as "entirely dull brown;" but, on the other hand, Dr. Jerdon, in his 'Birds of India,' vol. i. p. 64, has described an immature bird as having a light breast. Herr A. v. Pelzeln, again ('Ibis,' 1868, p. 305), mentions a young bird just able to fly as "underneath brown:" and subsequently Dr. Jerdon ('Ibis,' 1871, p. 246) was inclined to modify his former opinion; but as the specimens there alluded to are the ones I am about to describe, it is needless to recapitulate his views. Mr. Hume, however ('Rough Notes,' p. 184), hazarded the opinion that the dark plumage was the adult stage (!), apparently basing this upon an instance of a *female* in the

brown plumage having been shot from her nest. Previously, however, to the publication of his brochure, MM. Amédée Alléon and Jules Vian ('Rev. et Mag. Zool.' p. 342 *et seq.*) had pointed out that in two instances they had found an adult male mated with a female in immature plumage. If any of these naturalists had thought of leaving the eggs for the time, and revisiting the nests when the young birds were nearly fledged, they would probably have solved the question of the immature plumage of this species.

Of the numerous specimens of both sexes which had come into my possession, many of them shot from the nest, all had exhibited light-coloured underparts, with merely slight variations in the intensity of the striations; until in 1870 my collector at Granada sent to me a pair of Booted Eagles, and the *two nestlings* which they were in the act of feeding when shot from the nest, on the 20th of June, at Soto de Roma, the Duke of Wellington's estate. The male was in the usual adult plumage; but the whole of the underparts of the *female* were of a *deep coffee-brown*, with darker striations down the shafts of the feathers. This was an interesting stage, and one which I had not hitherto possessed; but so far it merely confirmed what MM. Alléon and Vian had already made known as to the *female* breeding in immature livery. But the plumage of the young birds, which were fully feathered except that the outer primaries were still in the quill, was most remarkable. The larger of the two had the whole of the *underparts* of a *dark brown*, of a somewhat deeper hue than those of the female parent, whilst the smaller nestling had the underparts of a *creamy buff*, with the usual striations down the shafts of the feathers covering the breast. It would have been more than human virtue, especially in a Spaniard, if my collector had tried to ascertain the sexes of these nestlings by actual dissection and with the help of a microscope; but from the size there can be no reasonable doubt that the *dark brown nestling* is the *female*, and the *light-breasted nestling* is the *male*.

This variation in the nestlings clears up at once the apparent discrepancies in the descriptions of the young. Dr. Jerdon's young bird was doubtless a male; and the British-Museum bird is a female. In further corroboration of this view, it should be noticed that whilst we have abundant and independent testimony of various females being obtained in this dark plumage, yet there is not on record a single instance of a *carefully sexed male* with dark brown underparts. The male evidently starts from the *nestling* stage with light-coloured underparts, and with a plumage almost identical with

his adult livery; whilst the female does not assume the white breast &c. until after one or, perhaps, several moults. It is generally supposed that most eagles in a wild state assume their adult plumage after the third change; but, from the comparative rarity of specimens in the brown plumage, it is possible that the female *Nisaetus pennatus* may assume the adult livery at the first moult.

With regard to the male, as I have said, there is little alteration from the nestling-plumage beyond a gradual change to a paler cream-colour on the abdomen and flanks, and a gradual narrowing of the striations. These last, however, are by no means a safe guide to the age of a specimen; for some individuals of the same sex are less streaked than others. The very lightest-coloured male in my series, and lighter also than any breeding female, is pronounced to be a remarkably clean young bird which has never moulted, by Col. Delmé-Radcliffe, who is probably the highest living authority upon raptorial birds.

I am not writing the history of the Booted Eagle, and it is therefore unnecessary to say more upon the subject; but the fact of the plumage of the two sexes being different in the nestling stage, and subsequently becoming the same, is, so far as I am aware, unparalleled in any other raptorial bird; and I have consequently deemed it worthy of being placed on record.

Note.—I am well aware that nestlings of *Archibuteo sanctijohannis* are subject to considerable variation; but it has never been shown that these variations are either sexual or constant.

XIX.—*On the Striæ of Foraminiferous Tests; with Reply to Criticism.* By H. J. CARTER, F.R.S. &c.

WHOEVER has studied fossilized Nummulites must have been struck with the striated appearance which their sections present; and hence it is very desirable to remember that this is of two-fold origin, viz. arising partly from what may be termed mineralogical, and partly from organic causes.

The mineralogical structure of the foraminiferous test consists of laminæ cut perpendicularly by striæ, which therefore in a globular Nummulite may often be seen to run directly and continuously from the circumference to the centre. The laminæ represent the lines of deposit, and the striæ the lines