BULLETIN

OF THE

FLORIDA STATE MUSEUM

BIOLOGICAL SCIENCES

Volume 15 Number 4

CATALOGUE OF FOSSIL BIRDS: Part 4 (Columbiformes through Piciformes)

Pierce Brodkorb

UNIVERSITY OF FLORIDA
Gainesville
1971

Numbers of the BULLETIN OF THE FLORIDA STATE MUSEUM are published at irregular intervals. Volumes contain about 300 pages and are not necessarily completed in any one calendar year.

Communications concerning purchase or exchange of the publication and all manuscripts should be addressed to the Editor of the Bulletin, Florida State Museum, Museum Drive, University of Florida, Gainesville, Florida. 32601

Publication date: 14 April 1971 Price: $2.50

CATALOGUE OF FOSSIL BIRDS

Part 4 (Columbiformes through Piciformes)

PIERCE BRODKORB[1]

SYNOPSIS: The fourth installment of the Catalogue of Fossil Birds includes 11 orders and 36 families, from the sandgrouse through the woodpeckers in the Wetmorean system. The four parts now published have treated the fossil record of all but one of the orders of birds (Passeriformes). They cover 132 families (38 extinct and 94 living), 744 genera (404 paleogenera and 340 neogenera), and 1,522 species (898 paleospecies and 624 neospecies).

The following are proposed new taxa of fossil birds: family *Zygodactylidae* for *Zygodactylus* Ballmann in order Piciformes; subfamily *Apopempsidae* and genus *Apopempsis* for *Musophaga meini* Ballmann in family Musophagidae; genus *Eostrix* for *Protostrix mimica* Wetmore in family Protostrigidae.

Aegialornis leehnardti Gaillard is emended to *Aegialornis leenhardti*, as the specific name honors Prof. F. Leenhardt of the University of Toulouse.

In the linear sequence the Cuculiformes precede the Psittaciformes to bring the parrots next to the owls, with which they share many characteristics.

On grounds of priority the following subfamily names replace those in Peters' Check-List: *Ptilinopinae* (Selby, 1835) for *Treroninae* Gray, 1840; *Coccyginae* (Swainson, 1837) for *Phaenicophaeinae* (Gray, 1840); *Geococcyginae* (Reichenow, 1882) for *Neomorphinae* Shelley, 1891; *Atelornithinae* Bonaparte, 1854, for *Brachypteraciinae* Sharpe, 1892.

[1] The author is Professor of Biological Sciences and Zoology at the University of Florida, Gainesville, Manuscript received 1 April 1970 —Ed.

Brodkorb, Pierce. 1971. Catalogue of fossil birds, Part 4 (Columbiformes through Piciformes). Bull. Florida State Mus., vol. 15, no 4, pp. 163-266.

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[1] New subfamily.
[2] New genus.

Fig. 1. Some workers in avian paleontology, XV International Ornithological Congress, The Hague, 3 September 1970. Left to right: E. N. Kurotchkin, Moscow; Peter Ballmann, Bonn; C. J. O. Harrison, London; Joel Cracraft, Chicago; Pierce Brodkorb, Gainesville; Alexander Wetmore, Washington; James Fisher, London; Robert W. Storer, Ann Arbor; Allan R. Phillips, Mexico City. Photograph by Ralph S. Palmer.

[1] New genus.

[1] New family.

INTRODUCTION

The fourth installment of the Catalogue of Fossil Birds covers the doves through the woodpeckers in the Wetmorean system. It includes 11 orders, 36 families (4 extinct and 32 living), 146 genera (48 paleogenera and 98 neogenera), and 300 species (of which 141 are paleospecies and 159 are neospecies). Many of the groups treated are tree dwellers and many are inhabitants of the tropics. These two categories are poorly represented in the fossil record, especially in the Tertiary, so that unlike the case in preceding parts of the Catalogue, the neogenera and neospecies outnumber the paleogenera and paleospecies.

Avian paleontology lost two of its leaders in 1970. Loye Holmes Miller, the first student of the birds of the tar pits at Rancho La Brea, died at Davis, California, on 6 April 1970 in his ninety-sixth year. His 64 paleornithological papers include studies of numerous avifaunas and descriptions of 12 genera and 42 species new to science. James Fisher, author of numerous ornithological works, died at the age of 58 on 29 September 1970, following an automobile accident in London. He was interested in extinction rates, and his two papers in *The Fossil Record* summarize the adaptive radiation and fossil history of the families of birds. He was among the group of paleornithologists photographed at the XV International Ornithological Congress at The Hague. (Fig. 1).

Alexander Wetmore and Hildegarde Howard read the manuscript of this as well as earlier parts of the Catalogue, and I am grateful for their suggestions. Many other friends, whose aid was acknowledged previously, continued their kind cooperation. I must now also acknowledge my indebtedness to Sevil M. Aslanova, Krakow, Poland; Joel Cracraft, Chicago; Eugene Eisenmann, New York; J. Alan Feduccia, Dallas, Texas; Karl-Heinz Fischer, Berlin, German Democratic Republic; Norman L. Ford, Collegeville, Minnesota; Arthur H. Harris, El Paso, Texas; James A. Jensen, Provo, Utah; David W. Johnston, Gainesville; G. N. Kashin, Moscow, USSR; L. S. B. Leakey and Mary Leakey, Nairobi, Kenya; Erlend Martini, Frankfurt a. M., Germany; Paul O. McGrew, Laramie, Wyoming; Bertram G. Murray, Ithaca, New York; Storrs Olson, Baltimore, Maryland; Ralph S. Palmer, Albany, New York; Dennis R. Paulson, Seattle, Washington; Roger Tory Peterson, Old Lyme, Connecticut; James H. Quinn, Fayetteville, Arkansas; Amadeo M. Rea, Tucson, Arizona; Emil K. Urban, Addis Ababa, Ethiopia; Stuart L. Warter, Long Beach, California; John A. White, Pocatello, Idaho; H. E.

Wilkinson, Melbourne, Australia; Richard L. Wilson, San Diego, California.

Authors are urged to send copies of their papers on fossil birds and to call my attention to omissions from and corrections to the Catalogue.

Part 5 is in an advanced stage of preparation. It will conclude the series with the order Passeriformes, Aves Incertae Sedis, and names based on feather impressions, tracks, and egg shells.

ADDENDA TO PREVIOUS PARTS

Genera and species listed below supplement those given on pages 203-204 of Part 2, and on pages 108-112 of Part 3. Workers are requested to call other additions and corrections to my attention.

ADDENDA TO PART 1

Family † ELEUTHERORNITHIDAE Wetmore

Genus †*Saurornis* Fischer

Saurornis K.-H. Fischer, 1967, Ber. Deutsch. Ges. geol. Wiss., Abt. A (Geol. Paläont.), vol. 12, no. 5, p. 603 (type by monotypy and g.n., sp. n. convention *Saurornis matthesi* Fischer). Position tentative.

2. *Saurornis matthesi* Fischer

Saurornis matthesi K.-H. Fischer, 1967, Ber. deutsch. Ges. geol. Wiss., Abt. A, vol. 12, no. 5, p. 603, pl. 1 (type from Neumark-West, proximal half of right tarsometatarsus, no. Av. G. 1956/Saur. 1, Geiseltalmuseum, Halle).

LOWEST MIDDLE EOCENE (lowest lignite). GERMAN DEMOCRATIC REPUBLIC: Saxony: Neumark-West.

Family STRUTHIONIDAE Vigors

Genus *Struthio* Linnaeus

7. *Struthio orlovi* Kurotchkin and Lungu

Struthio orlovi Kurotchkin and Lungu, 1970, Paleont. Zhurnal, no. 1, p. 119, text-figs. 1-2, pl. 7 (type from Varnitsa, distal half of right tibiotarsus, no. 6-3, Tiraspol State Pedagogical Institute).

UPPER MIOCENE (middle Sarmatian). MOLDAVIA: Vendersky province: Varnitsa.

Family PODICIPEDIDAE (Bonaparte)

Genus *Podiceps* Latham

8. *Podiceps discors* Murray

Podiceps discors Murray, 1967 (June 23), Condor, vol. 69, no. 3, p. 279, fig. 2 (type from Fox Canyon, left tarsometatarsus, Univ. Mich. Mus. Paleo. no. 29079).

UPPER PLIOCENE (Rexroad formation). KANSAS: Meade Co.: Fox Canyon, sec. 35, T. 34 S, R. 30 W (Murray, 1967).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls Co.: Hagerman Lake beds (Murray, 1967).

Genus *Podilymbus* Lesson

Podilymbus Lesson, 1831 (June 11), Traité d'Ornithologie, livr. 8, p. 595 (type by monotypy *Podilymbus carolinensis* Latham = *Colymbus podiceps* Linnaeus).

9. *Podilymbus majusculus* Murray

Podilymbus majusculus Murray, 1967 (June 23), Condor, vol. 69, no. 3, p. 283, fig. 2 (type from sec. 33, left tarsometatarsus, Univ. Mich. Mus. Paleo. no. 52470).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls Co.: Hagerman Lake beds, sec. 33, T. 7 S, R. 13 E (Murray, 1967). Owyhee Co.: Hagerman Lake beds, sec. 1, T. 6S, R. 8 E (Murray, 1967).

UPPER PLIOCENE: (Rexroad formation). KANSAS: Meade Co.: Wendell Fox pasture (Murray, 1967).

Genus *Aechmophorus* Coues

Aechmophorus Coues, 1862 (Aug. 1), Proc. Acad. Nat. Sci. Philadelphia, vol. 14, no. 5, p. 229 (type by original designation *Podiceps occidentalis* Lawrence).

10. *Aechmophorus elasson* Murray

Aechmophorus elasson Murray, 1967 (June 23), Condor, vol. 69, no. 3, p. 282, fig. 1, (type from sec. 20, distal part of left humerus and associated left ulna, Univ. Mich. Mus. Paleo. no. 45316).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls County: Hagerman Lake beds, sec. 20, T. 7S, R. 13 E.

Genus †*Pliolymbus* Murray

Pliolymbus Murray, 1967 (June 23), Condor, vol. 69, no. 3, p. 278 (type by original designation *Pliolymbus baryosteus* Murray).

11. *Pliolymbus baryosteus* Murray

Pliolymbus baryosteus Murray, 1967 (June 23), Condor, vol. 69, no. 3, p. 279, fig. 1 (type from Fox Canyon, anterior part of sternum, Univ. Mich. Mus. Paleo. no. 51839).

UPPER PLIOCENE (Rexroad formation). KANSAS: Meade Co.: Fox Canyon, sec. 35, T. 34 S, R. 30 W.

UPPER PLIOCENE? (Chapala formation). JALISCO: 1.3 miles north of Chapala (Howard, 1969, Los Angeles Co. Mus. Contr. Sci., no. 172, p. 2).

Family DIOMEDEIDAE (Gray)

Genus *Diomedea* Linnaeus

6. *Diomedea thryidata* Wilkinson

Diomedea thyridata Wilkinson, 1969, Mem. Natn. Mus. Victoria, vol. 29, no. 4, p. 42, pl. 3, fig. 2, pl. 4, figs. 2, 5 (type from Beaumaris, rostrum, Natn. Mus. Victoria no. P24172).

UPPERMOST MIOCENE (Black Rock Sandstone, Cheltenhamian stage). AUSTRALIA: Victoria: Beaumaris.

Family PROCELLARIIDAE (Boie)

Genus *Puffinus* Brisson

15. *Puffinus calhouni* Howard

Puffinus calhouni Howard, 1968 (June 14), Contributions in Science, no. 142, p. 6, fig. A-E (type from Leisure World, distal end of right humerus, Los Angeles Co. Mus. no. 17508).

UPPER MIOCENE (marine bed). CALIFORNIA: Orange County: Leisure World in Laguna Hills.

Genus *Fulmarus* Stephens

Fulmarus Stephens, 1826 (Feb. 18), in Shaw, General Zoology, pt. 1, p. 233 (type by designation of Gray, 1855, *Procellaria glacialis* Linnaeus).

16. *Fulmarus hammeri* Howard

Fulmarus hammeri Howard, 1968 (June 14), Contr. Sci., no. 142, p. 9, fig. 2 F

(type from Leisure World, proximal end of left carpometacarpus, Los Angeles Co. Mus. no. 18262).

UPPER MIOCENE (marine bed). CALIFORNIA: Orange County: Leisure World in Laguna Hills.

Family PHALACROCORACIDAE (Bonaparte)

Subfamily †PLOTOPTERINAE[1] (Howard)

Plotopteridae Howard, 1969 (14 Feb.), Condor, vol. 71, no. 1, p. 69 (family; type *Plotopterum* Howard).

Genus †*Plotopterum* Howard

Plotopterum Howard, 1969 (14 Feb.), Condor, vol. 71, no. 1, p. 68 (type by original designation *Plotopterum joaquinesis* Howard).

1. *Plotopterum joaquinensis* Howard

Plotopterum joaquinensis Howard, 1969 (14 Feb.), Condor, vol. 71, no. 1, p. 68, fig. 1 (type from Pyramid Hill, upper end of left coracoid, Los Angeles County Museum no. 8927).

LOWER MIOCENE (Pyramid Hill sands). CALIFORNIA: Kern County: Pyramid Hill, in center of SE ¼ of Section 15, Township 28 South, Range 29 East. L A C M locality 1626).

Family † PSEUDODONTORNITHIDAE Lambrecht

Genus †*Pseudodontornis* Lambrecht

3. *Pseudodontornis stirtoni* Howard and Warter

Pseudodontornis stirtoni Howard and Warter, 1969 (May), Rec. Canterbury Mus., vol. 8, no. 4, p. 348 (type from Motunau Beach, incomplete skull and jaws, Canterbury Mus. no. AV 20, 569; referred femur).

UPPER PLIOCENE (Greta siltstone, Waitotaran stage). NEW ZEALAND: South Island: Motunau Beach, 36 miles north of Christchurch.

Family †TELMABATIDAE Howard

Genus †*Telmabates* Howard

[1] New rank.

2. *Telmabates howardae* Cracraft

Telmabates howardae Cracraft, 1970 (28 Oct.), Condor, vol. 72, no. 4, p. 479, fig. 1 (type from Cañadon Hondo, distal part of right tibiotarsus, Amer. Mus. Nat. Hist. no. 3189).

LOWER EOCENE (Casamayor formation). ARGENTINA: Chubut: Cañadón Hondo, south of Río Chico del Chubut.

Family ARDEIDAE Vigors

Genus *Ardea* Linnaeus

18. *Ardea piveteaui* Brunet

Ardea piveteaui Brunet, 1970, Ann. Paléontologie, Vertébrés, vol. 56, fasc. 1, p. 16, pl. A (type from Paris, abraded right ulna lacking both ends and distal tip of right radius, Paris Mus. no. 1951-1).

UPPER EOCENE (Montmartre gypsum). FRANCE: Paris.

ADDENDA TO PART 2

Family ANATIDAE Vigors

Subfamily CYGNINAE Vigors

Genus †*Cygnopterus* Lambrecht

94. *Cynopterus lambrechti* Kurotchkin

Cygnopterus lambrechti Kurotchkin, 1968, Paleont. Zhurnal, Akad. Nauk SSR, no. 1, p. 93, fig. 1 (type from Kur-Sai ravine, distal end of left humerus, Paleont. Inst. Akad. Nauk SSR No. 1399-123).

MIDDLE OLIGOCENE (*Indricotherium* beds). CENTRAL KAZAKSTAN: Lake Chelkar-Teniz province: Kur-Sai ravine.

Genus †*Cygnavus* Lambrecht

95. *Cygnavus formosus* Kurotchkin

Cygnavus formosus Kurotchkin, 1968, Paleont. Zhurnal, Akad. Nauk SSR, no. 1,

p. 95, fig. 2, (type from Zhongiz-Shoki, distal end of right tibiotarsus, Paleont. Inst. Akad. Nauk SSR no. 2432-36).

LOWER OLIGOCENE (Aksirkaya beds). WESTERN KAZAKSTAN: southwest Zaisan ravine: west volcano of Zhongiz-Shoki.

Genus †*Guguschia* Aslanova and Burchak-Abramovich

Guguschia Aslanova and Burchak-Abramovich, 1968 (30 July), Acta Zoologica Cracoviensia, vol. 13, no. 14, p. 326 (type by monotypy *Guguschia nailiae* Aslanova and Burchak-Abramovich).

96. *Guguschia nailiae* Aslanova and Burchak-Abramovich

Guguschia nailiae Aslanova and Burchak-Abramovich, 1968 (30 July), Acta Zoologica Cracoviensia, vol. 13, no. 14, p. 326, text fig. 1; pl. 11; pl. 12, fig. B; pl. 13-14 (type from Perekishkyul, associated left humerus, radius, ulna, coracoid, and proximal part of scapula, G. Zardabi Museum of Natural History, Azerbaijan University, Baku).

MIDDLE OLIGOCENE (Riki horizon of Maykopian clays). AZERBAIJAN: River Sumgait, near village of Perekishkyul, northwest part of Apsheron peninsula.

Subfamily ANSERINAE Vigors

Genus *Anser* Brisson

97. *Anser udabnensis* Burchak-Abramovich

Anser udabnensis Burchak-Abramovich, 1957, Doklady Akad. Nauk Azerbaijan SSR, vol. 12, no. 6, p. 655 (type from Naylis-Mtsameli, proximal end of right ulna, Georgian Museum, Tiflis).

LOWER PLIOCENE (*Hipparion* fauna). EASTERN GEORGIA: Natlis-Mtsameli, near Udabno.

Genus †*Heterochen* Short

Heterochen Short, 1970 (July 3), Auk, vol. 87, no. 3, p. 537 (type by original designation *Heterochen pratensis* Short).

98. *Heterochen pratensis* Short

Heterochen pratensis Short, 1970 (July 3), Auk, vol. 87, no. 3, p. 538, figs. 1-2

(type from Devil's Gulch, left tarsometatarsus, Univ. Nebraska State Mus. no. 5781).

LOWER PLIOCENE (Valentine formation). NEBRASKA: Brown County: Devil's Gulch, 11 miles N and 2 miles E of Ainsworth.

Subfamily TADORNINAE Reichenbach

Genus †*Anabernicula* Ross

99. *Anabernicula robusta* Short

Anabernicula robusta Short, 1970, (30 April), Condor, vol. 72, no. 2, p. 147, figs. 1-2 (type from Rushville quarries, right humerus, Univ. Nebr. State Mus. no. 5769).

MIDDLE PLEISTOCENE (Sappa formation, Yarmouthian). NEBRASKA: Sheridan County: Rushville quarries, 14 mi. S, 2 mi. W of Rushville).

UnderNeospecies of Anatidae, no. 61, *Aythya marila* (Linnaeus), add:

AZERBAIJAN: Binagady (*Aythya marila asphaltica* Serebrovsky, Dec. 20, 1941, Doklady Akad. Nauk SSR, vol. 33, no. 7-8, p. 471; type cranium, Azerbaijan Akad. Sci., no. 281).

Family VULTURIDAE (Illiger)

12a. *Coragyps occidentalis mexicanus* Howard

Coragyps occidentalis mexicanus Howard, 1968 (July), Papers Archaeolog. Soc. New Mexico, no. 1, p. 124 (type from San Josecito Cave, left tarsometatarsus, Los Angeles Co. Mus. no. 20455).

UPPER PLEISTOCENE (cave deposit). MEXICO: Nuevo León: San Josecito Cave, Aramberri.

Family ACCIPITRIDAE (Vieillot)

Subfamily BUTEONINAE (Vigors)

Genus *Buteo* Lacépède

64. *Buteo circoides* Kurotchkin

Buteo circoides Kurotchkin, 1968, Ornitologiya, vol. 9, p. 323, fig. 1 (type from Tatal-Gol, distal part of right ulna, Paleont, Inst. Akad. Nauk SSR no. 475-1785).

MIDDLE OLIGOCENE. MONGOLIA: western Gobi: near Lake Tsagan-Nor: Tatal-Gol, 50 km. N of Baga-Bogdo.

65. *Buteo pusillus* Ballmann

Buteo pusillus Ballmann, 1968 (June), Geobios, no. 2, p. 173, pl. 13, figs. 1-4 (type from Grive-St.-Alban, proximal portion of right carpometacarpus, P. Mein no. 117).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

Genus *Aquila* Brisson

66. *Aquila borrasi* Arredondo

Aquila borrasi Arredondo, 1970 ("Jan.;" mailed Oct. 10), Ciencias Biologicas Univ. Habana, no. 8, p. 3, figs. 1,3-5,7,9-10 (type from Cueva del Túnel, left tarsometatarsus, Dept. Paleo. Univ. Havana no. D. P. U. H. no. 1250); paratype femur, and 2 ungues, Mus. Comp. Zool., Harvard).

UPPER PLEISTOCENE (cave deposit). CUBA: Prov. La Habana: Cueva del Túnel, La Salud; Cueva de Paredones, San Antonio de los Baños (paratypes).

Subfamily CIRCINAE Bonaparte

Genus †*Venerator* Kurotchkin

Tutor Kurotchkin, 1968, Ornitologiya, vol. 9, p. 324 (type by original designation *Tutor dementievi* Kurotchkin; preoccupied by *Tutor* Goldfuss, 1820).
Venerator Kurotchkin, 1969, Paleont. Zhurnal, Akad. Nauk SSSR, no. 12, p. 122 (new name for *Tutor* Kurotchkin).

67. *Venerator dementievi* (Kurotchkin)

Tutor dementievi Kurotchkin, 1968, Ornitologiya, vol. 9, p. 325, fig. 2 (type from Tatal-Gol, distal part of right humerus, Paleont. Inst. Akad. Nauk SSR no. 475-1783).

MIDDLE OLIGOCENE. MONGOLIA: western Gobi near Lake Tsagan-Ivor: Tatal-Gol (50 km north of Baga-Bogdo).

Subfamily ACCIPITRINAE (Vieillot)

Genus † *Gobihierax* Kurotchkin

Gobihierax Kurotchkin, 1968, Ornitologiya, vol. 9, p. 326 (type by original designation *Gobihierax edax* Kurotchkin).

68. *Gobihierax edax* Kurotchkin

Gobihierax edax Kurotchkin, 1968, Ornitologiya, vol. 9, p. 326, fig. 3 (type from Tatal-Gol, distal end of right humerus, Paleont, Inst. Akad. Nauk SSR no. 475-1784).

MIDDLE OLIGOCENE. MONGOLIA: western Gobi: near Lake Tsagan-Nor: Tatal-Gol (50 km north of Baga-Bogdo).

Family CRACIDAE Vigors

Genus *Ortalis* Merrem

Ortalida (accusative case of *Ortalis)* Merrem, 1786, Avium rariarum et minus cognitarum Icones et Descriptiones, fasc. 2, p. 40 (type *Phasianus motmot* Linnaeus, Recent).

28. *Ortalis affinis* Feduccia and Wilson

Ortalis affinis Feduccia and Richard L. Wilson, 1967 (Dec. 15), Occ. Papers Mus. Zool. Univ. Michigan, no. 655, p. 2, fig. 1 (type from section 22, right carpometacarpus, Univ. Mich. Mus. Paleo. no. V 55784).

LOWER PLIOCENE (Ogallala formation). KANSAS: Trego County: Ogallah, 1¾ miles W and 6½ miles N, in section 22, range 22 W, Township 11 S.

Family PHASIANIDAE Vigors

Subfamily PHASIANINAE (Vigors)

Genus †*Palaeortyx* Milne-Edwards

57a. *Palaeortyx phasianoides grivensis* Ballmann

Palaeortyx phasianoides grivensis Ballmann, 1969 (June), Geobios, no. 2, p. 178, pl. 15, figs. 4-7 (type from Grive-St.-Alban, fissure L 7, left humerus, coll. P. Mein no. 29; referred tarsometatarsi, tibiotarsi, femora, coracoids, ulnae, sternum, scapulae, carpometacarpi).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

Subfamily TETRAONINAE (Vigors)

Genus *Dendragapus* Elliot

44a. *Dendragapus gilli milleri* Jehl

Dendragapus gilli milleri Jehl, 1969 (12 Feb.), Trans. San Diego Soc. Nat. Hist., vol. 15, no. 12, p. 173, fig. 2 (type from Samwel Cave, left carpometacarpus, Univ. Calif. Mus. Paleo. no. 82977).

UPPER PLEISTOCENE (cave deposit). CALIFORNIA: Shasta County: Samwel Cave.

Subfamily MELEAGRIDINAE (Gray)

Genus †*Proagriocharis* Martin and Tate

Proagriocharis Martin and Tate, 1970 (5 June), Wilson Bull., vol. 82, no. 2, p. 214 (type by original designation *Proagriocharis kimballensis* Martin and Tate).

60. *Proagriocharis kimballensis* Martin and Tate

Proagriocharis kimballensis Martin and Tate, 1970 (5 June), Wilson Bull., vol. 82, no. 2, p. 215, fig. 1 (type from south of Lime Creek, left coracoid, Univ. Nebraska State Mus. no. 20033; referred tarsometatarsi).

UPPER PLIOCENE (lower part of Kimball formation). NEBRASKA: Frontier County: south of Lime Creek, in E ½, E ½, SW ¼, section 15, Township 5 N, Range 26 W.

ADDENDA TO PART 3

Family RALLIDAE Vigors

Subfamily RALLINAE (Vigors)

Genus †*Pararallus* Lambrecht

57. *Pararallus hassenkampi* Martini

Pararallus hassenkampi Martini, 1967 (Feb.), Neues Jahrbuch für Geologie und

Paläontologie Abhandlungen, vol. 127, no. 3, p. 289 (type from Sieblos, articulated distal end of left tarsometatarsus and proximal phalanges of four toes, Geol. Paläont. Inst. Univ. Würzburg no. F 1238 and counterpart, no. F 1237; nomen nudem in Martini, 1 Jan, 1967, Natur und Museum, vol. 97, no. 1, p. 8, Schriften).

LOWER OLIGOCENE (Sieblos dysodile). GERMANY: Hessen: Sieblos an der Wasserkuppe/Rhön.

Genus †*Limicorallus* Kurotchkin

Limicorallus Kurotchkin, 1968, Paleont. Zhurnal, Akad. Nauk SSR, no. 1 p. 98 (type by original designation *Limicorallus saiensis* Kurotchkin).

58. *Limicorallus saiensis* Kurotchkin

Limicorallus saiensis Kurotchkin, 1968, Paleont. Zhurnal, Akad. Nauk SSR, no. 1, p. 99, fig. 4 (type from Min-Sai, distal end of left humerus, Paleont. Inst. Akad. Nauk SSR no. 1442-262).

MIDDLE OLIGOCENE (*Indricotherium* beds). CENTRAL KAZAKSTAN: Lake Chelkar-Teniz Province: Myn-Sai ravine.

59. *Palaeorallus alienus* Kurotchkin

Palaeorallus alienus Kurotchkin, 1968, Ornitologiya, vol. 9, p. 329 (type from Tatal-Gol, distal end of left tibiotarsus, Paleont. Inst. Akad. Nauk SSR, no. 475-1786).

MIDDLE OLIGOCENE. MONGOLIA: western Gobi: near Lake Tsagan-Nor; Tatal-Gol, 50 km north of Baga-Bogdo.

Genus *Gallirallus* Lafresnaye

60. *Gallirallus hartreei* Scarlett

Gallirallus hartreei Scarlett, 1970 (March), Notornis, vol. 17, no. 1, p. 70, pl. 2-3 (holotype from Tewaka No. 1 cave, right and left femur, left tibiotarsus, right tarsometatarsus, right and left humeri, Canterbury Mus. no. AV 18,475).

QUATERNARY (cave deposits, below Hatepe lapilli of 1900 ± 50 b.p. and below Waimihia lapilli of 3430 ± 50 b.p.). NEW ZEALAND: North Island: Te Waka No. 1 cave, 12 miles north of Patoka.

Genus *Porzana* Vieillot

61. *Porzana avita* (Feduccia)

Coturnicops avita Feduccia, 1968 (July 15), Auk, vol. 85, no. 3, p. 447, fig. 3 (type from section 5, distal part of right tibiotarsus, Univ. Mich. Mus. Paleo. no. V52530).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls County: Hagerman Lake beds in NW ¼, section 5, T. 8 S, R. 13 E.

62. *Porzana insignis* (Feduccia)

Laterallus insignis Feduccia, 1968 (July 15), Auk, vol. 85, no. 3, p. 447, fig 3 (type from Wendell Fox pasture, distal part of right tibiotarsus, Univ. Mich. Mus. Paleo. no. v 45423).

UPPER PLIOCENE (Rexroad formation). KANSAS: Meade Co.: Wendell Fox pasture, south side of Shorts Creek, in SW ¼, sec. 33, T. 33, R. 29 W.

Subfamily GALLINULINAE Gray

Genus †*Megagallinula* Kurotchkin

Megagallinula Kurotchkin, 1968, Paleont. Zhurnal, Akad. Nauk SSR, vol. 1, p. 96 (type by original designation *Megagallinula harundinea* Kurotchkin).

63. *Megagallinula harundinea* Kurotchkin

Megagallinula harundinea Kurotchkink 1968, Paleont. Zhurnal, Akad. Nauk SSR, no. 1, p. 97, fig. 3 (type from Kur-Sai, proximal half of left ulna, Paleont. Inst. Akad. Nauk SSR no. 1399-122).

MIDDLE OLIGOCENE (Indricotherium beds). CENTRAL KAZAKSTAN: Lake Chelkar-Teniz Province: Kur-Sai ravine.

Subfamily FULICINAE (Nitzach)

64. *Fulica stekelesi* Tchernov

Fulica stekelesi Tchernov, 1968, Preliminary investigation of the birds in the Pleistocene deposits of 'Ubeidiya, Israel Acad. Sci. and Humanities, p. 11, text fig. 1, pl. 1, figs. 9-10 (type from layer 11-23, 'Ubeidiya, hypocleidium, no. 'U.2(b).

MIDDLE PLEISTOCENE (Red Layer, 11-23, of 'Ubeidiya formation). ISRAEL: southwestern bank of Sea of Galilee: 'Ubeidiya.

