

ORANG - OUTAN

GORILLA

CHIMPANZEE

HULLOCK GIBBON

JOHNSON'S

HOUSEHOLD BOOK

NATURE

CONTAINING FULL AND INTERESTING
DESCRIPTIONS OF THE

ANIMAL KINGDOM

BASED UPON THE WRITINGS OF THE

EMINENT NATURALISTS

AUDUBON, WALLACE, BREHM, WOOD, AND OTHERS

EDITED BY HUGH CRAIG M.A. TRINITY COLLEGE CAMBRIDGE

WITH SIXTY FOUR FULL PAGE ILLUSTRATIONS

ACCURATELY AND BEAUTIFULLY EXECUTED

IN COLOR

NEW YORK

HENRY J. JOHNSON, PUBLISHER

27 BEEKMAN STREET

91.100

Copyright, 1880, by Henry F. Johnson.



Electrotyped by
SMITH & McDOUGAL,
.82 Beekman Street.

Printed by
D. G. F. CLASS,
17 Rose Street.

To the Youth of America, who look up
from Nature's work to Nature's God and
see in all creatures the ministers of Infinite
Wisdom, this account of the friends and
servants, the foes and scourges of mankind, is
respectfully dedicated by the Author.



PREFACE



THE work which the publisher now offers to the public is intended to be instructive as well as entertaining, accurate as well as popular. A knowledge of zoology can be imparted without the use of technical language; in fact, the conventional vocabulary must be in great part discarded by any one who seeks to address the general public rather than a select band of scientific

students. And it is to the general public, to our clergymen, our men of business, our workingmen, and especially to our young people, that this Natural History is dedicated. In a work with such an aim, a formal inventory and technical description of the manifold forms of animal existence would be evidently out of place; instead of investigations of the lifeless organism there must be accounts of the living creature; instead of scientific terminology there must be language plain, clear, and direct; the information which the volume seeks to impart must be conveyed in a manner easy to comprehend, easy to remember, and generally attractive. To the attractiveness of this work the numerous beautifully-colored plates with which it is illustrated contribute in no ordinary degree. The designs are original and have been prepared at unusual expense. They represent in a more vivid and striking way than mere words can depict, the shape, the habits and the habitations of the animals, as well as the colors with which Nature has adorned them and the attitudes which most distinctly characterize them.

JOHNSON'S HOUSEHOLD BOOK OF NATURE aims, as has been said, to be interesting. It is hoped, however, that it will be more than a mere readable book of entertainment, and that it will not allay, but stimulate

curiosity, and invite to a deeper and further study of the wondrous works of Nature. In this hope there have been added the technical names of each order, genus and species.

It does not require to be pointed out how fascinating a study Natural History in all its branches must ever be, or what a perpetual source of interest can be found in observing the forms and habits of the living creatures which meet our view whatever portion of the world we visit. Still more interesting and more instructive must be a knowledge of that class of Animated Nature to which man himself belongs, and which contains such friends of man as the dog that guards him, the horse that labors for him, the ox that supplies him food, and the sheep that furnishes him with clothing; till man had brought these under his dominion, how inconceivably helpless he must have been! No less instructive is it to note how the lower animals differ from or resemble Man, the crown of Nature's work; how admirably each species is adapted for the location in which its lot is cast, and for the uses it has to fulfil in the economy of the world; how marvellously they are endowed with power and grace and beauty.

Especially in the present day is a knowledge of the elements of Natural History a necessary part of our education. This work claims to minister to the educational wants of all classes, and therefore carefully avoids discussion of unsettled points, and states nothing but incontrovertible facts.

The order in which the various genera of the Mammalia is placed has been adopted in accordance with the most eminent authorities.

The first two chapters are devoted to an account of the system of classification of the Animal Kingdom, and therefore may prove less interesting to many readers than the following chapters, in which the different genera and species are described, and in which there is more of living interest and entertaining narrative.

HUGH CRAIG.

MOUNT VERNON, N. Y., *March 1, 1880.*

CONTENTS.

MAMMALIA.

CHAPTER I.

Inanimate and Animated Nature (1)—The Mineral (1), Vegetable (2), and Animal (3) Kingdoms—Classification of Animals (4)—The Vertebrates (4)—Classes of Vertebrates (5).

CHAPTER II.

The Class Mammalia (6)—General Characteristics (7)—The “Dental Formula” (8)—Division into Orders (13).

QUADRUMANA.

CHAPTER III.

GENERAL CHARACTERISTICS.

The General Characteristics of Quadrumana (17)—Their Habits in their Native Haunts (18)—Their Gregarious Disposition (20)—Division of the Quadrumana (22).

CHAPTER IV.

THE ANTHROPOID APES.

The African Division (23)—The Genus Troglodytes (23)—The Gorilla (23)—The Chimpanzee (27)—The Asiatic Division (32)—The Genus Simia (32)—Orang-Outan (32)—The Genus Hylobates or Gibbon (35).

CHAPTER V.

THE OLD WORLD MONKEYS.

The Long-tailed Monkeys (41)—The Genus Semnopithecus (41)—The Proboscis Monkey (44)—The Douc (45)—The Genus Colobus (45)—The Guereza (45).

CHAPTER VI.

BABOONS AND MACAQUES.

The Family Cynopithecidæ (47)—The Genus Myiopithecus or Talapoin (47)—The Genus Cercopithecus (47)—The Guenons (51)—The Genus Cercocebus or Mangabeys (52)—The Genus Theropithecus or Gelada (53)—The Genus Cynocephalus or Baboon (54)—The Baboon Proper (56)—The Chacma (58)—Its Use in Finding Water (58)—The Sphinx (60)—The Hamadryad (61)—Its Pugnacious Disposition (61)—Disgusting Character of the Mandrill and Drill (62).

CHAPTER VII.

BABOONS AND MACAQUES.—*Continued.*

Genus *Micacacus* (63)—The Common Macaque (65)—The Bonnet Ape (67)—The Rhesus or Bunder (68)—The Lapander (103)—The Wanderoo (71)—The Magots (72)—The Gibraltar Monkeys (72)—Genus *Cynopithecus* (74)—The Black Baboon-ape or Celebes (74).

CHAPTER VIII.

THE NEW WORLD MONKEYS.

The American Monkeys or Cebidæ (75)—The Genus *Cebus* or Sapajou (77)—The Genus *Lagothrix* (80)—The Spider Monkeys (81)—The Genera *Ateles* and *Eriodes* (87)—The Howling Monkeys (85)—The Sakis (89)—The Night Monkeys (92)—The Tee-tees (94).

CHAPTER IX.

THE MARMOSETS.

The Marmosets or Ouistitis (95)—The Family Hapalidæ (97)—The Genus *Hapale* (97)—The Silky Marmoset (98)—The Pinche (98)—The Dwarf Marmoset (98)—The Genus *Midas* (99)—The Sagouins (99).

CHAPTER X.

THE LEMUROIDEA.

The Indris (102)—The Lemurs (104)—The Ruffed Lemur (105)—The Cat Lemur (106)—The Hapalemur (107)—The Cheirogaleus (108)—The Loris (110)—The Tarsier Spectre (114)—The Aye-aye (115).

CHEIROPTERA.

CHAPTER I.

GENERAL CHARACTERISTICS.

The Order Cheiroptera (121)—Superstitious Dread of Bats (122)—Their Usefulness (122)—Their Flying Apparatus (124)—Their General Characteristics and Habits (124)—The Genera of the Order (127).

CHAPTER II.

THE VAMPIRES

The Fruit-eating Bats or Flying Foxes (129)—The Kalongs (129)—The Leaf-nosed Bats or Vampires (130)—The Horseshoe Bats (134)—The *Rhinopoma* (136).

CHAPTER III.

THE TRUE BATS.

The Common Bat (137)—The Taphozous (138)—The Pipistrelle (138)—The *Barbastelle* (139)—The California Bat (140)—The Great Bat of Britain (140)—The New York Bat (141)—The Carolina Bat (141)—The Hoary Bat (142)—The Long-eared Bat (142)—The Big-eared Bat (142)—The Noctilionidæ (143)—The Genus *Nycticeius* (143)—The Genus *Nyctinomus* (144)—The Genus *Noctilio* (144).

INSECTIVORA.

CHAPTER I.

THE FLYING LEMURS, ELEPHANT SHREWS AND PENTAIL.

Characteristics of the Order (147)—Its Division into Nine Families (148)—The Galeopithecidae (149)—The Flying Lemurs (149)—The Macroscelididae or Elephant Shrews (151)—The Genus *Rhynchocyon* (152)—The Genus *Petrodromus* (153)—The *Tupaia*dæ (153)—The Bangsring (154)—The Press (154)—The Genus *Hylomys* (155)—The Genus *Ptilocercus* (155)—The Pentail (155)

CHAPTER II.

THE HEDGEHOGS, MOLES, AND SHREWS.

The Erinaceidæ (157)—The Hedgehogs (158)—The Genus *Gymnura* (159)—The Centetidæ (159)—The Tenrec and Tendrac (161)—The Genus *Solenodon* (161)—The Agouti (161)—The Potamogalidæ (162)—The Chrysochloridæ or Golden Moles (163)—The Talpidæ (163)—The Moles (163)—The Genus *Talpa* (163)—Genus *Condylura* (164)—The Star-nosed Moles (165)—The Genus Scalops or American Mole (165)—The Genus *Mygale* (166)—The Desmans (166)—The *Urotrichus* (167)—The Soricidæ or Shrews (168).

CARNIVORA.

CHAPTER I.

CHARACTERISTICS OF THE ORDER.

The Carnivora or Flesh-eaters (173)—General Characteristics of the Order (173)—Its Function in the Economy of Nature (174)—Its Geographical Distribution (175)—Its Division into Families (175).

CHAPTER II.

THE LION.

The Lion (178)—Their Size and Strength (179)—Their Roar (180)—Their Habits (180)—Different Opinions of their Character (181)—Modes of Destroying (182)—The African Lion, the Cape Lion, the Gambia Lion, the Lion of North Africa (183)—The Asiatic Lion, the Maneless Lion (183)—Tame Lions (186)—Dangerous Pets (187).

CHAPTER III.

THE TIGER.

The Tiger (188)—Its Favorite Haunts (188)—Its Destructiveness (189)—Tiger Hunting (191)—Modes of Killing the Tiger (192)—Tame Tigers (194)—The Tiger in Ancient Times (195).

CHAPTER IV.

PANTHERS AND LEOPARDS.

The Cougar or American Panther (196)—The Jaguar (198)—Its Destructiveness (199)—A Tame Jaguar (200)—The African Leopard (201)—The Asiatic Leopard or Panther (202)—The Japanese Panther (202)—The Black Panther (203).

CHAPTER V.

THE OCELOTS AND THE CATS.

The Marbled Cat (205)—The Tiger Cats (205)—The Common Ocelot (205)—The Painted Ocelot (206)—The Syra (207)—The Chati (207)—The Long-tailed Cat (207)—The Pampas Cat (207)—The Clouded Tiger (208)—The Colocolo (208)—The European Wildcat (209)—The Manul (211)—The Malay Cat (211)—The Dwarf Cat (211)—The Egyptian Cat (212)—Letting the Cat out of the Bag (212)—The Common Cat (214)—The Marten Cat (215)—The Serval (215).

CHAPTER VI.

THE LYNXES AND CHEETAHS.

The Genus Lynx (217)—The Persian Lynx (217)—The Caracal (218)—The European Lynx (219)—The Booted Lynx (220)—The Canadian Lynx (220)—The American Wild-Cats (222)—The Genus *Cynælurus* (223)—The Cheetah or Hunting Leopard (224).

CHAPTER VII.

THE CIVET CATS.

The Cryptoproctidæ (226)—The Galet (226)—The Viverridæ (227)—The Civet (228)—The Zibeth (228)—The Genets (230)—The Pale Genet (231)—The Linsang (230)—The Hemigale (230)—The Binturong (231)—The Nandinia (231)—The Pougoune (231)—The Musang (231)—The Masked Paguma (232)—The Mampalon (233)—The Ichneumons (233)—The Mungos or Mangouste (234)—The Egyptian Ichneumon (235)—The Crab-eating Mangouste (237)—The Zebra Mangouste (237)—The Meerkat (238)—The Zenick (238)—The Mangue (239)—The Banded Mungos (239).

CHAPTER VIII.

THE AARD-WOLF AND THE HYÆNAS.

The Family Protelidæ (240)—The Aard-wolf (240)—The Family Hyænidæ (241)—Fables and Superstitions about the Hyæna (241)—The Striped Hyæna (242)—Two Tame Ones (243)—The Brown Hyæna (243)—The Spotted Hyæna or Tiger-Wolf (244)—Rapacity of this Species (244)—Its Horrid Laughter (245).

CHAPTER IX.

THE WOLVES.

General Description of the Genus *Canis* (246)—The Common European Wolf (247)—The Jackal Wolf (250)—The Kaberoo (250)—The Striped Wolf (250)—The American Wolves (251)—The Gray Wolf (251)—The Red Wolf (252)—The Coyote (253)—The South American Wolves (253)—The Crab-eating Wolf (254)—The Aguarachay (253).

CHAPTER X.

THE JACKALS AND FOXES.

The Jackal (255)—The Landjak (256)—The Common Fox (256)—The Raccoon Dog (259)—The Corsac (260)—The Caama (260)—The Fennek (260)—The American Foxes (261)—The Red Fox (261)—The Silver or Black Fox (261)—The Cross Fox (261)—The Kid Fox (262)—The Gray Fox (262)—The Arctic Fox (262)—The Blue Fox (263)—The Large-eared Fox (264)—The Hunting Dog (264).

CHAPTER XI.

THE DOG.

The Wild Dogs (265)—The Dhole (265)—The Alpine Wolf (266)—The Domesticated Dog (266)—Regard in which the Dog is Held (267)—Abhorrence of the Dog by the Orientals (267)—The Dogs of the East (267)—The Dog in Antiquity (268)—The Mental Qualities of the Dog (268)—Its Moral Sense (269)—Its Affection for its Master (270)—Rabies or Hydrophobia (270).

CHAPTER XII.

THE SPORTING DOGS.

Modes of Classification (273)—Sporting Dogs (273)—The Scotch Greyhound (273)—The Irish Greyhound (274)—The African Greyhound (274)—The Common Greyhound (275)—The Hare Indian Dog (276)—The Italian Greyhound (276)—The Stag Hound (277)—Fox Hound (277)—Harrier (277)—Beagle (277)—The Otter Hound (277)—The Dachs Hund and Turnspit (278)—The Bloodhound (278)—The Pointers and Setters (279)—The Spaniels (280)—Springers (280)—Cockers (280)—Water Spaniel (280)—Chesapeake Bay Dog (281)—Retriever (281).

CHAPTER XIII.

SHEPHERD'S DOGS AND HOUSE DOGS.

