

FIRST-WINTER PLUMAGES IN THE GALLIFORMES

BY GEORGE A. PETRIDES

As is well known, the typical post-juvenal wing of the Galliformes differs from that of most birds in that the outer two pairs of juvenal primaries are not replaced by adult remiges at the post-juvenal molt but are carried until the second autumn. In a recent investigation of age criteria for gallinaceous game birds (Petrides, 1942), however, it was noted that this feature, which identifies young of the year in most species, did not apply to all Galliformes and that considerable variation also occurred in the number of juvenal greater primary coverts retained. It was particularly noted that the pheasants and European quails, which have been placed in the same subfamily in recent revisions of the order, undergo radically different types of post-juvenal molt.

Intrigued by the findings for native and naturalized American species, a study of the entirely exotic forms was also planned, but time limitations and lack of suitable specimen material eventually permitted only a cursory investigation of these groups. Because it seems quite unlikely that the project will be resumed, however, the limited findings in these foreign groups are also presented here as a possible aid to future investigators.

Reference to Table 1 will indicate the types of post-juvenal molt in the several groups of the Galliformes; the more detailed notes beyond list the evidence (not always complete) upon which the table is based. Variation in the size of the outermost greater primary covert as described in the table may also be of taxonomic importance. Some aspects of this matter were discussed in an earlier note (Petrides, 1943).

For American birds: Native quails retain the two outer juvenal primaries and the entire series of primary coverts; turkeys keep their distal primaries but no coverts. All grouse and the introduced Hungarian and Chukar partridges retain the outer two flight feathers and their coverts, but the imported Ring-necked Pheasant sheds and replaces all primaries and all coverts.

The types of molts occurring in the pheasants and quails agree more closely with the classification of these groups given by the 1931 A. O. U. Check-List than with the more recent revisions of the Galliformes (Peters, 1934; Wetmore, 1940; American Ornithologists' Union, 1944). In the Check-List, the American and European quails formed the two subfamilies of the family *Perdixidae*, while the pheasants alone comprised the *Phasianidae*. The recent classification is shown in Table 1.

TABLE 1
POST-JUVENAL MOLTS IN THE GALLIFORMES

<i>Classification</i> (Peters, 1934)	<i>Juvenal</i> <i>primaries</i> <i>retained</i>	<i>Juvenal</i> <i>primary</i> <i>coverts</i> <i>retained</i>	<i>Outer</i> <i>covert</i> <i>type*</i>
Suborder GALLI			
Superfamily CRACOIDEA			
Family MEGAPODIIDAE (Megapodes)	Outer 2?	Outer 2?	No. 4, few No. 2
Family CRACIDAE (Chachalacas, guans)	Outer 2?	?	No. 2
Superfamily PHASIANOIDEA			
Family TETRAONIDAE (Grouse)	Outer 2	Outer 2	No. 1
Family PHASIANIDAE			
Subfamily ODONTOPHORINAE (American quails)	Outer 2	All	No. 1
Subfamily PHASIANINAE			
European quails	Outer 2	Outer 2	No. 1
Pheasants	None	None	No. 2, some No. 1, Pavo (peacock) No. 4
Family NUMIDIDAE (Guinea fowls)	Outer 2?	Outer 2?	Mostly No. 3
Family MELEAGRIDIDAE (Turkeys)	Outer 2	None	No. 4
Suborder OPISTHOCOMI			
Family OPISTHOCOMIDAE (Hoatzins)	?	?	No. 4

- * No. 1. Outermost covert rudimentary, wedge-shaped, often barely evident.
 No. 2. Outermost covert of normal width but short, easily seen.
 No. 3. Outermost covert as long as its neighbor but slim and pointed.
 No. 4. Outermost covert full sized, matching its neighbors.

FAMILY MEGAPODIIDAE.—Little evidence was found among 38 skins of *Megapodius nicobariensis* from Celebes to indicate that any juvenal primaries are retained in the post-juvenal plumage. Several undated specimens of *M. reinwardi* from Australia, however, appeared to be young of the year with short, pointed outer two primaries and worn outer coverts.