Family GRUIDAE Vigors

Subfamily BALAEARICINAE (W. L. Sclater)

Genus †*Paragrus* Lambrecht

25. *Paragrus shufeldti* Cracraft

Paragrus shufeldti Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no. 2388, p. 9, figs. 3-5 (type from Elk Creek, distal end of right tibiotarsus, Amherst College Mus. no. 6619).

LOWER EOCENE (Willwood formation). WYOMING: Bighorn County: head of Elk Creek, 10 miles west of Otto; Bone Hill.

Subfamily GERANOIDINAE (Wetmore)

Genus †*Eogeranoides* Cracraft

Eogeranoides Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no. 2388, p. 14, (type by original designation *Eogeranoides* Cracraft).

26. *Eogeranoides campivagus* Cracraft

Eogeranoides campivagus Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no. 2388, p. 14, fig. 6, (type from Foster Gulch, distal ends of right and left tibiotarsi and "distal" (proximal) ends of right and left tarsometatarsi, Princeton Univ. no. 16179).

LOWER EOCENE (Willwood formation). WYOMING: Big Horn County: Foster Gulch, south of Lovell.

Genus †*Palaeophasianus* Shufeldt

27. *Palaeophasianus meleagroides* Shufeldt

Transferred from family Cracidae. After restudy of the type Cracraft (1968, Wilson Bull., vol. 80, no. 3, p. 281, fig. 1) referred it to the Aramidae. A little later he transferred it to the Geranoididae, stated that the specimen from Henry's Fork was unidentifiable, and recorded additional material from Five Mile Creek, Bighorn County, Wyoming (Cracraft, 1969, op. cit., p. 16, figs. 7-8).

28. *Palaeophasianus incompletus* Cracraft

Palaeophasianus incompletus Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no.

2388, p. 21, fig. 9 (type from Dorsey Creek, distal end of right tarsometatarsus, Princeton Univ. no. 19913).

LOWER EOCENE (Willwood formation). WYOMING: Bighorn County: Dorsey Creek, on Wardell's Ranch, 6 miles south of Otto, 12 miles southwest of Basin.

Genus †*Geranodornis* Cracraft

Geranodornis Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no. 2388, p. 24 (type by original designation *Geranodornis aenigma*). Position tentative.

29. *Geranodornis aenigma* Cracraft

Geranodornis aenigma Cracraft, 1969 (Aug. 27), Amer. Mus. Novitates, no. 2388, p. 24, fig. 10 (type from Church Buttes, distal end of right tibiotarsus, Amer. Mus. Nat. Hist. no. 2628).

MIDDLE EOCENE (Bridger formation). WYOMING: Uinta County: Church Buttes.

Family CARIAMIDAE Bonaparte

Subfamily † BATHORNITHINAE Wetmore

Genus † *Paracrax* Brodkorb

14. *Paracrax wetmorei* Cracraft

Paracrax wetmorei Cracraft, 1968 (June 21), Amer. Mus. Novitates, no. 2326, p. no. 11, figs. 3-10 (type from northeast of Indian Stronghold, right humerus, Frick Coll., Amer. Mus. Nat. Hist. no. 42998).

UPPER OLIGOCENE (Poleside member, Brule formation). SOUTH DAKOTA: Washington Co.: northeast of Indian Stronghold on divide between West Big Corral Draw and Cottonwood Creek.

15. *Paracrax gigantea* Cracraft

Paracrax gigantea Cracraft, 1968 (June 21), Amer. Mus. Novitates, no. 2326, p. 24, figs. 11-12 (type from Cedar Pass, distal end of right humerus, Frick Coll., Amer. Mus. Nat. Hist. no. 42999).

UPPER OLIGOCENE (Poleside member, Brule formation). SOUTH DAKOTA: Jackson Co.: 2 miles N of E of Cedar Pass.

16. *Bathornis fricki* Cracraft

Bathornis fricki Cracraft, 1968 (June 21), Amer. Mus. Novitates, no. 2326, p. 7, figs. 1-2 (type from Willow Creek, right tibiotarsus, Amer. Mus. Nat. Hist. no. 2100).

LOWER MIOCENE (Gering equivalent). WYOMING: Converse Co.: Willow Creek, near Lusk.

Family SCOLOPACIDAE Vigors

Subfamily SCOLOPACINAE (Vigors)

Genus *Tringa* Linnaeus

Tringa Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 148 (type by tautonomy *Tringa ocrophus* Linnaeus, Recent).

38. *Tringa antiqua* Feduccia

Tringa antiqua Feduccia, 1970 (Sept.), Jour. Grad. Research Center, Southern Methodist Univ., vol. 38, no. 3-4, p. 58, fig. 1 (type from XI Ranch, left humerus, Univ. Michigan Mus. Paleo. no. V 25800).

UPPER PLIOCENE (Saw Rock Canyon local fauna, Rexroad formation). KANSAS: Seward County: Saw Rock Canyon, XI Ranch.

Family ALCIDAE Vigors

Subfamily ALCINAE (Vigors)

Genus *Aethia* Merrem

Aethia Merrem, 1788, Versuch eines Grundrisses zur allgemeinen Geschichte und natürlichen Eintheilung der Vögel, vol. 1, pp. 7, 13, 20 (type by monotypy *Alca cristatella Pallas*).

15. *Aethia rossmoori* Howard

Aethia rossmoori Howard, 1968 (June 14), Contr. Sci., no. 142, p. 16 figs. 2 I-J (type from Leisure World, right ulna, Los Angeles Co. Mus. no. 18948).

UPPER MIOCENE (marine bed). CALIFORNIA: Orange County: Leisure World in Laguna Hills.

Subfamily † MANCALLINAE (L. Miller)

16. *Mancalla milleri* Howard

Mancalla milleri Howard, 1970 (Nov. 24), Contr. Sci., no. 203, p. 7, fig. 1 A-C (type from San Diego, left femur, Los Angeles Co. Mus. no. 2185; paratype left humerus).

MIDDLE PLIOCENE (San Diego formation). CALIFORNIA: San Diego County: San Diego.

Genus † *Alcodes Howard*

Alcodes Howard, 1968 (June 14), Contr. Sci., no. 142, p. 16 (type by original designation *Alcodes ulnulus* Howard).

17. *Alcodes ulnulus* Howard

Alcodes ulnulus Howard, 1968 (June 14), Contr. Sci., no. 142, p. 16, fig. 2 G-H, L (type from Leisure World, left ulna, Los Angeles Co. Mus. no. 18277).

UPPER MIOCENE (marine bed). CALIFORNIA: Orange County: Leisure World in Laguna Hills.

Order COLUMBIFORMES (Latham)

Columbae Latham, 1790, Index Ornithologicus, vol. 2, p. 604 (order; type *Columba* Linnaeus).—*Columbiformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (subordo).

Didi Bonaparte, 1857, Rev. et Mag. Zool., no. 2, p. 15 ("tribus," i.e., suborder; type *Didus* Linnaeus).—*Didi* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 70 (suborder).

Pteroclae Boucard, 1876, Catalogus Avium, pp. viii, x, 25 (ordo; type *Pterocles* Temminck).—*Pterocletes* Sclater, 1880, Ibis, ser. 4, no. 15, pp. 407, 410 (order).—*Pterocletes* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 69 (suborder).—*Ptéroclidiformes* Berlioz, 1950, in Grassé, Traité de Zoologie, vol. 15 (Oiseaux), p. 919 (sous-ordre).

Geophapes Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 69 (suborder; type *Geophaps*).

Raphi Ridgway, 1916 (May 5), Bull. U.S. Nat. Mus., no. 50, pt. 7, p. 277 (suborder; type *Raphus* Brisson).

Suborder PTEROCLETES (Boucard)

Pteroclae Boucard, 1876.

Family PTEROCLIDAE Bonaparte

Pteroclidae Bonaparte, 1831, Saggio di una distribuzione metodica degli animali vertebrati, p. 53 (familia; type *Pterocles* Temminck).—*Pteroclinae* Bonaparte, op. cit., p. 53 (subfamilia).

Syrrhaptinae Bonaparte, 1831, Saggio di una distribuzione metodica degli animali vertebrati, p. 53 (subfamilia; type *Syrrhaptes* Illiger).

Genus *Pterocles* Temminck

Pterocles Temminck, 1815, Hist. Nat. Gen. pigeons et gallinacés, vol. 3, pp. 238, 712 (type *Tetrao alchata* Linnaeus).

1. *Pterocles validus* Milne-Edwards

Pterocles validus Milne-Edwards, 1892, C.R. 2. Congrès internat. ornith. Budapest, p. 70 (type from plateau du Quercy, tarsometatarsus, Paris Mus.).

Pterocles varius Paris, 1912, Rev. Franç. d'Orn., vol. 4, no. 37, p. 296 (lapsus).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Mouillac.

2. *Pterocles larvatus* Milne-Edwards

Pterocles larvatus Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 71 (type from plateau du Quercy, coracoid, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: plateau du Quercy.

3. *Pterocles sepultus* Milne-Edwards

Pterocles sepultus Milne-Edwards, 1869, Ois. Foss. France, vol. 2, pl. 141, fig. 1-9; 1870, sheet 37, p. 294 (types from Allier, 2 tarsometatarsi, coll. Milne-Edwards).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Langy.

Neospecies of Pteroclidae from Pleistocene and *prehistoric sites:

1. *Syrrhaptes paradoxus* (Pallas). HUNGARY: Beremend? (Lambrecht, 1912, Aquila, vol. 19, p. 284); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. Ungar. Geol. Anst., vol. 23, p. 480). INNER MONGOLIA: Sjara-Osso-Gol (Bate, 1931, Geol. Surv. China, Paleo. Sinica, ser. C, vol. II, fasc. 4, p. 41).

2. *Pterocles arenarius* Pallas. AZERBAIJAN: Binagady (Burchak-Abramovich, "1963" [1962], Ornithologiya, vol. 4, p. 426).

Suborder COLUMBAE Latham

Columbae Latham, 1790.
Didi Bonaparte, 1857.
Geophapes Sharpe, 1891.
Raphi Ridgway, 1916.

Family COLUMBIDAE (Illiger)

Columbini Illiger, 1811, Prodromus systematis mammalium et avium, pp. 197, 235 (familia; type *Columba* Linnaeus).—*Columbidae* Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 480 (family)—*Columbinae* Bonaparte, 1831, Saggio di una distribuzione metodica degli Animali Vertebrati, p. 39 (subfamilia).—*Columbeae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 56 (series [below subfamily]).—*Columbae* Ridgway, 1916 (May 5), Bull. U. S. Nat. Mus., no. 50, pt. 7, p. 279 (series).—*Columbini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu).

Ptilonopinae Selby, 1835 (June), Natural History of Pigeons, p. 103 (subfamily; type *Ptilonopus* Swainson, 1837, a junior synonym of *Ptilinopus* Swainson, 1825).—*Ptilopodinae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Ptilopus* "Sw." i. e. Strickland,

1841, a junior synonym of *Ptilinopus* Swainson; preoccupied by *Ptilopus* Schönherr, 1826).—*Ptilopodeae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 54 (series).—*Ptilinopinae* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (subfamilia; type *Ptilinopus* Swainson).—*Ptilinopini* Verheyen, 1957 (Jan.), op. cit., p. 36 (tribu).

Peristerinae Selby, 1835 (June), Natural History of Pigeons, p. 103 (subfamily; type *Peristera* Swainson, 1827, a senior synonym of *Claravis* Oberholser, 1899; preoccupied by *Peristera* Rafinesque, 1815).—*Peristereae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 54 (series).—*Peristeridae* Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xv, 3, 372 (family).

Treroninae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 57 (subfamily; type *Treron* Vieillot).—*Treronidae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (familia).—*Treroneae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 54 (series).

Turturinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 58 (subfamily; type *Turtur* Selby, 1835, a senior synonym of *Streptopelia* Bonaparte, 1855; preoccupied by *Turtur* Boddaert, 1783).—*Turtureae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 57 (series).

Gourinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 58 (subfamily; type *Goura* Fleming, i.e. Stephens).—*Gouridae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (familia).—*Goureae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 59 (series).

Didunculinae G. R. Gray, 1848 (Dec.), Genera of Birds, vol. 2, p. 480 (subfamily; type *Didunculus* Peale).—*Didunculidae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (familia).—*Didunculeae* Bonaparte, Coup d'Oeil sur l'Ordre des Pigeons, p. 54 (series).

Carpophaginae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Carpophaga* Selby, 1835, a senior synonym of *Ducula* Hodgson, 1836; preoccupied by *Carpophaga* Billberg, 1828).—*Carpophageae* Bonaparte, 1855, op. cit., p. 55 (series).—*Carpophagidae* Elliot, *in* Stejneger, 1885, Standard Nat. Hist., vol. 4, p. 254 (family).

Lopholaiminae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Lopholaimus* Gray, 1841).—*Lopholoeminae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, pp. 50, 56 (subfamilia; type *Lopholoemus* "Gr[ay]").—*Lopholoemeae* Bonaparte, 1855, op. cit., p. 56 (series).

Zenaidinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Zenaida* Bonaparte).—*Zenaideae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 58 (series).—*Zenaidae* Ridgway, 1916 (May 5), Bull. U. S. Nat. Mus., no. 50, p. 281.

Phapinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Phaps* Selby).—*Phapeae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 59 (series).—*Phabinae* Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xv, 372, 500 (subfamily).—*Phabini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu).

Calaenadidae Bonaparte, 1853 (Séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (familia; type *Calaenas* Gray, 1845, a junior synonym of *Caloenas* Gray, 1840).—*Calaenadinae* Bonaparte, 1853, op. cit., p. 643 (subfamilia).—*Caloenadidae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 50 (familia).—*Caloenidae* Bonaparte, 1855, op. cit., p. 59 (familia).—*Caloeninae* Bona-

parte, 1855, op. cit., pp. 50, 59 (subfamilia).—*Caloeneae* Bonaparte, 1855, op. cit., p. 59 (series).—*Caloenatidae* Elliot, *in* Stejneger, Standard Nat. Hist., vol. 4, p. 243 (family).—*Caloenadinae* Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xvii, 373, 614 (subfamily).—*Caloenidinae* R. Martin, 1904, Zool. Jahrb., Abt. Syst. Geog. Biol. Thiere vol. 20, p. 338 (subfamily).—*Caloenididae* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, pp. 31, 36 (famille).

Alectraenadinae Bonaparte, 1853 (seance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (subfamilia; type *Alectroenas* Gray).—*Alectroeninae* Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, pp. 50, 55 (subfamilia).—*Alectroeneae* Bonaparte, 1855, op. cit., p. 55 (series).—*Alectroenini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (tribu).

Chrysoeneae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 55 (series; type *Chrysoena* Bonaparte).

Palumbeae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 56 (series; type *Palumbus* Kaup).

Macropygieae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 57 (series; type *Macropygia* Swainson).—*Macropygiinae* Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xiv, 240, 333 (subfamily).—*Macropygiini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu).

Starnoeneae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 58 (series; type *Starnoenas* Bonaparte).—*Starnoeninae* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (subfamille).

Chamaepeliae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 58 (series; type *Chamaepelia* Swainson, 1827, a junior synonym of *Columbigallina* Boie, 1826).

Chalcophapeae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 59 series; type *Chalcophaps* Gould).—*Chalcophabini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu).

Geopelieae Bonaparte, 1855, Coup d'Oeil sur l'Ordre des Pigeons, p. 59 (series; type *Geopelia* Swainson).—*Geopeliini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu).

Ectopistinae Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xiv, 240, 369 (subfamily; type *Ectopistes* Swainson).—*Ectopisteae* Ridgway, 1916 (May 5), Bull. U. S. Nat. Mus., no. 50, pt. 7, p. 279 (series).

Geotrygoninae Salvadori, 1893, Cat. Birds Brit. Mus., vol. 21, pp. xvi, 373, 537 (subfamily; type *Geotrygon* Gosse).

Megaloprepiinae Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (sous-famille; type *Megaloprepia* Reichenbach).

Duculidae Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (famille; type *Ducula* Hodgson).—*Duculinae* Verheyen, 1957, op. cit., p. 36 (sous-famille).—*Duculini* Verheyen, 1957, op. cit., p. 36 (tribu).

Hemiphagini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (tribu; type *Hemiphaga* Bonaparte).

Oenini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu; type *Oena* Swainson).

Claravisinae Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (sous-famille; type *Claravis* Oberholser).

Turturinae Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (sous-famille; type *Turtur* Boddaert, 1783; preoccupied as a family-group

name by *Turturinae* Gray, 1840, type *Turtur* Selby, 1835).—*Turturini* Verheyen, 1957, op. cit., p. 37 (tribu).

Ocyphabini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu; type *Ocyphaps* Gray).

Cosmopeliini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu; type *Cosmopelia* Sundevall).

Gallicolumbinae Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (sous-famille; type *Gallicolumba* Heck).—*Gallicolumbini* Verheyen, 1957, op. cit., p. 37 (tribu).

Geophabini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat Belgique, vol. 33, no. 3, p. 37 (tribu; type *Geophaps* Gray).

Leucosarcini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu; type *Leucosarcia* Gould).

Trugonini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (tribu; type *Trugon* Gray).

Otidiphabini Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 37 (sous-famille; type *Otidiphaps* Gould).

Subfamily COLUMBINAE (Illiger)

Columbini Illiger, 1811.
Peristerinae Selby, 1835.
Turturinae Gray, 1840.
Carpophaginae Bonaparte, 1853.
Zenaidinae Bonaparte, 1853.
Phapinae Bonaparte, 1853.
Calaenadidae Bonaparte, 1853.
Palumbeae Bonaparte, 1855.
Macropygieae Bonaparte, 1855.
Starnoeneae Bonaparte, 1855.
Chamaepeliae Bonaparte, 1855.
Chalcophapeae Bonaparte, 1855.
Geopelieae Bonaparte, 1855.
Ectopistinae Salvadori, 1893.
Geotrygoninae Salvadori, 1893.
Megaloprepiinae Verheyen, 1957.
Oenini Verheyen, 1957.
Claravisinae Verheyen, 1957.
Turturinae Verheyen, 1957 [nec Gray].
Ocyphabini Verheyen, 1957.
Cosmopeliini Verheyen, 1957.
Gallicolumbinae Verheyen, 1957.
Geophabini Verheyen, 1957.
Leucosarcini Verheyen, 1957.
Trugonini Verheyen, 1957.
Otidiphabini Verheyen, 1957.

Genus †*Gerandia* Lambrecht

Gerandia Lambrecht, 1933, Handb. Palaeorn., p. 602 (type by monotypy *Columba calcaria* Milne-Edwards).

1. *Gerandia calcaria* (Milne-Edwards)

Columba calcaria Milne-Edwards, 1869, Ois. Foss. France, vol. 2, pl. 141, fig. 10-14; 1870, sheet 37, p. 292 (type from between Saint-Gérand-le-Puy and Langy, left humerus, coll. Milne-Edwards).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: between Saint-Gérand-le-Puy and Langy.

Genus *Zenaidura* Bonaparte

Zenaidura Bonaparte, 1855 (séance du 15 Jan.), C. R. Acad. Sci. Paris, vol. 40, no. 3, p. 96 (type by original designation *Columba carolinensis* Linnaeus, Recent).

2. *Zenaidura prior* Brodkorb

Zenaidura prior Broadkorb, 1969 (25 July), Quart. Jour. Florida Acad. Sci., vol. 31, no. 3, p. 174, fig. 1 (type Rexroad locality 3, proximal part of left humerus, Univ. Kansas Mus. no. 3995).

UPPER PLIOCENE (Rexroad formation). KANSAS: Meade County: Rexroad, locality 3, in W ½, SW ¼, section 22, Township 33 S, Range 29 W.

Genus *Columba* Linnaeus

Columba Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 162 (type *Columba oenas* Linnaeus, Recent).

3. *Columba micula* (Wetmore)

Chloroenas micula Wetmore, 1924, Proc. U. S. Nat. Hist. Mus., vol. 64, art. 5, no. 2495, p. 13, fig. 8-9 (type from Curtis Ranch, distal end of right tarsometatarsus, U. S. Nat. Mus., no. 10549).

LOWER PLEISTOCENE (Curtis Ranch beds of San Pedro Valley formation). ARIZONA: Cochise Co.: Curtis Ranch, 12 miles southeast of Benson.

4. *Columba melitensis* Lydekker

Columba melitensis Lydekker, 1891, Cat. Foss. Birds Brit. Mus., p. 124, fig. 29 (type from Malta, left coracoid, Brit. Mus. no. A. 212).

MIDDLE PLEISTOCENE (cave deposits). MALTA.

Genus *Streptopelia* Bonaparte

Streptopelia Bonaparte, 1855, C. R. Acad. Sci. Paris, vol. 40, p. 17 (type *Columba risoria* Linnaeus, Recent).

5. *Streptopelia rodericana* (Milne-Edwards)

Columba rodericana Milne-Edwards, 1873, Bibl. École Hautes Études, sect. sci. nat., vol. 9, art. 3, p. 15, pl. 12, fig. 1 (type from Rodriquez, sternum).

QUATERNARY. RODRIGUEZ ISLAND.

Genus *Geotrygon* Gosse

Geotrygon Gosse, 1847, Birds Jamaica, p. 316 (type *Geotrygon sylvatica* Gosse = *Columbigallina versicolor* Lafresnaye, Recent).

6. *Geotrygon larva* (Wetmore)

Oreopeleia larva Wetmore, 1920 (Dec. 30), Proc. Biol. Soc. Washington, vol. 33, p. 79 (type from Cueva Clara, left tarsometatarsus, Amer. Mus. Nat. Hist. no. 4923).

QUATERNARY. PUERTO RICO: Cueva Clara near Morovís (Wetmore, 1920); Cueva Catedral near Morovís and Cueva Toraño near Utuado (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 315, figs. 16-18); kitchen middens near Mayaguez (Wetmore, 1956, Smithsonian Misc. Coll., vol. 131, no. 5, p. 82); kitchen middens near Ponce at Barrio Cañas (Wetmore, 1938, Auk, vol. 55, p. 54).

Genus *Leucosarcia* Gould

Leucosarcia Gould, 1843, Birds of Australia, vol. 5, pl. 63 (type by monotypy *Columba picata* Latham = *Columba melanoleuca* Latham, Recent).

7. *Leucosarcia proevisa* DeVis

Leucosarcia proevisa DeVis, 1906 (30 Sept. 1905), Ann. Queensland Mus., no. 6,

p. 8, pl. 1, fig. 5a (type from Wurdulumankula, proximal half of right humerus; Queensland Mus.).

UPPER PLEISTOCENE (Katipiri sands, Malkuni fauna). AUSTRALIA: South Australia: Wurdulumankula on Lake Eyre.

Subfamily GOURINAE Gray

Gourinae Gray, 1840.

†*Progoura* DeVis

Progoura DeVis, 1889, Proc. Roy. Soc. Queensland, vol. 6, p. 127 (type by monotypy *Progoura gallinacea* DeVis).

8. *Progoura gallinacea* DeVis

Progoura gallinacea DeVis, 1889, Proc. Roy. Soc. Queensland, vol. 6, p. 127 (type from Queensland).

UPPER PLEISTOCENE. AUSTRALIA: Queensland.

Subfamily PTILINOPINAE (Selby)

Ptilonopinae Selby, 1835.
Treroninae Gray, 1840.
Carpophaginae Bonaparte, 1853.
Lopholaiminae Bonaparte, 1853.
Alectraenadinae Bonaparte, 1853.
Chrysoeneae Bonaparte, 1855.
Duculidae Verheyen, 1957.
Hemiphagini Verheyen, 1957.

Genus †*Lithophaps* DeVis

Lithophaps DeVis, 1891, Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 6, p. 117 (type by monotypy *Lithophaps ulnaris* DeVis).

9. *Lithophaps ulnaris* DeVis

Lithophaps ulnaris DeVis, 1891, Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 6, p. 117 (type from Warwick, ulna, Queensland Mus.).

UPPER PLEISTOCENE (*Nototherium* beds). AUSTRALIA: Queensland: Warwick.

Neospecies of Columbidae from Pleistocene and °prehistoric sites:

Subfamily COLUMBINAE

1. *Columba livia* Gmelin. IRELAND: Edenvale Cave, Newhall Cave, and Ballintoy (Lambrecht, 1933, Handb. Palaeorn., p. 768). ENGLAND: Newport (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 124); Langwith Bassett Cave?, Chudleigh Cave, °Caerwent, and °Silchester (Lambrecht, 1933, Handb. Palaeorn., p. 768). PORTUGAL: Grotte de Furninha (Lambrecht, 1933, Handb. Palaeorn., p. 768). SPAIN: Caverna Santimamiñe, Casteldefels, and Bora gran d'en Carreras (Villalta, 1964, Speleon, p. 95). GIBRALTAR: Devil's Tower (Bate, 1928, Jour. Roy. Anthrop. Inst., vol. 58, p. 104); Forbes Quarry (Lambrecht, 1933, Handb. Palaeorn., p. 768). FRANCE: Neschers (Lydekker, 1891, Cat. Fossil Birds, Brit. Mus., p. 124); Aurignac (Lambrecht, 1933, Handb. Palaeorn., p. 768). MONACO: Grottes de Menton, Grotte de l'Observatoire, and Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 768). CORSICA: Toga (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 25). SARDINIA: Pietro Tampoia Cave on Tavolara Island (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 25, pl. 37, fig. 11; text-fig. 3). ITALY: Grotta dei Columbi (Regália, 1893, Arch. Anthrop. Etnol., vol. 23, p. 262); Caverne delle Arene candide Caverna d'Equi, Grotta Romanelli, Bucca del Bersagliere, and Grotta Zachita (Lambrecht, 1933, Handb. Palaeorn., p. 768). SWITZERLAND: Schweizersbild bei Schaffhausen (Lambrecht, 1933, Handb. Palaeorn., p. 768). GERMANY: Zwergloch bei Pottenstein (Lambrecht, 1933, Handb. Palaeorn., p. 768). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. Internat. ornith. Kongr. Berlin, p. 941). DENMARK: °Vordingborg (H. Winge, 1903, Vidensk. Meddel. naturh. Foren., vol. 6, p. 103). ISRAEL: Mugharet-el-Zuttiyeh (Bate, 1927, *in* F. Turville-Petre, Researches in prehistoric Galilee 1922-26, p. 28); Oumm Qatafa Cave and Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, pp. 99, 116); 'Ubeidiya (Tchernov, 1968, Prelim. Invest. Birds Pleist. 'Ubeidiya, p. 14). AZERBAIJAN: Binagady (Burchak-Abramovich, "1963" 1962, Ornitologiya, vol. 4, p. 462). CHINA: Chihli locality 61 (Bate, 1931, Geol. Surv. China, Paleo. sinica, ser. C, vol. 6, fasc. 4, p. 42). JAPAN; °Iki Island (Kuroda, 1959, Bull. Biogeogr. Soc. Japan, vol. 21, no. 7, p. 70).

2. *Columba oenas* Linnaeus. ENGLAND: Merlin's Cave? and Kirkdale Cave (Lambrecht, 1933, Handb. Palaeorn., p. 768). SPAIN: Caverna Santimamiñe, Cueva de la Ermitia, and Castelldefels (Villalta, 1964, Speleon, vol. 15, p. 46). GIBRALTAR: Devil's Tower (Bate, 1928, Jour. Roy. Anthrop. Inst., vol. 58, p. 104). MONACO: Grotte de l'Observatoire and Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 768). ITALY: Grotta Romanelli, Grotta dei Colombi?, Caverna di Verezzi, Caverne delle Arene candida, Grotta all Onda, and Caverna d'Equi (Lambrecht, 1933, Handb. Palaeorn., p. 768). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 941). HUNGARY: Pilisszanto Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Köszeg (Lambrecht, 1916, Aquila, vol. 22, p. 195). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 768). ISRAEL: Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 106).

3. *Columba palumbus* Linnaeus. IRELAND: Edenvale Cave and Newhall Cave (Lambrecht, 1933, Handb. Palaeorn., p. 767). ENGLAND: Langwith Bassett

Cave and Chudleigh Cave (Lambrecht, 1933, Handb. Palaeorn., p. 767). BELGIUM: Trou des Nutons and Trou du Frontal (Lambrecht, 1933, Handb. Palaeorn., p. 767). FRANCE: Tourbières d'Essone (Paris, 1912, Rev. franç d'Ornith., vol. 4, p. 295). SPAIN: Caverna Santimamiñe (Villalta, 1964, Speleon, vol. 15, p. 96). GIBRALTAR: Devil's Tower (Bate, 1928, Jour. Roy. Anthrop. Inst., vol. 58, p. 104). MONACO: Grottes de Menton, Grotte de l'Observatoire, and Grotte de Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 767). ITALY: Grotta dei Colombi (Regàlia, 1893, Arch. Anthrop. Etnol., vol. 23, p. 262); Grotta Zachita, Bucca del Bersagliere, Grotta all Onda, Bucca Tana di Maggiano, Caverna d'Equi, Bucca delle Volpe sopra Ravenna, and Caverne delle Arene candide (Lambrecht, 1933, Handb. Palaeorn., p. 767). CORSICA: Grotta di Funtanedu and Margine Cave? (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). SWITZERLAND: Schlossfelsen von Birseck bei Basel, Moos-Seedorf, and °Robenhausen (Lambrecht, 1933, Handb. Palaeorn., p. 767). °DENMARK (Løppenthin, 1967, Danske ynglefugle i fortid og nutid, pp. 42, 47, 60, 333, 542). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 941). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 767). HUNGARY: Urkut (Lambrecht, 1933, Aquila, vol. 19, p. 287); Oregköhöhle bei Bajót (Kormos and Lambrecht, 1914, Barlangkutatás, vol. 2, p. 105); Remetegey (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pillisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Subalyuk-Höhle (Jánossy, 1962, Aquila, vol. 67, p. 180); Lambrecht Cave (Jánossy, 1963, Acta Zoologica Acad. Sci. Hungaricae, vol. 9, p. 303). GREECE: Nesakia (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). ISRAEL: Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 106).