The Shepherd's Dog (282)—The Colley (282)—The Spitz (283)—The Esquimaux Dog (283)—The St. Bernard (284)—The Mastiff (284)—The Thibet Dog (285)—The Bulldog (285)—The Newfoundland Dog (285)—The Black and Tan Terrier (288)—The Scotch Terrier (288)—The Skye Terrier (288)—The Yorkshire Terrier (288)—The Bull-Terrier (288)—The Fox Terrier (289)—The Coach-Dogs (289)—The Pug (289)—The Poodle (289)—King Charles (290)—Blenheim (290)—The Mexican Mopsey (291)—The Dingo, or the Dog Relapsed into Barbarism (291).

CHAPTER XIV.

THE WEASELS, OTTERS AND SKUNKS.

The Martens (293)—The Sable (294)—The American Sable (295)—The Black Cat (295)—The Polecat (295)—The Ermine (296)—The Ferrets (296)—The New York Ermine (297)—The Mink (297)—The Weasels (298)—The Wolverine (299)—The Otters (300)—The Canada Otter (301)—The California Otter (302)—The Sea Otter (302)—The Brazilian Otter (303)—The Chinese Otter (303)—The Badgers (303)—The American Badger (304)—The Teledu (305)—The Ratel (306)—The Skunks (307)—The Zorilla (307)—The Suriho (308)—The Common Skunk (308)—The Nyentek (310).

CHAPTER XV.

THE RACOONS AND PANDAS.

The Common Raccoon (311)—The Crab-eating Raccoon (313)—The California Coon (313)—The Coati (313)—The Red Coati (314)—The White Coati (314)—The Kinkajou (315)—The American Civet or Mountain Cat (316)—The Panda or Wah (316).

CHAPTER XVI.

THE BEARS.

The Bears (318)—The Polar Bear (318)—The Brown Bear (320)—The Syrian Bear (321)—The American Bears (322)—The Black Bear (322)—The Grizzly Bear (323)—The Bornean Sun Bear (325)—The Sloth or Lipped Bear (326)—The South American or Spectacled Bear (327).

CHAPTER XVII.

THE EARED SEALS AND WALRUSES.

The Eared-Seals (328)—The Fur Seals and Hair Seals (328)—The Sea-Lion (329)—The Sea-Bear (329)—Value of its Fur (330)—The Fur Seals (331)—The California Hair Seal (331)—The California or Northern Sea Lion (332)—Manner of Capturing it Alive (333)—The Walrus (334).

CHAPTER XVIII.

THE TRUE SEALS.

The Common Seals (337)—Their Wide Distribution (337)—Their Habits (338)—Their Love of Music (338)—Robbin's Reef (339)—The Caspian Seal (340)—The Hoe-Rat (340)—The Harp-Seal (340)—Richard's Seal (341)—The Bearded Seal (341)—The Gray Seal (342)—The White-bellied Seal (342)—The Sea Leopard (342)—The Crab-eating Seal (342)—The False Sea Leopard (343)—The Large-eyed Seal (343)—The Sea Elephant (344)—The Crested Seal (345)—The West Indian Seal (346).

CETACEA.

CHAPTER I.

THE RIGHT WHALES.

The Cetacea (349)—The Family Balænidæ (350)—The Greenland Whale (350)—Its Mode of Respiration (351)—Its Blubber (351)—Whalebone (352)—The Young Whale (353)—Enemies of the Whale (354)—The Whale Fishery (355)—American Whalers (355)—Mode of Hunting the Whale (356)—The Harpoon and Bomb-lance (357)—Australian Right Whale (358)—Scrag Whale (358)—Biscay Whale (358)—Genus Eubalæna (358)—Genera Hunterius, Caperia, Macleayus (359).

CHAPTER II.

THE FINNER WHALES AND RORQUALS.

The Humpback or Bunched Whales (360)—The Rorquals or Big Finners (362)—Difficulty of Taking them (363)—The Northern Finner (364)—The Sulphur-bottom (364)—Adventure of the Ship "Plymouth" (364)—The Great Indian Rorqual (365)—Ancient Accounts of it (365)—The Pike Whale (366)—The Southern Rorqual (367)—The California Gray Whale (367).

CHAPTER III.

THE SPERM WHALES AND BLACK FISH.

The Family Catodontidæ (368)—The Sperm Whales (368)—The Spermaceti (369)—Their Speed (370)—Their Fury when Provoked (370)—The Story of the Ship "Essex" (371)—Other Ships Destroyed by this Whale (371)—Ambergris (372)—Speculations as to its Origin (372)—Food of the Sperm Whale (372)—Black Fish (373)—The Genus Cogia (374).

CHAPTER IV.

THE BEAKED WHALES AND THE NARWHALS.

The Family Hyperoodontidæ (375)—The Beaked Whales (375)—The Bottle-nosed Whale (375)—The Xiphius (376)—The Family Monodontidæ (377)—The Narwhal (377)—The Extra-

ordinary Horn (378)—Conjectures as to its Use (378)—Fables Respecting it (379)—Medicinal Properties attributed to it (379)—Value of the Narwhal to the Greenlanders (380)—Ships Struck by it (380).

CHAPTER V.

THE DOLPHINS.

The Delphinidæ (381)—The Soosook or Dolphin of the Ganges (382)—The Inia (383)—The Lorelei of the Amazon River (383)—The Tucuxi (384)—The Dolphins Proper (385)—Legends—Symbols (385)—The Common Dolphin (386)—The White-beaked Dolphin (387)—The Bottlenosed Dolphin (387).

CHAPTER VI.

THE PORPOISES AND WHITE WHALES.

The Common Porpoise (388)—The Grampus, or Gladiator Dolphin (390)—Its Destructiveness (391)—Its Name "The Thresher" (391)—The Pilot Whale, or Caaing Whale, or Grind (392)—Mode of Capturing (392)—The White Whale (393)—Specimens Exhibited in Shows (394).

SIRENIA.

THE SEA COWS.

The Order Sirenia (397)—Mermaids (397)—The Family Manatidæ (398)—The Manatees of America (399)—Their Voracity and Laziness (399)—Modes of Capture (399)—Tame Specimens (399)—The Florida Manatee (400)—The African Lamantin (400)—The Eastern Dugong (400)—The Australian Dugong (401)—The Northern Sea Cows (401)—Steller's Description (401)—Extinct since 1768 (403).

UNGULATA.

CHAPTER I.

HOOFED ANIMALS.

The Order Ungulata (407)—The Numerous Families (407)—The Ruminants (407)—Their Peculiar Stomach (408)—Horns (408)—Antlers (408)—Extinct Species (408)—The Original Horse Protohippus (409)—Gradual Development (409)—The Family Equidæ (409)—The Genus Equus (409)—The Horse (410)—The Tarpan or Wild Horse of Tartary (410)—The Mustang or Wild Horse of America (411).

CHAPTER II.

THE ARAB AND THE BARB.

Early Domestication of the Horse (416)—The Horse in Egypt (416)—Assyria—Judæa (416)—Greece—Persia (417)—Bits and Stirrups (417)—Chariot Races (417)—The Arab Horse (418)—Exaggerated Pedigrees (419)—The Best Arabs (419)—Their Training (419)—Attachment of the Arab for his Mare (420)—Speed and Endurance (421)—The Barb (422)—The Same Horse as the Arab (422)—Abd-el-Kader on the Horse (422).

CHAPTER III.

THE RACE-HORSE AND TROTTING HORSE.

The Race-Horse (425)—The English Turf (426)—The American Turf (427)—Imported Horses (427)—The Trotting-Horse (428)—Flora Temple (431)—Steve Maxwell (432)—St. Julien and Maud S (432)—The Narragansett Pacers (432)—Pocahontas (432).

CHAPTER IV.

EUROPEAN HORSES.

The Hunter (434)—The Hackney (434)—The Russian Horse (436)—The Austrian Horse (437)—The Holstein Horse (438)—The French Horse (438)—The Italian Horse (440)—The Races at Rome (440)—The Spanish Horse (440)—The Shetland Pony (441)—The Carriage Horse (443)—The Cart Horse (443)—The Percheron Horse (443),

CHAPTER V.

THE WILD AND THE COMMON ASS.

The Wild Asses (445)—The Kulan or Dziggetai (445)—Their Speed (446)—Domestication (446)—The Wild Ass of the Bible (447)—The African Wild Ass (448)—The Common Ass (448)—Its Patience—Its Intelligence (449)—The Egyptian Ass (450).

CHAPTER VI.

THE ZEBRAS.

The Zebras or Tiger-Horses (452)—The Quagga (452)—The Dauw, or Burchell's Zebra (453)—Harris's Description of it (454)—The Zebra Proper (454)—Hunting the Zebra (455)—Cross-Breeds (456)—The Mule (456)—The Hinny (456)—Instances of their Fertility (457)—Darwinism (457).

CHAPTER VII.

THE TAPIRS.

The Family Tapiridæ (458)—The American Tapir (458)—Its Trunk (459)—Its Habits (459)—The Tapir as a Domestic Animal (460)—A Tapir Hunt (461)—Peculiar Marks of the Young Tapir (461)—The Malay Tapir (462)—Its Trunk (462)—Its Color (462)—Discovery of the Animal (462)—Chinese Account (463)—The Pinchaque (463)—Baird's Tapir (463).

CHAPTER VIII.

THE RHINOCEROS.

The Family Rhinocerotidæ (464)—General Description (464)—The Horn—Peculiar Structure of the Horn (465)—Known to the Ancients (466)—Wood-cut by Albert Durer (466)—Arab Superstitions (466)—Haunts of the Rhinoceros (466)—A Nocturnal Animal (467)—Its Food—Its Habits (467)—Its Senses (468)—Its Fits of Rage (468)—Maternal Affection (469)—Its Friends the Small Birds (469)—Captive Rhinoceroses (470)—Uses of its Hide (470).

CHAPTER IX.

THE ASIATIC RHINOCEROSSES.

The One-horned Rhinoceroses (470)—The Indian Rhinoceros (470)—Its Thick Hide (470)—Mode of Hunting (473)—The Wara or Javanese Rhinoceros (473)—The Emperor Baber (474)—

The Two-horned Rhinoceros or Badak of Sumatra (474)—The Fire-eating Rhinoceros (476)—The Rough-eared Rhinoceros (476).

CHAPTER X.

THE AFRICAN RHINOCEROS.

The Borele or Little Black Rhinoceros (477)—The Sword-Hunters of Abyssinia (479)—The Keitloa (479)—Their Fierceness (480)—The Mohogoo or White Rhinoceros (481)—Hunting Adventure of Mr. Oswell (482)—The Kobaoba (484)—Probability of its Extinction (484).

CHAPTER XI.

THE HIPPOPOTAMUS.

The Hippopotamus or River Horse (485)—Description (486)—Habits (486)—Favorite Haunts (487)—Food (487)—Violence when Provoked (488)—Maternal Affection (488)—Modes of Hunting (489)—Pitfalls and Downfalls (489)—Harpooning (489)—The Hippopotamus in Captivity (491)—The Small or Liberian Hippopotamus (492).

CHAPTER XII.

THE PECCARIES.

The Swine Family (493)—General Characteristics (493)—The Peccaries (494)—The Collared Peccary (494)—Its Courage and Fierceness (495)—The White-lipped Peccary (495)—Its Habits (495)—Methods of Hunting the Peccary (496)—Flesh of the Peccary (497).

CHAPTER XIII.

THE TRUE SWINE.

The Genus *Sus* (498)—Religious Prohibitions (498)—The Boar of Valhalla (499)—The Boar's Head (499)—The Wild Boar of Europe (499)—Hunting the Wild Boar (500)—The Wild Hog of India (501)—The Domestic Hog (502)—Anecdotes of the Hog (502)—Breeds of Hogs (504)—The Berkshire (504)—Trichiniasis (504).

CHAPTER XIV.

THE RIVER-HOGS, BABYROUSSA, AND WART-HOGS.

The River Hogs (506)—The Pencilled Hog (506)—The Bush Hog, or Bosch Vark (507)—Edwards' River-Hog (508)—The Babyroussa (508)—Its Peculiar Tusks (508)—The Wart-Hogs (509)—Hideous Appearance (510)—The African Wart-Hog, or Vlacke Vark (510)—The Wart-Hog of Ælian or Engallo (511).

CHAPTER XV.

THE CAMEL.

The Ruminants (512)—The Camelidæ (512)—The Camels of the Old World (513)—The Arabian Camel, or Dromedary (514)—The Camel in the Bible (515)—The Camel in Europe (515)—The Camel in Africa (515)—Its Food (516)—Its Powers of Resisting Thirst (516)—Its speed (517)—Mode of Riding (517)—Its Behavior when Loading (518)—Its Vices (519)—Anecdote of Latif Pacha (520)—Its Value (521)—The Two-humped Camel of Bactria (522).

CHAPTER III.

THE RACE-HORSE AND TROTTING HORSE.

The Race-Horse (425)—The English Turf (426)—The American Turf (427)—Imported Horses (427)—The Trotting-Horse (428)—Flora Temple (431)—Steve Maxwell (432)—St, Julien and Maud S (432)—The Narragansett Pacers (432)—Pocahontas (432).

CHAPTER IV.

EUROPEAN HORSES.

The Hunter (434)—The Hackney (434)—The Russian Horse (436)—The Austrian Horse (437)—The Holstein Horse (438)—The French Horse (438)—The Italian Horse (440)—The Races at Rome (440)—The Spanish Horse (440)—The Shetland Pony (441)—The Carriage Horse (443)—The Cart Horse (443)—The Percheron Horse (443),

CHAPTER V.

THE WILD AND THE COMMON ASS.

The Wild Asses (445)—The Kulan or Dziggetai (445)—Their Speed (446)—Domestication (446)—The Wild Ass of the Bible (447)—The African Wild Ass (448)—The Common Ass (448)—Its Patience—Its Intelligence (449)—The Egyptian Ass (450).

CHAPTER VI.

THE ZEBRAS.

The Zebras or Tiger-Horses (452)—The Quagga (452)—The Dauw, or Burchell's Zebra (453)—Harris's Description of it (454)—The Zebra Proper (454)—Hunting the Zebra (455)—Cross-Breeds (456)—The Mule (456)—The Hinny (456)—Instances of their Fertility (457)—Darwinism (457).

CHAPTER VII.

THE TAPIRS.

The Family Tapiridæ (458)—The American Tapir (458)—Its Trunk (459)—Its Habits (459)—The Tapir as a Domestic Animal (460)—A Tapir Hunt (461)—Peculiar Marks of the Young Tapir (461)—The Malay Tapir (462)—Its Trunk (462)—Its Color (462)—Discovery of the Animal (462)—Chinese Account (463)—The Pinchaque (463)—Baird's Tapir (463).

CHAPTER VIII.

THE RHINOCEROS.

The Family Rhinocerotidæ (464)—General Description (464)—The Horn—Peculiar Structure of the Horn (465)—Known to the Ancients (466)—Wood-cut by Albert Durer (466)—Arab Superstitions (466)—Haunts of the Rhinoceros (466)—A Nocturnal Animal (467)—Its Food—Its Habits (467)—Its Senses (468)—Its Fits of Rage (468)—Maternal Affection (469)—Its Friends the Small Birds (469)—Captive Rhinoceroses (470)—Uses of its Hide (470).