FAMILY CRACIDAE.—In young chachalacas (*Ortalis vetula*) from Mexico, the two outermost pairs of pointed juvenal primaries are apparently retained until the February or early March following hatching, when a complete molt of the flight feathers takes place. No data were obtained on covert retention. Specimens of other Cracidae yielded no positive information.

FAMILY TETRAONIDAE.—All North American grouse, prairie chickens and ptarmigan apparently retain the outer two pairs of juvenal primaries and their coverts during the first winter. This seemed to be true also for specimens of the exotic genera *Tetraophasis* and *Tetraogallus*. The Committee of Inquiry on Grouse Disease (1911) found the outer primaries retained in young Red Grouse (*Lagopus scoticus*) of the British Isles.

FAMILY PHASIANIDAE.—Van Rossem (1925) was evidently the first investigator to determine that, in addition to the outer two juvenal primaries, the entire series of juvenal greater primary coverts are retained through the first winter by members of the Odontophorinae. This feature is easily apparent in all the quails of the United States and in specimens of *Odontophorus gujanensis* from Panama (4000'). Sufficient specimens of other tropical Odontophorinae were lacking.

In the Phasianinae, the retention of the outer two juvenal primaries was determined for the Hungarian Partridge (*Perdix perdix*) as early as 1788 (Bureau, 1911) and 1792 (Portal and Collinge, 1932). It has been used as a criterion of age since then. Bureau also found (1913) that the outer two primaries are retained in first winter specimens of *Alectoris rufa* from France. For the European quails, the present investigation determined that these species and the young of the introduced Chukar Partridge (*A. graeca*) and several other species of *Perdix* retain the outer primaries and also keep the outer two pairs of greater coverts until their second autumn.

In contrast to Bent's (1932) and Witherby's (1941) statements that the outer two primaries of Ring-necked Pheasants (*Phasianus colchicus*) are more pointed than adult remiges and are kept through the first year, the American and Asiatic specimens examined had replaced all flight feathers and wing coverts at the post-juvenal molt. (A complete post-juvenal molt of the flight feathers in the Ring-necked Pheasant was also found by technicians of the Michigan Department of Conservation (personal letter). This was also true of the Reeves's Pheasant (*Syrnaticus reevesii*). Friedmann (1930) determined the post-juvenal molt of *Francolinus sephaena* from East Africa to be complete.

FAMILY NUMIDIDAE.—As was previously determined by Friedmann (1930), the guinea fowl (*Numida meleagris*) in Africa undergoes a complete post-juvenal molt. Specimens of this species naturalized in Haiti, however, apparently retain the worn outer two pairs of primaries and coverts until, at least, the April following hatching.

FAMILY MELEAGRIDIDAE.—The pointed and darkened tips of the outer two primaries of first year turkeys (*Meleagris gallopavo*) are distinctive. In the Florida subspecies (*M. g. osceola*), however, there seems to be a tendency to retain only the outermost primary. Normally, the greater coverts of the retained primaries are replaced at the post-juvenal molt but in an occasional young specimen they are kept. A few undated specimens of the Ocellated Turkey (*Agriocharis ocellata*) of tropical America showed indications of a typical *Meleagris* molt but complete material was lacking.

FAMILY OPISTHOCOMIDAE.—No data.

In conclusion, the author wishes to thank Dr. Alexander Wetmore of the Smithsonian Institution for reviewing the manuscript and offering several valuable suggestions. Doctors Herbert Friedmann and John W. Aldrich were so kind as to permit him to study the collections at the U. S. National Museum under their care.

SUMMARY

In native and naturalized American gallinaceous game birds, it was found that, during the first winter, native quails retain the two outer juvenal primaries and the entire series of greater primary coverts; turkeys keep their distal primaries but no coverts. All grouse and the introduced Hungarian and Chukar partridges retain the outer two flight feathers of the wing and their coverts, but the imported Ring-necked Pheasant sheds and replaces all primaries and all coverts. It was particularly noted that the pheasants and European quails, which have been placed in the same subfamily in recent revisions of the Galliformes, undergo radically different types of post-juvenal molts. Limited notes on the post-juvenal molt in other Galliformes are given and variation in the outermost greater primary covert is described.