4. *Columba leucocephala* Linnaeus. BAHAMAS: Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 356); °Gordon Hills Cave on Crooked Island (Wetmore, 1938, Auk, vol. 55, p. 52). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 272). PUERTO RICO: °Cueva Clara (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 318). ST. CROIX: °Concordia (Wetmore, 1937, Jour. Agr. Univ. Puerto Rico, vol. 21, p. 11).

5. *Columba squamosa* Bonnaterre. BAHAMAS: Great Exuma Island (Wetmore, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 435); Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 355). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 273). PUERTO RICO: °Cueva Catedral and °Cueva Clara (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 319); °Barrio Cañas (Wetmore, 1938, Auk, vol. 55, p. 54). ST. CROIX: °Concordia (Wetmore, 1937, Jour. Agr. Univ. Puerto Rico, vol. 21, p. 11). MARTINIQUE: Paquemar (Wetmore, 1952, Auk, vol. 69, p. 460).

6. *Columba flavirostris* Wagler. YUCATAN: °Actun Spukil (H. I. Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83).

7. *Columba inornata* Vigors. PUERTO RICO: °Cueva Catedral, °Cueva Clara, °Cueva San Miguel, and °caves on Hacienda Jobo (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 318); °Barrio Cañas (Wetmore, 1938, Auk, vol. 55, p. 54).

8. *Columba cayennensis* Bonnaterre. BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, p. 6).

9. *Columba fasciata* Say. CALIFORNIA: Rancho La Brea (L. Miller, 1925, Carnegie Inst. Washington Publ., no. 349, p. 80); Carpinteria (L. Miller, 1931, Univ. Calif. Publ. Geol. Sci., vol. 20, p. 364); Stone Man Cave (Wetmore, 1956, Smithsonian Misc. Coll., vol. 131, no. 5, p. 81). MÉXICO: San Josecito Cavern in Nuevo León (L. Miller, 1943, Univ. California PUbl. Zool., vol. 47, p. 160); Barranca Seca in Veracruz (Brodkorb, 1962, Condor, vol. 65, no. 4, p. 334).

10. *Columba plumbea* Vieillot. BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

11. *Nesoenas mayeri* (Prevost). MAURITIUS: Mare aux Songes (Lambrecht, 1933, Handb. Palaeorn., p. 769). Often stated to be extinct but still quite common (Greenway, 1958, Extinct and vanishing birds of the world, p. 299).

12. †*Ectopistes migratorius* (Linnaeus). NOVA SCOTIA: Port Jolie (Halifax Mus.). CALIFORNIA: Rancho La Brea (Howard, 1937, Condor, vol. 39, p. 12, fig. 6a). IOWA: °Mill Creek (Hamon, 1961, Plains Anthropologist, vol. 6, p. 211). ILLINOIS: °Modoc rock shelter site (Parmalee, 1956, Illinois State Mus., Rept. of Investig., no. 4, p. 53); °Fountain Bluff site, °Peter's Cave, °Huber site, °Fisher site, °McDonough Lake site, °Starved Rock, and °Cahokia (Parmalee, 1958, Auk, vol. 75, no. 2, p. 173). OHIO: °Feurt Village site (Wetmore, 1943, Wilson Bull., vol. 55, p. 55); °Ash Cave, °Kettle Hill Cave, and °Canter Caves (Goslin, 1955, Ohio Jour. Science, vol. 55, no. 6, p. 359). TENNESSEE: bone caves (Shufeldt, 1897, Amer. Naturalist, vol. 31, p. 649). VIRGINIA: Natural Chimneys (Wetmore, 1962, Smithsonian Misc. Coll., vol. 145, no. 2, p. 10). GEORGIA: Ladds (Wetmore, 1967, Bull. Georgia Acad. Sci., vol. 25, no. 3, p. 152); °Etowah site (Parmalee, 1960, Florida Anthropologist, vol. 8, nos. 2-3, p. 49). FLORIDA: Reddick (Brodkorb, 1957, Jour. Pal., vol. 31, p. 135); Arredondo (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 282); Rock Spring (Woolfenden, 1959, Wilson Bull., vol. 71, p. 185); Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 147); °Vero Beach (Weigel, 1963, Florida Geol. Surv., Spec. Publ., no. 10, p. 29).

13. *Zenaidura macroura* (Linnaeus). CALIFORNIA: McKittrick (L. Miller, 1925, Univ. Calif. Publ. Geol. Sci., vol. 15, no. 9, p. 322); Rancho La Brea (L. Miller, 1925, Carnegie Inst. Washington Publ., no. 349, p. 80); Carpinteria (DeMay, 1941, Carnegie Instn. Washington Publ., no. 530, p. 68); °Buena Vista Lake (DeMay, 1942, Condor, vol. 44, p. 228). NEVADA: Smith Creek Cave (Howard, 1952, Bull. So. Calif. Acad. Sci., vol. 51, pt. 2, p. 54). ARIZONA: °Turkey Tank Caves, °Winona Village, and °Wupatki Pueblo (Hargrave, 1939, Condor, vol. 41, no. 5, p. 208). NEW MEXICO: Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, no. 1, p. 16). TEXAS: Miller's Cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108). KANSAS: Jones Sink (Downs, 1954, Condor, vol. 56, p. 213, fig. 5b). FLORIDA: Seminole Field (Wetmore, 1931, Smithsonian Misc. Publ., vol. 85, no. 2, p. 39); Reddick (Brodkorb, 1957, Jour. Paleont., vol. 31, p. 135); Arredondo (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 282); Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 147). MÉXICO: San Josecito Cavern in Nuevo León (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 160); Barranca

Seca in Veracruz (Brodkorb, 1962, Condor, vol. 65, p. 334). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 273).

14. *Zenaidura auriculata* (Des Murs). BRAZIL: Lapa da Escrivania? (Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

15. *Zenaida asiatica* (Linnaeus). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 274).

16. *Zenaida aurita* (Temminck). BAHAMAS: Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 356). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 273). PUERTO RICO: °Cueva Catedral, °Cueva Clara, °Cueva Toraño, and °Cueva San Miguel (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 317); °Barrio Cañas (Wetmore, 1938, Auk, Vol. 55, p. 54). ST. CROIX: °Concordia (Wetmore, 1937, Jour. Agr. Univ. Puerto Rico, vol. 21, p. 11). MARTINIQUE: °Paquemar (Wetmore, 1952, Auk, vol. 69, p. 460). Includes *Zenaida zenaida* (Bonaparte).

17. *Streptopelia turtur* (Linnaeus). FRANCE: Grottes de Menton (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 125). ITALY: Buca del Bersagliere (Lambrecht, 1933, Handb. Palaeorn., p. 768). HUNGARY: °Remetehegy (Lambrecht, 1916, Mitt. Jahrb. Kgl. ungar. geol. Reichsanst., vol. 22, p. 403); Legenybarlang bei Pilisszentlelek (Lambrecht, 1933, Handb. Palaeorn., p. 768). ISRAEL: Oumm Qatafa Cave and Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, pp. 100, 106).

18. *Scardafella squammata* (Lesson). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 39).

19. *Uropelia campestris* (Spix). BRAZIL: Lapa da Escrivania? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 39).

20. *Columbigallina passerina* (Linnaeus). HAITI: St. Michel de l'Atalye (Wetmore, 1922, Smithsonian Misc. Coll., vol. 74, p. 2). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 274). PUERTO RICO: °Cueva Catedral and °Cueva Clara (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 317). BRAZIL: Lapa da Escrivania? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 39).

21. *Columbigallina talpacoti* (Temminck). YUCATÁN: °Actun Lara and °Actun Spukil (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83). BRAZIL: Lapa da Escrivania (O. Winge, 1887 E Museo Lundii, vol. 1, no. 2, p. 13).

22. *Columbigallina cruziana* (Prevost). PERU: °Ancon (Lambrecht, 1933, Handb. Palaeorn., p. 769).

23. *Claravis pretiosa* (Ferrari-Pérez). BRAZIL: Lapa da Escrivania? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

24. *Claravis godefrida* (Temminck). BRAZIL: Lapa da Escrivania and Hule ved Sumidouro (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

25. *Leptotila verreauxi* (Bonaparte). YUCATÁN: *Actun Spukil (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83.) VENEZUELA: *Los Tamarindos (Wetmore, 1935, Auk, vol. 52, p. 329). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

26. *Geotrygon chrysia* Bonaparte. BAHAMAS: Exuma Island (Wetmore, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 436).

27. *Geotrygon montana* (Linnaeus). PUERTO RICO: *Cueva Catedral, *Cueva Clara, and *Cueva Toraño (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 314); *Barrio Canas (Wetmore, 1938, Auk, vol. 55, p. 54). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

28. *Geotrygon frenata* Tschudi. PERU: *Ancon (Lambrecht, 1933, Handb. Palaeorn., p. 769).

Subfamily PTILINOPINAE

29. *Hemiphaga novaeseelandiae* (Gmelin). NEW ZEALAND: Waingonoro (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 126, fig. 30); Pyramid Valley swamp (Scarlett, 1955, Rec. Canterbury Mus., vol. 6, p. 263); *Martinborough Cave (Yaldwyn, 1956, Records Dominion Mus., vol. 3, p. 4); *Ototara and *Tai Rua (Trotter, 1965, Notornis, vol. 12, p. 177); *Robbers Hole (Medway, 1967, Notornis, vol. 14, p. 160).

Family †RAPHIDAE Wetmore

Inepti Illiger, 1811, Prodromus systematis mammalium et avium, p. 245 (familia; for *Didus* Linnaeus).

Dididae Swainson, 1836, Natural history and classification of birds, vol. 1, p. 286 in text (type *Didus* Linnaeus, 1766, a junior synonym of *Raphus* Brisson, 1760).—*Dididae* Swainson, 1837, op. cit., vol. 2, p. 200,—*Didinae* (Subfamily).—*Didusidae* Lesson, 1842 (Dec. 8), Écho du monde savant, ann. 9, vol. 6, ser. 2, no. 44, col. 1036.

Raphidae Wetmore, 1930, Proc. U. S. Nat. Mus., vol. 76, art. 24, p. 5 (type *Raphus* Brisson).—*Raphinae* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, pp. 30, 36 (sous-famille).—*Raphini* Verheyen, 1957, op. cit., p. 36 (tribu).

Pezophapidae Hachisaka, 1953, Dodo and kindred Birds, p. 40 (family; type *Pezophaps* Strickland).—*Pezophabini* Verheyen, 1957 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 33, no. 3, p. 36 (tribu).

Neospecies of Raphidae from Pleistocene and *prehistoric sites:

1. †*Raphus cucullatus* (Linnaeus). MAURITIUS: Plaisance, Grand Puet (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 128, fig. 21); Mare aux Songes (Lambrecht, 1921, Fossilium Catalogus, p. 86). Exterminated about 1681 (Fisher and

Peterson, 1964, World of Birds, p. 272). Much of the literature on the dodo is under the name *Didus ineptus* Linnaeus.

2. †*Pezophaps solitaria* (Gmelin). RODRIGUEZ: (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 128). Exterminated about 1791. *Pezophaps minor* Strickland (1882, Jardine's Contribution to Ornithology, p. 19) was based on bones.

A third species, *Raphus solitarius* (Selys-Longchamps) of Réunion, was exterminated about 1746, but apparently no fossil or subfossil bones have been reported. It is sometimes placed in a monotypic genus *Ornithaptera* Bonaparte, or in the genus *Pezophaps* Strickland, where the specific name *solitaria* is preoccupied and must be replaced by *bourbonica* Bonaparte (1854) or *apterornis* Schlegel (1854).

Victoriornis imperialis Hachisuka (1937, Proc. Biol. Soc. Washington, vol. 50, p. 71) was founded exclusively on seventeenth century water color paintings and travelers' tales of a white dodo said to have lived on Réunion.

Order CUCULIFORMES (Wagler)

Cuculi Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel. p. 80 (ordo; type *Cuculus* Linnaeus).—*Cuculi* Coues, 1872, Key N. Am. Birds, ed. 1, p. 186 (suborder).—*Cuculiformes* Coues, 1884, Key N. Amer. Birds, ed. 2, pp. viii, 446, 447 (suborder).

Coccyges Sundevall, 1835, Svenska Vetensk.-Akad. Handl., p. 69 (type *Coccyzus* Vieillot).—*Coccygomorphae* Huxley, 1867, Proc. Zool. Soc. London, p. 117.—*Coccygiformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (suborder).—*Coccyges* Shelley, 1891, Cat. Birds Brit. Mus., vol. 19, pp. x, 209 (suborder).

Musophagi Seebohm, 1890, Classif. Birds, pp. vii, 11 (suborder; type *Musophagi* Isert).—*Musophagiformes* Verheyen, 1956 (June), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 32, p. 6 (order).—*Musophagae* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).—*Musophagae* Verheyen, 1961 (October), Bull. Inst. roy. Sci. nat. Beligique, vol. 37, no. 27, p. 28 (suborder).

Centropodes Verheyen, 1956 (April), Bull. Inst. roy. Sci. nat. Belgique, vol. 37, no. 27, p. 7 (suborder; type *Centropus* Illiger).

Suborder MUSOPHAGAE (Seebohm)

Musophagi Seebohm, 1890, Classif. Birds, pp. vii, 11 (suborder; type *Musophaga* Isert).—*Musophagiformes* Verheyen, 1956 (June), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 32, p. 6 (order).—*Musophagae* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).—*Musophagae* Verheyen, 1961 (October), Bull. Inst. roy. Sci. nat. Belgique, vol. 37, no. 27, p. 28 (suborder).

Family MUSOPHAGIDAE Bonaparte

Musophagidae Bonaparte, 1831, Saggio di una distribuzione metodica degli animali vertebrati, p. 39 (familia; type *Musophaga* Isert).—*Musophaginae* Swainson, 1837, Nat. Hist. and Classif. Birds, vol. 2, p. 297 (subfamily).—*Musophagi* Ridgway, 1916 (May 5), Bull. U. S. Nat. Mus., no. 50, pt. 7, p. 2 (superfamily).

Corythaeolinae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 7 (subfamily; type *Corythaeola* Heine).

Criniferinae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 7 (subfamily; type *Crinifer* Jarocki).

Tauracinae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 7 (subfamily; type *Tauraco* Kluk).

Subfamily †APOPEMPSINAE Brodkorb[1]

Genus †*Dynamopterus* Milne-Edwards

Dynamopterus Milne-Edwards, 1892, C. R. 2 Congrès Internat. Orn. Budapest, p. 64 (type by monotypy *Dynamopterus velox* Milne-Edwards).

[1] New subfamily. Type *Apopempsis* Brodkorb, new genus.

1. *Dynamopterus velox* Milne-Edwards

Dynamopterus velox Milne-Edwards, 1892, C. R. 2. Congrès Internat. Orn. Budapest, p. 64 (type from phosphorites de Caylux, humerus Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: plateau du Quercy.

2. *Dynamopterus boulei* Gaillard

Dynamopterus boulei Gaillard, 1938, Arch. Mus. Hist. Nat. Lyon, vol. 15, p. 19, fig. 8 (type from phosphorites du Quercy, right humerus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: plateau du Quercy.

Genus † *Apopempsis* Brodkorb[1]

3. *Apopempsis meini* (Ballmann)

Musophaga meini Ballmann, 1969 (June), Geobios, no. 2, p. 188, pl. 13, figs. 5-9 (type from Grive-Satint-Alban, proximal part of right carpometacarpus, coll. P. Mein, no. 118, Faculté de Sciences de Lyon).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Isère: La Grive-Saint-Alban, fissure M.

Suborder CUCULI Wagler

Cuculi Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel, p. 80 (ordo; type *Cuculus* Linnaeus).—*Cuculi* Gadow, 1893, Bronn's Thier-Reich, Vögel, pt. 2, pp. 213, 300 (Unterordnung).

Coccyges Sundevall, 1835, Svenska Vetensk.-Akad. Handl., p. 69 (type *Coccyzus* Vieillot).—*Coccygomorphae* Huxley, 1867, Proc. Zool. Soc. London, p. 117. *Coccygiformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (suborder).—*Coccyges* Shelley, 1891, Cat. Birds Brit. Mus., vol. 19, pp. x, 209 (suborder).

Centropodes Verheyen, 1956 (April), Bull. Inst. roy. Sci. nat. Belgique, vol. 37, no. 27, p. 7 (suborder; type *Centropus* Illiger).

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[1] New genus. Type *Musophaga meini* Ballmann. Greek feminine noun *apópempsis*, a turning away, in allusion to the cry of the "go away bird," vernacular name of the gray turacou, *Crinifer concolor* (Smith). Differs from living genera of Musophagidae in having metacarpal I very wide, but without prominent swelling and overhang at tip and along distal border of facet for digit I; shaft of metacarpal II more curved.

Family CUCULIDAE Vigors

Cuculidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 452 (family; type *Cuculus* Linnaeus).—*Cuculinae* Nitzsch, 1829, Observationes de avium arteria carotide communi, p. 15 (familia).—*Cuculinae* Swainson, 1837, Nat. Hist. Classif. Birds, vol. 2, p. 321 (subfamily).—*Cuculoideae* Stejneger, 1884 (May 15), Sci. Rec., vol. 2 p. 155 (superfamily).—*Cuculoidae* Hay, Carnegie Inst. Washington Publ., no. 390, vol. 2, p. 347 (superfamily).

Coccyzinae Swainson, 1837, Nat. Hist. Classif. Birds, vol. 2, p. 322 (subfamily; type *Coccyzus* Vieillot).—*Coccyginae* Cabanis and Heine, 1862 (Nov. 24), Mus. Heineanum, pt. 4, no. 1, p. 75 (subfamilia).—*Coccystidae* Verheyen, 1956 (Apr.). Bull. Inst. roy Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily).

Crotophaginae Swainson, 1837, Nat. Hist. Classif. Birds, vol. 2, p. 324 (subfamily; type *Crotophaga* Linnaeus).—*Crotophagidae* Reichenow, 1882, Vögel der zoologischen Gärten, fide Sharpe.—*Crotophagidae* Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (family).

Saurotherinae C. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 55 (subfamily; type *Saurothera* Vieillot).

Centropinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 56 (subfamily; type *Centropus* Illiger).—*Centropodinae* Bonaparte, 1850, Conspectus Generum Avium, vol. 1, p. 106 (subfamilia).—*Centropidae* Verheyen, 1956 Apr.), Bull. Inst. roy. Sci. nat. Belgique, p. 25 (family).

Phoenicophainae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 56 (subfamily; type *Phoenicophus* Vieillot, 1816, = *Phaenicophaeus* Stephens, 1815).—*Phaenicophaeinae* Bonaparte, 1850, Consp. Gen. Av., vol. 1, p. 97 (subfamilia).—*Phaenicophaeidae* Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (family).

Scythropinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia; type *Scythrops* Latham).

Diplopterinae Sclater, 1862, Cat. Coll. Amer. Birds, p. 321 (subfamily; type *Diplopterus* Boie, 1826, a junior synonym of *Tapera* Thunberg, 1819).

Seriocosominae Cabanis and Heine, 1862 (Nov. 18), Mus. Heineanum, Pt. 4, no. 1, p. 71 (subfamilia; type *Sericosomus* Sunderall, 1857, a junior synonym of *Coua* Schinz, 1821).

Couanae G. R. Gray, 1870, Hand-List of Genera and Species of Birds, pt. 2, pp. xii, 207 (subfamily; type *Coua* Schinz).—*Couinae* Peters, 1940, Check-List of Birds of the World, pp. x, 64).

Zancolostominae Reichenow, 1882, Vögelden zoologischen Garten, fide Sharpe (subfamily; type *Zanclostomus* Swainson).

Geococcyges Reichenow, 1882, Vögel der zoolgischen Garten, fide Sharpe (section; type *Geococcyx* Wagler).

Neomorphinae Shelley, 1891, Cat. Birds Brit. Mus., vol. 19, pp. xii, 210, 414 (subfamily; type *Neomorphus* Gloger).—*Neomorphidae* Verheyen, 1956 (before Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (family).

Carpococcystinae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily; type *Carpococcyx* Gray).

Taperinae Verheyen, 1956 (Apr.) Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily; type *Tapera* Thunberg).

Piaynae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily; type *Piaya* Lesson).

Eudynamynae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily; type *Eudynamys* Vigors and Horsfield).
Surniculinae Verheyen, 1956 (Apr.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 23, p. 25 (subfamily; type *Surniculus* Lesson).

Subfamily COCCYGINAE (Swainson)

Coccyzinae Swainson, 1837.
Saurotherinae Gray, 1840.
Phoenicophainae Gray, 1840.
Zanclostominae Reichenow, 1882.
Piaynae Verheyen, 1956.

Genus †*Uintornis* Marsh

Uintornis Marsh, 1872 (Oct.), Amer. Jour. Sci., ser. 3, vol. 4, no. 22, p. 259 (type by monotypy *Uintornis lucaris* Marsh).

1. *Uintornis lucaris* Marsh

Uintornis lucaris Marsh, 1872 (Oct.), Amer. Jour. Sci., ser. 3, vol. 4, no. 22, p. 259 (type from Henry's Fork, distal part of right tarsometatarsus, Yale Peabody Mus. no. 617).—Shufeldt, 1915, Trans. Connecticut Acad. Arts Sci., vol. 19, p. 50, pl 6, fig. 42 (type restudied).

MIDDLE EOCENE (upper levels of Bridger formation). WYOMING: Sweetwater County: Henry's Fork.

Genus †*Neococcyx* Weigel

Neococcyx Weigel, 1963 (Dec. 5), Quart. Jour. Florida Acad. Sci., vol. 26, no. 3, p. 260 (type by original designation *Neococcyx mccorquodalei* Weigel).

2. *Neococcyx mccorquodalei* Weigel

Neococcyx mccorquodalei Weigel, 1963 (Dec. 5), Quart. Jour. Florida Acad. Sci., vol. 26, no. 3, p. 261, pl. 1 (type from Calf Creek, distal end of right humerus, Saskatchewan Mus. Nat. Hist. no. 1420).

LOWER OLIGOCENE (Cypress Hills formation). SASKATCHEWAN: north branch of Calf Creek, 10 miles NW of Eastend, in Legal Subdivision 4, sec. 8, township 8, rank 22, W 3rd meridian.

Subfamily Geococcyginae (Reichenow)

Diplopterinae Sclater, 1862.
Geococcyges Reichenow, 1882.
Neomorphinae Shelley, 1891.
Carpococcystinae Verheyen, 1956.
Taperinae Verheyen, 1956.

Genus *Geococcyx* Wagler

Geococcyx Wagler, 1831, Isis von Oken, vol. 24, Heft 5, col. 524 (type *Geococcyx variegata* Wagler = *Saurothera californiana* Lesson, Recent).

3. *Geococcyx conklingi* Howard

Geococcyx conklingi Howard, 1931 (Sept. 15), Condor, vol. 33, no. 5, p. 208, figs. 49-50 (type from Conkling Cavern, distal end of humerus, Los Angeles Mus. no. 118).

Upper Pleistocene (cave deposits). New Mexico: Dona Ana County: Organ Mountains; Conkling Cavern and Shelter Cave (Howard, 1931). Mexico: Nuevo León: San Josecito Cave near Aramberri (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 161)

Subfamily Couinae (Gray)

Sericosominae Cabanis and Heine, 1862.
Couanae Gray, 1870.

Genus *Coua* Schinz

Coua Schinz, 1821, Das Thierreich, vol. 1, p. 661 (type *Cuculus madagascariensis* Gmelin, 1788, = *Cuculus gigas* Boddaert, 1783, Recent).

4. *Coua primaeva* Milne-Edwards and Grandidier

Coua primaeva Milne-Edwards and Grandidier, 1895, Bull. Mus. Hist. Nat. Paris, vol. 1, p. 11 (type from Belo, tarsometatarsus, Paris Mus.).

Quaternary. Madagascar: Belo on east coast.

Neospecies of Cuculidae from Pleistocene and *prehistoric sites:

Subfamily Cuculinae

1. *Clamator glandarius* (Linnaeus). Israel: Oumm Qatafa Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, pp. 100, 104).

2. *Cuculus canorus* Linnaeus. ITALY: Buca del Bersagliere (Lambrecht, 1933, Handb. Palaeorn., p. 769). CZECHOSLOVAKIA: Balcarova skála and Certova díra (Capek, 1910, Ver. V. internat. ornith. Kongr. Berlin, p. 938). HUNGARY: Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480).

Subfamily COCCYGINAE

3. *Coccyzus americanus* (Linnaeus). FLORIDA: Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 147).

4. *Coccyzus erythropthalmus* (Wilson). DOMINICAN REPUBLIC: °Cerro de San Francisco (Bernstine, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 275).

5. *Piaya cayana* (Linnaeus). BRAZIL: Lapa da Escrivania and Mocambo in Minas Geraes (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 45).

6. *Piaya rufigularis* (Hartlaub). DOMINICAN REPUBLIC: Cerro de San Francisco? (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 275).

7. *Saurothera vetula* (Linnaeus). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 275). PUERTO RICO: °Cueva Catedral, °Cueva Clara, and °Cueva Toraño (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 319).

Subfamily CROTOPHAGINAE

8. *Crotophaga ani* Linnaeus. HAITI: St. Michael de l'Atalye (Wetmore, 1922, Smithsonian Misc. Coll., vol. 74, no. 4, p. 2). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 276). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 45).

9. *Crotophaga sulcirostris* Swainson. YUCATÁN: °Actun Spukil (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83).

Subfamily GEOCCOCYGINAE

10. *Tapera naevia* (Linnaeus). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E. Museo Lundii, vol. 1, no. 2, p. 45).

11. *Geococcyx californianus* (Lesson). CALIFORNIA: McKittrick (L. Miller, 1925, Univ. California Publ. Bull., Dept. Geol. Sci. vol. 15, no. 9, p. 325); Rancho La Brea (L. Miller, 1925, Carnegie Instn. Washington Publ., vol. 349, p. 104), includes *Neomorpha?* sp.; see L. Miller and De May, 1942, Univ. California Publ. Zool., vol. 47, pp. 67, 116; Carpinteria (Larson, 1930, Univ. Calif. Publ. Zool., vol. 32, no. 4, p. 409). NEW MEXICO: °Shelter Cave (Howard, 1931, Condor, vol. 33, no. 5, p. 206).

Order PSITTACIFORMES (Wagler)

Psittaci Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel, pp. 80 (ordo; type *Psittacus* Linnaeus).—*Psittacomorphae* Huxley, 1867, Proc. Zool. Soc. London, p. 465.—*Psittaciformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, pp. 1552, 1567 (subordo).—*Psittaciformes* Sharpe, 1900, Hand-List of Genera and Species of Birds, pt. 2, p. 1 (order).

Family PSITTACIDAE (Illiger)

Psittacini Illiger, 1811, Prodromus systematis mammalium et avium, pp. 195, 200 (familia; type *Psittacus* Linnaeus).—*Psittacidae* [Leach, fide Gray] Vigors, 1825, Trans Linn. Soc. London, vol. 14, p. 452 (family).—*Psittacina* Vigors, 1825, fide Gray.—*Psittacinae* Nitzsch, 1829, Observationes de Avium Arteria carotide communi, p. 16 (familia).—*Psittacinae* Swainson, 1837, Nat. Hist. and Classif. of Birds, vol. 2, p. 300 (subfamily).—*Psittaceae* Bonaparte, 1854, Conspectus Systematis Ornithologiae, p. 5 (sous-division de sous-famille).

Macrocercina Vigors, 1825, fide Gray (type *Macrocercus* Vieillot, 1816, a junior synonym of *Ara* Lacépède, 1799).—*Macrocercinae* Swainson, 1837, Nat. Hist. and Classif. of Birds, vol. 2, p. 299 (subfamily).

Palaeornina Vigors, 1825, fide Gray (type *Palaeornis* Vigors, 1825, a junior synonym of *Psittacula* Cuvier, 1800).—*Palaeorninae* G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 51 (subfamily).—*Palaeornithinae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, pl. 643 (sous-famille).—*Palaeornithidae* Beddard, 1898, Structure and Classification of Birds, p. 269 (family).

Plyctolophina Vigors, 1825, fide Gray (type *Plyctolophus* Vieillot, 1816, a junior synonym of *Cacatua* "Brisson", 1760 = *Cacatua* Vieillot, 1817).—*Plyctolophinae* Swainson, 1837, Nat. Hist. and Classif. Birds, vol. 2, p. 302 (subfamily).

Platycercinae Swainson, 1837, Nat. Hist. and Classif. Birds, vol. 2, p. 304 (subfamily; type *Platycercus* Horsfield and Vigors).—*Platicercinae* [sic] Bonaparte, 1854, Revue et Mag. de Zool., no. 3, p. 10 of reprint.—*Platycercidae* Reichenow, 1913, Handbuch der systematisch Ornithologie, Vögel, vol. 1, fide Sharpe (family).—*Platycercoidea* Brereton, 1963, Proc. XIII Internat. Ornith. Congress, p. 509 (superfamily).

Lorianae Swainson, 1837, Nat. Hist. and Classif. Birds, vol. 2, p. 303 (subfamily; type *Lorius* "Brisson," i.e. Vigors, 1825 preoccupied by *Lorius* Boddaert, 1783, and hence to be replaced by *Domicella* Wagler, 1832).—*Lorinae* G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 52 (subfamily).—*Lorinae* Bonaparte, 1840, Prod. Syst. Orn., p. 2.—*Loriinae* Bonaparte, 1850, Conspectus Gen. Av., vol. 1, p. 4 (subfamilia).—*Loriidae* Salvadori, 1891, Cat. Birds Brit. Mus., vol. 20, pp. xi, 2, 11.

Arainae G. R. Gray, 1840 (before Apr.), List of Gen. Birds, p. 53 (subfamily; type *Cacatua* "Brisson," 1760).—*Cacatuidae* Bonaparte, 1857 (fide Boucard) (family).—*Cacatoidae* Ridgway, 1916 (May 5), Bull. U. S. Nat. Hist. Mus., no. 50, pt. 7, p. 105 in key (family [cf. *Cacatoes* Cuvier, French vernacular name]).—*Cacatuoidea* Brereton, 1963, Proc. XIII Internat. Ornith. Congress, p. 508 (superfamily).

Pezoporinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 54 (subfamily; type *Pezoporus* Illiger).—*Pezoporinae* Bonaparte, 1840, Prodr. Syst. Ornith., p. 2.—*Pezoporidae* Brereton, 1963, Proc. XIII Internat. Ornith. Congress, p. 509 (family).

Trichoglossinae Bonaparte, 1850, Consp. Gen. Avium, vol. 1, p. 3 (subfamilia; type *Trichoglossus* Vigors and Horsfield).—*Trichoglossidae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (familia).

Nestorinae Bonaparte, 1850, Consp. Gen. Av., vol. 1, p. 8 (subfamilia; type *Nestor* Wagler).—*Nestoridae* Salvadori, 1891, Cat. Birds Brit. Mus., vol. 20, pp. xi, 2, 4 (family).

Strigopidae Bonaparte, 1850, Consp. Gen. Av., p. 8 (familia; type *Strigops* Gray).—*Strigopinae* Bonaparte, 1850, loc. cit. (subfamilia).

Microglossidae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (famille; type *Microglossum* Geoffroy, 1823, a junior synonym of *Probosciger* Kuhl, 1820).—*Microglossinae* Bonaparte, 1853, loc. cit. (sous-famille).

Calyptorhynchinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (sous-famille; type *Calyptorhynchus* Vigors and Horsfield).

Conurinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (sous-famille; type *Conurus* Kuhl, 1820).

Psittaculinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (sous-famille; type *Psittacula* "Brisson" = *Psittacula* Illiger, 1811, preoccupied by *Psittacula* Cuvier, 1800, and hence to be replaced by its junior synonym *Forpus* Boie, 1858).

Nasiterninae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 643 (sous-famille; type *Nasiterna* Wagler, 1832, a junior synonym of *Micropsitta* Lesson, 1831).

Electeae Bonaparte, 1854, Consp. syst. ornith., p. 5 (sous-division de sous-famille; type *Eclectus* Wagler; see also Tableau des Perroquets, separately paged reprint from Revue et Mag. de Zool., no. 3, 1854, p. 12).

Dasyptilinae Bonaparte, 1854, Consp. syst. ornith., p. 5 (sous-famille; type *Dasyptilus* Wagler, 1832, a junior synonym of *Psittrichas* Lesson, 1831; see also Tableau des Perroquets, p. 13).

Stringopinae Finsch, 1867, Papageien, vol. 1, p. 241 (subfamily; type *Stringops* Finsch, 1867, a junior synonym of *Stringops* Gray, 1854).—*Stringopidae* Sclater, 1880, Ibis, p. 403 (family).

Plissolophidae Reichenow, 1884, Zool. Garten, Vögel, vol. 2, p. 8 (family; type *Plissolophus* Gloger, 1842, a junior synonym of *Cacatua* Brisson, 1760).

Cyclopsittacidae Salvadori, 1891, Cat. Birds Brit. Mus., vol. 20, pp. xii, 2, 86 (family; type *Cyclopsittacus* Reichenbach, generic name indeterminable fide Mathews, 1912, Novitates Zool., vol. 18, p. 261).—*Cyclopsittacinae* Gadow, 1893, Bronn's Klassen u. Ordn. Thier-Reichs, Vögel, pt. 2, p. 222 (Unterfamilie).

Calopsittacinae Salvadori, 1891, Cat. Birds Brit. Mus., vol. 20, pp. xii, 101, 135 (subfamily; type *Calopsittacus* Lesson).

Pioninae Salvadori, 1891, Cat. Birds Brit. Mus., vol. 20, pp. xiv, 137, 267 (subfamily; type *Pionus* Wagler).

Pyrrhurinae Beddard, 1898, Structure and Classification of Birds, p. 270 (subfamily; type *Pyrrhura* Bonaparte).

Chrysotinae Beddard, 1898, Structure and Classification of Birds, p. 270 (subfamily; type *Chrysotis* Swainson).

Micropsittidae Reichenow, 1913, Handbuch der systematischen Ornithologie, Vögel, vol. 1, fide Sharpe (family; type *Micropsitta* Lesson).—*Micropsittinae* Peters, 1937, Check-list of Birds of World, vol. 3, pp. xi, 167 (subfamily).

Kakatoeidae Reichenow, 1913, Handbuch der systematischen Ornithologie, Vögel, vol. 1, fide Sharpe (family; type *Kakatoe* Cuvier, 1800).—*Kakatoeinae* Peters, 1937, Check-list of Birds of World, vol. 3, pp. xl, 170 (subfamily).

Opopsittidae Reichenow, 1913, Handbuch der systematischen Ornithologie, Vögel, vol. 1, fide Sharpe (family; type *Opopsitta* Sclater; replaces *Cyclopsittacus* "Reichenbach" i.e. Sundevall, indeterminable fide Mathews, 1912).

Aratinginae Reichenow, 1913, Handbuch der systematischen Ornithologie, Vögel, vol. 1, fide Sharpe (subfamily; type *Aratinga* Spix).

Loriculinae Verheyen, 1956 (Nov.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 55, p. 42 (sous-famille; type *Loriculus* Blyth).

Polytelinae Verheyen, 1956 (Nov.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 55, p. 42 (sous-famille; type *Polytelis* Wagler).

Lathaminae Verheyen, 1956 (Nov.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 55, p. 43 (sous-famille; type *Lathamus* Lesson).

Nymphicinae Verheyen, 1956 (Nov.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 55, p. 43 (sous-famille; type *Nymphicus* Wagler).

Amazoninae Verheyen, 1956 (Nov.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 55, p. 43 (sous-famille; type *Amazona* Lesson).—*Amazonidae* Brereton, 1963, Proc. XIII Internat. Ornith. Congress, p. 508 (family).

Palaeopsittacinae Glenny, 1957 (Aug. 10), Annals of Zool., vol. 2, no. 4, p. 48 (subfamily; not based on generic name; includes all Old World psitticine parrots with A-2-s carotid arrangement).

Neopsittacinae Glenny, 1957 (Aug. 10), Annals of Zool., vol. 2, no. 4, p. 48 (subfamily; not based on generic name; includes all Neotropical genera).

Alisteridae Brereton, 1963, Proc. XIII Internat. Ornith. Congress, p. 509 (family; type *Alisterus* Mathews).

Forpidae Brereton, 1963, Proc. XIII Internat. Ornith. Congr., p. 509 (family; type *Forpus* Boie).

Subfamily PSITTACINAE (Illiger)

Psittacini Illiger, 1811.
Macrocercina Vigors, 1825.
Palaeorhina Vigors, 1825.
Platycercinae Swainson, 1837.
Arainae Gray, 1840.
Pezoporinae Gray, 1840.
Conurinae Bonaparte, 1853.
Psittaculinae Bonaparte, 1853.
Eclecteae Bonaparte, 1854.
Dasyptilinae Bonaparte, 1854.
Pioninae Salvadori, 1891.
Pyrrhurinae Beddard, 1898.
Chrysotinae Beddard, 1898.
Aratinginae Reichenow, 1913.
Loriculinae Verheyen, 1956.
Polytelinae Verheyen, 1956.

Amazoninae Verheyen, 1956.
Palaeopsittacinae Glenny, 1957.
Neopsittacinae Glenny, 1957.
Alisterinae Brereton, 1963.
Forpidae Brereton, 1963.

Genus †Archaeopsittacus Lambrecht

Archaeopsittacus Lambrecht, 1933, Handbuch Palaeorn., p. 609 (type by monotypy *Psittacus verreauxi* Milne-Edwards).

1. *Archaeopsittacus verreauxi* (Milne-Edwards)

Psittacus verreauxi Milne-Edwards, 1870, C. R. Acad. Sci. Paris, vol. 70, p. 557 (type from Allier, tarsometatarsus, Paris Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Langy (Milne-Edwards); Montaigut and Saint-Gerand-le-Puy (Lambrecht, 1933, Handbuch Palaeorn., p. 609).

Genus †*Conuropsis* Salvadori

Conuropsis Salvadori, Cat. Birds Brit. Mus., vol. 20, pp. 146, 203 (type *Psittacus carolinensis* Linnaeus, Recent).

2. *Conuropsis fratercula* Wetmore

Conuropsis fratercula Wetmore, 1926 (March 11), Amer. Mus. Novitates, no. 211, p. 3, fig. 5-6 (type from Snake Creek, left humerus, Amer. Mus. Nat. Hist. no. 6292a).

UPPER MIOCENE (lower Snake Creek beds). NEBRASKA: Sioux County: Snake Creek quarries.

Genus *Pionus* Wagler

Pionus Wagler, 1832, Abh. bayer. Akad. Wiss., Math.-physikalische Classe, vol. 1, p. 497 (type *Psittacus menstruus* Linnaeus, designated by Gray, 1840).

3. *Pionus ensenadensis* Cattoi

Pionus ensenadensis Cattoi, 1957 (Jan.), Ameghiniana, vol. 1, nos. 1-2, p. 23, fig. (type from Puerto de Olivos, Museo Argentino de Ciencias Naturales, no. 17.716).

LOWER PLEISTOCENE (lower part of Pampas formation, Enseñadensian). ARGENTINA: Prov. Buenos Aires: Puerto de Olivos.

Genus *Aratinga* Spix

Aratinga Spix, 1824, Av. Bras., vol. 1, p. 29 (type *Psittacus luteus* Boddaert = *Psittacus solstitialis* Linnaeus, Recent).
Protoconurus Spillmann, 1942, Proc. Eighth Amer. Sci. Congr., vol. 4, p. 381 (type *Protoconurus roosevelti* Spillmann).

4. *Aratinga roosevelti (Spillmann)*

Protoconurus roosevelti Spillman, 1942, Proc. Eighth Amer. Sci. Congress, vol. 4, p. 381, figs. 1-8 (type not specified; skull, scapula, coracoid, humerus, carpometacarpus, pelvis, tibiotarsus, and tarsometatarsus figured; other elements described).

UPPER PLEISTOCENE. ECUADOR: Santa Elena peninsula: Río Chico and Carolina Oil Company camp.

Genus †*Lophopsittacus* A. Newton

Lophopsittacus A. Newton, 1875, Proc. Zool. Soc. London, p. 350 (type *Psittacus mauritianus* Owen).

5. *Lophopsittacus mauritianus* (Owen)

Psittacus mauritianus Owen, 1866 (April), Ibis, n.s., vol. 2, no. 6, p. 168, figs. 1-2 (type from Mauritius, mandible, Cambridge University?).

QUATERNARY. MAURITIUS: Mare aux Songes.

Genus †*Necropsittacus* Milne-Edwards

Necropsittacus Milne-Edwards, 1874, Ann. Sci. Nat. Zool.), ser. 5, vol. 19, p. 18 (type by monotypy *Psittacus rodericanus* Milne-Edwards).

6. *Necropsittacus rodericanus* (Milne-Edwards)

Psittacus rodericanus Milne-Edwards, 1873, Bibl. École Hautes Etudes, vol. 9, art. 3, p. 16 (type from Rodriguez, tibiotarsus, Cambridge University).

QUATERNARY. RODRIGUEZ ISLAND.

Genus *Ara* Lacépède

Ara Lacépède, 1799, Ois., p. 1 (type *Psittacus macao* Linnaeus, Recent).

7. *Ara autocthones* Wetmore

Ara autocthones Wetmore, 1937 (Jan.), Jour. Agr. Univ. Puerto Rico, vol. 21, no. 1, p. 12, pl. 1, figs. 8-9 (type from Concordia, left tibiotarsus, U. S. Nat. Mus. no. 343033).

QUATERNARY (kitchen middens). VIRGIN ISLANDS: St. Croix Island: Concordia, near Southwest Cape.

Neospecies of Psittacidae from Pleistocene and °prehistoric sites:

Subfamily STRIGOPINAE

1. *Strigops habroptilus Gray.* NEW ZEALAND: Timaru (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 10); Pyramid Valley swamp (Scarlett, 1955, Rec. Canterbury Mus., vol. 6, no. 4, p. 263); Moa Bone Point and Castle Rock (Oliver, 1955, New Zealand Birds, ed. 2, p. 551); °Martinborough Cave (Yaldwyn, 1956, Records Dominion Mus., vol. 3, no. 1, p. 3); °Robbers Hole and °Aussie Cave (Medway, 1967, Notornis, vol. 14, p. 158). CHATHAM ISLANDS (E. W. Dawson, 1952, Emu, vol. 52, p. 259).

Subfamily NESTORINAE

2. *Nestor meridionalis* (Gmelin). NEW ZEALAND: Waingongoro (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 10); Lake Grassmere and Pyramid Valley (E. W. Dawson, 1952, Emu, vol. 52, p. 259); Takaka, Wairau coast, Moa Bone Point, Pateora, Kapua, Long Beach, and Castle Point (Oliver, 1955, New Zealand Birds, ed. 2, p. 546); °Martinborough Cave? (Yaldwyn, 1956, Records Dominion Mus., vol. 3, p. 4). CHATHAM ISLANDS (Forbes, 1893, Ibis, ser. 6, vol. 5, no. 20, p. 544).

3. *Nestor notabilis* Gould. NEW ZEALAND: South Island (E. W. Dawson, 1952, Emu, vol. 52, p. 259). CHATHAM ISLANDS (Forbes, 1893, Ibis, ser. 6, vol. 5, no. 20, p. 544).

Subfamily PSITTACINAE

4. *Ara ararauna* (Linnaeus). PERU: °Ancón (Lambrecht, 1933, Handb. Palaeorn., p. 770).

5. *Ara chloroptera* Gray. BRAZIL: Lapa da Escrivania and Lapa da Lagoa do Sumidouro in Minas Geraes (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

6. *Ara maracana* (Vieillot). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

7. *Ara †tricolor* Bechtein. CUBA: Baños de Ciego Montero (Wetmore, 1928, Amer. Mus. Novitates, no. 301, p. 4). Exterminated; last collected in 1864 (Bangs and Zappey, 1905, Amer. Naturalist, vol. 39, p. 179).

8. *Aratinga leucophthalmus* (Müller). BRAZIL: Lapa da Escrivania and Salpeterhule near Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 41).

9. *Aratinga astec* (Souance). YUCATÁN: *Mayapan? (Pollock and Ray, 1957, Carnegie Inst. Washington, Current Repts. Dept. Archaeology, no. 41, p. 646).

10. *Aratinga aurea* (Gmelin). BRAZIL: Lapa da Escrivania and Salpeterhule (O. Winge, 1887, E Museo Lundii, vol. no. 2, p. 41).

11. †*Conuropsis carolinensis* (Linnaeus). ILLINOIS: *Cahokia (Parmalee, 1958, Auk, vol. 75, no. 2, p. 174); *Irving site near Chambersburg (Parmalee, 1967, Wilson Bull., vol. 79, p. 158). Exterminated; last captive bird died Feb. 21, 1918, in Cincinnati Zoo (Laycock, 1968, Audubon Mag., vol. 71, no. 2, p. 25); last specimen collected in 1901, with more or less authentic sight records until about 1920 (Brodkorb, 1968, Vertebrates of the United States, ed. 2, p. 359).

12. *Rhynchopsitta pachyrhyncha* (Swainson). ARIZONA: *Wupatki Pueblo (Hargrave, 1939, Condor, vol. 41, no. 5, p. 208). MEXICO: San Josecito cavern in Nuevo León (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, no. 5, p. 160).

13. *Pyrrhura frontalis* (Vieillot). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

14. *Forpus coelestis* (Lesson). BRAZIL: Lapa da Escrivania and Lapa da Lagoa do Sumidouro (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 6).

15. *Amazona leucocephala* (Linnaeus). BAHAMAS: Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, no. 11, p. 356); *Gordon Hills cave on Crooked Island (Wetmore, 1938, Auk, vol. 55, no. 1, p. 52).

16. *Amazona amazonica* (Linnaeus). BRAZIL: Lapa da Escrivania (O. Winge, 1887 E Museo Lundii, vol. 1, no. 2, p. 6).

17. *Amazona farinosa* (Boddaert). PERU: *Ancon (Lambrecht, 1933, Handb. Palaeorn., p. 770).

18. *Coracopsis vasa* (Shaw). MADAGASCAR: Sirabé (Lambrecht, 1933, Handb. Palaeorn., p. 769).

19. *Cyanoramphus noveaezelandiae* (Sparrman). NEW ZEALAND: Pyramid Valley swamp (Scarlett, 1955, Rec. Canterbury Mus., vol. 6, no. 4, p. 263); Martinborough Cave (Yaldwyn, 1956, Rec. Dominion Mus., vol. 3, p. 4); *Ototara and *Waimataitai (Trotter, 1965, Notornis, vol. 12, p. 178).

Subfamily TRICHOGLOSSINAE

No record.

Subfamily MICROPSITTINAE

No record.

Subfamily KAKATOEINAE

No record.

Order STRIGIFORMES (Wagler)

Striges Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classif. der Säugethiere und Vögel, p. 80 (ordo; type *Strix* Linnaeus).—*Strigiformes* Sharpe, 1899, Hand-List of genera and species of birds, vol. 1, p. 280.

Family †PROTOSTRIGIDAE Wetmore

Protostrigidae Wetmore, 1933 (Dec. 4), Amer. Mus. Novitates, no. 680, p. 4 (type *Protostrix* Wetmore).

Genus †*Eostrix* Brodkorb[1]

1. *Eostrix mimica* (Wetmore)

Protostrix mimica Wetmore, 1938 (Jan. 17), Proc. U. S. Nat. Mus., vol. 85, no. 3031, p. 27, figs. 4-5 (type from Ten Mile Creek, distal end of right tibiotarsus, U. S. Nat. Mus. no. 15156; referred distal end of right tarsometatarsus).

LOWER EOCENE ("Wasatch formation," probably Knight formation). WYOMING: Washakie County: south side of Ten Mile Creek, 12 miles northwest of Worland.

Genus †*Protostrix* Wetmore

Protostrix Wetmore, 1933 (Dec. 4), Amer. Mus. Novitates, no. 680, p. 3 (type *Aquila lydekkeri* Shufeldt).

2. *Protostrix lydekkeri* (Shufeldt)

Aquila lydekkeri Shufeldt, 1913 (Aug. 4), Bull Amer. Mus. Nat. Hist., vol. 32, art. 16, p. 298 (type from lower Cottonwood Creek, distal portion of left tibiotarsus, selected by Wetmore, 1933, Amer. Mus. Novitates, no. 680, p. 3, Amer. Mus. Nat. Hist. no. 5165).

MIDDLE EOCENE (lower Bridger Formation). WYOMING: Lincoln County: lower Cottonwood Creek.

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[1] New genus. Type *Protostrix mimica* Wetmore. Tibiotarsus with outer condyle projecting forward far beyond internal condyle; (in *Protostrix* the two condyles project about the same distance forward; in Strigidae and Tytonidae the inner condyle projects farther forward than the outer condyle); outer condyle wider than in *Protostrix*. Name from Greek *Eos* (dawn) and *strix* (a screaming night bird), feminine.

3. *Protostrix leptosteus* (Marsh)

Bubo leptosteus Marsh, 1871 (Aug.), Amer. Jour. Sci., ser. 3, vol. 2, no. 8, p. 126 (type from Grizzly Buttes, distal portion of left tibiotarsus, Yale Peabody Mus. no. 512).—*Protostrix leptosteus* Wetmore, 1937, Condor, vol. 39, no. 2, p. 85, fig. 23 (type restudied).

MIDDLE EOCENE (lower Bridger formation, Black Fork member). WYOMING: Uinta County: Grizzly Buttes, near Mountain View.

4. *Protostrix saurodosis* (Wetmore)

Minerva saurodosis Wetmore, 1921 (Apr. 6), Proc. Acad. Sci. Philadelphia, vol. 73, pt. 3, p. 455, figs. 1-2 (type from Lodgepole Trail Crossing, distal end of left humerus, Acad. Nat. Sci. Phila. no. 9131, part of the original type material of the lizard *Saniva major* Leidy).

MIDDLE EOCENE (Bridger formation). WYOMING: Uinta County: Lodgepole Trail Crossing on (Little?) Dry Creek, about 10 miles from [south of?] Fort Bridger.

5. *Protostrix californiensis* Howard

Protostrix californiensis Howard, 1965 (June 22), Jour. Paleontology, vol. 39, no. 3, p. 350, pl. 49, figs. 1-3 (type from San Diego, left humerus, Los Angeles Co. Mus. no. 6171).

UPPER EOCENE (Poway formation). CALIFORNIA: San Diego County: San Diego, 300 yards north of intersection of Lake Shore Drive and Jackson Drive.

Family STRIGIDAE Vigors

Strigidae Vigors, 1925, Trans. Linn. Soc. London, vol. 14, p. 421 (family; type *Strix* Linnaeus).—*Strigina* Vigors, 1825 (Oct.), Zool. Jour., vol. 2, p. 393.—*Striginae* Swainson, 1836, Nat. Hist. and Classif. Birds, vol. 1, p. 325 (subfamily).

Bubonina Vigors, 1825 (Oct.), Zool. Jour., fide Gray, 1869 (type *Bubo* Duméril).—*Buboninae* Bonaparte, 1838, Geog. Comp. List Birds Eur. and N. Amer., p. 6 (subfamilia).—*Bubonidae* Sclater and Salvin, 1873, Nomenclator avium neotropicalium pp. vii, 116 (family).

Ululinae Bonaparte, 1838, Geog. and Comp. List Birds Eur. and N. Amer., p. 7 (subfamilia; type *Ulula* Cuvier, 1817, a junior synonym of *Strix* Linnaeus, 1758).

Surninae Bonaparte, 1838, Geog. Comp. List Birds Eur. and N. Amer., p. 6 (subfamilia; type *Surnia* Duméril).—*Syrniinae* G. R. Gray, 1845 (Oct.), Genera of

Birds, vol. 1, p. 39 (subfamily; type *Syrnium* Savigny).—*Surniinae* Bonaparte, 1850, Conspectus Generum Avium, vol. 1, sig. 5, p. 36 (subfamilia).
Asionidae Sclater, 1880 Ibis, p. 403 (family; type *Asio* Brisson).—*Asioninae* Verheyen, 1956 (Jan.), Bull. Inst. roy. Sci. nat. Belgique, vol. 32, no. 29 (subfamily).

Subfamily BUBONINAE (Vigors)

Bubonina Vigors, 1825.
Surninae Bonaparte, 1838.

Genus *Bubo* Duméril

Bubo Duméril, 1806, Zool. Analytique, p. 34 (type *Strix bubo* Linnaeus, Recent).

1. *Bubo incertus* Milne-Edwards

Bubo incertus Milne-Edwards, 1892, C. R. 2. Congrès internat. orn. Budapest, p. 63 (type from phosphate de Chaux, humerus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: plateau du Quercy.

2. *Bubo poirrieri* Milne-Edwards

Bubo poirrieri Milne-Edwards, 1863, C. R. Acad. Sci. Paris, vol. 56, p. 1222 (almost a nomen nudum; type from Saint-Gérand-le-Puy, coll. Poirrier).—*Bubo poirrieri* Milne-Edwards, 1863, Ann. Sci. Nat., ser. 4, vol. 20, p. 158—*Bubo poirrieri* Milne-Edwards, 1871, Ois. foss. France, vol. 2, sheet 62, p. 496, pl. 192, figs. 24-29 (type tarsometatarsus).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier Saint-Gérand-le-Puy (Milne-Edwards, 1863).

3. *Bubo florianae* Kretzoi

Bubo (?) *florianae* Kretzoi, 1957, Aquila, vol. 63-63, pp. 243 [Magyar], 247 [English], figs. 47-49 (type from Esterházy cave, phalanx 1 of pedal digit II, Magyar Geol. Mus.).

LOWER PLIOCENE (*Hipparion* fauna, lower Pannonian). HUNGARY: County Fejer; Esterházy cave, on south face of Vertes Mountain, 2 kilometers south of Csákvár.

4. *Bubo binagadensis* Burchak-Abramovich

Bubo binagadensis Burchak-Abramovich, 1965, Ornitologiya, vol. 7 p. 452 (type from Binagady, femur).

MIDDLE UPPER PLEISTOCENE (asphalt). AZERBAIJAN: Binagady.

5. *Bubo sinclairi* L. Miller

Bubo sinclairi L. Miller, 1911 (Oct. 28), Univ. Calif. Publ., Bull Dept. Geol., vol. 6, no. 16, p. 393, figs. 4-5 (type from Potter Creek Cave, right tarsometatarsus, Univ. Calif. Mus. Paleo. no. 7092).

UPPER PLEISTOCENE (cave deposit). CALIFORNIA: Shasta County: Potter Creek Cave and Samwel Cave (L. Miller, 1911).

6. *Bubo leguati* Rothschild

Bubo leguati Rothschild, 1907, Extinct Birds, p. 71 (type from Rodriguez, tibiotarsus).

QUATERNARY. RODRIGUEZ ISLAND.

Genus *Otus* Pennant

Otus Pennant, 1769, Indian Orn., p. 3 (type *Otus bakkamoena* Pennant, Recent).

7. *Otus wintershofensis* Ballmann

Otus wintershofensis Ballmann, 1966 (Jan. 25, 1967), Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West), p. 71, pl. 2, fig. 1 (type from Wintershof (West), distal half of right tibiotarsus, Inst. Pal.u. hist. Geol., Univ. München no. 18121).

MIDDLE MIOCENE (early Burdigalian fissure deposit). GERMANY: Bavaria: Wintershof (West) bei Eichstatt.

8. *Otus providentiae* Brodkorb

Otus providentiae Brodkorb, 1959 (June 3), Bull. Florida State Mus., vol. 4, no. 11, p. 360, pl. 2, figs. 2-6 (type from Banana Hole, distal portion of left tibiotarsus, Univ. Florida no. 3207).

UPPER PLEISTOCENE (Wisconsin age sink hole deposit). BAHAMAS: New Providence Island: Banana Hole.

Genus *Speotyto* Gloger

Speotyto Gloger, 1842 (1841), Hand- und Hilfsbuch Natur, p. 226 (type *Strix cunicularia* Molina, Recent).

9. *Speotyto megalopeza* Ford

Speotyto megalopeza Ford, 1966 (Oct. 4), Condor, vol. 68, no. 5, p. 473, fig. 1 (type from Fox Canyon, distal part of right tarsometatarsus, Univ. Mich. Mus. Paleo. no. 50979).

UPPER PLIOCENE (Rexroad formation). KANSAS: Meade County: Fox Canyon, XI Ranch (Ford 1966).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls County: Hagerman lake beds (Ford and Murray, 1967, Auk, vol. 84, p. 116).

Genus *Athene* Boie

Athene Boie, 1822, Isis von Oken, Band 1, col. 549 (type *Athene noctua* Boie = *Strix noctua* Scopoli, Recent).

10. *Athene murivora* (Milne-Edwards)

Strix (Athene) murivora Milne-Edwards, 1873, Bibl. Ecole Hautes Etudes, vol. 9, art. 3, p. 12, pl. 11, fig. 2 (type from Rodriguez, tibiotarsus and tarsometatarsus).

QUATERNARY. RODRIGUEZ ISLAND.

Genus †*Ornimegalonxyx* Arredondo

Ornimegalonyx Arredondo, 1958 (July), El Cartero Cubano, vol. 17, no. 7, p. 11 (type *Ornimegalonyx oteroi* Arredondo, designated by Brodkorb, 1961, Jour. Pal., vol. 35, no. 3, p. 634).

11. *Ornimegalonyx oteroi* Arredondo

Ornimegalonyx oteroi Arredondo, 1958 (July), El Cartero Cubano, vol. 17, no. 7, p. 11, fig. on p. 12 (lectotype from Cueva Pío Domingo, left tarsometatarsus, designated by Brodkorb, 1961, Jour. Paleontology, vol. 35, no. 3, p. 634; now in Mus. Comp. Zool., Harvard).

Ornimegalonyx arredondoi Arredondo, 1958 (July), El Cartero Cubano, vol. 17, no. 7, p. 11 (same lectotype; name rejected).

UPPER PLEISTOCENE. CUBA: Prov. Pinar del Río: Sierra de Sumidero: Valle de Pica Pica: Cueva Pío Domingo.

Genus *Glaucidium* Boie

Glaucidium Boie, 1826, Isis von Oken, vol. 2, col. 970 (type *Strix passerina* Linnaeus, Recent, designated by Gray, 1840).

12. *Glaucidium dickinsoni* Brodkorb

Glaucidium dickinsoni Brodkorb, 1959 (June 3), Bull. Florida State Mus., vol. 4, no. 11, p. 358, pl. 2, fig. 1 (type from Banana Hole, distal half of left tibiotarsus, Univ. Florida no. 3202).

UPPER PLEISTOCENE (Wisconsin age). BAHAMAS: New Providence Island: Banana Hole.

Genus *Pulsatrix* Kaup

Pulsatrix Kaup, 1848, Isis von Oken, vol. 41, col. 771 (type by monotypy *Strix torquata* Daudin = *Strix perspicillata* Latham, Recent).

13. *Pulsatrix arredondoi* Brodkorb

Pulsatrix arredondoi Brodkorb, 1969 (May 22), Quart. Jour. Florida Acad. Sci., vol 31, no. 2, p. 112, fig. 1 (type from Caverna Paredones, left tarsometatarsus, Brodkorb no. 8420).

UPPER PLEISTOCENE (cave deposit). CUBA: Prov. Habana: Caverna Paredones near San Antonio de los Baños.

Subfamily STRIGINAE (Vigors)

Strigidae Vigors, 1825.
Ululinae Bonaparte, 1838.
Asionidae Sclater, 1880.

Genus †*Necrobyas* Milne-Edwards

Necrobyas Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 61 (type *Necrobyas harpax* Milne-Edwards, designated by Richmond, 1902, Proc. U. S. Nat. Mus., vol. 24, no. 1267, p. 699).

14. *Necrobyas harpax* Milne-Edwards

Necrobyas harpax Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 61 (type from phosphate de Chaux, tarsometatarsus, tibiotarsus, humerus, ulna Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Mouillac.