CHAPTER IX.

THE ASIATIC RHINOCEROSES.

The One-horned Rhinoceroses (470)—The Indian Rhinoceros (470)—Its Thick Hide (470)—Mode of Hunting (473)—The Wara or Javanese Rhinoceros (473)—The Emperor Baber (474)—

The Two-horned Rhinoceros or Badak of Sumatra (474)—The Fire-eating Rhinoceros (476)—The Rough-eared Rhinoceros (476).

CHAPTER X.

THE AFRICAN RHINOCEROS.

The Borele or Little Black Rhinoceros (477)—The Sword-Hunters of Abyssinia (479)—The Keitloa (479)—Their Fierceness (480)—The Mohogoo or White Rhinoceros (481)—Hunting Adventure of Mr. Oswell (482)—The Kobaoba (484)—Probability of its Extinction (484).

CHAPTER XI.

THE HIPPOPOTAMUS.

The Hippopotamus or River Horse (485)—Description (486)—Habits (486)—Favorite Haunts (487)—Food (487)—Violence when Provoked (488)—Maternal Affection (488)—Modes of Hunting (489)—Pitfalls and Downfalls (489)—Harpooning (489)—The Hippopotamus in Captivity (491)—The Small or Liberian Hippopotamus (492).

CHAPTER XII.

THE PECCARIES.

The Swine Family (493)—General Characteristics (493)—The Peccaries (494)—The Collared Peccary (494)—Its Courage and Fierceness (495)—The White-lipped Peccary (495)—Its Habits (495)—Methods of Hunting the Peccary (496)—Flesh of the Peccary (497).

CHAPTER XIII.

THE TRUE SWINE.

The Genus *Sus* (498)—Religious Prohibitions (498)—The Boar of Valhalla (499)—The Boar's Head (499)—The Wild Boar of Europe (499)—Hunting the Wild Boar (500)—The Wild Hog of India (501)—The Domestic Hog (502)—Anecdotes of the Hog (502)—Breeds of Hogs (504)—The Berkshire (504)—Trichiniasis (504).

CHAPTER XIV.

THE RIVER-HOGS, BABYROUSSA, AND WART-HOGS.

The River Hogs (506)—The Pencilled Hog (506)—The Bush Hog, or Bosch Vark (507)—Edwards' River-Hog (508)—The Babyroussa (508)—Its Peculiar Tusks (508)—The Wart-Hogs (509)—Hideous Appearance (510)—The African Wart-Hog, or Vlacke Vark (510)—The Wart-Hog of Ælian or Engallo (511).

CHAPTER XV.

THE CAMEL.

The Ruminants (512)—The Camelidæ (512)—The Camels of the Old World (513)—The Arabian Camel, or Dromedary (514)—The Camel in the Bible (515)—The Camel in Europe (515)—The Camel in Africa (515)—Its Food (516)—Its Powers of Resisting Thirst (516)—Its speed (517)—Mode of Riding (517)—Its Behavior when Loading (518)—Its Vices (519)—Anecdote of Latif Pacha (520)—Its Value (521)—The Two-humped Camel of Bactria (522).

CHAPTER XVI.

THE LLAMAS.

The American Camelidæ (524)—The Genus *Auchenia* (524)—The Guanaco (525)—Its Habits (526)—The Llama (527)—Its Use as a Beast of Burden (527)—The Alpaca or Paco (528)—Its Wool (528)—The Vicuna (529)—Indian Hunts (530).

CHAPTER XVII.

THE MOUSE DEER.

The Tragulidæ or Hornless deer (532)—Disputes of Naturalists (532)—The Kanchil (532)—Its Appearance and Habits (533)—Attempts to introduce it to Europe (534).

CHAPTER XVIII.

THE DEER.

The Cervidæ (535)—Their Antlers (535)—The Process of Growth of the Antler (536)—The Shedding of the Velvet (536)—Habits of the Cervidæ (538)—The Various Genera (538)—The Elk of the Old World or the Moose of the New World (539)—The Elk of Sweden (539)—The Moose of Canada (541)—Habits—Modes of Hunting (541).

CHAPTER XIX.

THE REINDEER AND THE CARIBOU.

The Reindeer (544)—Its Life in Northern Europe (545)—Its Life in Siberia (545)—Its Life when Domesticated (547)—Its Value (547)—The Caribou (548)—Modes of Hunting it (548).

CHAPTER XX.

THE TRUE DEER.

The True Deer (550)—The Wapiti (550)—The Red Deer of Europe (552)—The Virginian Deer or Carcajou (554)—The Persian Deer (556)—The Indian Species (556)—The Barasinga (556)—The Axis Deer (557)—The Sambur (557)—The Maned Stag (557)—The Hog Deer (558)—The South American Species (558)—The Pampas Deer (558)—The Red Deer or Guasupita (559).

CHAPTER XXI.

THE FALLOW DEER, ROE DEER, AND MUSK DEER.

The Genus *Dama* (560)—Fallow Deer (560)—Genus *Capreolus* (562)—Roe Deer (562)—Genus *Cervulus* (564)—Muntjak or Kidang (564)—Genus *Moschus* (565)—Musk Deer (565)—Its Abode—Habits—The Musk (566).

CHAPTER XXII.

THE GIRAFFE.

The Camelopardalidæ or Giraffes (568)—Its Size and Appearance (569)—Its Habitat (570)—Its adaptation to its Location (570)—Its Movements (570)—Its Food (571)—Its Senses (572)—Giraffes in London and Paris (572)—Modes of Hunting (572)—Meaning of the Word "Giraffe" (573).

CHAPTER XXIII.

THE HOLLOW-HORNED RUMINANTS.

The Bovidæ (574)—The Thirteen Sub-families (574)—The Bovinæ (575)—The Genus *Bos* (575)—The Domestic Ox (575)—The Wild Cattle (576)—The Cattle of the Pampas (577)—Cattle of Africa (578)—Domestic Cattle (579)—The Highland Cattle (582)—The Durham (582)—The Alderney (582).

CHAPTER XXIV.

THE BISONS.

The Bonassus or European Bison (584)—Called also the Aurochs (584)—The Real Aurochs Extinct (584)—The Forest or Bialowicz (584)—Description of the Bonassus (585)—The Bison of the Caucasus (586)—The American Bison or Buffalo (586)—Enormous Numbers (586)—Terrible Destruction (587)—Estimate of Numbers Killed (588)—The Mountain Buffalo (589)—Death of a Bull (590).

CHAPTER XXV.

EASTERN CATTLE.

The Domestic Cattle of India (591)—The Zebu (591)—The Wild Cattle of India (592)—Genus *Bibos* (593)—The Gayal (593)—The Gaur (594)—The Banteng (595)—Genus *Poephagos* (595)—The Yak (595)—The Plough Yak (596)—Hunting the Yak (597)—Genus *Anoa* (597)—The Chamois Buffalo or Celebes (597)—Its Fierceness (598).

CHAPTER XXVI.

THE BUFFALOES.

The Genus *Bubalus* (599)—The Cape Buffalo (599)—Drayson's Account (600)—Buffalo Shooting (602)—The Indian Buffalo (602)—Buffalo and Tiger Fights (603)—Williamson's Account (604)—The Kerabau (605)—The Domesticated Buffalo (605)—Its Habits—Its Uses (606).

CHAPTER XXVII.

THE ANTELOPES.

The Antelopes (607)—The Eland (607)—The Koodoo (609)—The Bosch-bok (610)—The Nylghau (611)—The Passan (613)—The Beisa (614)—The Sabre Antelope (614)—The Addax (614)—The Sable Antelope (615)—The Blau Bok (616).

CHAPTER XXVIII.

THE GAZELLES.

The Gazelle (617)—Its Beauty and Grace (617)—The Ariel Gazelle (618)—The Jairou (619)—The Spring-Bok (620)—Its Immense Numbers (620)—The Dseren (622)—The Sasin (623)—The Pallah (624)—The Saiga (624)—The Sub-family *Antilocaprinæ* (625)—The Prong Horn (625).

CHAPTER XXIX.

THE LESSER ANTELOPES.

The Ourebi (627)—The Klippspringer (628)—The Water Buck (628)—The Blue Buck (630)—The Musk Antelope (629)—The Duyker Bok (630)—The Rhoode Bok (631)—The Chickara

(631)—The Hartebeest (632)—The Sassyby (632)—The Gnu (633)—The Chamois (633)—The Goral (635)—The Mountain Goat of the Rocky Mountains (638).

CHAPTER XXX.

GOATS AND IBEXES.

The Genus *Capra* (637)—The Goats (637)—The Bezoar Goat or Paseng (639)—The Cashmere Goat (639)—The Angora Goat (640)—The Mamber Goat (641)—The Markhor and Tahir (641)—The Egyptian Goat (641)—The Ibexes (642)—The Alpine Ibex (642)—The Pyrenean Ibex (643)—The Arabian Ibex (644).

CHAPTER XXXI.

THE SHEEP AND THE MUSK-OX.

The Aoudad (646)—The Moufflon (647)—The Argali (647)—The Katshkar (648)—The Big Horn (648)—Its Habits (649)—Fat-tailed Sheep (649)—The Cretan Sheep (650)—The Southdown (651)—The Leicester (651)—The Merino (652)—The Highland Sheep (653)—The Genus *Ovibos* (653)—The Musk-ox of North America (654).

PROBOSCIDEA.

CHAPTER I.

ELEPHANTS IN GENERAL.

The Order Proboscidea—Derivation of Name (657)—The Family Elephantidæ (657)—Fossil Elephants—The Mammoth (657)—The Mastodon (658)—The Elephant (659)—Its Trunk—Its Tusks (660)—The Elephant in History (661)—In the East—In Rome—In Modern Times (603).

CHAPTER II.

THE ASIATIC ELEPHANT.

The Asiatic Elephant (665)—Its Use (666)—Mode of Capture in Ceylon (666)—Points of a Good Elephant (669)—White Elephants (670)—Funeral of a White Elephant (670)—The Dwarf Elephant (671).

CHAPTER III.

THE ELEPHANT.

The African Elephant—Difference from the Indian Elephant (672)—Hunting the Elephant (672)—Delegorgue (672)—Gordon Cumming (673)—The Abyssinian "Hock-cutters" (674)—Captive Elephants (676)—Baby Elephants (676)—Anecdotes of Elephants (677).

HYRACOIDEA.

THE ROCK RABBITS.

The Order Hyracoidea (681)—The Genus *Hyrax* (681)—Its Characteristics (682).

RODENTIA.

CHAPTER I.

RATS AND MICE.

The Order Rodentia (687)—The Family Muridæ (688)—Rats and Mice (688)—The Black Rat (688)—The Brown Rat (688)—The Mouse (689)—The Harvest Mouse (689)—The Barbary Mouse (690)—The Hamster (690)—The Musk Rat (692)—The Water Rat (693)—The Field Mouse (693)—Wilson's Meadow Mouse (694)—Le Conte's Mouse (691)—The Cotton Rat (692)—The Lemming (695).

CHAPTER II.

MOLE RATS, POUCH RATS, AND BEAVERS.

The Mole Rat (696)—The Jerboa (697)—The Alactaga (697)—The Cape Leaping Hare (697)—The Hudson Bay Jumping Mouse (698)—The Fat Dormouse (698)—The Common Dormouse (699)—The Pouched Rats (699)—The Beavers (701)—The American Beaver (702)—The European Beaver (704).

CHAPTER III.

THE SQUIRRELS AND MARMOTS.

The Family Sciuridæ (707)—The European Squirrel (707)—The Javanese Squirrel (708)—The Hare Squirrel (708)—The Black Squirrel (708)—The Gray Squirrel (708)—The Northern Gray Squirrel (709)—The Red Squirrel (709)—The Long-haired Squirrel (710)—The Flying Squirrel (710)—The American Flying Squirrel (711)—The Taguan (711)—The Chipmuck (712)—The Leopard Marmot (713)—The Marmot (714)—The Babac (715)—The Woodchuck (715)—The Prairie Dog (716).

CHAPTER IV.

THE SEWELLELS, PORCUPINES, AND CAVIES.

The Family Haploodontidæ (718)—The Family Chinchillidæ (718)—The Chinchillas and Visachas (719)—The Octodontidæ (720)—The Hutia Conga (720)—The Degu (721)—The Tuko-tugo (722)—The Gundy (722)—The Coypu (723)—The Ground Pig (723)—The Canadian Porcupine (724)—The Tufted-tailed Porcupines (726)—The Agouti (726)—The Sooty Paca (727)—The Capybara (727)—The Guinea Pig (728)—The Mara (728)—The Pikas (729).

CHAPTER V.

HARES AND RABBITS.

The Family Leporidæ (730)—The American Hares (730)—The Polar Hare (730)—The Northern Hare (731)—The Wood Hare (731)—The Jackass Rabbit (731)—The African Hares (731)—The Sand Hare (732)—The Common Hare (732)—The Alpine Hare (733)—The Rabbit (733)—The Wild Rabbit (734)—The Domestic Rabbit (734).

EDENTATA.

CHAPTER I.

THE SLOTHS AND ARMADILLOS

The Edentata (737)—The Sloths (737)—The Two-toed Sloth (738)—The Ai or Three-toed Sloth (738)—The Spotted Sloth (739)—The Scaly Ant-eaters (739)—The Phatagin (739)—The

Pangolin (740)—The Tatouhon (740)—The Giant Armadillo (740)—The Tatouay (741)—The Armadillo (741)—The Apar (741)—The Picheogo (742).

CHAPTER II.

THE AARD VARK AND ANT-EATERS.

The Aard Vark of the Cape (743)—The Great Ant-eater or Tamanoir (744)—The Tamandua (745)—The Little Ant-eater (746).

MARSUPIALIA.

CHAPTER I.

THE OPOSSUMS AND BANDICOOTS.

The Marsupials (749)—The True Opossum (749)—The Virginia Opossum (750)—Merriam's Opossum (750)—The Crab-eating Opossum (750)—The Yapock (750)—The Pouched Mouse (751)—The Tasmanian Devil (751)—The Native Cat (751)—The Zebra Wolf (752)—The Native Ant-eater (752)—The Striped Bandicoot (752)—The Chæropus (753).

CHAPTER II.

THE KANGAROOS, PHALANGERS, AND WOMBATS.

The Kangaroo (754)—The Woolly Kangaroo (755)—The Wallabee (755)—The Rock Kangaroo (755)—The Tree Kangaroo (756)—The Kangaroo Hare (756)—The Jerboa Kangaroo (756)—The Potoroo (757)—The Koala (757)—The Sooty Phalangist (757)—The Valpine Phalangist (758)—The Cuscus (758)—The Taguan (758)—The Great Flying Phalanger (759)—The Sugar Squirrel (759)—Opossum Mouse (759)—The Wombat (760).

MONOTREMATA.

THE DUCK MOLE AND AUSTRALIAN HEDGEHOG.

The Monotremata (763)—The Family Ornithorhynchidæ (763)—The Duck Mole (763)—The Family Echidnidæ (765)—The Native Hedgehog (766)—The Tasmanian Species (766)—Conclusion.

