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Columba livia, the various domestic breeds which have sprung from it. C. Darwin, Anim. and Pl. under Domestic. i. pp. 131–224.

Mr. Darwin was led to study domestic Pigeons with particular care, first, because the evidence that all the domestic races have descended from one known source was far clearer than with any other anciently-domesticated animal; secondly, because many treatises in various languages, some of them old, have been written on these birds, so that we are able to trace the history of the several breeds; and thirdly, because the amount of variation, arising from causes we can partially understand, has been extraordinarily great. Above 150 kinds exist, which "breed true" and have been separately named; and there can be no doubt, says the author (and most justly as it appears to us), that if well-characterized forms of the several races had been found wild, all of them would have been ranked as distinct species, and several would have been placed in different genera. These various breeds are classified by Mr. Darwin in *four* groups, as follows:—

Group I. is composed of a single Race, that of the "Pouters," having the œsophagus of great size, barely separated from the crop, often inflated. Body and legs elongated. Bill moderate. The most strongly-marked subrace,

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* We imagine the *Corvus spermologus* of Vieillot (*Monedula nigra*, Brehm) to be only the young of *C. monedula*; and even if *C. dauricus* be a good species, it may well be that its young resembles that of the common European form (*cf.* Ibis, 1868, p. 447, note).

the "Improved English Pouter" (of which a figure is given, p. 137), is perhaps the most distinct of all domesticated Pigeons.

Group II. includes *three* Races: (1) "Carriers," (2) "Runts," and (3) "Barbs." The First have the bill long, narrow, and pointed, the eyes surrounded by much naked and generally carunculated skin, the neck and body much elongated. (The "English Carrier," one of the four subraces into which it is divided, is figured, p. 140.) The Second have the bill long and massive, and the body of great size. (Five subraces are described.) The Third Race of this group have the bill short, broad, and deep, the bare skin round the eyes broad and carunculated, the skin over the nostrils slightly swollen. (The "English Barb," the only subrace mentioned, is figured, p. 145.)

Group III. is artificial, and to it are assigned a heterogeneous collection of *five* Races: (1) "Fantails," (2) "Turbits" and "Owls," (3) "Tumblers," (4) "Indian Frill-backs," and (5) "Jacobins." The First are remarkable for the wonderful development of tail, consisting of many rectrices—according to one authority, of 42! In one subrace, the "English Fan-tail," which is figured (p. 147), the oil-gland is aborted; in the other, the "Java Fan-tail," it is well developed. The Second have the feathers divergent along the front of the neck and breast, the bill short and rather thick, and the œsophagus somewhat enlarged. The subraces (if any) are not enumerated, but the "African Owl" is figured (p. 149). The Third Race take their name from the habit of tumbling backwards during flight; the body is generally small, the bill usually short, sometimes excessively so, and conical. Four subraces are described, one of them, the "Lotan" or "Indian Ground-Tumbler," being very remarkable; another, the "Short-faced Tumbler," is figured (p. 152). The Fourth Race have the bill very short, and the feathers reversed. The Fifth have the feathers of the neck forming a hood, the wings and tail long, the bill moderately short. Of neither of these latter are any subraces mentioned.

Group IV. greatly resembles *Columba livia*. It comprises *two* Races: (1) "Trumpeters," and (2) Pigeons scarcely differing in structure from the wild stock. The First have a tuft of feathers at the base of the neck curling forward, the feet much feathered, and a very peculiar voice. They are larger than the wild *C. livia*. The Second are divided into five subraces. Besides these, some three or four other little-known breeds are mentioned.

Passing over a section devoted to remarkable "Individual Variations" (pp. 158–162), we come to one wherein Mr. Darwin describes at some length the "Osteological Characters" (pp. 162–171) of the different Races. These are exceedingly important, and prove that scarcely any part of the skeleton is constant, while the illustrations show, better even than the full-length figures of the birds, the remarkable nature of the modifications which have taken place in the head and parts of the sternal apparatus. Then follows a section on the "Effects of Disuse" (pp. 171–177), and the chapter closes with a "Summary of the Points of Difference between the several Domestic Races, and between the Individual Birds" (pp. 177–179).

The remainder of Mr. Darwin's account of these birds we must pass over more briefly. It treats of their "Aboriginal parent-stock," the "Wild Races of *Columba livia*" (*C. affinis*, *C. intermedia*, *C. leuconota*, *C. schimperi*, and so forth, which are commonly accounted good species, but differ much less than do nearly all the domestic forms already described), "Proofs of the

descent of the several Races" from that species, "Fertility of the Races when crossed," "Reversion to the plumage" of the wild form, "Circumstances favourable to the Formation of Races," their "Antiquity and History," "Artificial Selection," "Extinction of Intermediate Forms," "Permanence and Mutability of Certain Breeds," and, finally, a "Summary," of which we may give the following abstract:—It may be confidently concluded that all the domestic Races are descended from *C. livia*, including under that name certain wild Races, though the differences between these latter throw no light on the distinctive characters of the domestic Races. In each breed or subbreed the individuals are more variable than birds in a state of nature, and occasionally they vary in a sudden and strongly-marked manner. This plasticity apparently results from changed conditions of life. Disuse reduces certain parts of the body. Correlation of growth so ties together the organization, that when one part varies, other parts vary simultaneously. When several breeds have been formed, their intercrossing aids the progress of modification, and has even produced new subbreeds; but herein "Selection" has been the presiding power, whether followed methodically or unconsciously; and this almost inevitably leads to the extinction of the earlier and less improved forms, as well as of many intermediate links in each line of descent.

Such, then, is a very brief account of what we must regard as two of the most remarkable chapters ever written on any zoological subject; and in thus looking upon them, we entirely set aside every consideration as to the probability of the author's theory being true or false. Few reflective men will deny the utility of such an accumulation of facts relating to one species; and none will presume to question the ability with which they are presented to the reader, forming a monograph of a kind never attempted before. It would be beyond our province to express any further opinion.