15. *Necrobyas rossignoli* Milne-Edwards

Necrobyas rossignoli Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 63 (type from phosphate de Chaux, tarsometatarsus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: plateau du Quercy.

16. *Necrobyas edwardsi* Gaillard

Necrobyas edwardsi Gaillard, 1938, Arch. Mus. Hist. Lyon, vol. 15, p. 8, fig. 3 (type from Bach, left tarsometatarsus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Lot: Bach.

Genus †*Strigogyps* Gaillard

Strigogyps Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci.-med., fasc. 23, p. 39 (type by monotypy *Strigogyps dubius* Gaillard).

17. *Strigogyps dubius* Gaillard

Strigogyps dubius Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci.-med., fasc. 23, p. 39, text-fig. 5, pl. 2 (type from Escamps, lower end of left tibiotarsus, Munich Mus. no. 2).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Lot: Escamps.

18. *Strigogyps minor* Gaillard

Strigogyps minor Gaillard, 1938, Arch. Mus. Hist. Nat. Lyon, vol. 15, p. 10, fig. 4 (type from Bach, left humerus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Lot: Bach.

Genus *Asio* Brisson

Asio Brisson, 1769, Orn., vol. 1, p. 28 (type *Strix otus* Linnaeus).

19. *Asio henrici* (Milne-Edwards)

Otus henrici Milne-Edwards, 1892, C. R. 2. Congrès internat. Ornith. Budapest,

p. 63 (type from phosphate de Chaux, distal portion of tibiotarsus, tarsometatarsus, Paris Mus.).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: plateau du Quercy.

20. *Asio pigmaeus* Serebrovsky

Asio pigmaeus Serebrovsky, 1941, Doklady Acad. Sci. U. R. S. S., vol. 33, nos. 7-8, p. 476 (type from Odessa).

LOWER PLIOCENE (Meotian). UKRAINE: Odessa.

21. *Asio brevipes* Ford and Murray

Asio brevipes Ford and Murray, 1967 (March 22), Auk, vol. 84, no. 1, p. 116, fig. 1 (type from sec. 28, distal part of right tarsometatarsus, Univ. Mich. Mus. Paleo. no. 49490).

UPPER PLIOCENE (Glenns Ferry formation). IDAHO: Twin Falls County: Hagerman lake beds in section 28, Township 78, Range 13 E.

22. *Asio priscus* Howard

Asio priscus Howard, 1964 (Apr. 21), Bull. So. California Acad. Sci., vol. 63, pt. 1, p. 28, fig. 1 (type from Arlington Canyon, right tibiotarsus, Los Angeles Co. Mus. no. 4712).

UPPER PLEISTOCENE (Tecolote member, Santa Rosa Island formation). CALIFORNIA: Santa Rosa Island: Arlington Canyon.

Genus *Strix* Linnaeus

Strix Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 92 (type by tautonomy *Strix stridula* Linnaeus = *Strix aluco* Linnaeus).

23. *Strix dakota* A. H. Miller

Strix dakota A. H. Miller, 1944 (June 22), Univ. Calif. Publ., Bull. Dept. Geol. Sci. vol. 27, no. 4, p. 95, fig. 8 (type from Flint Hill, distal portion of right tarsometatarsus, Univ. Calif. Mus. Paleo. no. 37368).

LOWER MIOCENE (Rosebud formation). SOUTH DAKOTA: Bennett County: Flint Hill, 9 miles WSW of Martin.

24. *Strix brevis* Ballmann

Strix brevis Ballmann, 1966 (25 Jan. 1967), Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West), p. 66, pl. 1, figs. 4-5 (type from Wintershof (West), distal part of left humerus, Inst. f. Pal. u. hist. Geol. Univ. München no. 18012; cast in coll. Brodkorb).—Ballmann, 1969 (1 Sept.), Zitteliana, vol. 1, p. 38, pl. 1, fig. 7-9).

MIDDLE MIOCENE (early Burdigalian fissure deposit). GERMANY: Bavaria: Wintershof (West) bei Eichstätt.

25. *Strix brea* Howard

Strix brea Howard, 1933 (March 17), Condor, vol. 35, no. 2, p. 66, fig. 15 (type from Pit 16, Rancho La Brea, left tarsometatarsus, Los Angeles Co. Mus. no. E9379).

UPPER PLEISTOCENE (Rancholabrean). CALIFORNIA: Los Angeles County: Los Angeles: Rancho La Brea.

Neospecies of Strigidae from Pleistocene and *prehistoric sites:

Subfamily BUBONINAE

1. *Otus scops* (Linnaeus). MONACO: Grotte de Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 771) ITALY: Buca Tana di Maggiano (Lambrecht, 1933, Handb. Palaeorn., p. 771). SWITZERLAND: Ettingen? (Lambrecht, 1933, Handb. Palaeorn., p. 771). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 771). HUNGARY: Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Püspökfürdö (Capek, 1917, Barlangkutatás, vol. 5, p. 28). AZERBAIJAN: Binagady (Burchak-Abramovich, "1963," 1962, Ornitologiya, vol. 4, p. 463). ISRAEL: Oumm Qatafa Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 100).

2. *Otus flammeolus* (Kaup). CALIFORNIA: Samwel Cave (L. Miller, 1933, Trans. San Diego Nat. Hist. Soc., vol. 7, p. 209). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. California Publ. Zool., vol. 47, p. 162). YUCATÁN: *Actun Lara (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83). Supposed record of *Micropallas whitneyi* (Cooper) from Samwel Cave, California (L. Miller, 1911, Univ. California Publ., Bull. Dept. Geol., vol. 6, p. 395) refers to this species (see L. Miller, 1933, Trans. San Diego Nat. Hist. Soc., vol. 7, p. 209).

3. *Otus asio* (Linnaeus). OREGON: *Five Mile Rapids (L. Miller, 1957, Condor, vol. 59, p. 62) CALIFORNIA: Potter Creek Cave (L. Miller, 1911, Univ. California Publ., Bull. Dept. Geol., vol. 6, p. 395); Rancho La Brea (L. Miller, 1912, Univ. Calif. Publ., Bull. Dept. Geol., vol. 7, p. 71); Carpinteria (L. Miller, 1931, Univ. Calif. Publ. Sci., vol. 20, p. 364). IDAHO: *Weiss rock shelter (L. Mil-

ler, 1963, Bull. So. Calif. Acad. Sci., vol. 62, pt. 4, p. 180). ARIZONA: °35 miles north of Flagstaff (A. H. Miller, 1932, Condor, vol. 34, p. 138). NEW MEXICO: Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16). TEXAS: Millers Cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108). TENNESSEE: bone caves (Shufeldt, 1897, Amer. Naturalist, vol. 31, p. 649). PENNSYLVANIA: °Varner site, four and one-half miles south of Waynesburg (Guilday, 1961, Pennsylvania Archaeologist, vol. 31, p. 122). GEORGIA: °Etowah site (Parmalee, 1960, Florida Anthropologist, vol. 8, p. 49). FLORIDA: Sabertooth Cave near Lecanto (Wetmore, 1931, Smithsonian Misc. Coll., vol. 85, no. 2, p. 40); Reddick (Brodkorb, 1957, Jour. Palaeontology, vol. 31, p. 136); Arredondo (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 282); Haile (Ligon, 1966, Bull. Florida State Mus., vol 10, p. 148); °Vero Beach (Weigel, 1963, Florida Geol. Surv., Spec. Publ., no. 10, p. 29).

4. *Otus trichopsis* (Wagler). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 162).

5. *Otus nudipes* (Daudin). PUERTO RICO: °Cueva Clara, °Cueva Catedral, °Cueva San Miguel, and °Cueva Toraño (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 320). ST. CROIX: °Concordia (Wetmore, 1937, Jour. Agr. Univ. Puerto Rico, vol. 21, p. 14).

6. *Bubo virginianus* (Gmelin). ALASKA: °Kodiak Island (Friedmann, 1934, Jour. Washington Acad. Sci., vol. 24, p. 236). WASHINGTON: °Puget Sound (L. Miller, 1960, Wilson Bull., vol. 72, p. 397). OREGON: Fossil Lake (Shufeldt, 1892, Jour. Acad. Nat. Sci., Philadelphia, vol. 9, p. 418). CALIFORNIA: Rancho La Brea (L. Miller, 1909, Univ. Calif. Publ., Bull. Dept. Geol., vol. 5, p. 306); Samwel Cave (L. Miller, 1911, Univ. Calif. Publ., Bull. Dept. Geol., vol. 6, p. 393); McKittrick (L. Miller, 1925, Univ. Calif. Publ., Bull. Dept. Geol. Sci., vol. 15, p. 324); Carpinteria (L. Miller, 1931, Univ. Calif. Publ., Bull. Dept. Geol. Sci., vol. 20, p. 364); °Buena Vista Lake (DeMay, 1942, Condor, vol. 44, p. 228). NEVADA: Smith Creek cave (Howard, 1952, Bull. So. Calif. Acad. Sci., vol. 51, pt. 2, p. 54). ARIZONA: °35 miles north of Flagstaff (A. H. Miller, 1932, Condor, vol. 34, no. 3, p. 138); °Grand Falls, °Nalakihu Pueblo, °Awatobi Pueblo, and °Dead man's Cave (Hargrave, 1939, Condor, vol. 41, p. 208). UTAH: °Poncho House (Hargrave, 1939, Condor, vol. 41, p. 208). NEW MEXICO: °Carlsbad Cavern (Wetmore, 1931 Condor, vol. 33, p. 248); Rocky Arroyo (Wetmore, 1932, Condor, vol. 34, p. 141); Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16); Howells Ridge Cave? (Howard, 1962, Condor, vol. 64, p. 242). NORTH DAKOTA: Thomas Riggs site (L. Miller, 1961, Bull. So. Calif. Acad. Sci., vol. 60, pt. 3, p. 126). TEXAS: °South Mule Ears Peak cave (Wetmore and Friedmann, 1933, Condor, vol. 35, p. 37). IOWA: °Mill Creek (Hamon, Plains Anthropologist, vol. 6, p. 211). ILLINOIS: °Plum Island (Baker, 1941, Trans. Amer. Philosoph. Soc., n.s., vol. 32, p. 68); °Schild site (Parmalee, 1967, Wilson Bull., vol. 79, p. 159). GEORGIA: °Etowah site (Parmalee, 1960, Florida Anthropologist, vol. 8, p. 49). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 162).

7. *Bubo bubo* (Linnaeus). ENGLAND: East Runton in Norfolk (E. T. Newton, 1887, Geol. Mag., n.s., decade 3, vol. 4, no. 4, p. 146, pl. 4, figs. 3-5); Langwith

Bassett Cave (Lambrecht, 1933, Handb. Palaeorn., p. 772). PORTUGAL: Grotte de Furninha (Lambrecht, 1933, Handb. Palaeorn., p. 772). SPAIN: Caverna de Lumertxa and Cueva de la Ermitia (Villalta, 1964, Speleon, vol. 15, p. 96). BELGIUM: Trou de Frontal (Lambrecht, 1933, Handb. Palaeorn., p. 772). FRANCE: Grotte de Bruniquel near Montauban (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 14); cavernes de l'Aude (Paris, 1912, Rev. Franç d'Ornith, vol. 4, no. 37, p. 287); Seneze?, Gourdan, and Carcassone (Lambrecht, 1933, Handb. Palaeorn., p. 772). MONACO: Grotte de Grimaldi and Grotte de l'Observatoire (Lambrecht, 1933, Handb. Palaeorn., p. 772). ITALY: Grotta dei Colombi (Regàlia, 1893, Arch. Anthrop. Etnol., vol. 23, p. 262); Grotta di Parignan, Höhle d'Equi, Verezzi, and Rome (Lambrecht, 1933, Handb. Palaeorn., p. 772). DENMARK: (Loeppenthin, 1967, Danske ynglefugle i fortid og nutid, pp. 46-47, 341, 543). GERMANY: Kastelhäng-Höhle, Buchberg bei Münster, Höhle bei St. Wolfgang and Dürrlock bei Schwaighausen (Lambrecht, 1933, Handb. Palaeorn., p. 772). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 940). AUSTRIA: Tischoferhöhle bei Kufstein (Lambrecht, 1933, Handb. Palaeorn., p. 772). HUNGARY: Otto Herman Cave (Lambrecht, 1916, Aquila, vol. 22, p. 188, fig. 3); *Csákvár (Lambrecht, 1933, Handb. Palaeorn., p. 772); Subalyuk-Höhle (Jánossy, 1962, Aquila, vol. 67-68, p. 180). ISRAEL: Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 106). AZERABAIJAN: Binagady (Serebrovsky, 1941, C. R. (Doklady) Acad. Sci. U. R. S. S., vol. 33, p. 473).

8. *Bubo africanus* (Temminck). SARDINIA: Monte San Giovanni and Tavolara Cave (Lydekker, 1891, Proc. Zool. Soc. London, p. 468, pl. 37, fig. 1).

9. *Ketupa zeylonensis* (Gmelin). INDIA: Karnul District in Madras (Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 16, fig. 4).

10. *Nyctea scandiaca* (Linnaeus). ENGLAND: Kent's Hole cavern near Torquay (Lydekker, 1891, Ibis, ser. 6, vol. 3, p. 386). SPAIN: Cueva de Toll (Villalta, 1964, Speleon, vol. 15, p. 96). FRANCE: Grottes du Périgord, Grotte de Lherm, Grotte des Eyzies and Grotte de Bruniquel (Milne-Edwards, 1871, Oiseaux fossiles de la France, vol. 2, p. 501); Gourdan, Lyon, Madelaine, Laugerie, Haute, Lacomb-Thayac, Massat, and Aurignac (Lambrecht, 1933, Handb. Palaeorn., p. 771). SARDINIA? (Milne-Edwards, 1871, Oiseaux fossiles de la France, vol. 2, p. 501). ITALY: Grotta dei Colombi (Regàlia, 1896, Arch. Anthrop. Etnol., vol. 26, p. 141, pl. 1, figs. 3,9); Cagliari (Lambrecht, 1933, Handb. Palaeorn., p. 771). GERMANY: Höhlefels bei Happurg, Martins Cave bei Lethmate, Steinkirche bei Scharzfeld, and *Bsetzi be Thayingen (Lambrecht, 1933, Handb. Palaeorn., p. 771). CZECHOSLOVAKIA: Predmost, Balcarova Skála, Sipka, and Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 938); Holubic, and Kosfelik (Lambrecht, 1933, Handb. Palaeorn., p. 771). POLAND: Zuzlawitz (Lambrecht, 1933, Handb. Palaeorn., p. 771). AUSTRIA: Schusterlucke (Lambrecht, 1912, Aquila, vol. 19, p. 302). HUNGARY: Novi III? (Lambrecht, 1912, Aquila, vol. 19, p. 302); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Puskaporos (Lambrecht, 1916, Barlangkutatás, vol. 4, p. 204); Pálffy Cave, and *Csákvár (Lambrecht, 1933, Handb. Palaeorn., p. 771); Buják (Jánossy, 1959, Ann. Mus. hungarica, vol. 51, p. 114, fig. 1); Istállóskö? (Janossy, Aquila, vol. 55-58, p.

217). AZERBAIJAN: Binagagy (Burchak-Abramovich, "1963," 1962, Ornitologiya, vol. 4, p. 460). ALASKA: *St. Lawrence Island (Friedmann, 1934, Jour. Washington Acad. Sci., vol. 24, p. 96); *Little Kiska Island (Friedmann, 1937, op. cit., vol. 27, p. 437); *Cape Prince of Wales (Friedmann, 1941, op. cit., vol. 31, p. 409). ILLINOIS: *Emmons, *Schild, and *Krueger sites (Parmalee, 1967, Wilson Bull., vol. 79, p. 158).

11. *Surnia ulula* (Linnaeus). SWITZERLAND: Schaffhausen (Lambrecht, 1912, Aquila, vol. 19, p. 302). AUSTRIA: Schusterlucke (Lambrecht, 1912, Aquila, vol. 19, p. 302). HUNGARY: Puskaporos (Lambrecht, 1911, Mitt. Jahrb. ungar. geol. Anst., vol. 19, p. 152); Balla Cave and Istállóskö Cave (Lambrecht, 1912, Aquila, vol. 19, pp. 275, 282); Pálffy Cave (Lambrecht, 1913, Aquila, vol. 20, p. 428); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480). ALASKA: *Kodiak Island (Friedmann, 1934, Jour. Washington Acad. Sci., vol. 24, p. 236).

12. *Glaucidium passerinum* (Linnaeus). FRANCE: Avignon (Lambrecht, 1933, Handb. Palaeorn., p. 771). ITALY: Verezzi (Lambrecht, 1933, Handb. Palaeorn., p. 771). GERMANAY: Zwergloch bei Potterstein? (Lambrecht, 1933, Handb. Palaeorn., p. 771). CZECHOSLOVAKIA: Balcarova skála, Sipka, and Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 938). HUNGARY: Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Otto Herman Cave (Lambrecht, 1916, op. cit., vol. 22, p. 189); Püspökfürdö (Capek, 1917, Barlangkutatás, vol. 5, p. 28).

13. *Glaucidium gnoma* Wagler. CALIFORNIA: Samwel cave (L. H. Miller, 1911, Univ. California Publ. Bull. Dept. Geol., vol. 6, p. 395); Rancho La Brea (L. Miller, 1925, Carnegie Instn. Washington Publ., vol. 349, p. 104); Carpinteria (L. Miller, 1931, Univ. Calif. Publ., Dept. Geol. Sci., vol. 20, p. 364). NUEVO LEÓN: San Josecito cavern? (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 164).

14. *Glaucidium brasilianum* (Gmelin). YUCATÁN: *Actun Coyok (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83). BRAZIL: Lapa da Escrivania, Salpeterhule near Escrivania, and Lapa da Lagoa do Sumidouro (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 37).

15. *Ninox novaeseelandiae* (Gmelin). NEW ZEALAND: Pyramid Valley swamp (Scarlett, 1955, Rec. Canterbury Mus., vol. 6, p. 263); *Ototara (Trotter, 1965, Notornis, vol. 12, p. 178).

16. *Sceloglaux albifacies* (Gray). NEW ZEALAND: Pyramid Valley swamp (Scarlett, 1955, Rec. Canterbury Mus., vol. 6, p. 263); *Ototara and *Waimataitai (Trotter, 1965, Notornis, vol. 12, p. 178). CHATHAM ISLANDS: (Forbes, 1893, Ibis, ser. 6, vol. 5, p. 544).

17. *Athene noctua* Scopoli). ENGLAND: Chudleigh Cave (Lambrecht, 1933, Handb. Palaeorn., p. 771). SPAIN: Castelldefels (Villalta, 1964, Speleon, vol. 15, p. 96). BELGIUM: Trou de Chaleux (Lambrecht, 1933, Handb. Palaeorn., p. 771). FRANCE: Grotte de la Trou-des-Farges (Paris, 1912, Rev. Franç. d'Ornith., vol. 4,

p. 287); Bruniquel (Lambrecht, 1933, Handb. Palaeorn., p. 771) ITALY: Grotta Verezzi and Grotte dei Colombi (Lambrecht, 1933, Handb. Palaeorn., p. 771). DENMARK: (Loeppenthin, 1967, Danske ynglefugle i fortid og nutid, pp. 52, 348, 543). POLAND: Zechovice and Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 771). HUNGARY: Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Püspökfürdö (Capek, 1917, Barlangkutatás, vol. 5, p. 28). ISRAEL: Oumm Qatafa cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, p. 100); 'Ubeidiya (Tchernov, 1968, Prelim. Invest. Birds of Pleistocene of 'Ubeidiya, p. 14). AZERBAIJAN: Binagady (Burchak-Abramovich, "1963" 1962, Ornitologiya, vol. 4, p. 463). CHINA: Chou Kou Tien (Howard, 1939, Fortschritte der Paläont., vol. 2, p. 314).

18. *Speotyto cunicularia* (Molina). CALIFORNIA: Rancho La Brea (L Miller, 1909, Univ. California Publ., Bull. Dept. Geol., vol. 5, p. 306); McKittrick (L. Miller, 1935, Condor, vol. 37, p. 79); *Buena Vista Lake (DeMay, 1942, Condor, vol. 44, p. 228). NEW MEXICO: Conkling Cavern and Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16). NEBRASKA: Sand Draw (*Speotyto cunicularia intermedia* Feduccia, 1970, Wilson Bull., vol. 82, p. 333, fig. 1; type proximal end of left tarsometatarsus, Univ. Mich. Mus. Paleo. no. V57018; preoccupied by *Speotyto cunicularia intermedia* Cory, 1915). FLORIDA: Reddick (Brodkorb, 1957, Jour. Paleont., vol. 31, p. 136); Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 148). BAHAMAS: Great Exuma Island (Wetmore, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 439). DOMINICAN REPUBLIC: Cerro de San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 276). YUCATÁN: *Actun Spukil (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 38). ARGENTINA: Lujan (Ameghino, 1891, Revista argentina Hist. nat. vol. 1, p. 443).

19. *Ciccaba virgata* (Cassin). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 165).

Subfamily STRIGINAE

20. *Strix aluco* Linnaeus. ENGLAND: Langwith Bassett Cave (Lambrecht, 1933, Handb. Palaeorn., p. 771). DENMARK: Ertboelle, Havelse, Soelager, *Borrebjerg, and *Vordinborg (O. Winge, 1903, Vidensk, Meddel. naturh. Foren., vol. 6, p. 102). MONACO: Grotte de Grimaldi and Grotte de l'Observatoire (Lambrecht, 1933, Handb. Palaeorn., p. 771). ITALY: Grotta dei Colombi (Regàlia, 1893, Arch. Anthrop. Etnol., vol. 23, p. 262); Grotta Zachito, Buca dell Tasso, and Buca Tana di Maggiano (Lambrecht, 1933, Handb. Palaeorn., p. 771). SWITZERLAND: Concise (Lambrecht, 1933, Handb. Palaeorn., p. 771). GERMANY: Cave near St. Wolfgang? and Szontagsee (Lambrecht, 1933, Handb. Palaeorn., p. 771). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 940). HUNGARY: Bajót cave (Lambrecht, 1913, Aquila, vol. 20, p. 433); Csév Passage (Jánossy, 1959, Ann. Mus. hungarica, vol. 51, p. 117); Tarkö (Jánossy, 1962, Ann. Mus. hungarica, vol. 54, p. 157); *Legenybarlang bei Pilisszentlelek (Lambrecht, 1933, Handb. Palaeorn., p. 771).

21. *Strix occidentalis* (Xantus). NEVADA: Smith Creek cave? (Howard, 1952, Bull. So. California Acad. Sci., vol. 51, pt. 2, 52). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. California Publ. Zool., vol. 47, p. 164).

22. *Strix varia* Barton. ONTARIO: caves near Hamilton (Wetmore, 1958, Smithsonian Misc. Coll., vol. 135, no. 8, p. 9). OHIO: *Twinsburg rock shelter and *Canter caves (Goslin, 1955, Ohio Jour. Science, vol. 55, p. 360). GEORGIA: *Etowah site? (Parmalee, 1960, Florida Anthropologist, vol. 13, p. 49). FLORIDA: Seminole Field, Melbourne, and Sabertooth Cave near Lecanto (Wetmore, 1931, Smithsonian Misc. Coll., vol. 85, no. 2, p. 40); Eichelberger Cave (Brodkorb, 1956, Auk, vol. 73, p. 136); Reddick (Brodkorb, 1957, Jour. Paleont., vol. 31, p. 136); Rock Spring (Woolfenden, 1959, Wilson Bull., vol. 71, p. 185); Vero Beach (Weigel, 1963, Florida Geol. Surv., Spec. Publ. no. 10, p. 29).

23. *Strix uralensis* Pallas. SWITZERLAND: Schweizersbild bei Schaffhausen? (Lambrecht, 1933, Handb. Palaeorn., p. 771). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 940). HUNGARY: Palffy cave (Lambrecht, 1913, Aquila, vol. 20, p. 426); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90).

24. *Strix nebulosa* Forster. RUMANIA: Curata Cave? (Jánossy, 1965, Vertebrata Hungarica, vol. 7, p. 109).

25. *Rhinoptynx clamator* (Vieillot). VENEZUELA: *Los Tamarindos (Wetmore, 1935, Auk, vol. 52, p. 329).

26. *Asio otus* (Linnaeus). MONACO: Grotte de Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 772). ITALY: Grotta dei Colombi (Lambrecht, 1933, Handb. Palaeorn., p. 772). HUNGARY: Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Subalyuk cave (Jánossy, 1962, Aquila, vol. 67-68, p. 180); Tarkö (Jánossy, 1962, Ann. Mus. hungarica, vol. 54, p. 157); *Remetehegy (Lambrecht, 1916, Mitt. Jahrb. ungar. geol. Anst., vol. 22, p. 396, pl. 15, figs. 9-13). AZERBAIJAN: Binagady (Serebrovsky, 1941, C. R. Acad. Sci. U. R. S. S., vol. 33, p. 473). CALIFORNIA: Rancho La Brea (Howard, 1964, Bull. So. Calif. Acad. Sci., vol. 63, pt. 1, p. 30 [earlier records are erroneous]); Samwel Cave (L. H. Miller, 1911, Univ. California Publ., Bull. Dept. Geol., vol. 6, p. 395); Carpinteria (L. Miller, 1931, Univ. Calif. Publ., Bull. Dept. Sci., vol. 20, p. 364); McKittrick (L. Miller, 1935, Condor, vol. 37, p. 79). IDAHO: *Weiss rock shelter and *Birch Creek Valley (L Moller, 1963, Bull. So. Calif. Acad. Sci., vol. 62, pt. 4, pp. 179, 183). ARIZONA: *Nalakihu Pueblo, *Wupatki Pueblo, and *Jack Smith's tank (Hargrave, 1939, Condor, vol. 41, p. 208). NEW MEXICO: Conkling Cavern (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16); Howells Ridge cave (Howard, 1962, Condor, voo. 64, p. 242). TEXAS: Millers Cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108). NUEVO LEON: San Josecito cavern (L. Miller, 1943, Univ. California Publ. Zool., vol. 47, p. 165). Supposed records (Lambrecht, 1933, Handb. Palaeorn., p. 772), from Tennessee, from Lecanto, Florida, and from Potter Creek Cave, California, are in error and refer to *Otus asio*.

27. *Asio stygius* (Wagler). DOMINICAN REPUBLIC: Cerro San Francisco? (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 276). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 37).

28. *Asio flammeus* (Pontoppidan). ENGLAND: Merlin's Cave? and Long-

cliffe Cave (Lambrecht, 1933, Handb. Palaeorn., p. 772). PORTUGAL: Gruta de Furninha (Villalta, 1964, Speleon, vol. 15, p. 96). SPAIN: Caverna de Santima mine and Castelldefels (Villalta, 1964, Speleon, vol. 15, p. 96). FRANCE: Bruniquel (Lambrecht, 1933, Handb. Palaeorn., p. 772). MONACO: Grotte de Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 772). CORSICA: Grotta di Funtanedu (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). ITALY: Grotta Romanelli?, Grotta dei Colombi, and Grotta d'Equi (Lambrecht, 1933, Handb. Palaeorn., p. 772). SWITZERLAND: Schweizerbild (Lambrecht, 1933, Handb. Palaeorn., p. 772). GERMANY: Hermanns cave near Rübeland (Blasius, 1901, Jour. f. Orn., vol. 49, p. 58); Thiede (Lambrecht, 1912, Aquila, vol. 19, p. 301); Andernach? (Lambrecht, 1933, Handb. Palaeorn., p. 772). AUSTRIA: Schuster lucke (Lambrecht, 1912, Aquila, vol. 19, p. 301). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 772). CZECHOSLOVAKIA: Balcarova skála, Ludmirau, Sipla, and Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, pp. 938-940); Holubic (Lambrecht, 1933, Handb. Palaeorn., p. 772). HUNGARY: Puskaporos (Kormos, 1911, Mitt. Jahrb. ungar. geol. Anst., vol. 19, p. 152); Balla Cave and Peskö cave (Lambrecht, 1912, Aquila, vol. 19, pp. 275, 280); Pálffy cave (Lambrecht, 1913, Aquila, vol. 20, p. 428); Oregkö cave near Bajót (Kormos and Lambrecht, 1914, Barlangkutatás, vol. 2, p. 105); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); Otto Hermann cave (Lambrecht, 1916, Aquila, vol. 22, p. 189); Istállóskö (Jánossy, 1954, Aquila, vol. 55-58, p. 217). RUMANIA: Betfia (Kretzoi, 1962, Aquila, vol. 67-68, p. 172); Curata cave (Jánossy, 1965, Vertebrata hungarica, vol. 7, p. 109). AZERBAIJAN: Binagady (Burchak-Abramovich, "1963" 1962, Ornitologiya, vol. 4, p. 463). CALIFORNIA: Rancho La Brea (L. Miller, 1909, Univ. Calif. Publ., Bull. Dept. Geol. Sci., vol. 5, p. 306); Vallecito Creek? (Howard, 1963, Contrib. Sci., no. 73, p. 24); *Buena Vista Lake (DeMay, 1942, Condor, vol. 44, p. 228). NEVADA: Smith Creek Cave (Howard, 1952, Bull. So. Calif. Acad. Sci., vol. 51, pt. 2 p. 54). ARIZONA: *Nalakihu Pueblo (Hargrave, 1939, Condor, vol. 41, p. 208). NEW MEXICO: *Rocky Arroyo (Wetmore, 1932, Condor, vol. 34, p. 141). TEXAS: Millers cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108). KANSAS: Shortts Creek (Stettenheim, 1958, Wilson Bull., vol. 70, p. 198). FLORIDA: Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 148). YUCATÁN: *Actun Spukil (Fisher, 1953, Cranbrook, Inst. Sci. Bull., vol. 33, p. 83).

29. *Aegolius funereus* (Linnaeus). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 770). AUSTRIA: *Mixnitz (Lambrecht, 1933, Handb. Palaeorn., p. 770). HUNGARY: Puskaporos (Kormos, 1911, Mitt. Jahrb. ungar. geol. Anst., vol. 19, p. 152); Balla cave (Lambrecht, 1912, Aquila, vol. 19, p. 275); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., p. 189); Istállóskö (Jánossy, 1954, Aquila, vol. 55-58, p. 217). NEW MEXICO: Shelter Cave (Howard, 1931, Condor, vol. 33, p. 216).