LIST OF ILLUSTRATIONS.

PLATE	ORDER	
I.....	I. QUADRUMANA.....	<i>Frontispiece.</i>
II.....	I. QUADRUMANA.....	<i>To face page</i> 54
III.....	I. QUADRUMANA.....	96
IV.....	II. CHEIROPTERA.....	128.
V.....	III. INSECTIVORA.....	150
VI.....	IV. CARNIVORA.....	182
VII.....	IV. CARNIVORA.....	188
VIII.....	IV. CARNIVORA.....	196
IX.....	IV. CARNIVORA.....	206
X.....	IV. CARNIVORA.....	218
XI.....	IV. CARNIVORA.....	212
XII.....	IV. CARNIVORA.....	228.
XIII.....	IV. CARNIVORA.....	242
XIV.....	IV. CARNIVORA.....	266.
XV.....	IV. CARNIVORA.....	274
XVI.....	IV. CARNIVORA.....	284
XVII.....	IV. CARNIVORA.....	256
XVIII.....	IV. CARNIVORA.....	262
XIX.....	IV. CARNIVORA.....	294
XX.....	IV. CARNIVORA.....	302
XXI.....	IV. CARNIVORA.....	312
XXII.....	IV. CARNIVORA.....	318.
XXIII.....	IV. CARNIVORA.....	322
XXIV.....	IV. CARNIVORA.....	326
XXV.....	IV. CARNIVORA.....	332
XXVI.....	IV. CARNIVORA.....	344
XXVII.....	V. CETACEA.....	354
XXVIII.....	V. CETACEA.....	362
XXIX.....	V. CETACEA.....	370
XXX.....	VI. SIRENIA.....	308
XXXI.....	VII. UNGULATA.....	416
XXXII.....	VII. UNGULATA.....	428
XXXIII.....	VII. UNGULATA.....	448.

PLATE	ORDER	PAGE
XXXIV.....	VII. UNGULATA.....	458
XXXV.....	VII. UNGULATA.....	472
XXXVI.....	VII. UNGULATA.....	486
XXXVII.....	VII. UNGULATA.....	504
XXXVIII.....	VII. UNGULATA.....	512
XXXIX.....	VII. UNGULATA.....	526
XL.....	VII. UNGULATA.....	544
XLI.....	VII. UNGULATA.....	538
XLII.....	VII. UNGULATA.....	560
XLIII.....	VII. UNGULATA.....	570
XLIV.....	VII. UNGULATA.....	582
XLV.....	VII. UNGULATA.....	588
XLVI.....	VII. UNGULATA.....	598
XLVII.....	VII. UNGULATA.....	608
XLVIII.....	VII. UNGULATA.....	618
XLIX.....	VII. UNGULATA.....	638
L.....	VII. UNGULATA.....	648
LI.....	VIII. PROBOSCIDEA.....	666
LII.....	VIII AND IX. PROBOSCIDEA AND HYRACOIDEA.....	672
LIII.....	X. RODENTIA.....	688
LIV.....	X. RODENTIA.....	696
LV.....	X. RODENTIA.....	704
LVI.....	X. RODENTIA.....	710
LVII.....	X. RODENTIA.....	716
LVIII.....	X. RODENTIA.....	722
LIX.....	X. RODENTIA.....	728
LX.....	X. RODENTIA.....	734
LXI.....	XI. EDENTATA.....	744
LXII.....	XII. MARSUPIALIA.....	750
LXIII.....	XII. MARSUPIALIA.....	756
LXIV.....	XIII. MONOTREMATA.....	764

MMALIA

CHAPTER I.

INANIMATE AND ANIMATED NATURE—THE MINERAL, VEGETABLE AND ANIMAL KINGDOMS—
CLASSIFICATION OF ANIMALS—THE VERTEBRATES—CLASSES OF VERTEBRATES.

THE first and simplest division which an observer must make in the infinite variety of natural objects by which he is surrounded is a division between things living or ANIMATED and things lifeless or INANIMATE. He sees the corn springing up from the seed, increasing to maturity, then withering; he sees the tree shooting heavenward, towering higher and spreading wider year after year till a pause comes to its development, and then he sees its branches decay and its trunk moulder, and knows that the giant of the forest, like the grass of the field, will fade and die. He knows, too, that the beasts of the earth, the birds of the air, the fishes of the sea, all the thousand tribes of creatures which people the globe, will pass, like the tree or plant, from the seed to maturity, from maturity to death. He knows that man himself is no exception to this law of change; that he grows to manhood and declines into old age; that from the cradle to the grave he changes surely and uninterruptedly day by day, and year by year. But the cliffs which lift their heads to the clouds, the rocks which crop out from the hillside, the stones he treads on, present no such phenomena of growth or decay. Man may shatter them, earthquakes may rend them, frost may disintegrate them, rain may wash them, but the alterations thus effected are merely physical results of physical causes acting from without, not the results of an indwelling force in rock or stone: even when, as in the case of crystals, an increase of size takes place, this increase is not a growth from within but an augmentation by the addition of particles from the outside. The MINERAL KINGDOM is a kingdom of the dead.

If we examine the bodies comprehended in the MINERAL KINGDOM more closely, we find that, in addition to the entire absence of any tendency to periodic change, they are characterized by possessing a very simple chemical composition; they often consist of only one ele-

ment, or if they are composite, they are simple compounds of two or three elements. We find, too, that mineral bodies are either of indefinite shape or crystalline, and that they are composed of similar particles which do not stand in any definite relation to each other. In technical language they are *amorphous* and *homogeneous* bodies.

Every substance which has yet been examined is found to consist of one or more elements. These elements, sixty-three in number, are divided into forty-nine metals and fourteen non-metals; in the latter class are placed those substances which at ordinary temperatures are gaseous in form, such as oxygen, hydrogen and the like, as well as some solid bodies, such as sulphur, phosphorus and carbon. All the known elements occur variously dispersed in the solid mass of the earth, only four in the air, but thirty in the sea. Among the compounds of these elements there is a very peculiar class which form a characteristic and essential portion of the bodies of animals. These compounds are of very complicated constitution; they do not crystallize, but exist in a jelly-like form. They all contain sulphur, and most of them phosphorus, in addition to carbon, hydrogen, oxygen and nitrogen. To a substance closely allied to these *albuminous* compounds, the name of "protoplasm" has been given, and apparently no other form of matter can manifest what we call vital phenomena.

Leaving INANIMATE NATURE to be discussed and described in treatises of Geology, Mineralogy, Chemistry or Physics, let us cast a further look on the division to which we have attributed LIFE.

We observe that these bodies pass through sundry periodic changes, that they grow and decay, and that although subject to the universal physical and chemical laws, they possess a something which enables them to resist or check these laws. We see they increase, not by the mere external addition of particles from outside, but by the assimilation of foreign substances which they take into their interior; and if we continue our observation of them for a sufficient length of time, we discover that they can produce germs which, circumstances favoring, will develop into the likeness of their parent. In other words, we see that they possess organs of nutrition and reproduction. If we examine further these bodies which possess life, we find that the chemical elements of which they are composed form complex organic compounds which differ fundamentally from any inorganic compound by exhibiting an *organized* structure. Such an organized structure is seen in the simple cell, the

germ of living organisms; it cannot be prepared artificially from its elementary constituents, but is the sole and direct product of life. All bodies possessing life consist essentially of cells, minute solid particles and fibres.

Again, in these living bodies the ordinary spectator perceives at once a great and striking difference. The grass indeed waves in the wind, the trees bow to the tempest, the flower turns to the light, the sensitive plant shrinks from the touch. But the snake creeps through the grass, the birds fly from tree to tree, the bee or the butterfly hovers over the flower, the seas and rivers are filled with creatures that swim through the waters. Such bodies not merely live, but live and move. The tree seems not to feel a pang when the woodman's axe cuts into its tissues, the grass does not apparently feel the scythe, but the moving creatures are susceptible of pain and pleasure. They not merely live, but live and move and feel.

Linnæus, the father of Natural History, said that "Plants grow, animals grow and move," and his definition will suffice for the higher classes of animals and plants; but modern microscopic investigations show that it will not do for the lower classes. Many of the plants possess powers of locomotion, many of the animals are rooted to solid objects and destitute of any nervous organization. Perhaps the most reliable test which enables us to distinguish between the animal and the plant is the nature of their food, although even this test is not of universal application.

We may distinguish, then, between the VEGETABLE and ANIMAL KINGDOMS by saying that the plant lives on *unorganized* materials, especially carbonic acid, water, ammonia and salts, organizing them and evolving oxygen, while the animal lives upon *organized* materials taking up oxygen and evolving carbonic acid. The animal cannot produce the complicated chemical compounds it needs for its structure, the plant can do so. Without sunlight the plant cannot grow or assimilate carbon and eliminate oxygen; without vegetables the animal cannot live. Thus, in literal truth as well as in ancient fable, we are the children of the sun.

Abandoning the VEGETABLE KINGDOM with all its marvels and beauties to the BOTANIST, let us confine ourselves to the ANIMAL KINGDOM, to creatures which live and move and feel.

It is at once obvious that the number of living beings which swarm on the earth, in the air, in the water, is so vast and enormous that some

classification is absolutely necessary if we wish to acquire a clear knowledge of the Animal Kingdom as a whole. The simplest system of classification is that named *morphological* (from the Greek words *morphe* form, and *logos* science), by which animals that are constructed on the same plan are placed in the same group. The first grand division we make is between animals that have a backbone, the VERTEBRATA, and animals that have no backbone, the INVERTEBRATA.

THE INVERTEBRATA are divided into five sub-kingdoms: PROTOZOA, structureless jelly-like creatures of minute size; CŒLEENTERATA, animals without a heart or nervous system, such as the ordinary "Sea Nettle"; ANNULOIDA, a class which contains the "Star-fishes" and "Tape-worms"; ANNULOSA, animals composed of different segments arranged one behind the other; to this sub-kingdom belong forms so widely different to the eyes of the superficial observer as "Earth-worms," "Lobsters," "Spiders," "Bees" and "Butterflies." Lastly, the MOLLUSCA, of which the best known are the "Oyster" and the "Snail."

The VERTEBRATA are so-called from the Latin word *vertebra* (joint of the backbone), and possess a backbone made of many parts joined together. Each joint consists of a central portion which helps to give rigidity to the body and support to the limbs. On the upper part of this central portion are certain projections, called in technical language *processes*, that form a protection to the spinal cord; on the lower part are similar processes which cover the great descending artery. The joints of this backbone from the top of the neck to the end of the tail are made up of similar parts. In the neck we do not find ribs, but the rudiments of ribs. In the back the lower bony processes are elongated into ribs; in the loins the processes again degenerate; in the haunches they become confluent with bones that form a cylindrical covering for the softer vessels, and offer a strong fulcrum for the lower limbs. Nay more, the skull is made up of parts corresponding to four vertebræ.

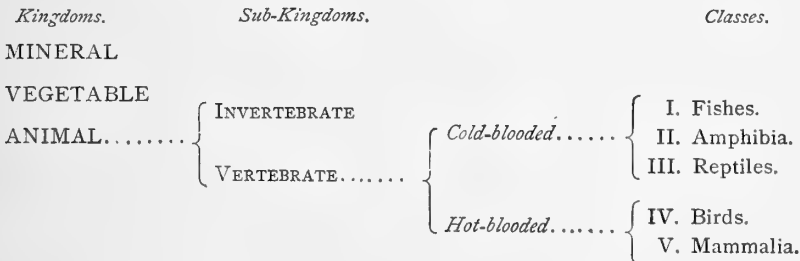
The nervous system of the Vertebrates consist of the *brain*, enclosed in the bony cavity of the skull, and the *spinal cord*, whence spring at intervals symmetrical pairs of nerves distributed to the voluntary muscles. The organs of sense become more perfect, the eyes are invariably two in number, and sagacity is developed in proportion as the nervous centres expand. The blood is red, and the temperature of the body higher than that of the surrounding medium. But this temperature differs so much

in the various classes of Vertebrates, that they are sometimes distinguished into COLD-BLOODED and HOT-BLOODED Vertebrate.

To the COLD-BLOODED Vertebrata belong the countless race of PISCES, or FISHES. They breathe by gills; the heart is usually of two chambers; the limbs when present become fins. The AMPHIBIA have gills and a two-chambered heart when young; when old, lungs and a heart of three chambers; the limbs never become fins. The REPTILES have lungs, not gills, a three-chambered heart, and the skin covered with plates or scales.

The HOT-BLOODED Vertebrata contain two classes: AVES, or birds, and MAMMALIA. In the birds the lungs are connected with air receptacles in various parts of the body; the heart consists of four chambers; the skin is covered with feathers; the forearms become wings. Like fishes and reptiles, birds are *oviparous* or egg-layers. The MAMMALIA form the subject of this volume.

The subjoined table will show the method of division or classification that we have adopted in order to narrow our field of view from the world at large down to that portion of its inhabitants to which we ourselves belong. CLASSES are divided again into Orders; ORDERS subdivided into Genera, and GENUS into Species. SPECIES may be so modified by accidental external circumstances as to give rise to Varieties, and VARIETIES embrace more or fewer INDIVIDUALS.



CHAPTER II.

THE CLASS MAMMALIA—GENERAL CHARACTERISTICS—THE “DENTAL FORMULA”—
DIVISION INTO ORDERS.

THE name MAMMALIA is derived from the Latin word *mamma*, “a teat,” and signifies animals that have teats. The possession of these organs constitutes the most apparent and decisive distinction between the Mammalia and the other classes of animals. They alone bring forth their young alive and suckle them with their milk. The fishes cast their spawn upon the waters, careless of their future offspring. The reptile leaves its eggs to be hatched by the sun’s ray, and so far exercises some degree of forethought for its posterity. The bird sits patiently on her nest till her fledglings appear from the egg, and then tenderly watches over them, feeds them, and gathers them under her wings. But the mammal brings forth her young alive, and nourishes them at the living fountain of her breast.

While all mammals possess teats, the number and position of them vary. Some, like the cow, have them on the belly; some, like man, have them on the breast; some, like the sow, have them on both. In general, the number of these teats corresponds to the number of young each animal bears at a birth.

The Mammalia vary greatly in size. How enormous is the difference in this respect between the elephant and the mouse, or between the whale and the bat, between the giraffe and the mole. Yet all are constructed on the same plan. In all the vertebrates, as we have said, the skull consists of modifications and developments of parts corresponding to four vertebræ; in all the mammalia the number of the neck vertebræ are the same. Seven vertebræ form the neck of the giraffe as well as that of the seemingly neckless whale. In birds, on the contrary, the number of vertebræ increase with the length of the neck. The vertebræ in the back vary in number from ten to twenty-three, the commonest number being thirteen; man, however, has only twelve. The vertebræ

in the loins are commonly seven ; man possesses five, but some animals have as many as nine or as few as two. The sacral vertebræ are amalgamated in most cases into a single bone, and the vertebræ of the tail vary from four to forty-six in number, and are usually freely movable on each other. The number of ribs varies with the number of the *dorsal* or back vertebræ.

