the side as a sharp-pointed and handsome hook (see also Fig. 1), terminating in a free extremity. Figure 4 shows this arrangement to be quite different in *Sphyrapicus*, where the form of the external branch is narrower, and the bifurcation higher up towards the neck of the bird. It too, however, terminates in a free-pointed extremity at the side. The abdominal part of the main ventral tract is much stronger in *Sphyrapicus* than it is in Harris's Woodpecker, in which latter species it usually dwindles to a single row of contour-feathers before arriving at the vent. Both species have the aperture of the vent completely surrounded by a single row of small contour-feathers, while in *Dryobates* there are posterior to this region a mid-coccygeal pteryla, with an oblique lateral one on each side of it (Fig. 3). These I have designated as the 'postventral tracts.'

Colaptes has, both in arrangement and form, its ventral and postventral tracts almost identically the same as we find them in the genus *Dryobates.*

Nitzsch, alluding to the rectrices and remiges in the Woodpeckers, says "*twelve* tail-feathers, but the two outer ones small and bent in between the two preceding ones," and "the wings bear from nineteen to twenty-one remiges, but always ten on the pinion, of which the first is rather short, the second is likewise shorter than the following ones, but the third is sometimes equal to the fourth and fifth, and with them the longest, and sometimes exceeded by the fourth, fifth and sixth, which are then of equal length."

Persons interested in the study of this subject may well consult besides Nitzsch's 'Pterylography' certain important papers in the early issues of the 'Proceedings' of the Zoölogical Society of London.

Faithfully yours,

R. W. SHUFELDT.

Fort Wingate, New Mexico,
21st Feb. 1888.

Polydactylism in Birds.

TO THE EDITORS OF THE AUK:—

Sirs:—My attention has been directed to a short article in 'The Auk' (Vol. IV, No. 4, pp. 331-333, Oct. 1887), on 'Ornithological Curiosities.—A Hawk with nine toes, and a Bobolink with spurs on its wings.' I do not profess to be an ornithologist, though much interested in the subject, and something of an observer of bird life; I prepare this note as a teratologist. I am much pleased with the report of the cases of the supernumerary development by Mr. Henry K. Coale, and hope his example will be followed by others from numerous observers all over the land.

In my somewhat extensive researches for the purpose of collecting and classifying the bibliography and references relating to the 'The Material of Teratology,' I have been surprised at the infrequency as well as the meagreness of reports, and the almost absence of even incidental mention of cases of supernumerary and duplex development in birds. Such as

are found are almost exclusively such as occur in domesticated fowls. I have been disposed to believe that ornithologists are inclined to ignore malformations and monstrosities as unworthy of study, or even mention, and that they have cast aside the specimens which have presented themselves to their casual notice, as one would an imperfect example in any other department of natural objects.

I desire to invite the co-operation of all classes of 'bird men'—sportsmen, collectors, and scientific ornithologists—in procuring and reporting all cases of double monsters, or of supernumerary development, in any degree in which it may be found in any species of the feathered tribes. I am quite certain that 'The Auk' will be a proper medium of communication—under the head of Teratological Notes—or Ornithological Teratology.

Ulysses Aldrovandus, who was a celebrated ornithologist, and a voluminous writer on the subject two and a half centuries ago, gives us many illustrations of double monstrosities, extra legs and extra toes in various species of birds. These are chiefly found in his special work 'Monstrorum Historiam,' a ponderous folio, published sumptuously in 1642. The pages 549 to 570 are occupied with descriptions of cases of extra limbs in birds, under the title 'Multiplicatio pedvm in fœtivs avivm,' and is illustrated with seventeen figures. The cock of the common fowl on page 560 has two extra toes attached to his left leg.

Otto, in his great work, 'Monstrorum Sexcentorum Descriptio-Anatomica,' grand folio, 1841, describes (No. 473) a chicken with seven toes on its right foot.

Polydactylus is not rare among animals that normally are possessed of several digits. In the human subject six or more fingers or toes are not very uncommon. In three well authenticated cases, as many as nine toes were developed on the left foot.

There is already an extensive literature pertaining to teratology, and still it is desirable to have more accurate records of genuine cases of congenital malformations, particularly such as may occur among non-domesticated animals and birds. There are many interesting questions, both scientific and popular, which may be enlightened by a powerful array of well attested facts. The miserable popular belief that maternal mental emotion can and does produce malformations, will receive its annihilating blow when it is generally known that every form of malformation which has ever been observed in the human fœtus, has its exact analogue in all the lower animals—viviparous and oviparous. It is a fact, that there is no physical monstrosity which is peculiar to the human fœtus.

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