30. *Aegolius acadicus* (Gmelin). CALIFORNIA: Rancho La Brea (Howard, 1936, Condor, vol. 38, p. 36). NEVADA: Smith Creek Cave (Howard, 1952, Bull. So. Calif. Acad. Sci., vol. 51, pt. 2, p. 54). ARIZONA: *Kiet Siel Pueblo (Hargrave, 1939, Condor, vol. 41, p. 208). NEW MEXICO: Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16).

Family PHODILIDAE (Beddard)

Photodilinae Beddard, 1898 (July or later), Structure and Classification of Birds, p. 251 (sub-family; type *Photodilus*[1] = *Phodilus* Geoffroy St. Hilaire, Recent). —*Phodilidae* Oberholser, 1932 (Jan. 29 or later), Bull. U. S. Nat. Mus., no. 159, pp. iii, 40 (family). —*Phodilinae* Verheyen, 1956 (Jan.), Bull. Inst. royal Sci., nat. Belgique, vol. 32, no. 3, p. 29 (sous-famille). —*Phodilidae* J. T. Marshall, 1966 (Dec.), Nat. Hist. Bull. Siam Soc., vol. 21 nos. 3-4, p. 238 (family).

Genus †*Paratyto* Brodkorb

Paratyto Brodkorb, 1970 (Feb. 27), Quart. Jour. Florida Acad. Sci., vol. 32, no. 2, p. 159 (type by original designation *Bubo arvernensis* Milne-Edwards).

1. *Paratyto arvernensis* (Milne-Edwards)

Bubo arvernensis Milne-Edwards, 1863 (séance du 29 juin), C. R. Acad. Sci. Paris, vol. 56, p. 1222 (type from St.-Gérand-le-Puy; practically a nomen nudum at this point). —*Bubo arvernensis* Milne-Edwards, 1863, Ann. Sci. Nat., ser. 4, vol. 20, p. 158 (not seen). —*Bubo arvernensis* Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sheet 62, p. 493, pl. 192, figs. 10-23 (types from "environs de Langy," but referring to the region, not the town, left tarsometatarsus and tibiotarsus, Paris Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Saint-Gérand-le-Puy (Milne-Edwards, 1863, p. 1222).

Family TYTONIDAE Ridgway

Striginae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 6 (subfamily; type *Strix* Linnaeus, i.e. *Tyto* Billberg). —*Strigidae* "Leach," Boucard, 1876, Catalogus avium, pp. xi, 95 (familia).

Aluconidae Coues, 1884 (Apr. or later), Key to N. American Birds, ed. 2, pp. viii, 494, 500 (family; type *Aluco* Fleming, 1822, preoccupied by *Aluco* Link, 1807). —*Aluconinae* Barrows, 1885, Standard Nat. Hist., vol. 4, p. 346 (subfamily). —*Alucinae* A. Newton, 1894, Dict. Birds, p. 674 (subfamily).

Tytonidae Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 598 (family; type *Tyto* Billber, 1828, a junior synonym of the preoccupied *Aluco* Fleming, 1822). —*Tytoninae* Mayr and Amadon, 1951 (Apr. 2), Amer. Mus. Novitates, no. 1496, p. 35 (subfamily).

Genus †*Prosybris* Brodkorb

Prosybris Brodkorb, 1970 (Feb. 27), Quart. Jour. Florida Acad. Sci., vol. 32, no. 2, p. 159 (type by original designation *Strix antiqua* Milne-Edwards).

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[1] *Photodilus* is not listed in Waterhouse's Index Generum Avium or in Richmond's supplements.

1. *Prosbybris antiqua* (Milne-Edwards)

Strix antiqua Milne-Edwards, 1863 (séance du 29 juin), C. R. Acad. Sci. Paris, vol. 56, p. 1222 (practically a nomen nudum at this point). —*Strix antiqua* Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sheet 498, pl. 192, figs. 3-9 (type from Saint-Gérand-le-Puy, right tarsometatarsus, Paris Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Saint-Gérand-le-Puy.

Genus *Tyto* Billberg

Tyto Billberg, 1828, Synopsis Faunae Scand., vol. 1, pt. 2, tab. A (type by monotypy *Strix flammea* = *Strix alba* Scopoli, 1769).

2. *Tyto ignota* (Paris)

Strix ignota Paris, 1912, Rev. Franç. d'Ornith., vol. 4, no. 37, p. 287 (new name for *Strix* sp. Milne-Edwards, 1871, Ois. Foss. France, vol. 2, p. 499, pl. 192, figs. 1-2, type from Sansan, distal end of right tarsometatarsus).

MIDDLE MIOCENE (Helvetian). FRANCE: Dept. Gers: Sansan.

3. *Tyto sancti-albani* (Lydekker)

Strix sancti-albani Lydekker, 1893, Proc. Zool. Soc. London, p. 518, pl. 41, figs. 1-4 (type from Grive-St.-Alban, distal portion of tibiotarsus, proximal and distal ends of tarsometatarsus, ungual phalanx, humerus, carpometacarpus, Brit. Mus.).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

4. *Tyto edwardsi* (Ennouchi)

Strix edwardsi Ennouchi, 1930, Contr. Etude Faune Tortonien de La Grive-Saint-Alban (Isère), p. 66, pl. 5, figs. 9-12 (type from Grive-St.-Alban, distal portion of right tibiotarsus, Mus. Lyon).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

5. *Tyto ostologa* Wetmore

Tyto ostologa Wetmore, 1922 (Oct. 17), Smithsonian Misc. Coll., vol. 74, no. 4, p. 2, figs. 1-2 (type from Grotte San Francisco, proximal end of left tarsometatarsus, U. S. Nat. Mus. no. 10746).

UPPER PLEISTOCENE. HAITI: Grotte San Francisco, 3-4 kilometers northeast of St. Michel de l'Atalye; caves near l'Atalye.

6. *Tyto pollens* Wetmore

Tyto pollens Wetmore, 1937 (Oct.), Bull. Mus. Comp. Zool., vol. 80, no. 12, p. 436, figs. 10-16 (type from Great Exuma, left femur, Mus. Comp. Zool., Harvard, no. 2262).

UPPER PLEISTOCENE (Wisconsin age). BAHAMAS: Great Exuma Island (Wetmore, 1937). New Providence Island: Banana Hole (Brodkorb, 1959, Bull. Florida State Mus., vol. 11, p. 358).

7. *Tyto cavatica* Wetmore

Tyto cavatica Wetmore, 1920 (Dec. 30), Proc. Biol. Soc. Washington, vol. 33, p. 80 (type from Cueva Torano, proximal portion of left tarsometatarsus, Amer. Mus. Nat. Hist., no. 4924).

QUATERNARY. PUERTO RICO: Cueva Toraño near Utuado.

8. *Tyto melitensis* (Lydekker)

Strix melitensis Lydekker, 1891, Cat. Foss. Birds Brit. Mus., p. 13 (type from Malta, left femur, Brit. Mus. no. 49322).

UPPER PLEISTOCENE (cavern deposits). MALTA.

9. *Tyto sauzieri* (Newton and Gadow)

Strix sauzieri Newton and Gadow, 1893, Trans. Linn. Soc. London, vol. 13, pp. 282, 286, pl. 33, figs. 11-18 (types from Mare aux Songes, humerus, tibiotarsi, tarsometatarsi, Mautitius Museum, Port Louis). = ♀

Strix newtoni Rothschild, 1907, Extinct Birds, p. 79 (type from Mare aux Songes, tarsometatarsus, Mauritius Museum). = ♂

QUATERNARY. MAURITIUS: Mare aux Songes.

Genus †*Lechusa* L. Miller

Lechusa L. Miller, 1956 (Nov. 26), Proc. Calif. Acad. Sci., ser. 4, vol. 28, no. 16, p. 619 (type by original designation *Lechusa stirtoni* L. Miller).

10. *Lechusa stirtoni* L. Miller

Lechusa stirtoni L. Miller, 1956 (Nov. 26), Proc. Calif. Acad. Sci., ser. 4, vol. 28,

no. 16, p. 619, fig. 1 (type from San Diego, right coracoid, Univ. Calif. Mus. Paleo. no. 45331).

MIDDLE PLIOCENE (San Diego formation). CALIFORNIA: San Diego County: San Diego.

Neospecies of Tytonidae from Pleistocene and °prehistoric sites:

1. *Tyto alba* (Scopoli). IRELAND: Edenvale Cave and °Glastonbury (Lambrecht, 1933, Handb. Palaeorn., p. 770). ENGLAND: °Cranbourn, °Chase, and °Woodcuts (Lambrecht, 1933, Handb. Palaeorn., p. 770). PORTUGAL: Grotte de Furninha (Lambrecht, 1933, Handb. Palaeorn., p. 770. SPAIN: Castelldefels and Cueva de Toll (Villalta, 1964, Speleon, vol. 15, p. 96). FRANCE: Bruniquel (Lambrecht, 1933, Handb. Palaeorn., p. 770). MONACO: Grotte de Grimaldi (Lambrecht, 1933, Handb. Paleorn., p. 770). ITALY: Buca della Volpe sopra Ravenna, and Pytina jama near Prosecco (Lambrecht, 1933, Handb. Palaeorn., p. 770). SWITZERLAND: Schweizersbild bei Schaffhausen (Lambrecht, 1933, Handb. Palaeorn., p. 770). POLAND: Zuzlavitz (Lambrecht, 1933, Handb. Palaeorn., p. 770). GREECE: Nesakia on Cerigo Isle) E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 232). ISRAEL: Oumm Qatafa Cave and Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 99). CALIFORNIA: Rancho La Brea (L. Miller, 1909, Univ. Calif. Publ., Bull. Dept. Geol., vol. 5, p. 306); Carpinteria (L. Miller, 1931, Univ. Calif. Publ., Bull. Dept. Geol. Sci., vol. 20, p. 364); °Buena Vista Lake (DeMay, 1942, Condor, vol. 44, p. 228). ARIZONA: Rampart Cave (L. Miller, 1960, Condor, vol. 62, p. 70). NEW MEXICO: Shelter Cave (Howard, and A. H. Miller, 1933, Condor, vol. 35, p. 16); Howells Ridge Cave (Howard, 1946, Condor, vol. 64, p. 242). TEXAS: Coppell (Slaughter et al., 1962, Bur. Econ. Geol., Univ. Texas, Rept. Invest., no. 48, p. 39). FLORIDA: Sabertooth Cave near Lecanto (Wetmore, 1931, Smithsonian Misc. Coll. vol. 85, no. 2, p. 39); Reddick (Brodkorb, 1957, Jour. Paleont., vol. 31, p. 136); Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 147); °Vero stratum 3 (Shufeldt, 1917, Florida Geol. Surv., Ninth Ann. Rept., p. 38, pl. 1, fig. 7). BAHAMAS: Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 11, p. 358). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 276). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. Calif. Publ. Zool., vol. 47, p. 161). YUCATAN: °Loltun and °Actun Coyok (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83). BRAZIL: Lapa da Escrivania and Lapa da Lagoa do Sumidouro (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 37). NEW ZEALAND: °Tom Bowling Beach (Scarlett, 1967, Notornis, vol. 14, p. 218).

Order CAPRIMULGIFORMES (Ridgway)

Caprimulgi Ridgway, 1881 (May), Bull. Illinois State Lab. Nat. Hist., no. 4, p. 185 (suborder; type *Caprimulgus* Linnaeus). —*Caprimulgiformes* Wetmore and W. D. Miller, 1926 (July 3), Auk, vol. 43, no. 3, p. 344 (order). —Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).

Steatornithes Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 79 (suborder; type *Steatornis* Humboldt).

Podargi Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 79 (suborder; type *Podargus* Vieillot).

Suborder CAPRIMULGI Ridgway

Caprimulgi Ridgway, 1881.

Family †AEGIALORNITHIDAE Lydekker

Aegialornithidae Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 182 (family; type *Aegialornis* Lydekker).

Genus † *Aegialornis* Lydekker

Aegialornis Lydekker, 1891, Cat. Fossil Birds Brit. Mus., p. 183 (type by original designation *Aegialornis gallicus* Lydekker).

Tachyornis Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith., Budapest, pp. 66, 80 (type by monotypy *Tachyornis hirundo* Milne-Edwards).

Belornis Milne-Edwards, 1893 (July 4), Bull. Brit. Ornith. Club, vol. 1, p. liv. — *Belornis* Milne-Edwards, 1893 (Oct.), Ibis, ser. 6, vol. 5, no. 20, p. 568 (new name for *Tachyornis* Milne-Edwards, preoccupied).

1. *Aegialornis gallicus* Lydekker

Aegialornis gallicus Lydekker, 1891 (Apr. 25), Cat. Fossil Birds Brit. Mus., p. 183, fig. 41 (types from Bach, 13 humeri, Brit. Mus. no. A. 60; referred, 2 coracoids, 3 ulnae, 11 metacarpi, 3 proximal phalanges of index finger).

Tachyornis hirundo Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, pp. 66, 80 (type from phosphate de Chaux, humerus, Paris Mus.; synonymized on p. 80 with the prior *Aegialornis gallicus* Lydekker).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Lot: Bach near Lalbenque (Lydekker, 1891). Dept. Tarn-et-Garonne: Mouillac (Lambrecht, 1933, Handb. Palaeorn., p. 623).

2. *Aegialornis leenhardti* Gaillard[1]

Aegialornis leehnardti [sic!] Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci., med., fasc. 23, p. 60, text-figs. 11-12, pl. 3, figs. 1-6 (lectotype by present designation from phosphorites du Quercy, right humerus, Faculté de Théologie de Montauban; left tarsometatarsus from Caylus, Mus. Lyon).—*Aegialornis lechnardti* [sic!] Paris, 1912, Rev. Franç. d'Orn., vol. 4, no. 37, p. 286—*Aegialornis lehnardti* [sic!] Lambrecht, 1918, Aquila, vol. 24, p. 212.

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Caylus (Paris, Rev. Franç. d'Orn., vol. 4, no. 37, p. 286); Mouillac (Lambrecht, 1933, Handb. Palaeorn., p. 623). Dept. Lot: Bach near Lalbenque (Lambrecht, 1933, Handb. Palaeorn., p. 623).

Family CAPRIMULGIDAE Vigors

Caprimulgidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 428 (family; type *Caprimulgus* Linnaeus). —*Caprimulginae* Swainson, 1831, fide Gray. —*Caprimulginae* Bonaparte, 1838 (Apr. 14), Geogr. Comp. List Birds Europe N. Amer., p. 8 (subfamilia).

Scotorninae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 8 (subfamily; type *Scotornis* Swainson).

Podagerinae G. R. Gray, 1847 (Dec.), Genera of Birds, vol. 1, p. 51 (subfamily; type *Podager* Wagler).

Chordeileae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section; type *Chordeiles* Swainson). —*Chordedilinae* Cabanis and Heine, 1860 (Aug. 22), Museum Heineanum, pt. 3, p. 86 (subfamilia; type *Chordediles* "Swainson"). —*Chordeilinae* Sclater, 1862, Cat. Coll. Amer. Birds, p. 278 (subfamily). —*Chordeilidae* Oberholser, 1914 (Apr. 6), Bull. U. S. Nat. Mus., no. 86, p. 9 (family).

Nyctidromeae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci., vol. 37, no. 18, p. 645 (section; type *Nyctidromus* Gould).

Semeiophorinae Verheyen, 1956 (Jan.), Bull. Inst. royal Sci. nat. Belgique, vol. 32, no. 3, p. 29 (sous-famille) type *Semeiophorus* Gould).

Neospecies of Caprimulgidae from Pleistocene and *prehistoric sites:

1. *Chordeiles minor* (Forster). CALIFORNIA: *Buena Vista Lake? (DeMay, 1942, Condor, vol. 44, p. 228). NEVADA: Smith Creek Cave (Howard, 1952, Bull.

[1] New emendation. The three different spellings of the specific name are all apparently wrong. The species was undoubtedly named for F. Leenhardt, professor at the University of Toulouse (see p. 3 of Gaillard's introduction). This is apparently Franz Leenhardt, a member of the Geological Society of France (see Römer et al., 1962, Bibliography of Fossil Vertebrates exclusive of North America, 1509-1927, Geol. Soc. Amer. Memoir 87, p. 800).

So. Calif. Acad. Sci., vol. 51, pt. 2, p. 54). ARIZONA: *Deadman's Cave (Hargrave, 1939, Condor, vol. 41, p. 209). TEXAS: Miller's Cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108).

2. *Nyctidromus albicollis* (Gmelin). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 42).

3. *Phalaenoptilus nuttallii* (Audubon). CALIFORNIA: Rancho la Brea (Howard, 1962, Contrib. Sci., no. 58, p. 23). NUEVO LEÓN: San Josecito cavern (L. Miller, 1943, Univ. California Publ. Zool., vol. 47, p. 165).

4. *Siphonorhis americanus* (Linnaeus). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 277).

5. *Caprimulgus noctitherus* (Wetmore). PUERTO RICO: *Cueva Catedral and *Cueva Clara (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 323, fig. 22).

6. *Caprimulgus europaeus* Linnaeus. ENGLAND: Merlin's Cave? (Lambrecht, 1933, Handb. Palaeorn., p. 773). ITALY: Buca del Bersagliere (Lambrecht, 1933, Handb. Palaeorn., p. 773). HUNGARY: Püspökfürdö (*Capr.* [*imulgus*] *eur.* [*opaeus*] *fossilis* Capek, 1917, Barlangkutatás, vol. 5, no. 1, pp. 29 (Magyar), 70 (German); types from Günz-Mindel stage, left coracoid, and phalanx 1 indicis).

7. *Hydropsalis brasiliana* (Gmelin). BRAZIL: Lapa da Escrivania and Mocambo? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 43).

8. *Eleothreptus anomalus* (Gould). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 42).

Suborder PODARGI Sharpe

Podargi Sharpe, 1891.

Family PODARGIDAE (Gray)

Podarginae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 7 (subfamily; type *Podargus* Cuvier = *Podargus* Vieillot). —*Podarginae* Bonaparte, 1840, Prodromus systematis ornithologiae, p. 4 (subfamily). —*Podargidae* Sclater, 1880, Ibis, p. 401 (family).

No fossil record.

Family NYCTIBIIDAE (Bonaparte)

Nyctibiinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia; type *Nyctibius* Vieillot). —*Nyctibieae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section). —

Nyctibinae Boucard, 1876, Catalogus avium hucusque descriptorum, p. 330 (subfamilia). —*Nyctibiidae* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 81 (family).

Neospecies of Nyctibiidae from Pleistocene sites:

1. *Nyctibius griseus* (Gmelin). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, pp. 7, 9, 43).

Family AEGOTHELIDAE (Bonaparte)

Aegothelinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia; type *Aegotheles* Vigors and Horsfield). —*Aegothelidae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 489 footnote (family).

Genus †*Megaegotheles* Scarlett

Megaegotheles Scarlett, 1968, Notornis, vol. 15, p. 254 (type by monotypy *Megaegotheles novaezealandiae* Scarlett).

1. *Megaegotheles novaezealandiae* Scarlett

Megaegotheles novaezealandiae Scarlett, 1968, Notornis, vol. 15, p. 254, pl. 40-42 (type from Harwood Hole, postcranial skeleton, Canterbury Mus. no. AV 16,996).

QUATERNARY (cave deposits). NEW ZEALAND: SOUTH ISLAND: Earnscleugh Cave in Otago district; Frenchman's Gully in Timaru district; Pyramid Valley Swamp and Murchison's rockshelter in Canterbury district; Harwood Hole, Pothole, Moa Hole, and Kiwi Hole (all near Canaan, Takaka), Nelson district; Limestone Bluff on Heaphy River, Gouland Downs, and Cascade Cave near Paturau, in Nelson District. NORTH ISLAND: Te Waka Cave, Hukanui Cave, and Puketitiri Cave, in Hawkes Bay district, Skyline Cave near Mahoenui in Taranaki district; Gaskell's Caves near Pukemiro, Auckland district.

Suborder STEATORNITHES Sharpe

Steatornithes Sharpe, 1891.

Family STEATORNITHIDAE (Gray)

Steatorninae G. R. Gray, 1846 (Oct.), Genera of Birds, vol. 1, p. 43 (subfamily; type *Steatornis* Humboldt). —*Steatornithinae* Bonaparte, 1850, Conspectus Gen-

erum Avium, fig. 8, vol. 1, 57 (subfamily).—*Steatornithidae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (familia).

No fossil record.

Order APODIFORMES Peters

Cypselomorphae Huxley, 1867, Proc. Zool. Soc. London, p. 468 (*type Cypselus* Illiger, 1811, a junior synonym of *Apus* Scopoli, 1777). —*Cypseliformes* Garrod, 1874, Proc. Zool. Soc. London, p. 118). —*Cypseli* Sclater, 1880, Ibis, p. 349.

Micropodii Knowlton, 1909, Birds of World, pp. 50, 553 (suborder; type *Micropus* Meyer and Wolf, 1810, a junior synonym of *Apus* Scopoli, 1777). —*Micropodiiformes* Wetmore and W. D. Miller, 1926, Auk, vol. 43, no. 3, p. 344 (order) —*Micropodiformes* Wetmore, 1930 (Jan. 8), Proc. U. S. Nat. Mus., vol. 76, no. 2821, p. 5 (order).

Apodiformes Peters, 1940 (before Sept.), Check-List Birds World, vol. 4, pp. xi, 220 (order; type *Apus* Scopoli, 1777, not *Apos* Scopoli, 1777, in Crustacea). —*Apodi* Peters, 1940 (before Sept.), Check-List Birds World, vol. 4, pp. xi, 220 (suborder).

Chaeturiformes Brodkorb, 1940 (Sept. 27), Wilson Bull., vol. 52, no. 3, p. 214 (order; type *Chaetura* Stephens). —*Chaeturae* Brodkorb, 1940 (Sept. 27), Wilson Bull., vol. 52, no. 3, p. 214 (suborder).

Ocyptilinae Milne-Edwards, 1870, Oiseaux Foss. France, vol. 2, p. 300 (section [i.e. sous-ordre]; type les Cypsélides).

Family APODIDAE (Hartert)

Cypselinae Bonaparte, 1838, Geogr. and Comp. List Birds Europe and North America, p. 8 (subfamilia; type *Cypselus* Illiger, 1811, a junior synonym of *Apus* Scopoli, 1777). —*Cypselidae* Cabanis, 1847, Archiv für Naturgeschichte, pt. 1, p. 345 (family). —*Cypseleae* Bonaparte, 1854, Ann. Sci. Nat., part 1, p. 34 (section).

Collocaliinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia; type *Collocalia* Gray).

Dendrochelidoneae Bonaparte, 1854, Ann. Sci. Nat., part 1, p. 34 (section; type *Dendrochelidon* Ersch and Gruber, 1837, a junior synonym of *Hemiprocne* Nitzsch, 1829). —*Dendrochelidonidae* Lucas, 1889, Auk, vol. 6, no. 1, p. 12 (family).

Chaeturinae Sclater, 1865, Proc. Zool. Soc. London, p. 597 (subfamily; type *Chaetura* Stephens). —*Chaeturidae* Brodkorb, 1940 (Sept. 27), Wilson Bull., vol. 52, no. 3, p. 214 (family).

Micropodoideae Stejneger, 1885, Standard Nat. Hist., vol. 4, p. 435 (super-family; type *Micropus* Meyer and Wolf, 1810, a junior synonym of *Apus* Scopoli, 1777). —*Micropodidae* Stejneger, 1885, op. cit., p. 437 (family). —*Micropodinae* Stejneger, 1885, op. cit., p. 437 (sub-family).

Macropterygidae Lucas, 1895, Auk, vol. 12, p. 156 (family; type *Macropteryx* Swainson, 1832, a junior synonym of *Hemiprocne* Nitzsch, 1829).

Apodinae Hartert, 1897, Das Tierreich, vol. 1, Lief. 1, p. 80 (subfamily; type *Apus* Scopoli, 1777, Introductio ad Historiam Naturalem, p. 483, not *Apos* Scopoli, 1777, op. cit., p. 404, in Crustacea). —*Apodidae* Peters, 1940, Check-List of Birds of World, vol. 4, pp. xii, 220 (family; preoccupied by *Apodidae* Burmeister, 1843, based on *Apos* Scopoli, in Crustacea; see also G. M. Allen, 1941, Auk, vol. 58, no. 1, p. 118, where *Aposidae* is proposed as a new name for the crustacean family; see also Wetmore, 1947, Wilson Bull., vol. 59, no. 4, p. 211; see also International Commission on Zoological Nomenclature, 1958, Official List of

International Commission on Zoological Nomenclature, 1958, Official List of Family Group Names, no. 208).

Hemiprocnidae Oberholser (May 1), Proc. Biol. Soc. Washington, vol. 19, p. 68 (family; type *Hemiprocne* Nitzsch).—*Hemiprocninae* Mayr and Amadon, 1951 Apr. 2), Amer. Mus. Novitates, no. 1496, p. 35 (subfamily).

Panyptilinae Brodkorb, 1940 (Sept. 27), Wilson Bull., vol. 52, no. 3, p. 214 (subfamily; type *Panyptila* Cabanis).

Subfamily APODINAE Hartert

Cypselinae Bonaparte, 1838.
Collocaliinae Bonaparte, 1853.
Chaeturinae Sclater, 1865.
Micropodoideae Stejneger, 1885.
Apodinae Hartert, 1897.
Panyptilinae Brodkorb, 1940.

Genus †*Cypselavus* Gaillard

Cypselavus Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci., med., fasc. 23, p. 63 (type by monotypy *Cypselavus gallicus* Gaillard).

1. *Cypselavus gallicus* Gaillard

Cypselavus gallicus Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci., med., fasc. 23, p. 63, text-fig. 13, pl. 3, figs. 12-15 (lectotype by present designation from Mouillac, right humerus, Mus. Munich no. 29).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Mouillac.

2. *Cypselavus intermedius* Gaillard

Cypselavus intermedius Gaillard, 1938, Arch. Mus. Hist. Nat. Lyon, vol. 15, p. 42, fig. 20 (type from Chavroches, left humerus, Faculté des Sciences de Lyon).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Chavroches.

Genus *Apus* Scopoli

Apus Scopoli, 177, Intr. Hist. Nat., p. 483 (type by tautonomy *Hirundo apus* Linnaeus, Recent).

3. *Apus ignotus* (Milne-Edwards)

Cypselus ignotus Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sheet 50, p. 394,

pl. 159, figs. 18-19; pl. 177, figs. 9-13 (types from Saint-Gérand-le-Puy, ulna, carpometacarpus, Paris Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier; Saint-Gérand-le-Puy.

4. *Apus gaillardi* (Ennouchi)

Cypselus gaillardi Ennouchi, 1930, Contr. Étude Faune Tortonien de La Grive-St.-Alban (Isère), p. 98, pl. 4, figs. 9-12 (type from Grive-St.-Alban, right humerus, Mus. Lyon).

–UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-St.-Alban.

Genus *Collocalia* Gray

Collocalia G. R. Gray, 1840, List of Genera of Birds, p. 8 (type *Hirundo esculenta* Linnaeus, Recent).

5. *Collocalia incerta* Milne-Edwards

Collocalia incerta Milne-Edwards, 1871, Ois. Foss. France, vol. 2, p. 394, pl. 177, figs. 1-8 (type from Saint-Gérand-le-Puy, tibiotarsus, Paris, Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Saint-Gérand-le-Puy.

Subfamily HEMIPROCNINAE (Oberholser)

Dendrochelidoneae Bonaparte, 1854.
Macropterygidae Lucas, 1895.
Hemiprocnidae Oberholser, 1906.

No fossil record.

Neospecies of Apodidae from Pleistocene and °prehistoric sites:

1. *Streptoprocne zonaris* (Shaw). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 44).

2. *Apus melba* (Linnaeus). GIBRALTAR: Devil's Tower (Bate, 1928, Jour. Roy. Anthrop. Inst., vol. 58, p. 104); Forbes quarry (Lambrecht, 1933, Handb. Palaeorn., p. 773). SARDINIA: Tavolara (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). ITALY: Buca del Bersagliere, Grotta dei Colombi, and Caverna d'Equi (Lambrecht, 1933, Handb. Palaeorn., p. 773). HUNGARY: Beremend (Kretzoi, 1956, Geologica hungarica, ser. pal., fasc. 27, p. 164); Subalyuk cave

(Jánossy, 1962, Aquila, vol. 67-68, p. 180, fig. 30A); Tarkö (Jánossy, 1962, Ann. Mus. hungarica, vol. 54, p. 157). ISRAEL: Mugharet-el-Zuttiyeh (Bate, 1927, *in* F. Turville-Petre, Researches in prehistoric Galilee 1922-1926, p. 28).

3. *Apus apus* (Linnaeus). ENGLAND: Clevedon Cave (Lambrecht, 1933, Handb. Palaeorn., p. 773). MONACO: Grotte de Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 773). CORSICA: Grotta di Funtanedu (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). SARDINIA: Tavolara (E. T. Newton, 1921, Proc. Zool. Soc. London, pt. 2, p. 231). ITALY: Grotta dei Colombi (Lambrecht, 1933, Handb. Palaeorn., p. 773). HUNGARY: Puskaporos (Lambrecht, 1912, Aquila, vol. 19, p. 302); Istállóskö (Jánossy, 1954, Aquila, vol. 55-58, p. 216). ISRAEL: Oumm Qatafa Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, pp. 100, 104).

4. *Apus affinis* (J. E. Gray). ISRAEL: Mugharet-el-Zuttiyeh? (Bate, 1927, *in* F. Turville-Petre, Researches in prehistoric Galilee, 1922-1926, p. 28); Hayonim Cave (Bar-Yosef and Tchernov, 1966, Israel Jour. Zool., vol. 15, p. 131).

5. *Aeronautes saxatalis* (Woodhouse). NEVADA: Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, no. 1, p. 16); Smith Creek Cave (Howard, 1952, Bull. So. California Acad. Sci., vol. 51, pt. 2, p. 54).