The limbs are the members in which the greatest differences are seen. The regular number is four, and hence this class, the mammalia, are sometimes called Quadrupeds, or four-footed things. We must remember, however, that many reptiles walk on four legs, and that in some genera of mammalia the hind limbs are either wanting or entirely rudimentary. The fore-limbs also exhibit striking differences in the various classes ; the hand in the ape becomes in the cat a paw, and in the horse a single hoof ; the fingers in one animal are five in number, in another only one is found.

This skeleton, this bony framework, is moved by muscles which lie close to the bones and move them in diverse directions. To describe the muscular or other tissues is the function of the anatomists, and whoever desires to have a perfect knowledge of their wonderful constitution must consult some treatise on Anatomy. Such descriptions are out of place here ; it is sufficient for us to remark that the muscles stand in the strictest harmony with the peculiarities of the skeleton and the animal's mode of life, which mode of life both influences and is influenced by the figure of the animal. In some, one muscle is wanting, in others, another ; the whales, for example, have no neck muscles, the apes have them developed as in men. Animals that climb, or burrow, or fly, or prey, have immense muscles to the upper arm ; those that run have immense muscles of the rump and shoulder. In brief, each creature is provided as befits its mode of life, or its mode of life has developed the fitting provision.

A like variation is seen in the organs of nutrition. The mouth with fleshy, sensitive lips is a characteristic feature of all except the small order of the *Monotremata*. The *teeth* vary remarkably both in number and shape. Like the hoof or foot, the teeth are admirably adapted in the case of each species to enable it to support its existence ; and hence these two features form a convenient basis for classification. Teeth indeed are wanting in the scaly and great ant-eaters, and are found in the whale only before it is born, but the great majority of mammals

possess teeth invariably planted in distinct sockets in the jaw; in most cases the young animal has *milk teeth*, which are ultimately succeeded by *permanent teeth*. In man the teeth may be divided into four groups: the *incisors* or cutting teeth in front, the *canine* or eye-teeth, the *false molars*, and the back teeth or *molars*. The number of teeth in any animal is usually expressed by what is called the "Dental Formula." We know that in each half of each jaw there is a like number of teeth; hence we have in man the "dental formula" as follows:

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, F. M. \frac{2-2}{2-2}, M. \frac{3-3}{3-3} = 32;$$

where I. denotes *incisors*; C., *canine*; F. M., *false molars*; M., *true molars*; the figures above the line the number of teeth in the upper jaw; those in the lower line, in the lower jaw; the first numbers in each group, the teeth in the left; the second ones, the teeth in the right jaw; the final figures, the total number of teeth in the mouth. The same dental formula is given for the chimpanzee, but what a difference it presents to that of the ruminant or cud-chewing animal! The dental formula of the sheep, for example, is

$$I. \frac{0-0}{3-3}, C. \frac{0-0}{1-1}, F. M. \frac{3-3}{3-3}, M. \frac{3-3}{3-3} = 32.$$

Thus we see at a glance that while the sheep has as many teeth as ourselves, they are widely different from ours in position. In the upper jaw the incisors and canines are wanting; the false molars are three in each side, while we have but two; the molars in both jaws are as numerous as our own; in the lower jaw there are three incisors on each side against our two, and the same number of canines as we possess.

In the *Carnivora*, or flesh-eating animals, the molars assume a cutting character, while in those that feed on herbage, the *Herbivora*, the molar structure prevails. In the *Rodentia*, or gnawing animals, such as rats or squirrels, the incisors project forward and are continually growing; in the *elephant* there are no lower incisors, but the upper incisors, two in number, grow into enormous tusks. In the adult *whale*, the teeth are replaced by the whalebone plates.

The digestive organs of the Mammalia do not differ to any great extent. They possess one stomach with the exception of the *Ruminantia*, or cud-chewers, which have four, the first three of which are so arranged

as to allow the food to be returned with ease into the mouth. The intestines vary in length considerably. In the *Carnivora*, or flesh-eaters, their length is only three or four times the length of the animal's body; in the *Herbivora*, or grass-eaters, they are from twelve to twenty-eight times their length. It is worthy of notice, as indicating how a change in structure may be developed by change of food and habits, that the intestines of the common cat whom domestic life has accustomed to a less carnivorous diet, are longer than those of its wild and bloody kindred.

The heart of the Mammalia is a double heart, consisting of two auricles and two ventricles, which are provided with valves so arranged that the blood can flow from the auricle into the ventricle, but not from the ventricle to the auricle. The course of the blood through this organ may be briefly described. The venous blood that has become impure in the tissues is returned by them to the right auricle, and is then discharged into the right ventricle. The powerful muscles of the heart thence propel it to the lungs, where it meets the air taken in by respiration and is changed into arterial blood. From the lungs it is drawn back into the left auricle, passes into the left ventricle, and is thence forced through the arteries to all parts of the body, and then by means of the exceedingly fine vessels called capillaries, passes again once more into the veins.

Venous blood is changed into arterial blood in the lungs, where it absorbs the oxygen of the air. The *lungs* are two in number, one on each side of the chest, and communicate by the bronchial tubes and the *trachea*, or windpipe, with the outer air. The windpipe we can all feel in the front of our necks; it divides in the chest into the two bronchial tubes, and they are subdivided into an infinite number of little rootlets that enter into the substance of the lung.

The air is taken into and discharged from the lungs by the operation of breathing; and breathing is effected by the elevation and depression of the ribs and the contraction and relaxation of the flat, powerful muscular partition which separates the cavity containing the stomach and the intestines from the chest, which contains the heart and lungs. The air we inhale enters the lungs laden with oxygen; the air we exhale leaves them laden with carbonic acid gas.

The *blood*, which the lungs renew and the heart distributes, is of a light red color. It is the substance which animates the whole being, and from which all the complex structures of the body are formed. Blood

when freshly-drawn is of a uniform appearance; if it is allowed to stand, a dark red mass called the clot rises to the surface, the fluid below, named *serum*, becomes colorless. This process of coagulation occupies about twenty minutes, and during it a peculiar odor is emitted. The upper part of the clot is covered with a film of fibrous matter called *fibrin*; the remainder consists of myriads of small, round bodies called corpuscles, which can be readily seen by examining a drop of blood under the microscope. These blood corpuscles are *circular* in the Mammalia, while in the other Vertebrates they are elliptical, and even in the class of Mammalia the distinction between the blood of the various orders is so marked as to enable a practised eye to indicate the kind of animal from which it has been taken.

Under the microscope the blood corpuscles are seen to consist of two classes, red and colorless corpuscles; and Huxley writes, "The invertebrate animals which have true blood corpuscles, possess only such as resemble the colorless corpuscles of man. The lowest vertebrate animals possess only colorless corpuscles. Vertebrate animals, the young of which are born from eggs, have two kinds of corpuscles, colorless ones and red ones, oval in shape and possessing a nucleus. All the animals which suckle the young (the Mammalia) have, like man, two kinds of corpuscles, colorless ones and small colored corpuscles, the latter being always flattened and devoid of any nucleus. They are usually circular, but in the camel tribe they are elliptical. In the vertebrate series the colorless corpuscles differ much less from one another in size and form than the colored. The latter are smallest in the little musk deer, in which animal they are about a quarter as large as those of a man. On the other hand, the red corpuscles are largest in the Amphibia, in some of which animals they are ten times as long as in man." The blood is the product not of one organ, but of all; and it is profoundly affected by the circumstance that every part of the body takes something from the blood and pours something into it. "The blood may be compared to a river, the nature of which is determined by that of the head-waters, and by that of the animals which swim in it, but which is also much affected by the soil over which it flows, by the water-weeds which cover its banks, and by affluents from distant regions, by irrigation works which are supplied from it, and by drain-pipes which flow into it."

We have gone somewhat fully into detail respecting the blood, because "the Blood is the Life."

The teats or *mammæ* from which this class derives its technical name, are supplied with the milk which supports the young by glands consisting of bunches of tiny cells. These by means of very small tubes pour their secretions into larger vessels, which unite into five or six principal vessels, that are capable of enlargement according to the amount of milk which they are called upon to hold. These reservoirs become smaller towards the mamma or teat, and serve as tubes for the conveyance of the milk into the mouth of the young.

As regards the *organs of sense*, that of sight is perhaps more highly developed in birds than in any other class of animals, but the others are generally most highly developed in the Mammalia. Especially is this the case with the sense of touch, which reaches its highest delicacy in the human hand. The sense of taste varies according as the animal is HERBIVOROUS, CARNIVOROUS, or INSECTIVOROUS.

These various senses convey intelligence of the external world to the brain, and from the brain the voluntary muscles receive their orders to exercise their various functions. The brain which receives this intelligence and issues these directions, together with the multitudinous channels through which they are conveyed, belongs to the *Nervous System*. From the great nerve mass, the *brain*, protected by the bony armor of the skull, there runs the great cord of nervous matter, the spinal cord, which, defended by the vertebræ, extends along the back, giving out branches of various sizes. These *nerves* are composed of fibres, and those fibres which form the anterior root of a nerve give rise to motion, and those which form the posterior root give rise to sensation. This nervous system, then, not only enables us to move our bodies and to know what is going on in the external world, but enables us to discriminate nutritious from innutritious matters, tells us when food is needed, gives us the power to seize and kill, guides the hand to the mouth or the mouth to the food, and governs all the movements of the jaws and of the alimentary canal—it rules the vital actions.

The *brain* varies considerably in size; in some Mammalia it resembles the brain of birds, but as we rise in the scale it quickly changes from the less to the more perfect, and displays convolutions which in number and extent are proportionate to the intelligence of the animal.

The intelligence of man and the intelligence of the brute creation have been distinguished by the names of *Reason* and *Instinct* respectively. A distinction like this is convenient, and unobjectionable if we remem-

ber that it implies only difference in the degree, not in the kind of intelligence. Animals possess memory, can distinguish objects, have perceptions of time, place, color and sound; can learn, apprehend, judge and conclude. Like man, they learn by experience, they perceive danger and devise means to avoid it, they like and dislike, love their friends and benefactors, hate their enemies and ill-doers; they exhibit gratitude, loyalty, respect and contempt, anger and gentleness, cunning and sagacity, deceitfulness and honesty; some think before they act, some stake life and liberty to gratify their impulses. Animals comprehend the benefits of association, and sacrifice themselves for the good of their society; they tend their sick, support the weak, divide their food with the hungry; they can subdue their desires and passions, and have an independent will. They can recall the past, and forecast the future, for which they save and provide. In character, too, animals differ widely. They are daring or timid, bold or cowardly, open or sly, proud or humble, trusting or suspicious, docile or stupid, servile and tyrannous, lovers of peace or lovers of strife, merry or sad, joyous or melancholy, fond of or averse to society, friends to each other or foes of all the world.

Their characters are altered and their faculties developed by education. The horse, the dog, the ox, the elephant display, when tamed and trained by man, powers which their wild kindred never exhibit.

The *Geographical distribution* of animals has attracted much attention, but any detailed classification of animals according to their location would, we think, be needless in this work. We may remark generally, that the *Quadrumanæ* inhabit the Tropics, but the families in the Western Hemisphere are different from those that dwell in the Eastern; the *Marsupials* are most abundant in Australia, with some genera in America. There are no *Edentata* in Europe, nor any native *Ruminantia* in Australia. The *Cheiroptera*, *Carnivora*, *Rodentia*, and *Cetacea* are citizens of the world.

We have not yet spoken of the external covering of most tribes of Mammalia. Their coats vary both in color and thickness according to the dwelling-places and habits of the wearer; from the stripes of the tiger to the white fur of the polar bear. This external coat consists of *hair*, which in the sheep becomes wool, in the swine bristles, in the hedgehog prickles, in the porcupine quills; the scales, nails and horns which some orders possess are formed by the close contact of the roots of the hair, whose horny filaments join firmly together and compose solid

flakes. As a general rule, the coat falls off in spring or autumn and is replaced by new hair.

In one very striking point, *the voice*, the Mammalia are far inferior to the birds. Man, indeed, possesses a voice that can produce articulate and melodious sounds, but his fellow mammals are a tuneless and songless race, and their tones have no charm for us. The voice of most of them is disagreeable, and becomes more so when the animal is excited. Love, which bids the bird warble its melodious lays, only makes the voice of the mammal more unpleasing. Compare the notes of our feathered denizens of the air and the amatory serenades of the domestic cat. We admire indeed the poet's verse that tells us how

“The lowing herd winds slowly o'er the lea,”

but we admire it as a picture of evening; it is not the “lowing,” but the idea of return from labor that pleases us. “Lowing” in itself is as inharmonious as the bleating of sheep, the grunting of swine, the braying of the ass. The voice of all mammals, excepting man, is rough, dissonant, devoid of flexibility, and not susceptible of cultivation.

We must now proceed to enumerate the *orders* into which all the animals comprehended in the *class* MAMMALIA are divided. Without such a further classification we should be in a labyrinth “in endless mazes lost.” We will, however, first give as briefly as possible a definition of the *class*.

“The MAMMALIA form a class of VERTEBRATE animals. They bring forth their young alive and nourish them with milk. They breathe by means of lungs; their heart is four-chambered; the appendages to the skin take the form of hair.”

The basis of classification of the Mammalia has been a subject of frequent discussion. The first and most obvious division is into PLACENTAL and NON-PLACENTAL Mammals; in the former the unborn young are nourished by means of the *placenta*, and are not born till they are able to obtain their natural food, milk, by their own exertions. In the latter, the young are born before there is any necessity for a placenta to supply them with the nutrient materials of the mother's blood; they are born so helpless that they cannot suck, but the milk is forced into their mouths by a muscle surrounding the mammary gland. But these grand divisions are too large, for the class of placental mammals embraces animals so diverse as man and whales, bats and elephants,

sheep and tigers. Commencing, then, with the creatures most like man, we arrange our ORDERS in a descending scale. The technical Latin names will be explained at the beginning of our account of each order.

CLASS MAMMALIA.

PLACENTAL DIVISION.

ORDER I.—QUADRUMANA.	ORDER VII.—UNGULATA.
II.—CHEIROPTERA.	VIII.—PROBOSCIDEA.
III.—INSECTIVORA.	IX.—HYRACOIDEA.
IV.—CARNIVORA.	X.—RODENTIA.
V.—CETACEA.	XI.—EDENTATA.
VI.—SIRENIA.	

NON-PLACENTAL DIVISION.

ORDER XII.—MARSUPIALIA.	ORDER XIII.—MONOTREMATA.
-------------------------	--------------------------

The above arrangement is in accordance with the conclusions of the most eminent naturalists of the present day, and is undoubtedly the most convenient for a popular exposition of the Natural History of the Mammalia. We may mention, however, that many scientific writers separate the *Ruminantia* from the *Ungulata*, that some form *Ruminantia*, *Ungulata* and *Proboscidea*, and some only the two latter, into an order called PACHYDERMATA.



ORDER I.

QUADRUMANA.