LITERATURE CITED

AMERICAN ORNITHOLOGISTS' UNION

1931. Check-List of North American birds, ed. 4, 526 pp. (Lancaster, Pa.).

1944. Nineteenth supplement to the American Ornithologists' Union check-list of North American birds. *Auk*, 61 (3): 441-464.

BENT, ARTHUR CLEVELAND

1932. Life histories of North American gallinaceous birds. U. S. National Museum Bull. 162. xi + 490 pp., 93 pls.

BUREAU, LOUIS

1911. L'age des perdrix: I. La perdrix grise. Bull. Soc. Sci. Nat. Ouest France (Nantes) (ser. 3) 1 (1-2), 124 pp., 35 figs.

1913. L'age des perdrix: II. La perdrix rouge. Bull. Soc. Sci. Nat. Ouest France (Nantes) (ser. 3) 3 (2): 143 pp., 53 figs.

COMMITTEE OF INQUIRY ON GROUSE DISEASE

1911. The grouse in health and disease, 1: xxiii + 512 pp., 59 pls., 31 figs. (Smith, Elder and Co., London.)

FRIEDMANN, HERBERT

1930. Birds collected by the Childs Frick expedition to Ethiopia and Kenya Colony; part 1, non-passeres. U. S. Nat. Mus. Bull., 153: xiii + 516 pp., 12 pls., 22 figs.

PETERS, JAMES LEE

1934. Check-list of birds of the world, 2: xvii + 401 pp. (Harvard University Press, Cambridge, Massachusetts.)

PETRIDES, GEORGE A.

1942. Age determination in American Gallinaceous game birds. Trans. Seventh N. A. Wildlife Conf.: 308-328, fig. 4, tab. 1.

1943. Variation in the outermost greater primary covert as related to method of flight. *Auk*, 60 (2): 264-265.
- PORTAL, MAJOR M., AND COLLINGE, WALTER E.
1932. Partridge disease and its causes. Second rev. and enl. ed.: xl + 776 pp., 384 figs., 3 maps. (Gurney and Jackson, London.)
- VAN ROSSEM, ADRIAAN JOSEPH
1925. Flight feathers as age indicators in *Dendragapus*. *Ibis*, (ser. 12) 1 (2): 417-422.
- WETMORE, ALEXANDER
1940. A systematic classification for the birds of the world. *Smithsonian Misc. Coll.*, 99 (no. 7): 11 pp.
- WITHERBY, H. F.; JOURDAIN, F. C. R.; TICEHURST, N. F.; AND TUCKER, W. B.
1941. The handbook of British birds, 5: x + 356 pp., 22 pls. (Witherby, London)

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LAFRESNAYE¹

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Plates 10-11

NOËL-FRÉDÉRIC-ARMAND-ANDRÉ, BARON DE LA FRESNAYE, French ornithologist, was born on July 24, 1783, at the Château de La Fresnaye in Falaise, Département du Calvados, Normandie, France. He died in his ancestral home on July 14, 1861.

Frédéric de Lafresnaye, as he called himself, belonged to one of the most prominent and best families of France, which gave to Normandie historians and magistrates and to France military leaders and poets. He was a descendant of Jean, Vauquelin de La Fresnaye, celebrated French poet of the sixteenth century, presiding magistrate and Lieutenant Générale in the Baillage de Caen; and also of Nicolas, Sieur des Yveteaux, Lieutenant Générale at Caen, Preceptor to the Duc de Vendome (the son of Henri IV) and later to the Dauphin (Louis XIII). His father was André de La Fresnaye, Chevalier de Saint Louis, famous hippologist and author of historical works on Normandie and Falaise.

Born to fortune, Frédéric de Lafresnaye, like many another in his circumstances, might have lived a life of idleness and pleasure. From his earliest youth, however, he clearly showed higher aims in his pursuits. He had continually before him the good example of his distinguished father who gave much of his time to historical research.

¹ The following paper was prepared by the late author following extensive research on the subject, but the manuscript was mislaid after his death (1936) and has only recently been found and submitted for publication.—Ed.