Order TROCHILIFORMES (Wagler)

Trochili Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel, p. 82 (ordo; type *Trochilus* Linnaeus).—*Trochili* Seebohm, 1890, Classification of Birds, pp. vii, xi, 5 (suborder).—*Trochiliformes* Berlioz, 1950, in Grassé Traité de Zoologie, vol. 15 (Oiseaux), p. 960 (sous-ordre).

Family TROCHILIDAE Vigors

Trochilidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 463 (family; type *Trochilus* Linnaeus).—*Trochilinae* G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 14 (subfamily).—*Trochileae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section).

Lamporninae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 13 (subfamily; type *Lampornis* Swainson).—*Lampronithinae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia).

Phoethorninae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 13 (subfamily; type *Phoethornis* Swainson).—*Phaetornithinae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Paris, vol. 37, no. 18, p. 645.—*Phaëthornithinae* Cabanis and Heine, 1860 (Feb. 6), Mus. Heineanum, pt. 3, p. 6.—*Phoethornithinae* Ridgway 1911 (Nov. 29), Bull. U. S. Nat. Mus., no. 50, pt. 5, p. 303.

Grypinae G. R. Gray, 1848 (Dec.), Genera of Birds, vol. 1, p. 103 (subfamily; type *Grypus* Spix, 1824, a senior synonym of *Ramphodon* Lesson, 1830 [both generic names have *Trochilus naevius* Dumont as type]).

Mellisuginae G. R. Gray, 1848 (Dec.), Genera of Birds, vol. 1, p. 111 (subfamily; type *Mellisuga* Brisson).—*Mellisugeae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section).

Cynanthinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia type *Cynanthus* Swainson).—*Cynantheae* Bonaparte, 1853, op. cit., p. 645 (section).

Patagoneae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section; type *Patagona* G. R. Gray).

Florisugeae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section; type *Florisuga* Bonaparte).—*Florisuginae* Cabanis and Heine, 1860 (March 6), Mus. Heineanum, pt. 3, p. 29 (subfamilia).

Amazilieae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section; type *Amazilia* Lesson).

Polytmeae Bonaparte, 1953 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (section; type *Polytmus* Brisson).—*Polytminae* Cabanis and Heine, 1860 (Feb. 6) Mus. Heineanum, pt. 3, p. 1 (subfamilia).

Campylopterinae Cabanis and Heine, 1860 (Feb. 19), Mus. Heineanum, pt. 3, p. 11 (subfamilia; type *Campylopterus* Swainson).

Heliothricinae Cabanis and Heine, 1860 (March 6), Mus. Heineanum, pt. 3, p. 27 (subfamily; type *Heliothrix* Boie).

Hylocharinae Cabanis and Heine, 1860 (March 6), Mus. Heineanum, pt. 3, p. 31 (subfamilia; tyxpe *Hylocharis* Boie).

Orthorhynchinae Cabanis and Heine, 1860 (Apr. 9), Mus. Heineanum, pt. 3, p. 61 (subfamilia; type *Orthorhynchus* Cuvier).

Lesbiinae Cabanis and Heine, 1860 (Apr. 17), Mus. Heineanum, pt. 3, p. 67 (subfamilia; type *Lesbia* Lesson.).
Lophornithinae Ridgway, 1911 (Nov. 29), Bull. U. S. Nat. Mus., no. 50, pt. 5, p. 310 (subfamily; type *Lophornis* Lesson).

Neospecies of Trochilidae from Pleistocene sites:

1. *Anthracothorax dominicus* (Linnaeus). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 277).

2. *Clytolaema rubricauda* (Boddaert). BRAZIL: Lapa da Escrivania? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 44).

Order COLIIFORMES (Murie)

Coliomorphae Murie, 1872, Ibis, p. 278.—*Colii* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (gens; type *Colius* Brisson).—*Coliiformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 footnote (subordo).—*Colii* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 82 (suborder).—*Coliiformes* Wetmore and W. D. Miller, 1926 (July 3), Auk, vol. 43, p. 344 (order).—*Colii* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 279 (order).

Family COLIIDAE (Swainson)

Colinae Swainson, 1837, Natural history and classification of birds, vol. 2, p. 296 (type *Colius* Brisson).—*Coliinae* G. R. Gray, 1840 (before April), List of Genera of Birds, p. 49 (subfamily).—*Colidae* G. R. Gray, 1848, Genera of Birds, vol. 2, p. 392 (family).—*Coliidae* Bonaparte, 1850, Conspectus Generum Avium, vol. 1, p. 86 (familia).—*Colioideae* Stejneger, 1885, Standard Nat. Hist., p. 393 (superfamily).

Genus † *Limnatornis* Milne-Edwards

Limnatornis Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 49, p. 392 (type by original designation *Limnatornis paludicola* Milne-Edwards).

Palaeopicus Lambrecht, 1933, Handbuch d. Palaeornithologie, p. 629 (type *Picus archiaci* Milne-Edwards, designated by Brodkorb, 1952, Condor, vol. 54, no. 3, p. 175).

1. *Limnatornis paludicola* Milne-Edwards

Limnatornis paludicola Milne-Edwards, 1871, Ois. Foss. France, vol. 2, fig. 49, p. 392, pl. 176, figs. 14-18 (type from St.-Gérand-le-Puy, 1 right and 2 left humeri, Paris Mus. nos. Av. 2858, 2859, 2860).—*Colius paludicola* Ballmann, 1969, Geobios, no. 2, p. 195).

Picus consobrinus Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 50, p. 397, pl. 176, figs. 1-7 (type from St.-Gérand-le-Puy, left tibiotarsus, Paris Mus. no. Av. 2853).—*Colius consobrinus* Ballmann, 1969, Geobios, no. 2, p. 195 (probable synonym of *C. paludicola* or *C. archiaci*).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Saint-Grand-le-Puy.

2. *Limnatornis archiaci* (Milne-Edwards)

Picus archiaci Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 50 p. 396, pl. 178, figs. 1-5 (type from Langy quarries, left tibiotarsus, Paris Mus. no. Av 2852).—*Colius archiaci* Ballmann 1969, Geobios, no. 2, p. 195.

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Langy.

Genus †*Necrornis* Milne-Edwards

Necrornis Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 49, p. 388 (type by original designation *Necrornis palustris* Milne-Edwards).—*Necrornix* Ennouchi, 1940, Contr. Étude Faune Tortonien de La Grive-St.-Alban, p. 63 (lapsus).

3. *Necrornis palustris* Milne-Edwards

Necrornis palustris Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 49, p. 388, pl. 178, figs. 6-14 (type from Sansan, distal portion of right tarsometatarsus; Paris Mus.; referred distal portion of left tibiotarsus, is of a different species, fide Ballmann, 1969).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Gers: Sansan (Milne-Edwards). Dept. Isère: Grive-Saint-Alban? (*Colius* cf. *palustris* Ballmann, 1969, Geobios, no. 2, p. 194; humerus, carpometacarpus, tibiotarsus).

Order TROGONIFORMES American Ornithologists' Union

Trogones American Ornithologists' Union, 1886, Check-List of N. American Birds, ed. 1, p. 208 (suborder; type *Trogon* Brisson).—*Trogones* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (intermediäre gens).—*Trogones* Seebohm, 1890, Birds of Japanese Empire, fide Sharpe (order).—*Trogoniformes* Wetmore and W. D. Miller, 1926, Auk, vol. 43, no. 1, p. 344 (order).

Family TROGONIDAE Swainson

Trogonidae Swainson, 1831, Fauna Boreali-Americana, vol. 2, p. 326 (family; type *Trogon* Brisson). —*Trogoninae* Bonaparte, 1853 (séance du 31 Oct.), C.M R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia). —*Trogonoideae* Stejneger, 1885, Standard Natural History, p. 433 (superfamily). —*Trogonoidei* Cope, 1889 (Oct.), Amer. Naturalist, vol. 23, p. 873 (superfamily). —*Trogontidae* Oberholser, 1905 (Sept.), Outline Classification N. Amer. Birds, p. 3 (family).

Genus † *Archaeotrogon* Milne-Edwards

Archaeotrogon Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 64 (type by monotypy *Archaeotrogon venustus* Milne-Edwards).

1. *Archaeotrogon venustus* Milne-Edwards

Archaeotrogon venustus Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 64 (types from phosphate de Chaux, humerus, carpometacarpus).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Mouillac. Dept. Lot: Bach near Lalbenque.

2. *Archaeotrogon cayluxensis* Gaillard

Archaeotrogon cayluxensis Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci., med., fasc. 23, p. 67, text-figs. 15-16; pl. 3, figs. 26-27; pl. 4. figs. 1-4 (type from Caylux, right humerus, Mus. Lyon).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Caylux.

3. *Archaeotrogon zitteli* Gaillard

Archaeotrogon zitteli Gaillard, 1908, Ann. Univ. Lyon, n.s., vol. 1, sci., med., fasc. 23, p. 70, text-fig. 17; pl. 3, figs. 24-25 (type from Mouillac, left humerus, Mus. Munich no. 128).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Tarn-et-Garonne: Mouillac.

Genus †*Paratrogon* Lambrecht

Paratrogon Lambrecht, 1933, Handb. Palaeorn., p. 626 (type by monotypy *Trogon gallicus* Milne-Edwards).

4. *Paratrogon gallicus* (Milne-Edwards)

Trogon gallicus Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 50, p. 395, pl. 177, figs. 18-22 (types from Langy, 2 humeri, Paris Mus.).

LOWER MIOCENE (Aquitanian). FRANCE: Dept. Allier: Langy.

Neospecies of Trogonidae from Pleistocene sites:

1. *Trogon surrucura* Vieillot. BRAZIL: Lapa da Lagoa do Sumidouro (O. Winge, 1887, E. Museo Lundii, vol. 1, no. 2, p. 44).

2. *Temnotrogon roseigaster* (Vieillot). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 277).

Order CORACIIFORMES Forbes

Coraciiformes Forbes, 1884 (Jan.), Ibis, ser. 5, vol. 2, no. 5, p. 119 (order; type *Coracias* Linnaeus).—*Coracornithes* Furbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (order; type *Coracias* Linnaeus).—*Coraciiformes* Fürbringer, 1888, op. cit., p. 1567 (subordo).—*Coraciae* Fürbringer, 1888, op. cit. p. 1567 (gens).—*Coraciae* Seebohm, 1890, Classification of Birds, pp. vii, xi, 21 (suborder).—*Coracii* Wetmore and W. D. Miller, 1926 (July 3), Auk, vol. 43, no. 3, p. 344 (suborder).—*Coraciadiformes* Berlioz, 1950, in Grassé, Traité de Zoologie, vol. 15 (Oiseaux), pp. 856, 964 (ordre).—*Coraciae* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).

Todiformes Forbes, 1884 (Jan.), Ibis, ser. 5, vol. 2, no. 5, p. 119 (order; type *Todus* Brisson).—*Todi* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (intermediäre gens).—*Todi* Sharpe, 1890, Review of Recent Attempts to Classify Birds, p. 81 (suborder).—*Todi* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 279 (order).

Meropiformes Forbes, 1884 (Jan.), Ibis., ser. 5, vol. 2, no. 5, p. 119 (order; type *Merops* Linnaeus).—*Meropes* Fürbringer, 1888, Morph. Syst. Vögel, vol. 2, p. 1567 (gens).—*Meropes* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 80 (suborder).—*Meropes* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3 p. 278 (order).

Halcyones Forbes, 1884 (Jan.), Ibis, ser. 5, vol. 2, no. 5, p. 119 (suborder; type *Halycon* Swainson).—*Halcyoniformes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (subordo).—*Halcyones* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).[1]

Bucerotes Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (gens; type *Buceros* Linnaeus).—*Bucerotes* Seebohm, 1890, Classification of Birds, pp. vii, xi, 22 (suborder).

Upupae Seebohm, 1890, Classification of Birds, pp. vii, xi, 7 (suborder; type *Upupa* Linnaeus).—*Upupiformes* Verheyen, 1955 (Dec.), Bull. Inst. royal Sci. nat. Belgique, vol. 31, no. 94, p. 14 (order).—*Upupae* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 279 (order).

Leptosomati Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 79 (suborder; type *Leptosomus* Vieillot).

Momoti Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 81 (suborder; type *Momotus* Brisson).—*Momoti* Stresemann, 1959 (July 9), Auk, vol. 76, no. 3, p. 278 (order).

Alcedines Beddard, 1898, Structure and Classification of Birds, p. 197 (suborder; type *Alcedo* Linnaeus).

Suborder BUCEROTES Frbringer

Bucerotes Fürbringer, 1888.

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[1] *Alcyones* Temminck, 1820 (Oct.), Manuel d'Ornithologie, ed. 2, pt. 1, p. 418 (order; not based on generic name, includes *Merops* Linnaeus and *Alcedo* Linnaeus).—*Alcyones* American Ornithologists' Union, 1886, Check-List N. Amer. Birds, ed. 1, p. 209 (suborder); 1895, ed. 2, p. 156 (suborder).

Family BUCEROTIDAE (Vigors)

Buceridae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 444 (family; type *Buceros* Linnaeus).—*Bucerotidae* G. R. Gray, 1847 (May), Genera of Birds, vol. 2, p. 398 (family).—*Bucerotinae* Gray, 1847, op. cit., p. 398 (subfamily).—*Bucerotes* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 403 (superfamily).

Bucoracinae Ogilvie Grant, 1892, Cat. Birds, Brit. Mus., vol. 17, pp. x, 347 (subfamily; type *Bucorax* Sundevall, 1849, a junior synonym of *Bucorvus* Lesson, 1830).

Bucorvinae Verheyen, 1955 (Dec.), Bull. Inst. royal. Sci. nat. Belgique, vol. 31, no. 93, p. 14 (sous-famille; type *Bucorvus* Lesson).

Genus †*Geiseloceros* Lambrecht

Geiseloceros Lambrecht, 1935, Nova Acta Leopoldina, neue Folge, vol. 3, no. 14, p. 365 (type by original designation *Geiseloceros robustus* Lambrecht).

1. *Geiseloceros robustus* Lambrecht

Geiseloceros robustus Lambrecht, 1933, Nova Acta Leopoldina, neue Folge, vol. 3, no. 14, p. 365, pl. 2 = 19 (type from Cecilie, right shoulder girdle and wing, Geiseltal Mus.).

MIDDLE EOCENE (Geisel Valley brown coal). GERMANY: Saxony: Cecilie quarry near Halle.

Genus †*Cryptornis* Milne-Edwards

Cryptornis Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 47, p. 371, pl. 175 (type by monotypy *Centropus? antiquus* Gervais).

2. *Cryptornis antiquus* (Gervais)

Centropus? antiquus Gervais, 1852, Zoologie et Paléontologie françaises, ed. 2, p. 409, pl. 49, fig. 1 (type from Montmartre, partial skeleton impression, Paris Mus.).

UPPER EOCENE (gypse de Montmartre). FRANCE: Paris: Montmartre.

Genus †*Homalopus* Milne-Edwards

Homalopus Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 49, p. 385 (type by original designation *Homalopus picoides* Milne-Edwards).

3. *Homalopus picoides* Milne-Edwards

Homalopus picoides Milne-Edwards, 1871, Ois. Foss. France, vol. 2, sig. 49, p. 385, pl. 178, figs. 15-31 (types from Sansan, distal portion of tarsometatarsus, distal portions of several tibiotarsi, humerus, Paris Mus.).

MIDDLE MIOCENE (Helvetian). FRANCE: Dept. Gers: Sansan.

Suborder CORACIAE (Forbes)

Coraciiformes Forbes, 1884.
Leptosomati Sharpe, 1891.

Family CORACIIDAE (Vigors)

Coraciana Vigors, 1825, fide Gray (type *Coracias* Linnaeus).—*Coracianae* G. R. Gray, 1840, List of Genera of Birds, p. 9 (subfamily).—*Coraciadae* Gray, 1845 (June), Genera of Birds, vol. 1, p. 61 (family).—*Coraciidae* Cabanis, 1847, Archiv für Naturgeschichte, vol. 13, fide Gadow (familia).—*Coraciinae* Bonaparte, 1850 (March), Conspectus Generum Avium, vol. 1, pt. 1, p. 166 (subfamilia).—*Coraciadidae* Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (familia).—*Coraciadinae* Bonaparte, 1853, op. cit., p. 645 (subfamilia).—*Coracioideae* Stejneger, 1885, Standard Natural History, vol. 4, pp. 371, 384 (superfamily).[1]

Atelornithinae Bonaparte, 1854, Ann. Sci. Nat., vol. 1, p. 31 (subfamilia; type *Atelornis* Pucheran).

Brachypteraciinae Sharpe, 1892, Cat. Birds Brit. Mus., vol. 17, pp. vii, 4 (subfamily; type *Brachypteracias* Lafresnaye).—*Brachypteraciidae* Stresemann, 1934, in Kükenthal and Krumbach, Handbuch der Zoologie, vol. 7, pt. 2, sec. 9, p. 838 (family).

Subfamily CORACIINAE (Vigors)

Coraciana Vigors, 1825.

Genus † *Geranopterus* Milne-Edwards

Geranopterus Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 66 (type by monotypy *Geranopterus alatus* Milne-Edwards).

1. *Geranopterus alatus* Milne-Edwards

Geranopterus alatus Milne-Edwards, 1892, C. R. 2. Congrès internat. ornith. Budapest, p. 66 (type from phosphate de Chaux, humerus, Paris Mus.).

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[1] The type of the family name *Coraces* Illiger (1811, Prodromus systematis mammalium et avium, pp. 196, 225) and of *Coraces* Vieillot (1816, Analyse d'une nouvelle ornithologie élémentaire, p. 35) is *Coracia* Brisson (a synonym of *Corvus* Linnaeus), not *Coracias* Linnaeus (*Calgulus* of Brisson).

UPPER EOCENE OR LOWER OLIGOCENE (phosphorites du Quercy). FRANCE: Dept. Lot: Escamps near Lalbenque.

Subfamily ATELORNITHINAE Bonaparte

Atelornithinae Bonaparte, 1854.
Brachypteraciinae Sharpe, 1892.

No fossil record.

Neospecies of Coraciidae from Pleistocene and *prehistoric sites:

1. *Coracias garrulus* Linnaeus. ITALY: Grotta dei Colombi (Lambrecht, 1933, Handb. Palaeorn., p. 774). ISRAEL: Kebara Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 114).

2. *Coracias abyssinica* Hermann. SARDINIA: Pietro Tampoia on Tavolara? (Lydekker, 1891, Proc. Zool. Soc. London, p. 470, text-fig. 1; pl. 37, fig. 4).

3. *Eurystomus orientalis* (Linnaeus). NEW ZEALAND: Skyline Cave? (Medway, 1967, Notornis, vol. 14, p. 160).

Family LEPTOSOMATIDAE (Bonaparte)

Leptosomidae Bonaparte, 1850 (March), Conspectus Generum Avium, vol. 1, pt. 1, p. 96 (familia; type *Leptosoma* Vieillot).—*Leptosominae* Bonaparte, 1850, op. cit., p. 96 (subfamilia).—*Leptosomatidae* Sclater, 1865, Proc. Zool. Soc. London, p. 682 (family).—*Leptosomatinae* Hartert, 1911, Vögel der paläarktischen Fauna, vol. 1, p. 871 (subfamily).

No fossil record.

Suborder UPUPAE Seebohm

Upupae Seebohm, 1890.

Family PHOENICULIDAE Sclater

Irrisoridae Bonaparte, 1850 (Nov.), Conspectus Generum Avium, vol. 1, pt. 2, p. 410 (type *Irrisor* Lesson, 1831, a junior synonym of *Phoeniculus* Jarocki, 1821.—*Irrisorinae* Bonaparte, 1850, op. cit., p. 410 (subfamilia).
Phoeniculidae W. L. Sclater, 1924, System Avium Ethiopicarum, vol. 1, p. 233 (family; type *Phoeniculus* Jarocki).

Record confined to Phoeniculidae, gen. et sp. idet., from Middle Miocene (early Burdigalian) of Wintershof (West), Bavaria (cf. Ball-

mann, 1967, Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West) bei Eichstätt in Bayern, p. 64, pl. 2, fig. 5).

Family UPUPIDAE Bonaparte

Upupinae Bonaparte, 1831, Saggio di una distribuzione metodica delgi animali vertebrati, p. 49 (subfamilia; type *Upupa* Linnaeus).—*Upupidae* Bonaparte, 1838, Geog. Comp. List. Birds Eur. N. Amer., p. 10 (familia).—*Upupoideae* Stejneger, 1885, Standard Nat. Hist., vol. 4, p. 408 (superfamily).

Neospecies of Upupidae from Pleistocene and *prehistoric sites:

1. *Upupa epops* Linnaeus. SPAIN: Cova Negra de Bellus (Villalta, 1964, Speleon, vol. 15, p. 97). ITALY: Buca del Bersaliere and Buca della Volpe sopra Ravenna (Lambrecht, 1933, Handb. Palaeorn., p. 774). ISRAEL: Oumm Qatafa Cave (Tchernov, 1962, Bull. Res. Council Israel, vol. 11, no. 3, p. 104).

Suborder HALCYONES Forbes

Todiformes Forbes, 1884.
Halcyones Forbes, 1884.
Momoti Sharpe, 1891.
Alcedines Beddard, 1898.

Family HALCYONIDAE Vigors

Halcyonidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 428 (type *Halcyon* Swainson).—*Halcyonidae* Vigors, 1825 (Oct.), Zool. Jour., vol. 2, p. 394.—*Halcyoninae* G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 10 (subfamily).—*Halcyones* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. xii, 403 (superfamily).

Alcedininae Bonaparte, 1831, Saggio di una Distribuzione Metodica degli Animali Vertebrati, p. 41 (subfamilia; type *Alcedo* Linnaeus).—*Alcedinidae* Bonaparte, 1838, Geog. Comp. List Birds Eur. N. Amer., p. 9 (familia).—*Alcedinoideae* Stejneger, 1885, Standard Nat. Hist., vol. 4, p. 395 (superfamily).—*Alcedinides* Wetmore and W. D. Miller, 1926 (July 3), Auk, vol. 43, no. 3, p. 344 (superfamily). —*Alcedinoidea* Wetmore, 1934 (Apr. 23), Smithsonian Misc. Coll., vol. 89, no. 13, p. 9 (superfamily).

Tamatianae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 10 (subfamily; type *Tamatia* Cuvier).

Daceloninae Bonaparte, 1850, Consp. Gen. Av., vol. 1, p. 153 (subfamily; type *Dacelo* Leach).

Tanysipterinae Bonaparte, 1853 (séance du 31 Oct.), C. R. Acad. Sci. Paris, vol. 37, no. 18, p. 645 (subfamilia; type *Tanysiptera* Vigors).

Cerylinae Wetmore, and W. D. Miller, 1926 (July 3), Auk, vol. 43, no. 3, p. 344 (subfamily; type *Ceryle* Boie).

Genus †*Protornis* H. von Meyer

Protornis H. von Meyer, 1844, Jahrb. für Mineralogie, p. 338 (type by monotypy *Protornis glarniensis* Meyer).

1. *Protornis glarniensis* H. von Meyer

Protornis glarniensis H. von Meyer, 1844, Jahrb. für Mineralogie, p. 338 (type from Glarus, skeleton impression, Zürich Mus.).
Osteornis scolopacinus Gervais, 1844 (Aug. 5), Remarques sur les oiseaux fossiles, p. 39 (new name for the above).—Gervais, 1844 (Aug. 17), Bull Soc. philomathique de Paris, pp. 68-69.—Gervais, 1844, Institut, vol. 12, p. 293.
Protornis glaronensis H. von Meyer, 1856, Palaeontogr., vol. 4, p. 92 (emendation).

LOWER OLIGOCENE (Glarner Fischschiefer). SWITZERLAND: Kanton Glarus: Sernftal, near Engi-Matt.

2. *Protornis blumeri* Heer

Protornis blumeri Heer, 1865, Urwelt der Schweitz, p. 236, fig. 143 (type from Glarus, partial skeleton impression, coll. Choherr Blumer, present location unknown). Position uncertain.

LOWER OLIGOCENE (Glarner Fischschiefer). SWITZERLAND: Kanton Glarus: Sernftal, near Engi-Matt.

Neospecies of Halcyonidae from Pleistocene and °prehistoric sites:

1. *Megaceryle maxima* (Pallas). ISRAEL: Kebara Cave? (Tchernov, 1962, Bull. Research Council Israel, vol. 11, p. 114, pl. 1, fig. 7, pl. 6, fig. 12).

2. *Megaceryle alcyon* (Linnaeus). TEXAS: Miller's Cave (Weigel, 1967, Texas Jour.Sci., vol. 19, p. 108). VIRGINIA: Natural Chmimneys (Wetmore, 1962, Smithsonian Inst. Misc. Coll., vol. 145, no. 2, p. 11). FLORIDA: Rock Spring (Woolfenden, 1959, Wilson Bull., vol. 72, p. 185).

3. *Chloroceryle amazona* (Latham). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 44).

4. *Alcedo atthis* (Linnaeus). ENGLAND: Merlin's Cave? (Lambrecht, 1933, Handb. Palaeorn., p. 774). FRANCE: Le Moustier (Lambrecht, 1933, Handb. Palaeorn., p. 774).

5. *Halcyon smyrnensis* (Linnaeus). ISRAEL: Kebara Cave (Tchernov, 1962, Bull. Research Council Israel, vol. 11, p. 106).

Family MOMOTIDAE (Gray)

Momotinae G. R. Gray, 1840 (before April), List of Genera of Birds, p. 9 (subfamily; type *Momotus* Brisson).—*Momotidae* Selys, 1842, de Gray.—*Momoti* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. xii, 403, 450 (superfamily).—*Momotides* Wetmore, 1930 (Jan. 8), Proc. U. S. Nat. Mus., vol. 76, no. 2821, p. 6 (superfamily).—*Momotoidea* Wetmore, 1934 (Apr. 23), Smithsonian Misc. Coll., vol. 89, no. 13, p. 9 (superfamily).

Prionitidae Bonaparte, 1840, Prodromus Syst. Ornith., p. 6 (familia; type *Prionites* Illiger, 1811, a junior synonym of *Momotus* Brisson, 1790).—*Prionitinae* Bonaparte, 1850, Conspectus Gernerum Avium, vol. 1, p. 164 (subfamilia).

Neospecies of Momotidae from Pleistocene and °prehistoric sites:

1. *Eumomota superciliosa* (Sandbach). YUCATÁN: °Actun Lara, °Actun Coyok, and °Actun Spukil (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83); °Mayapan (Pollock and Ray, 1957, Carnegie Instn. Washington, Current Repts. Dept. Archaeology, no. 41, p. 646).

2. *Baryphthengus ruficapillus* (Vieillot). BRAZIL: Lapa da Escrivania, Lapa do Marinho, Lapa da Lagos do Sumidouro, and °Lapa do Capao Secco (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 44).

3. *Momotus momota* (Linnaeus). YUCATÁN: °Actun Coyok and °Actun Oxkintok (Fisher, 1953, Cranbrook Inst. Sci. Bull., vol. 33, p. 83).

Family TODIDAE Vigors

Todidae Vigors, 1825 (after Jan.), Trans. Linn. Soc. London, vol. 14, p. 428 (type *Todus* Brisson).—*Todidae* Vigors, 1825 (Oct.), Zool. Jour., vol. 2, p. 393.—*Todinae* G. R. Gray, 1840 (before Apr.), List of the Genera of Birds, p. 9 (subfamily).—*Todi* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. xii, 403 441 (superfamily).—*Todides* Wetmore, 1930 (Jan. 8), Proc. U. S. Nat. Mus., vol. 76, no. 2821, p. 6 (superfamily).—*Todoidea* Wetmore, 1934 (Apr. 23), Smithsonian Misc. Coll., vol. 89, no. 13, p. 9 (superfamily).

Neospecies of Todidae from the Pleistocene:

1. *Todus angustirostris* Lafresnaye. DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 278).

2. *Todus subulatus* Gray. DOMINICAN REPUBLIC: Cerro San Francisco Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 278).

Suborder MEROPES (Forbes)

Meropiformes Forbes, 1884 (Jan.), Ibis, ser. 5, vol. 2, no. 5, p. 119 (order; type

Merops Linnaeus).—*Meropes* Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (gens).

Family MEROPIDAE Vigors

Meropidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 428 (family; type *Merops* Linnaeus).—*Meropinae* G. R. Gray, 1846 (July), Genera of Birds, vol. 1, p. 85 (subfamily).—*Meropes* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 403 (superfamily).

Nyctiornithinae Cabanis and Heine, 1859 (Dec. 27), Mus. Heineanum, pt. 2, p. 132 (subfamilia; type *Nyctiornis* Swainson).

Neospecies of Meropidae from Pleistocene sites.

1. *Merops apiaster* Linnaeus. RUSSIA: Don Valley between Novocherkassk and Nihni-Tchirskaya (Fisher, 1967, Fossil Record, p. 751). ISRAEL: Abu-Usba Cave on Mt. Carmel? (Bar-Yosef and Tchernov, 1966, Israel Jour. Zool., vol. 15, p. 134).

Order PICIFORMES (Meyer and Wolf)

Pici Meyer and Wolf, 1810, Taschenbuch der deutschen Vögelkunde, vol. 1, p. 115 (order; type *Picus* Linnaeus).—*Pici* Wagler, 1830, Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel, p. 81 (ordo). —*Piciformes* Garrod, 1874, Proc. Zool. Soc. London, p. 117. —*Pici* Sclater, 1880, Ibis, p. 350 (suborder).

Galbulae Fürbringer, 1888, Untersuch. Morph. Syst. Vögel, vol. 2, p. 1567 (intermediäre gens; type *Galbula* Brisson).—*Galbulae* Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 84 (suborder).

Buccones Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 84 (suborder; type *Bucco* Brisson).

Capitones Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 83 (suborder type *Capito* Vieillot).

Indicatores Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 83 (suborder; type *Indicator* Stephens).

Rhamphastides Sharpe, 1891, Review of Recent Attempts to Classify Birds, p. 83 (suborder; type *Rhamphastos* Daudin, i. e. *Ramphastos* Linnaeus).