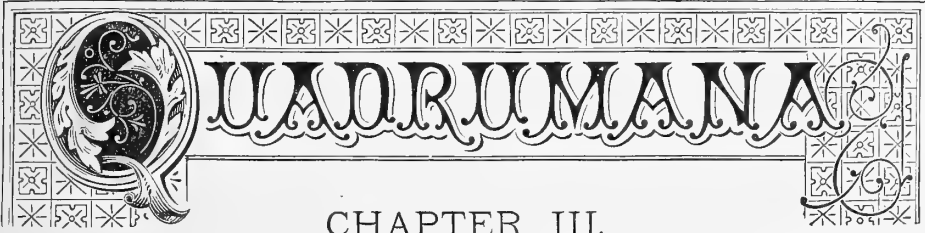
QUADRUMANA OR PRIMATES.

I.—ANTHROPOIDEA.

1. SIMIADÆ - - - - - ANTHROPOID APES.
2. SEMNOPITHECIDÆ - - - OLD WORLD MONKEYS.
3. CYNOPITHECIDÆ - - - BABOONS AND MACAQUES.
4. CEBIDÆ - - - - - NEW WORLD MONKEYS.
5. HAPALIDÆ - - - - - MARMOSETS.

II.—LEMUROIDEA.

6. LEMURIDÆ - - - - - LEMURS.
7. TARSIIDÆ - - - - - TARSIIERS.
8. CHEIROMYIDÆ - - - - - AYE-AYES.

The header features the word "QUADRUMANA" in a large, ornate, blackletter-style font. The letters are highly decorative with intricate flourishes. The word is enclosed within a rectangular border composed of repeating geometric and floral motifs. On the left side, there is a large, circular decorative element containing a stylized, swirling design. On the right side, there is another circular decorative element, similar to the one on the left, also containing a stylized design.

QUADRUMANA

CHAPTER III.

THE GENERAL CHARACTERISTICS OF QUADRUMANA—THEIR HABITS IN THEIR NATIVE HAUNTS—
THEIR GREGARIOUS DISPOSITION—DIVISION OF THE QUADRUMANA.

THE word *Quadrumana* is formed from two Latin words, *quattuor*, "four," and *manus*, "a hand," and means, therefore, "four-handed." To this order belong all the monkey tribes; and a comparison of the foot of a monkey with that of a man will indicate the reason why they are called "four-handed," while man is called in scientific language a *bimanous* (from the Latin *binus*, "two," and *manus*, a "hand"), or two-handed animal. In man the upper limbs terminate in a hand consisting of four fingers and a thumb, which thumb is capable of being "opposed" to each of the fingers. By "opposed" is meant that the thumb is so adjusted as to grasp objects between itself and the fingers. This arrangement is extended in the *Quadrumana* to the hind limbs; the inner or great toe is opposable to the other toes, the hind feet become hands and can grasp objects as easily and firmly as the human hand does. Such a construction enables the animals possessing it to climb with ease, and hence we find that the favorite home of this order is in the woods and forests of the warmer regions of the two hemispheres.

From the very earliest ages the extraordinary resemblance of the monkey tribes to man has attracted the curiosity of mankind. The ancient Egyptians sculptured their forms on their granite monuments, and revered some species as gods. The modern Arabs regard them as the progeny of the evil one, for whom nothing is sacred, nothing venerable, who have been cursed since the day when God changed them from man into apes, and who still bear in strange combination the form of the devil and of man. We of the present day look upon them with mixed feelings. The caricature of the human form and human faculties which they exhibit is tolerable to us in the smaller, playful species,

abhorrent in the larger, wilder kinds. They are at once too like and too unlike ourselves. Like man, they can stand upright; like man, they have hands, a hairless face, and eyes looking directly forward. Yet even these hands, so like ours to the ordinary eye, are not the admirable instrument possessed by man; the thumb is shorter and more widely separated from the fingers, and the fingers cannot act separately like a man's. The haggard, hairy body, the long arms, the thin, calfless legs, the small, receding skull, and the thin, in-drawn lips, are all characteristics of the ape, the very opposite of those found in man.

Morally as well as physically, the apes constitute the "seamy side" of man. They are malicious, cunning, sensual, greedy, thievish, easily provoked to rage, and have human vices and defects. But they are not without what we name virtues. They are sagacious, cheerful, social, devotedly fond of their offspring, and display striking compassion towards the sick and weak. Intellectually they are neither so much higher than other animals, nor so much lower than man, as is commonly maintained. The possession of a hand gives them great advantages over the rest of the animal kingdom, they have a strong tendency for imitating, and are easily taught actions which no other animals can perform. And if we compare the mental qualities of the ape with those of the dog, to the disadvantage of the former, we must remember that man has been for thousands of years training and educating the dog, while the ape has had no opportunity of enjoying the elevating society of mankind. Taking this circumstance into account, we must recognize the ape as the most sagacious of beasts. Yet he is deceived and out-tricked with ease: his passions conquer his prudence. The Malays make a small hole in a gourd, and then place in the interior sugar or some fruits that apes love. The ape inserts its hand through the narrow opening, grasps a handful, and finds that it cannot be withdrawn again; it allows itself to be captured rather than lose its grasp on the dainties it has seized.

The apes are the most agile and active of the Mammalia. When on a raid for food they are not at rest for a moment. They devour every species of food—fruits, roots, bulbs, corn, nuts and leaves—and insects, eggs, and young birds form the delicacies of their repasts. In search of provender their bands spread through the forests; even the elephant dares not invade the spots where the ape is foraging. But while jealous of guarding what they consider their own right, the rogues care not for the rights of others. "We sow, the apes reap," is a proverb in the

Soudan. Fields and gardens especially suffer; neither lock nor bolt, neither hedge nor wall can keep out the plunderers, who destroy much more than they consume. To an unconcerned spectator, the sight of an incursion of apes is an amusing spectacle. They run, they leap, they climb, they swim, they perform in the branches of the trees astounding feats of agility and acrobatic skill. Some seem to fly from bough to bough; a space of six or seven yards across is a mere trifle; they will drop ten feet or more perpendicularly to a branch; it bends with the weight, and as it springs back again, the ape lets go and is shot off by the recoil like an arrow from the bow. Every climbing plant is a ladder, every tree is a high-road. Head foremost, tail foremost, up and down they go as if on solid ground. If a branch breaks, they lay hold of another; if their hands fail, their hand-like feet succeed, or if both fail to grasp, the apes of this continent hold on by their tails. The American monkeys make the tail a fifth hand, or rather their first, most-used hand; they hang by it, they rock themselves by it, they swing by it; their tail is their hammock when they take their noon-day sleep.

This agility and grace of motion are confined to their actions when climbing; their walk is awkward; even the largest manlike apes can scarcely be said to walk; some put down the whole soles of their feet, others support themselves on the knuckles of the hand and swing the body forward in such a fashion that the feet come between the hands. This incapacity of attaining to a walk such as man has, arises partly from the fact that in the ape the orifice by which the spinal cord enters the skull is set very far back, thus overbalancing the body, partly from the conformation of the hind feet. These, as we have said, are like hands, and the outstretched, separate thumb cannot furnish such a firm support for the body as the great toe does, especially as the creature usually walks on the outside of its foot. The Gorilla goes upright most easily, and the Tschego shares this faculty. Many other species can maintain an upright position for a time, but they sink down, when no longer able to balance themselves, on their fore-limbs; when pursued by the hunter, or pursuing their own foes, they move on all-fours.

Some tribes of apes swim excellently, others sink like lead; the latter have a great dread of water. Many travelers describe how the Brazilian monkeys form an ingenious bridge over rivers. A number of them climb to a high branch on a tree on the bank of the river they wish to cross. One monkey grasps the branch with his tail, and seizes with his hands

his neighbor's tail; the second monkey seizes the tail of a third, and so on till a chain of monkeys from the branch to the ground is formed. This chain is then set swinging by the lowest monkey; at every oscillation a fresh impulse is given it, and higher and higher does the end monkey swing, till at last he grasps a branch on the opposite bank of the stream. Across this primitive suspension-bridge the young and old members of the band pass; when all have crossed, the first monkey uncurls his tail, and the chain swings from the last monkey to the land on the other bank. It is a pity that there is no truth in this fable.

Apes are social animals; very few are solitary; they usually gather into bands. Each band has its own home, a spot of greater or less extent, and fixes its home where food is most easily procured. When they have settled on their location, they organize themselves. The strongest, or oldest, or most capable of the males becomes their leader. The dignity is conferred not by the suffrage of the people, but by victory in a series of conflicts with every other male. The strongest arm and the longest teeth decide better than an Electoral Commission. The leader enforces implicit obedience and enjoys great privileges; he claims and exacts the love of all the female members of his band, and woe to maid or matron who dares to flirt with any young monkey. No chivalrous respect for the fair sex restrains the despot from letting his erring spouse feel the weight of his hand; the gallant comes off still worse, for no trifling is permitted in love affairs. The leader is literally the "father of his people." When the band becomes too numerous for its home, some bold youth becomes the leader of a secession, and fights his way, in a new location, to supremacy in power and monopoly in love. Naturally, not a day passes that is not signalized by some conflict for some attractive dame, or by some assertion of his power by the leader.

The leader discharges his office nobly. Secure in his position, he enjoys the esteem and flattery of his subjects; the ladies vie with each other in delicate attentions, and in scratching and cleaning his hairy skin, an operation he submits to with the air of a pasha amid the slaves of his harem.

The sounds of which the ape is capable are well marked and numerous. The cry of terror, which is a warning for flight, is peculiarly remarkable. It is difficult to describe or imitate; it consists of a series of short, abrupt, tremulous tones, and when it is heard, the whole troop takes flight; the mothers call together their little ones, which cling fast

to her, and hurry with their burdens to the nearest tree or rock. The leader marches in front and indicates the path to be taken; not till he announces that all danger is over, does the herd gather again and return to resume their foraging.

All apes do not fly from their enemies; the larger ones face the most savage beasts of prey, and man himself. They fight with hands and teeth in most cases, but have been known to employ as weapons broken limbs of trees, and to hurl stones and fruit at their foes. Even to a man armed with a musket the Gorilla is a dangerous opponent.

In captivity, almost all kinds of apes live in harmony together, but they form for themselves a government resembling that of their days of freedom—the strongest rules.

The females bear one or two young ones. This is regularly a small, hideous creature; its limbs are longer in proportion than those of the adult; its face, with its folds and wrinkles, is more like that of an old man than a child. But its mother loves and tends it with touching care; the whole attitude and manner of the mother and child are strikingly human as she presses her offspring fondly to her breast, while it flings its arms about her neck, as she dandles it up and down in both hands, or rocks it to sleep on her bosom. As soon as it can go alone, it is allowed to play with other monkey infants, but the mother keeps her eye on it, follows every step, every movement, and at the first symptom of danger rushes towards it uttering her cry of warning and recall. If it disobeys her she boxes its ears; but this punishment is seldom required, for the monkey child is an example to the human child, and rarely requires speaking to twice. She divides her food with it, and instances have been known where she has died of grief at its loss. If a mother dies, some female of the band adopts the orphan and displays towards it a tenderness equal to that with which she treats her own offspring.

It is not ascertained how long, on the average, apes are in arriving at maturity. In accordance with all analogy, the larger are slower in growth than the lesser. The American species probably attain their full growth in three or four years; the baboons in eight to twelve years; the anthropoid or manlike apes, such as the Gorilla, Chimpanzee and Orang-outan, much later, as they shed their teeth at about the same age as children. We know nothing of the sicknesses from which they suffer when at liberty, nor how long they live; in all probability the manlike apes live as long as man. In captivity, the climate of Europe

seems fatal to most species, and the poor beast dies of consumption. A sick ape is a sight to move the hardest heart. All his merry tricks are gone; he sits sad and sorrowful, looking piteously at the faces of his sympathizing visitors. The nearer he approaches his end the gentler he becomes. All the brute seems to leave him; a higher spirit seems to shine out. He is grateful for every attention, soon recognizes the physician as his benefactor, takes his medicine willingly, and without reluctance submits to surgical operations.

In their native country the apes are more destructive than useful. Some tribes of savages eat their flesh and make their skins into leather, but they do not minister in any other way to the wants of man.

The above general description is drawn, of course, from observation of the best known species, and due allowance must be made in many cases for the exaggeration of travelers, and in many cases for our ignorance.

The QUADRUMANA are divided by many writers into three sections, which are separated from each other by their geographical position and their anatomical peculiarities. The basis of this classification is the animal's face, or rather its nose. The first section contains the *Catarrhini* or "the straight-nosed," the second the *Platyrrhini* or "flat-nosed" apes, the third the *Strepsirrhini* or "twisted-nosed" Lemuridæ.

The CATARRHINI have the same dental formula (see p. 8) as man, have either no tail or a non-prehensile one, and the thumbs of all the feet are truly opposable. They all belong, with one trifling exception, to Asia and Africa, and include the ANTHROPOID or "man-like" apes.



CHAPTER IV.

THE ANTHROPOID APES.

THE AFRICAN DIVISION—THE GENUS TROGLODYTES—THE GORILLA—THE CHIMPANZEE—THE ASIATIC DIVISION—THE GENUS SIMIA—ORANG-OUTAN—THE GENUS HYLOBATES OR GIBBON.

HUXLEY remarks that whatever system of classification is adopted, the Anthropoid apes are less widely separated from man than from the lower races of apes. The body is strikingly like the human form, the front limbs being longer, the hinder ones shorter than ours; the position of the eyes and ears is the same as in man; the body is covered thinly with hair, except the face and the inside of the feet, which parts are bare; they have no tail. Among the man-like apes, the first place must be assigned to the huge and terrible inhabitant of Western Africa, the Gorilla.

I.—GENUS TROGLODYTES.

The GORILLA, *Troglodytes Gorilla*, (Plate I.)—More than two thousand two hundred years ago, a Carthaginian fleet set sail from the Mediterranean to explore the coast of Africa. The commander of the fleet, Hanno, left an account of his voyage, and we possess a Greek translation of his work. He describes how he passed the present district of Sierra Leone, and then continues: "On the third day, when we had sailed thence and passed the fire-stream, we came to the South horn. In the bottom of the bay formed by this promontory was an island, with a lake in which was an island where we found some wild men. The majority were females with hairy bodies, and our interpreter called them Gorillas. We could not catch any males; they escaped easily by clambering up and down the precipices, and defended themselves by hurling fragments of rock. We caught three females, but could not

bring them away because they bit and scratched. We were forced to kill them, but we flayed the bodies and sent the skins to Carthage." To this account, Pliny adds that the skins were preserved in the temple of Juno.

It is clear from the above extract from Hanno's log-book, that he had seen Anthropoid apes, and the name he uses is conveniently applied to the species we are describing.

The Gorilla, called by the present natives Njina, represents a distinct species. It is shorter but far broader than even a stout man. A full-grown male attains the height of about five feet five inches, and measures from shoulder to shoulder nearly thirty-eight inches. The length and strength of the fore-limbs, the disproportionate size of the hands and feet, and the connection by a skin of the middle fingers and toes, are the most marked characteristics.