Suborder GALBULAE Fürbringer

Galbulae Fürbringer, 1888.
Buccones Sharpe, 1891.

Family BUCCONIDAE Boie

Bucconidae Boie, 1826, Isis von Oken, p. 976 (familia; type *Bucco* Brisson).—*Buccoinae* G. R. Gray, 1840 (before April), List of Genera of Birds, p. 53 (subfamily).—*Bucconinae* G. R. Gray, 1846 (Dec.), Genera of Birds, vol. 1, p. 73 (subfamily).

Tamatiae Fitzinger, 1856, Sitzungsber. K. Akad. Wiss. Wien (Math.-nat. Cl.), vol. 21, p. 298 (family; type *Tamatia* Cuvier, 1798, a junior synonym of *Bucco* Boie, 1760).

Argornithidae Cabanis and Heine, 1862 Dec. 31), Museum Heineanum, pars 4, sectio 1, pp. [1], 123, 154, 213 (collective name for Bucconidae, Trogonidae, and Galbulidae; not based on generic name).

Genus †*Primobucco* Brodkorb

Primobucco Brodkorb, 1970 (Nov. 25), Contributions to Geology, Univ. Wyoming, vol. 9, no. 1, p. 13 (type by original designation *Primobucco mcgrewi* Brodkorb).

1. *Primobucco mcgrewi* Brodkorb

Primobucco mcgrewi Brodkorb, 1970 (Nov. 25), Contr. Geol. Univ. Wyoming, vol. 9, no. 1, p. 13, fig. 1 (type from Fossil, right wing, Univ. Wyoming no. 3299).

LOWER EOCENE (lower beds of Green River formation, late Wasatchian age). WYOMING: Lincoln County: near Fossil, in fish quarries, SE ¼, section 18, Township 18 N., Range 117 W.

Neospecies of Bucconidae from Pleistocene sites:

1. *Nystalus chacuru* (Vieillot). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 45).
2. *Malacoptila striata* (Spix). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol., no. 2, p. 45).

Family †ZYGODACTYLIDAE Brodkorb[1]

Genus †*Zygodactylus* Ballmann

Zygodactylus Ballmann, "1966" (25 Jan. 1967), Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West) bei Eichstätt in Bayern, p. 95 (type by monotypy *Zygodactylus ignotus* Ballmann).—Ballmann, 1969 (1 Sept.), Zitteliana, vol. 1, p. 52.

1. *Zygodactylus ignotus* Ballmann

Zygodactylus ignotus Ballmann, "1966" (25 Jan. 1967), Vögel aus der altburdi-

[1] New family. Type *Zygodactylus* Ballmann. Tarsometatarsus with (1) trochleae lying in an arc in distal view (as in Bucconidae and Galbulidae; trochleae almost in a plane in Capitonidae, Indicatoridae, Ramphastidae, and Picidae); (2) trochlea for digit III in line with shaft in anterior view, trochleae for digits II and IV slightly spread (resembling Bucconidae; trochleae for digits III and IV medially inclined or twisted in Galbulidae, Capitonidae, Indicatoridae, Ramphastidae, and Picidae); (3) facet for metatarsal I small and indistinct (as in Galbulidae and Picidae; facet large and distinct in Bucconidae, Capitonidae, Indicatoridae, and Ramphastidae); (4) distal foramen large (as in Bucconidae and Galbulidae; foramen small in Capitonidae, Indicatoridae, Ramphastidae, and Picidae, sometimes even absent in the latter two families); (5) a small internal distal foramen present in both known species (as occasionally present in Bucconidae, Ramphastidae, and Picidae; not present in available specimens of Galbulidae, Capitonidae, and Indicatoridae); (6) trochlea for digit II wide, with talon but without rotular groove (wide, without talon or rotular groove in Bucconidae; wide, without talon but with deep rotular groove in Galbulidae; very thin, without talon or rotular groove in Capitonidae, Indicatoridae, Ramphastidae, and Picidae); (7) trochlea for digit III wide, with shallow rotular groove (as in Bucconidae, Capitonidae, and Ramphastidae; wide, with deep rotular groove in Galbulidae and Indicatoridae; wide to compressed with deep rotular groove in Picidae); (8) accessory trochlea very large and separated by a furrow from rest of trochlea for digit IV (as in Capitonidae, Indicatoridae, Ramphastidae, and Picidae; accessory trochlea small and scarcely separated from rest of outer trochlea in Bucconidae; accessory trochlea small, but separated by a shallow furrow from rest of outer trochlea in Galbulidae).

galen Spaltenfüllung von Wintershof (West) bei Eichstätt in Bayern, p. 95, pl. 2, fig. 6 (type from Wintershof (West), distal part of right tarsometatarsus, Inst. Pal. u. Hist. Geol. Univ. München no. 18164; referred distal part of left tibiotarsus).—Ballmann, 1969 (1 Sept.), Zitteliana, vol. 1, p. 52, pl. 2, figs. 12-13.

MIDDLE MIOCENE (early Burdigalian). BAVARIA: Wintershof (West) bei Eichstätt.

2. *Zygodactylus grivensis* Ballmann

Zygodactylus grivensis Ballmann, 1969 (June), Geobios, no. 2, p. 197, pl. 14, figs. 7-9 (type from Grive-St.-Alban, distal part of right tarsometatarsus, coll. P. Mein no. 151, Mus. Lyon).

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

3. *Zygodactylus gaudryi* (Depéret)

Picus gaudryi Depéret, Arch. Mus. Hist. Nat. Lyon, vol. 4, p. 282, pl. 13, figs. 53-54 (type from Grive-St.-Alban, right femur and tentatively referred distal portion of left tibiotarsus, Mus. Lyon). Family and generic position tentative.

UPPER MIDDLE MIOCENE (Tortonian). FRANCE: Dept. Isère: La Grive-Saint-Alban.

Family GALBULIDAE Bonaparte

Galbulidae Bonaparte, 1831, Saggio di una distribuzione metodica degli animali vertebrati, p. 41 (familia; type *Galbula* Brisson).—*Galbulinae* G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 11 (subfamily).—*Galbulae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 2, 359 (superfamily).—*Galbuloidaea* Wetmore, 1934, Smithsonian Misc. Coll., vol. 89, no. 13, p. 9 (superfamily).

Jacameropinae Sclater, 1891, Cat. Birds Brit. Mus., vol. 19, pp. ix, 161, 176 (subfamily; type *Jacamerops* Lesson).

No fossil record.

Suborder PICI Meyer and Wolf

Pici Meyer and Wolf, 1810.
Capitones Sharpe, 1891.
Indicatores Sharpe, 1891.
Rhamphastides Sharpe, 1891.

Family CAPITONIDAE Bonaparte

Capitonidae Bonaparte, 1840, Prodromus Syst. Orn., p. 18 (family; type *Capito* Vieillot).—*Capitoninae* G. R. Gray, 1846 (March), Genera of Birds, vol. 2, p. 428 (subfamily).—*Capitones* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 2, 310 (superfamily).—*Capitonoidea* Wetmore, 1934, Smithsonian Misc. Coll., vol. 89, no. 13, p. 9 (superfamily).

Megalaiminae Sundevall, 1873, Met. Nat. Av. Disp. Tentamen, vol. 2, p. 75 (family; type *Megalaima* Gray).—*Megalaimidae* Stejneger, 1885, Standard Natural History, vol. 4, pp. 412, 418 (family).

Genus †*Capitonides* Ballmann

Capitonides Ballmann, "1966" (25 Jan. 1967), Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West), p. 79 (type by virtual monotypy and present designation *Capitonides europeus* Ballmann).—Ballman, 1969 (1 Sept.), Zitteliana, vol. 1, p. 43.

1. *Capitonides europeus* Ballmann

Capitonides europeus Ballmann, "1966" (25 Jan. 1967), Vögel aus der altburdigalen Spaltenfüllung von Wintershof (West), p. 80, pl. 2, fig. 3 (type from Wintershof (West), right carpometacarpus, Inst. Pal. u. Hist. Geol. Univ. München no. 18162; referred ulna, humerus, tibiotarsus, tarsometatarsus).—Ballmann, 1969 (1 Sept.), Zitteliana, vol. 1, p. 44, pl. 2, figs. 1-2.

MIDDLE MIOCENE (early Burdigalian fissure deposit). BAVARIA: Wintershof (West) bei Eichstätt.[1]

Family INDICATORIDAE (Swainson)

Indicatorinae Swainson, 1837, Natural History and Classification of Birds, vol. 2, p. 325 (subfamily; type *Indicator* Stephens).—*Indicatoridae* Sclater, 1880, Ibis, p. 402 (family).

No fossil record.

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[1] Cf. also *Capitonides?* sp. Ballmann (1967, Vögel von Wintershof (West), p. 82; 1969, Zitteliana, vol. 1, p. 45, pl. 2, fig. 3), a tarsometatarsus and a humerus from Wintershof (West).

Cf. also *Capitonidarum* gen. et sp. indet. Ballmann (1969, Geobios, no. 2, p. 195) a carpometacarpus from La Grive-Saint-Alban.

Giebel (1847, Fauna der Vorwelt, vol. 1, pt. 2, pp. 20, 39) reported that Lund collected the remains of *Capito* Temminck from bone caves of Brazil, but these apparently pertain to the neospecies of Bucconidae later listed by O. Winge (1887, E Museo Lundii, vol. 1, no. 2, p. 45).

Family RAMPHASTIDAE Vigors

Pteroglossi Vieillot, 1816, Analyse d'une nouvelle ornithologie élémentaire, p. 26 (family; type *Pteroglossus* Illiger).—*Pteroglossinae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., No. 50, pt. 6, p. 329 (subfamily).

Ramphastidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 451 (family; type *Ramphastos* Linnaeus).—*Ramphastinae* G. R. Gray, 1846 (April), Genera of Birds, vol. 2, p. 402 (subfamily).—*Rhamphastidae* Nitzsch, 1840, System der Pterlyographie, p. 135 (familia).—*Rhamphastinae* Bonaparte, 1840, Prodromus Syst. Orn., p. 17 (subfamilia).—*Ramphastoidea* Wetmore, 1934, Smithsonian misc. Coll., vol. 89, no. 13, p. 9 (superfamily).—*Ramphastides* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. xi, 327 (superfamily).

Neospecies of Ramphastidae from Pleistocene sites:

1. *Ramphastos dicolurus* Linnaeus. BRAZIL: Lapa da Escrivania? (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 46).

2. *Ramphastos toco* Müller. BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 46).

Family PICIDAE Vigors

Picidae Vigors, 1825, Trans. Linn. Soc. London, vol. 14, p. 452 (family; type *Picus* Linnaeus).—*Picinae* Bonaparte, 1838, Geog. Comp. List Birds Eur. and N. Amer., p. 39 (subfamilia).—*Picoideae* Stejneger, 1885, Standard Nat. Hist., vol. 4, p. 412 (superfamily).—*Piceae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 8 (section).—*Picoidae* Hay, 1930, Carnegie Inst. Washington Publ., no. 390, vol. 2, p. 352 (superfamily).

Yuncinae Bonaparte, 1838, Geog. Comp. List Birds Eur. and N. Amer., p. 40 (subfamilia; type *Yunx* "Linnaeus" = *Jynx* Linnaeus).—*Yunginae* Bonaparte, 1840, Prodromus Syst. Orn., p. 17.—*Ingidae* Carus, 1863, Handb. Zool., vol. 1, p. 245 (type *lynx* "Linnaeus" = *Jynx* Linnaeus).—*Iynginae* Sundevall, 1873, Met. Nat. Avium Disp. Tentamen, vol. 2, p. 74 (familia).—*Iunginae* Cabanis and Heine, 1863 (Apr. 25), Mus. Heineanum, pt. 4, sec. 2, p. 1 (subfamilia; type *lunx* "Linnaeus" = *Jynx* Linnaeus).—*Jyngidae* Sclater, 1880, Ibis, p. 350 (family; type *Jynx* Linnaeus).—*Iynginae* Hargitt, 1890, Cat. Birds Brit. Mus., vol. 18, pp. xv, 8, 559 (subfamily).—*Jynginae* Peters, 1948, Check-list of Birds of World, vol. 6, pp. x, 86 (subfamily).

Picumninae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 54 (subfamilia; type *Picumnus* Temminck).—*Picuminae* [sic] Bannerman, 1953, Birds West and Equatorial Africa, vol. 1, pp. 46, 47 (lapsus).

Dryocopinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 54 (subfamily; type *Dryocopus* Boie).

Celeinae G. R. Gray, 1840 g)oefore Apr.), List of Genera of Birds, p. 55 (subfamily; type *Celeus* Boie).—*Celeae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 8 (section).

Colaptinae G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p.

55 (subfamily; type *Colaptes* Swainson).—*Colapteae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 6 (section).

Gecininae G. R. Gray, 1846 (July), Genera of Birds, vol. 2, p. 738 (subfamily; type *Gecinus* Boie, 1831, a junior synonym of *Picus* Linnaeus, 1758).

Melanerpinae G. R. Gray, 1846 (Sept.), Genera of Birds, vol. 2, p. 442 (subfamily; type *Melanerpes* Swainson).—*Melanerpeae* Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 7 (section).

Centurinae Cabanis and Heine, 1863 (Apr. 25), Mus. Heineanum, pt. 4, sec. 2, p. 1 note (subfamilia; type *Centurus* Swainson).

Dendrocopinae Cabanis and Heine, 1863 (Apr. 25) Mus. Heineanum, pt. 4, sec. 2, p. 1 note; (May 18), p. 25 (subfamilia; type *Dendrocopos* Koch).

Chrysoptilinae Cabanis and Heine, 1863 (July 20), Mus. Heineanum, pt. 4, sec. 2, p. 113 (subfamilia) type *Chrysoptilus* Swainson).

Chrysocolaptinae Cabanis and Heine, 1863 (Oct. 9), Mus. Heineanum, pt. 4, sec. 2, p. 166 (subfamilia; type *Chrysocolaptes* Blyth).

Hemicercinae Cabanis and Heine, 1863 (Dec. 23), Mus. Heineanum, pt. 4, sec. 2, p. 175 (subfamilia; type *Hemicercus* Swainson).

Campephileae Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p.9 (section; type *Campephilus* Gray).

Dryobateae Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 10 (section; type *Dryobates* Boie, 1826, a junior synonym of *Dendrocopos* Koch, 1816).

Picoideae Ridgway, 1914 (Apr. 8), Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 11 (section; type *Picoides* Lacépède).

Subfamily PICINAE (Vigors)

Picidae Vigors, 1825.
Dryocopinae Gray, 1840.
Celeinae Gray, 1840.
Colaptinae Gray, 1840.
Gecininae Gray, 1840.
Melanerpinae Gray, 1846.
Centurinae Cabanis and Heine, 1863.
Dendrocopinae Cabanis and Heine, 1863.
Chrysoptilinae Cabanis and Heine, 1863.
Chrysocolaptinae Cabanis and Heine, 1863.
Hemicercinae Cabanis and Heine, 1863.
Campephileae Ridgway, 1914.
Dryobateae Ridgway, 1914.
Picoideae Ridgway, 1914.

Genus †*Pliopicus* Feduccia and Wilson

Pliopicus Feduccia and R. L. Wilson, 1967 (Dec. 15), Occ. Papers Mus. Zool. Univ. Michigan, no. 655, p. 3 (type by monotypy *Pliopicus brodkorbi* Feduccia and Wilson).

1. *Pliopicus brodkorbi* Feduccia and Wilson

Pliopicus brodkorbi Feduccia and R. L. Wilson, 1967 (Dec. 15), Occ. Papers Mus. Zool. Univ. Michigan, no. 655, p. 3, fig. 2 (type from near Ogallah, distal part of right tarsometatarsus, Univ. Mich. Mus. Paleo, no. V55785).

LOWER PLIOCENE (Ogallala formation). KANSAS: Trego County: 6 ½ miles N and 1 ¾ miles W of Ogallah, in section 22, Range 22 W, Township 11 S.

Genus † *Palaeonerpes* Cracraft and Morony

Palaeonerpes Cracraft and Morony, 1969 (Dec. 30), Amer. Mus. Novitates, no. 2400, p. 3 (type by original designation *Palaeonerpes shorti* Cracraft and Morony).

2. *Palaeonerpes shorti* Cracraft and Morony

Palaeonerpes shorti Cracraft and Morony, 1969 (Dec. 30), Amer. Mus. Novitates, no. 2400, p. 3, fig. 1 (type from Driftwood Creek, distal end of left tibiotarsus, Amer. Mus. Nat. Hist. no. 1641).

LOWER PLIOCENE (Ogallala group, beds equivalent to top of Valentine formation). NEBRASKA: Hitchcock County: Driftwood Creek.

Genus *Campephilus* Gray

Campephilus G. R. Gray, 1840 (before Apr.), List of Genera of Birds, p. 54 (type by original designation, *Picus principalis* Linnaeus, Recent).

3. *Campephilus dalquesti* Brodkorb

Campephilus dalquesti Brodkorb, 1971 (Feb. 23), Quart. Jour. Florida Acad. Sci., vol. 33, no. 2, p. 133 (type from Beck Ranch, distal half of left tarsometatarsus, Midwestern University).

UPPER PLIOCENE (Blancan). TEXAS: Scurry County: Beck Ranch, 10 miles east of Snyder.

Genus † *Bathoceleus* Brodkorb

Bathoceleus Brodkorb, 1959 (June 3), Bull. Florida State Mus., vol. 4, no. 11, p. 362 (type by original designation *Bathoceleus hyphalus* Brodkorb).

4. *Bathoceleus hyphalus* Brodkorb

Bathoceleus hyphalus Brodkorb, 1959 (June 3), Bull. Florida State Mus., vol. 4, no. 11, p. 362, pl. 2, fig. 7 (type from Banana Hole, right coracoid, Univ. Florida no. 3209).

UPPER PLEISTOCENE (Wisconsin age). BAHAMAS: New Providence Island: Banana Hole.

Neospecies of Picidae from Pleistocene and *prehistoric sites:

Subfamily JYNGINAE

1. *Jynx torquilla* Linnaeus. ITALY: Buca del Bersagliere (Lambrecht, 1933, Handb. Paleorn., p. 775). CZECHOSLOVAKIA: Balcarova skála (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 938). HUNGARY: Puskaporos (Lambrecht, 1916, Barlangkutatás, vol. 4, p. 205); Püspökfürdö (Capek, 1917, op. cit., vol. 5, p. 69).

Subfamily PICUMNINAE

2. *Nesoctites micromegas* (Sundevall). DOMINICAN REPUBLIC: Cerro San Francisco. (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 278).

Subfamily PICINAE

3. *Colaptes auratus* (Linnaeus).[1] OREGON: Fossil Lake (Howard, 1946, Carnegie Instn. Washington Publ., no. 551, p. 188). CALIFORNIA: Potter Creek, Samwel Cave, and Hawver Cave (L. Miller, 1911, Univ. California Publ., Bull. Dept. Geol. vol. 6, p. 398); Rancho La Brea (L. Miller, 1912, Univ. California Publ., Bull. Dept. Geol., vol. 7, p. 71); Carpinteria (L. Miller, 1931, Univ. California Publ., Bull. Dept. Geol. Sci., vol. 20, p. 364); McKittrick (L. Miller, 1935, Condor, vol. 37, p. 79). IDAHO: Weiss Rock shelter (L. Miller, 1963, Bull. So. California Acad. Sci., vol. 62, pt. 4, p. 179). ARIZONA: *35 mi. N. of Flagstaff (A. H. Miller, 1932, Condor, vol. 34, p. 138); *Betakin Pueblo and *Winona Village (Hargrave, 1939, Condor, vol. 41, p. 209). NEW MEXICO: Rocky Arroyo (Wetmore, 1932, Condor, vol. 34, p. 141); Conkling Cavern and Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16). TEXAS: Miller's Cave (Weigel, 1967, Texas Jour. Sci., vol. 19, p. 108). IOWA: *Mill Creek (Hamon, 1961, Plains Anthropologist, vol. 6, p. 211). ILLINOIS: *Kingston (Baker, 1936, Trans Illinois State Acad. Sci., vol. 29, p. 245). OHIO: Canter Caves (Goslin, 1955, Ohio Journ. Science, vol. 55, p. 361). PENNSYLVANIA: *Varner site, 4 ½ mi. S. of Waynesburg (Guilday, 1961, Pennsylvania Archaeologist, vol. 31, p.h 122). VIRGINIA: Natural Chimneys (Wetmore, 1962, Smithsonian misc. Coll., vol. 145, no. 2, p. 11). FLORIDA: Eichelberger Cave (Brodkorb, 1956, Auk, vol. 73, p. 136); Reddick (Brodkorb, 1957, Jour. Palaeont., vol. 31, p. 136); Arredondo (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 282); Itchtucknee River (McCoy, 1963, Auk, vol. 80, p. 347); Haile (Ligon, 1966, Bull. Florida

[1]Includes *Colaptes cafer* (Gmelin), *C. chrysocaulosus* Gundlach, and *C. chrysoides* (Malherbe), not differentiated at the specific level.

State Mus., vol. 10, p. 148); *Vero Beach stratum 3 (Weigel, 1963, Florida Geol. Surv., Spec. Publ., no. 10, p. 29). BAHAMAS: Great Exuma Island (Wetmore, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 439). NUEVO LEÓN: San Josecito Cavern (L. Miller, 1943, Univ. California Publ. Zool., vol. 47, p. 165).

4. *Colaptes campestris* (Vieillot). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 46).

5. *Chrysoptilus melanochloros* (Gmelin). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 46).

6. *Picus viridis* Linnaeus. GIBRALTAR: Devil's Tower (Bate, 1928, Jour. Roy. Anthrop. Inst., vol. 58, p. 104). DENMARK: (Loeppenthin, 1967, Danske ynglefugle i fortid og nutid, p. 42). CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 941). POLAND: Volyn (Lambrecht, 1933, Handb. Palaeorn., p. 775). AUSTRIA: Schusterlucke? (Lambrecht, 1933, Handb. Palaeorn., p. 775). HUNGARY: Tarkö (Jánossy, 1962, Ann. Mus. hungarica, vol. 54, p. 157).

7. *Picus canus* Gmelin. CZECHOSLOVAKIA: Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 941). HUNGARY: Balla Cave and Peskö Cave (Lambrecht, 1912, Aquila, vol. 19, p. 275); Pilisszántó (Lambrecht, 1916, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 480); O-Ruzsin (Lambrecht, 1933, Handb. Palaeorn., p. 775). POLAND: Wollin (Lambrecht, 1933, Handb. Palaeorn., p. 775). RUMANIA: Curata Cave (Jánossy, 1965, Vertebrata Hungarica, vol. 7, p. 112).

8. *Dryocopus martius* (Linnaeus). DENMARK: Maglemose (H. Winge, 1903, Vidensk, Meddel, naturh. Foren., vol. 6, p. 103). SARDINIA: bone breccia (Giebel, 1847, Fauna der Vorwelt, vol. 1, pt. 2, p. 19). AUSTRIA: *Mixnitz (Lambrecht, 1933, Handb. Palaeorn., p. 774).

9. *Dryocopus pileatus* (Linnaeus). CALIFORNIA: Rancho La Brea (A. H. Miller, 1937, Condor, vol. 39, p. 249). TENNESSEE: bone caves (Shufeldt, 1897, Amer. Nat., vol. 31, p. 649). OHIO: *Canter Caves (Goslin, 1955, Ohio Jour. Science, vol. 35, p. 361).

10. *Asyndesmus lewis* (Gray). CALIFORNIA: Rancho La Brea (Howard, 1936, Condor, vol. 38, p. 36); Carpinteria (DeMay, 1941, Carnegie Instn. Washington Publ., no. 530, p. 69).

11. *Melanerpes erythrocephalus* (Linnaeus), VIRGINIA: Natural Chimneys (Wetmore, 1962, Smithsonian Misc. Coll., vol. 145, no. 2, p. 11). FLORIDA: Reddick (Brodkorb, 1957, Jour. Paleont., vol. 31, p. 136); Haile (Ligon, 1966, Bull. Florida State Mus., vol. 10, p. 149).

12. *Melanerpes portoricensis* (Daudin). PUERTO RICO: *Cueva Clara and *Cueva Catedral (Wetmore, 1922, Bull. Amer. Mus. Nat. Hist., vol. 46, p. 320).

13. *Melanerpes formicivorus* (Swainson). CALIFORNIA: *Buena Vista

Lake (DeMay, 1942, Condor, vol. 44, p. 228). NEW MEXICO: Shelter Cave (Howard and A. H. Miller, 1933, Condor, vol. 35, p. 16).

14. *Melanerpes carolinus* (Linnaeus). VIRGINIA: Natural Chimneys (Wetmore, 1962, Smithsonian Misc. Coll., vol. 145, no. 2, p. 11). GEORGIA: *Etowah site (Parmalee, 1960, Florida Anthropologist, vol. 8, p. 49). FLORIDA: Arredondo (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 283); Vero Beach stratum 2 (Weigel, 1963, Florida Geol. Surv., Spec. Publ., no. 10, p. 30).

15. *Melanerpes superciliaris* (Temminck). BAHAMAS: Great Exuma Island (Wetmore, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 440); Banana Hole on New Providence (Brodkorb, 1959, Bull. Florida State Mus., vol. 4, p. 363).

16. *Melanerpes striatus* (Müller). DOMINICAN REPUBLIC: Cerro San Francisco (Bernstein, 1965, Quart. Jour. Florida Acad. Sci., vol. 28, p. 278).

17. *Melanerpes flavifrons* (Vieillot). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 47).

18. *Leuconerpes candidus* (Otto). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 7).

19. *Sphyrapicus varius* (Linnaeus). CALIFORNIA: Rancho La Brea? (Howard, 1962, Los Angeles Co. Mus., Contr. Sci., no. 58, p. 23). FLORIDA: *Vero Beach stratum 3 (Weigel, 1963, Florida Geol. Surv., Spec. Publ., no. 10, p. 30).

20. *Veniliornis maculifrons* (Spix). BRAZIL: Lapa da Escrivania (O. Winge, 1887, E Museo Lundii, vol. 1, no. 2, p. 47).

21. *Dendrocopos major* (Linnaeus). IRELAND: Edenvale Cave and Newhall Cave (Lambrecht, 1933, Handb. Palaeorn., p. 774). ENGLAND: Langwith Bassett Cave and Chudleigh Cave (Lambrecht, 1933, Handb. Palaeorn., p. 774). DENMARK: Erteboelle (H. Winge, 1903, Vidensk. Meddel. naturh. Foren., vol. 6, p. 103). MONACO: Grotte di Grimaldi (Lambrecht, 1933, Handb. Palaeorn., p. 774). SWITZERLAND: Ettingen? (Lambrecht, 1933, Handb. Palaeorn., p. 774). CZECHOSLOVAKIA: Balcarova skála and Certova díra (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, p. 938). Wollin (Lambrecht, 1933, Handb. Palaeorn., p. 774). HUNGARY: Puskaporos (Lambrecht, 1912, Aquila, vol. 19 p. 302); Remetehegy (Lambrecht, 1914, Aquila, vol. 21, p. 90); Pilisszántó (Lambrecht, 1915, Mitt. Jahrb. ungar. geol. Anst., vol. 23, p. 470); Otto Herman Cave (Lambrecht, 1916, Aquila, vol. 22, p. 189); Püspökfürdö (Capek, 1917, Barlangkutatás, vol. 5, p. 28); Istállóskö (Jánossy, 1954, Aquila, vol. 55-58, p. 216, fig. 19B); Tarkö? (Jánossy, 1962, Ann. Mus. Hungar., vol. 54, p. 157); *Lambrecht Cave (Jánossy, 1963, Acta Zool. Acad. Sci. Hungaricae, vol. 9, p. 295).

22. *Dendrocopos medius* (Linnaeus). GERMANY: Zwergloch bei Pottenstein (Lambrecht, 1912, Aquila, vol. 19, p. 302); Velburger Schlossberg (Lambrecht, 1933, Handb. Palaeorn., p. 775). CZECHOSLAVAKIA? (Lambrecht, 1933,

Handb. Paleorn., p. 775). HUNGARY: O-Ruzsin (Lambrecht, 1912, Aquila, vol. 19, p. 302); Püspökfürdö (Capek, 1917, Barlangkutatás, vol. 5, p. 28).

23. *Dendrocopos leuconotos* (Bechstein). CZECHOSLAVAKIA: Balcarova skala and Sipka (Capek, 1910, Ber. V. internat. ornith. Kongr. Berlin, pp. 938-939). AUSTRIA: Mixnitz (Lambrecht, 1933, Handb. Palaeorn., p. 775). HUNGARY: *Remetehegy (Lambrecht, 1916, Mitt. Jahrb. ungar. geol. Anst., vol. 22, p. 403).

24. *Dendrocopos villosus* (Linnaeus). CALIFORNIA: Carpinteria? (L Miller and DeMay, 1942, Univ. Calif. Publ. Zool., vol. 47, p. 121).

25. *Dendrocopos pubescens* (Linnaeus). VIRGINIA: Natural Chimneys (Wetmore, 1962, Smithsonian Misc. Coll., vol. 45, no. 2, p. 12).

26. *Dendrocopos borealis* (Vieillot). FLORIDA: Rock Spring (Woolfenden, 1959, Wilson Bull., vol. 71, p. 185).

27. *Dendrocopos syriacus* Ehrenberg. ISRAEL: Oumm Qatafa Cave (Tchernov, 1962, Bull. Research Council Israel, vol. 11, p. 99).

28. *Campephilus principalis* (Linnaeus). ILLINOIS: *Cahokia (Parmalee, 1958, Auk, vovl. 75, p. 174). OHIO: *Feurt Village (Wetmore, 1943, Wilson Bull., vol. 55, p. 55). WEST VIRGINIA: *Fairchance mound (Parmalee, 1967, Wilson Bull., vol. 79, p. 159). GEORGIA: *Etowah (Parmalee, 1960, Florida Anthropologist, vol. 8, p. 49).

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> Amer. Inst. Biol. Sci., Washington. 92 p.

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