The neck of this animal is so short that its head appears to be buried between its shoulders. The forehead is retreating. The ears are small, and nearly on a line with the eyes. The nose is flat, but a little more salient than in the other monkeys. The chest and shoulders are extremely wide. The abdomen is round and prominent. There is no swell in the upper arm muscles, the lower limbs have no calves; the hands are massive and thick, and the fingers short and stumpy. The back of the hands is hairy; the finger-nails are black, thick, and strong. The foot is proportioned like the hand of a giant, and is well adapted for maintaining the body in a vertical position. The huge body is covered with iron-gray hairs, each ringed with alternate bands of black and gray. On the arms the hair is darker and longer, and sometimes exceeds two inches in length. The head is covered with a crown of short, reddish hair descending to the neck. The hair of the female is black with a red tint, and is not streaked like that of the male; neither has the female the red-colored crown until she is aged. The young Gorilla is of a jet-black color. The eyes are buried beneath prominent and shaggy eyebrows, an arrangement which gives the face a cruel look. The jaws are enormous, and furnished with large canine teeth.

It is not yet ascertained how large a tract of country the Gorilla inhabits; the interior of that part of Africa is not yet thoroughly explored, but we may safely say that the Gorilla is found between the equator and the fifth degree of north latitude, and that the forests traversed by the rivers Gaboon Moonee and Fernando Vaz form its abode.

Battell, towards the end of the sixteenth century, describes two monstrous apes, which he names the Pongo and the Ensego. Another traveler calls by the name Impungoo "this monstrous production of Nature, which grows to the height of from seven to nine feet." In 1846, we began to receive more authentic accounts of this gigantic ape. The Reverend Mr. Leighton Wilson of New York, a missionary at the Gaboons, saw a dead Gorilla and obtained a skull, which he forwarded to Dr. Savage. The same missionary procured another skull and part of a skeleton, which he presented to the Natural History Society of Boston, Mass. In 1852, Ford gave accounts agreeing in all points with those of the gentlemen just mentioned; and finally, in 1867, Du Chaillu's great book, "Equatorial Africa," appeared. He tells how the king of the African forests stood suddenly before him, with his powerful chest, his mighty arms, his glittering eyes, and a countenance with a truly hellish expression. He stood and beat his breast with his huge hands till it echoed like a drum, while he uttered terrible roars. The eyes of the creature grew fiercer, his hair began to bristle, he showed his savage teeth and repeated his thundering roar. He came within ten steps of the intrepid traveler, and roared; he came nearer, and again drummed on his echoing breast. When he was six paces distant Du Chaillu fired, and the creature, with a groan awfully human and yet thoroughly brutal, fell dead on his face. The limbs quivered for a few minutes, then all was still. Whatever suspicion Du Chaillu's passion for fine writing may have at first aroused, it is now agreed that his account of the Gorilla is trustworthy. He agrees with the celebrated English philosopher, Owen, in placing it in the scale of animals next to man, and adds that, in hunting the Gorilla, "I have never been able to maintain the indifference, much less experience the triumphant joy of a hunter. It always seemed as if a fellow-creature, a monstrous one it is true, but still having about it something human, was my victim. It was a delusion; I knew it, but yet the feeling was stronger than myself."

The Gorilla lives in the loneliest and darkest spots of the dense African forest, preferring for his residence deep valleys, or rugged and rocky heights in the neighborhood of water. It is a restless animal, seldom two days together in the same place. This wandering is rendered necessary by the difficulty of procuring food; for although the Gorilla has enormous canines and is said to hunt the lion, it really is exclusively a feeder on plants. Its favorite food is fruit, nuts, banana

leaves ; and when it has laid waste an extensive space in satisfying its enormous appetite, it goes elsewhere to seek a supply. It knows when certain regions are fruitful, owing to the changes of the seasons, and periodically visits them. It does not live in trees, and its huge size prevents it from leaping like the lesser monkeys from bough to bough ; it only climbs to get food. Its favorite food is the wild sugar-cane, and a nut of exceeding hardness, which it crushes in its iron jaws. The young Gorilla, Du Chaillu thinks, sleep in trees, the older ones on the ground with their backs leaning against a trunk. The Gorilla is not social ; they are found most often in pairs. If a solitary male is met he is vicious and dangerous. Young Gorillas associate in fours and fives. They run on all fours, and owing to their acuteness of hearing it is difficult to get near them. There is no evidence to prove that they ever build for themselves huts or shelter. The adult Gorilla is very wary, and the hunter may spend a whole day without seeing one. "When I have surprised a couple of Gorillas," says Du Chaillu, "the male has usually been seated on a rock or against a tree in the darkest corner of the jungle. The female sat eating beside him, and, what was very singular, it was nearly always she who gave alarm by taking to flight, uttering at the same time piercing cries. But the male remained seated for a moment, and knitting together his savage countenance, slowly stood upright. Throwing a malicious glance at the invaders of his retreat, he then commenced to beat his breast, to elevate his great head, and to utter his formidable roars. The hideous aspect of the animal at this moment it is impossible to describe. Looking at him, I forgave my brave native hunters for being full of superstitious fears, and I ceased to be astonished at the strange and marvellous stories current among them with regard to the Gorillas."

The Gorilla does not make use of a stick as a weapon ; it only uses in its assaults its arms, feet, and teeth. With a single blow of its foot, armed as it is with short, curved nails, it disembowels a man or fractures his skull. In attacking this ferocious animal, experienced hunters always reserve their shot until the last moment, for the report of firearms irritates the terrible beast, and if the wound is not fatal, the Gorilla flings itself with incredible violence on its aggressor, crushing at the same moment both weapon and hunter.

When it is attacked, it utters a short, jerking, and acute bark, like that of an angry dog ; to this succeeds a low growling like distant thun-

der, which appears to come from the spacious cavities of the chest and abdomen rather than from the throat. The cry of the female and of the young is shrill and piercing.

The Gorilla dies as easily as man; a ball well-directed produces instant death.

The female does not attack the hunter; she flies with her little one, which clings around her neck with its legs encircling her body. The affection of these creatures for their young is so touching, so human, that white men have not the heart to kill them. The natives have no such scruples, and Du Chaillu saw some young Gorillas whose mothers had been slain. He himself had in his possession a young male about two to three years old and two feet and a half high. It was violent, fierce and quite untamable. It repeatedly broke out of its cage; neither hunger nor other means could conquer its obstinate love of liberty, and when it was at last secured by chains it died suddenly of a broken heart. A young female which was brought to him was a suckling, and died from want of milk. Winwood Reade states that he saw in captivity a young Gorilla and a young Chimpanzee, and that they were equally docile. He heard, too, a report that the Gorilla frequently pursued women who went any distance from a village, and saw a woman who affirmed that she had suffered from the violence of a Gorilla, and with difficulty escaped. He considers, however, that stories of captured women living with apes in the forests to which they had been dragged, are not deserving of implicit belief. Such stories are common in various places, and have this basis in fact that the larger male apes will undoubtedly assault women.

Specimens more or less imperfect exist in the Natural History collections at Boston and Philadelphia; no living Gorilla has ever been brought to America, and only one to Europe. The latter unfortunate animal died lately at Berlin from the effects of the climate.

THE CHIMPANZEE.

Wallace and others, differing from Owen and Du Chaillu, assign the highest rank among the apes to the CHIMPANZEE, *Troglodytes niger*, (Plate I.)—Its appearance is certainly not so bestial as that of the Gorilla or the Ourang-outan. The arms are shorter, the hands and feet are better formed, and it can more easily assume a vertical atti-

tude; the legs show a slight development of calf. It is smaller than the Gorilla, with a much shorter body; the head is proportionately large, the face broad and flat, the brow less receding than the Gorilla's; the nose is small, the mouth large with wrinkled lips. It has a pretty thick coat of moderately long hair, which becomes longer on the cheeks and the back of the head. The bare portions of the face are grayish-brown, the hands and feet like brown leather, the lips a dull red. The eyes are mild and soft, with a light-brown iris.

The Chimpanzee is found not only in the forests of Upper and Lower Guinea, but far in the interior of Africa. It usually lives in pairs and families; sometimes five are seen together; seldom more than ten, unless on some festive occasion, when as many as fifty assemble and amuse themselves by screaming and drumming on the old tree trunks. They build nests in the trees, and provide these nests with roofs to turn the rain. Rarely more than two of such nests are found together. The Chimpanzee is not a social ape.

When at rest the Chimpanzee assumes a sitting position; usually when discovered it is standing erect, but as soon as it perceives itself observed it drops on all fours and runs away, differing in this respect from the Gorilla which boldly faces the intruder on his privacy. It is an excellent climber and leaps from tree to tree with astonishing activity. A family group is often seen; the parents sit beneath the shade of a tree, eating and chattering, the little ones sport around and swing from bough to bough. Their food is usually fruits, nuts, leaves, or the bananas which the negroes plant in their cornfields.

Of all the man-like apes, the Chimpanzee is the best known and the most docile. Grandpret saw one that had been taught to attend to a cooking-stove, and call the cook when it was hot enough. The same ape worked with great intelligence on board ship, and hauled on, cast loose or made fast the ropes with all the skill of a sailor. Brosse brought a pair to Europe that ate at table, used a knife and fork, drank wine and spirits, called the waiter when they wanted anything, and grew angry at being neglected. The male had during a fit of sickness been bled by a surgeon; and ever afterwards when it felt indisposed, it held out its arm for the lancet. Lieutenant Sayers had a young one which was human enough to attempt suicide. On its master refusing to give it its favorite food, bananas, it rushed with its head against the wall so violently that it fell backwards; it then mounted on a chest, extended its arms with a

gesture of despair, and flung itself headlong down. The Lieutenant, fearing to lose it, gave way, and the creature gave lively testimony to its delight at its victory.

Buffon gives some interesting details regarding a young Chimpanzee which was brought to Paris in 1740. This animal offered its hand to lead people about who came to visit it; it promenaded with them in the gravest manner as if keeping them company; it sat at table, spread out its napkin, wiped its lips with it, and used its spoon and fork to carry food to its mouth; it poured out its drink into a glass by itself, hobnobbed when invited to do so; it would take a cup and saucer, put them on the table, put sugar in the cup, and pour tea over it, leave it to cool before drinking it, and all this without any other instigation than the signs or words of its master, and often even without this.

The Chimpanzee, writes Brehm, displays in all its actions so much that is human that we almost cease to regard it as a beast. Its intellect seems nearly on a par with that of the uneducated savage. It imitates whatever it sees just as a child does; it fails because its hand has not the capacity of the human hand, but its attempts are made consciously and with reflection. It knows its position, and cordially regards itself as higher than the other animals. It distinguishes between grown people and children, respecting the former, loving the latter, provided always they do not tease it. It expresses its feelings like men. It cannot laugh indeed, but it wrinkles up its face and assumes an unmistakable expression of pleasure. It proclaims its sorrows not only by gestures but by cries and wailing sounds that are intelligible to every one.

Of the many specimens which have been brought from their native homes, most have perished by disease of the lungs. Dr. Martini describes his visit to a sick Chimpanzee. "Covered up in its bed, it lay quite still with a deep expression of suffering on its countenance, shaken by paroxysms of coughing and at times turning its eyes upwards with sighs of pain. It was shy at first, but I soon gained its confidence. It was suffering from inflammation of the left lung accompanied with change of tissue in both lungs and a swelling of the lymphatic glands on both sides of the neck; a deep abscess pressed together the windpipe and the throat. I resolved to open the abscess. The state of the lungs forbade the use of chloroform; chloral hydrate produced a drowsiness, but not anæsthesia. He resisted all attempts at force by men. To my surprise, when my assistants retired he voluntarily submitted to an examination

of the abscess. I resolved to perform the operation. Seated on the knees of his keeper, the ape bent his head backwards and kept it quietly in that position. The incision was quickly made; the creature neither shrunk nor cried. Some thin purulent matter was pressed out, and his breathing was relieved. An unmistakable expression of pleasure and comfort spread over his face; he stretched out his hand to mine, and warmly embraced his keeper. The wound in the neck soon healed, but the inflammation of the lungs increased. He willingly and obediently took all the medicines prescribed for him, and displayed great gentleness and patience during his last hours. He died as a man dies."

A couple of Chimpanzees which were kept at the Jardin d'Acclimatation of Paris excited great attention. The following account of the behavior of the survivor is by an eye-witness:

"I have had an 'interview' with the most interesting widower that it has been my lot to meet in Paris. His poignant sorrow for his departed spouse and his deep affection for the baby she left behind called forth my warmest sympathy. This broken-hearted widower is a captive. His prison is an iron cage. He seems resigned to his lot, and seeks consolation in rendering kind offices to his little one, and in caressing it. The widower is a powerfully-built individual, eight feet high, and has most formidable fists, which he shuts like a prize-fighter. I do not exaggerate when I say that a comparison between his forehead and the foreheads of those who come to stare at him is not to their advantage. His cranium is nobly developed, being well arched at the top, and full in the anterior region. But the nose is flat, and the mouth and chin are prognate. You have already divined that I am speaking about the Chimpanzee at the Jardin d'Acclimatation and his bereaved baby, which sleeps with its head on the papa's arm, and keeps its own arm round his neck when it is awake. The senior animal, who has the advantage over his masters of having thumbs on his feet, has a trick of doubling the blanket which has been given him, and tucking it under the poor orphan. When weary of playing with a silky monkey, which has been turned into the cage to amuse the babe, it lies down to slumber. The father's eyes fill with tears as he watches the young thing, who seems to understand his unhappy position and to be in close sympathy with him. The female died eight days after the infant's birth. Her husband grew violent from despair when her corpse was thrown overboard, and he was placed upon low diet to weaken the prodigious

strength of his fists. Physically low as he now is, he can still bend up like a cane an iron rod an inch in diameter. I thought of Caracacus as I watched him in his prison. There is much dignity in his silent woe and resignation, and I fervently hope that he will never get into the hands of vivisectors."

THE BALD CHIMPANZEE.

The TSCHEGO or Nschiego Mbouve, *Troglodytes calvus*, of Du Chaillu differs in many respects from the Chimpanzee. A female five years old in the Zoological Gardens at Dresden, is remarkable for a head much smaller in proportion than the Chimpanzee's; the body is longer, the shoulders broader, the loins finer, the chest rounder, the stomach less prominent than the corresponding parts of the Gorilla or Chimpanzee. The arms are long, but the hands very narrow and thin; the thumb is long and weak, the two middle fingers very strong; the legs are longer than those of the other manlike apes, the feet well formed. The eyebrows are shaggy and prominent; the eyes small, brown, lively, surrounded with wrinkles. The nose is flattened; the lips, very mobile, are more protruding than the Chimpanzee. The face and a great part of the fore part of the head are bare of hair, and Du Chaillu therefore proposes for this ape the name of *Troglodytes calvus*, or the bald Chimpanzee. Du Chaillu says that the Nschiego Mbouvé builds its leafy nest in the boughs of the highest trees. The nest is composed of small interlaced branches well thatched with leaves and impenetrable to water; fixed by firmly tied bands, it is generally six to eight feet across and dome-formed. The male and female join in building the nest, but they live on different trees. These retreats are seldom used for more than ten days, by which time the animal has ravaged the district around its habitation and is compelled to move elsewhere in quest of food. Du Chaillu killed a female Nschiego carrying her young one in her arms. He took the little creature home, and in a few days it was so completely tamed that he could allow it to wander at liberty without fear of it running away. He could not move a step without being followed by the youngster; neither could he sit down without having the animal climbing on his knees, or hiding its head in his bosom. The poor little thing found extreme pleasure in being caressed and nursed.

It was possessed of great intelligence, and showed wonderful cunning

treat it kindly; a grave and melancholy expression is usually seen on its face.

Numerous living specimens have been brought to Europe. One at Paris is described by Cuvier, who gives an anecdote of its intelligence. "It was once shut up in a place in the vicinity of a saloon where it was usual for persons to assemble. After a time solitude made it impatient, and it endeavored to open the door in order to get in. But the bolt was high and beyond its reach. Ultimately it dragged a chair to the door, climbed up on it, and having drawn back the catch, triumphantly entered."

Another was brought to England by Dr. Abel Clarke; it was as docile as affectionate. It took a fancy for two kittens and patiently endured their scratches rather than lose their company. It was, however, observed trying to pull out their claws with its fingers. He adds: "Since its arrival in Great Britain, it acquired, to my knowledge, two habits which it certainly never practised on board ship, where its education, I ought to say, had been very much neglected. One of these was walking erect, or at least on its hind feet, without resting on its hands; the second was to kiss its keeper. Some writers assert that the Orang-outan gives real kisses, and they suppose that this is a natural act of the animal. I believe that they are wrong: it is acquired from imitation, and even then it does not altogether give a kiss like Man, by advancing the lips."

The Orang-outan is the very opposite in disposition to the Chimpanzee. While the latter is lively and playful, the former is quiet, solemn, and grave, his motions are slow and measured, and the expression of his brown eyes inconceivably sad.

We have mentioned above that this animal possesses a throat-pouch. This strange appendage is not a mere hollow sack, but is shaped like a badly-made glove; it is larger in the male than the female. A careful investigator, Mr. Vrolik, is of opinion that this throat-pouch has nothing to do with the voice, but is "intended to assist it in climbing and leaping." It is a pity that he did not show how it accomplishes this object. The sac is connected by a passage with the windpipe, and can be inflated at pleasure.

There seems to be in Borneo another species of SIMIA called by the natives Meias Kassar. It is much smaller than the Orang-outan, or Meias Pappan, and has often been regarded as the young of the latter.

III. GENUS HYLOBATES.

The GIBBONS.—The third genus of the man-like apes is that of the long-armed apes which are commonly called Gibbons. The scientific name HYLOBATES, or “forest walkers,” from the Greek *hyle* “a wood,” and *baino* “to walk,” was given them from the fact that they are chiefly found in the dense forests of India and the Eastern Archipelago. For life in the forest they are admirably adapted by the length of their fore-arms.

The Gibbons are divided into *Seven Species*, some of which attain a considerable size, although not exceeding three feet and a half. They are the only Anthropoid apes possessing gluteal callosities. The body, although the breast is well rounded, seems slender, owing to the thinness of the flanks; the hinder limbs are much shorter than the fore limbs, and in some species the long hand is characterized by a growing together of the index and middle finger. The head is small and egg-shaped, the face human-like, the tail is not visible externally. A silk fur covers their bodies, the colors being principally brown, brownish-gray, or straw-color.

THE HULOCK.

The HULOCK, *Hylobates hulock*, (Plate I), bears clearly the marks of the genus. It has no air-sack and the fingers do not grow together. Its hair is coal-black except a white line across the forehead; in the young it is dark-brown, and ash-gray on the back. The HULOCK inhabits Farther India and Bengal, especially the woody banks of the Brahmapootra river.

THE LAR, UNKO AND WAUWAW.

These species are natives of Malacca and Siam. The LAR, *Hylobates lar*, is almost as large as the Hulock. The prevailing color is a dark-gray, the hands are of a whitish-gray on the upper, but black on the lower surface.

The UNKO, *Hylobates rafflesii*, is distinguished from the Hulock anatomically by the possession of fourteen pairs of ribs. Its face and coat are black, inclining to reddish-brown on the back; the

eyebrows, cheeks and chin are white in the males, but dark-gray in the females.

The WAUWAW or Agile Gibbon, *Hylobates agiles*, has a bare, blue-black face, inclining in the female to brown, long hair of a dark-brown color on the head, stomach, and inside the arms; on the shoulders and behind the neck the hair becomes lighter, and in the females is light-brown, while on the hinder parts down to the knees, it is of mixed white and reddish hues. The hands and feet are dark-brown. The female is lighter colored than the male; the hair on the cheeks is shorter, but still long enough to make the face seem broader than it is long. The young are of a yellowish-white color.

Doctor Franklin, speaking of the Agile Gibbon, says: "Some years ago a female of this species was exhibited in London. The cries it emitted when going through its performances, naturalists decided to be most musical. This individual was timid and gentle. It preferred the society of women to that of men. It was thought that this circumstance was due to the bad treatment it had received at the hands of the stronger sex. It was intelligent and observant: its piercing eyes seemed to be always on the *qui vive*, scrutinizing every one, and missing nothing of what passed around. When any one gained its confidence, it consented after several invitations to descend from its perch and shake hands."

The Gibbons, as we have observed, are admirably adapted for climbing. The round chest gives room to the lungs, the strong hind legs give great propelling power, the long fore arms enable them to grasp securely the branch which is to be their next starting-point. An easy comparison will show how disproportionately long their limbs are. A man can barely touch his knee when standing erect, the GIBBONS can touch their ankles. Nothing can present a greater contrast than a Gibbon in a forest, and a Gibbon on the ground. In the former they fly like birds from bough to bough, their agility is boundless and graceful; on the ground they seem out of their element, they move slowly, they totter on their hind feet, and can only maintain their equilibrium by the aid of their long arms. If the Gorilla is the Hercules, the Gibbon is the Mercury of the ape world. The name *Lar* of one species is derived from a naiad Lara whom Mercury loved.

The HULOCK can only balance itself upright by raising its hands above its head, and then it waddles rather than walks. If urged to greater speed, it uses its long fore-arms. They hop rather than leap,

and when they use their arms they resemble cripples on crutches. The WAUWAW is the most agile. He ascends the smooth stems of the bamboo, swings the tall cane backwards and forwards till he gathers the required impetus, then flies over a space of thirteen or fourteen yards, grasps another twig, a third, a fourth, and so on, till he seems to shoot like an arrow. He is proud of his agility and is fond of displaying it when there is no occasion. A female Wauwau in London was kept in a large enclosure where trees were planted at a distance of seven or eight yards apart. All spectators were struck with wonder at its performances. It sprung from one tree to another without any preparatory efforts, and never failed in its leap. It would continue this performance for a considerable time, seeming scarcely to touch the boughs. No less remarkable was the sureness of its hand and eye. If an apple was flung at it during its flight, it caught it without a pause in its course. In the midst of its swiftest career it could in a twinkling change the direction of its flight, or come suddenly to a sitting position, in which it seemed as if it had never been in motion.

If a young one in captivity could display such astonishing feats of agility, it is needless to say that the adult Gibbon in its native forests moves like a swallow through the air.

The HULOCKS form bands of a hundred or a hundred and fifty members, and are usually seen in the tops of very high trees, occasionally descending to disport themselves in the clearings of the forest. Owen relates that in riding through the jungle he came upon a powerful band; the trees were full of them; they screamed and grimaced at the intruder, and some of the bolder spirits followed him as if with the intention to attack. Such attacks on travelers are said to be not uncommon. Owen's account, however, is at variance with all other observers, who agree in describing the Gibbon as running away from the sight of man.

At sunrise and sunset the Gibbons assemble and unite their voices in a clamor that can be heard a full mile away. This cry is very peculiar. Bennett says it begins with the fundamental note E and goes up through the chromatic scale to the E an octave higher. As it runs up the scale, the semitones come out slower and slower; as it descends, the notes increase in rapidity till the end is a yelling scream. The regularity, swiftness and precision with which these animals run up the scale is astonishing. The Wauwau derives its name from its cry. It begins

ua, ua, ua, then the a becomes longer, the u shorter, till it sounds like wa, and then the whole band join in the chorus.

The long-armed apes soon become tame. Harlan possessed a Hulock that, like the large apes already described, could sit at table, and learned to drink from a cup like a man. It preferred a vegetable diet, but sometimes ate a bit of fish or chicken. "When I paid him my morning visit, he greeted me with a loud Wau, wau, wau! repeated till he was quite out of breath. He liked to be combed and brushed, and stretched out first one arm, then another. He knew my voice and replied when I called to him from a distance."

The Gibbons are seldom found in captivity, even in their native country. They cannot bear the loss of freedom; they pine away in regret for their forest home and woodland sports, and become gradually quieter and quieter, sadder and sadder, till death sets them free.

IV.—GENUS SIAMANGA.

The SIAMANG, *Siamanga syndactyla*, differs in some considerable respects from the preceding genus, and one of the most striking of these is indicated by its name *syndactyla* (Greek *syn* "together," *dactylos* "a finger"). The fore and middle fingers of the posterior limbs are united by a membrane, and its arms are shorter than those of the other species. The low forehead presses down upon the eyebrows, the eyes are deep-set, the nose flat, the nostrils large, the mouth enormous. The air-sack, formed by loose folds of skin, consists of a double pouch at the throat; it protrudes like a bird's crop, and swells when the creature cries. A thick soft coat of deep black hair covers the body; the eyebrows, however, are of a reddish-brown. The hair of the fore arm points upwards, that of the upper arm downwards, just as in Man. The height of a full grown *Siamang* is about forty inches, but it can span twice that length. It is a native of the thick forests of Sumatra.

According to Duveaucel, the Siamangs collect in numerous troops, under the leadership of an experienced chief, and greet the sun, at its rising and setting, with cries which are heard for several miles around. They are not very nimble, but their sense of hearing is extremely acute; the moment they notice the slightest sound, they decamp without delay.

But if they are on the ground, and they have not time to reach trees, they are easily overtaken. The troop, however numerous, abandons one of their members who is wounded unless the victim be a young one; then maternal love bids the mother fly to the protection of her offspring, and with inflated air-sack and outstretched arms she faces the enemy. Otherwise, too, this maternal instinct is touchingly evinced. The mother bears her little one to the river, bathes it in spite of its cries, and carefully rubs it dry. The Malays affirm that the male parent carries the male young ones, while the mother bears the females, and travelers assert that this report is true.

One of these animals was for some time an inmate of a ship, where it became quite companionable, and gained the affections of passengers and crew. So far from exhibiting the sullen and sluggish demeanor which has been attributed to this ape, the Siamang displayed great activity and quickness, skipping about the ropes, and given to harmless tricks. It took a fancy to a little Papuan girl who was on board, and would sit with its arms round her neck, eating biscuit with her. It was of an inquisitive nature, running up the rigging, and watching from its elevated position a passing vessel, and remaining there until the ship was out of sight. In temper it was rather uncertain, and apt to fly into a passion if opposed in any wish.

When thus excited, it would fling itself down, just like a naughty, spoiled child, roll about the deck with great contortion of limbs and face, strike at everything which came in its way, and scream incessantly, with a sound like "Ra! ra! ra!"

It had a strange predilection for ink, and in order to procure this remarkable dainty, would drain the ink-bottle whenever there was an opportunity of so doing, or suck the pens in default of the liquid itself. Being itself destitute of a tail, and feeling no fear of reprisals in that direction, the Siamang used to make very free with the tails of some monkeys that lived on board of the same vessel. Catching an unfortunate monkey by its caudal appendage, away went Ungka, as the ape was named, dragging the monkey after him along the deck, until the wretched animal writhed itself free from its tormentor. At another time, Ungka would carry the monkey by the tail up the rigging, in spite of its squeaks and struggles, and then quietly let it drop.

It was sensitive to ridicule; and when its feelings were hurt, it used to inflate its throat until it resembled a huge wen, and looked seriously

at the offenders, uttering hollow barks at intervals. This sound seemed to be used for the purpose of expressing irritation. Anger was expressed by the shrieking "Ra! ra!" and pleasure by a kind of mixture between a squeak and a chirp.

Wallace had a Siamang that used to play with his native servant. Hence we may conclude that this genus does not deserve the character given it by some authors who describe it as a dull and stupid animal, that does not care to distinguish between friend and foes, that will not move till forced to do so, hardly even taking the trouble to put its food into its mouth.

Mr. Bennett the English naturalist confirms Wallace's account of the gentleness of this species. He writes: "Going into the courtyard where Ungka was tied up one morning, I was sorry to see it occupied in trying to get rid of its waist-belt and rope, while at the same time it uttered a sharp, plaintive cry. When unfastened, it went towards a group of Malays, and after catching hold of the legs of some of them, it approached one who was lying down, jumped on him, and closely embraced him with an expression of recognition. I learned that this man in whose arms the Monkey showed so much pleasure, was its first master."

Mr. Bennett adds that Ungka preferred vegetables, such as rice and onions, to flesh. She drank tea, coffee, and chocolate, but never wine or spirituous liquors.



CHAPTER V.

THE OLD WORLD MONKEYS.

THE LONG-TAILED MONKEYS—THE GENUS SEMNOPITHECUS—THE PROBOSCIS MONKEY—THE DOUC—
THE GENUS COLOBUS—THE GUEREZA.

LEAVING the anthropoid or tailless apes, we now proceed to consider the remaining apes of the Old World. The old world monkeys differ from the anthropoid apes by the shortness of their arm, the presence of tails and gluteal callosities, and, in many instances, of cheek pouches. The "gluteal callosities" are those bare and hard plates which are seen on the posterior parts of these animals, and on which they rest when sitting. The cheek pouches are sacks, more or less capacious, between the cheeks and the jaws, in which they place their food when they wish to reserve it. Like the tailless apes, the tailed monkeys of the Old World have the same "dental formula" as we ourselves possess; and their tails are not prehensile or able to lay hold of anything. As a rule they are sagacious, but mischievous and ungraceful, and very destructive. Hence some nations regard them with fear and abhorrence, others regard them as sacred or divine.

The apes described in this chapter differ, as we have said, from the anthropoid apes by the possession of a tail; they differ also from those which will be hereafter described in the length of this appendage and in the use they make of it. The tail in these genera is usually very long; it is habitually raised, and serves as a balance.

They are divided into two families, of which the first or SEMNOPITHECIDÆ are distinguished by the absence of cheek pouches.

I.—GENUS SEMNOPITHECUS.

The genus SEMNOPITHECUS (from the Greek words *scmnos*, grave, and *pithecus*, ape) is found in Asia. They are slender, with long limbs.

a long tail, a small head, a hairless face, a short muzzle, and very slight callosities. *Twenty-nine Species* are known.

The hands have long fingers, but the thumb on the fore limbs is very short, and of no use for grasping. Their hair is fine, and often very long on the head. The conformation of the stomach is peculiar, and distantly resembles that of the Kangaroo. All species possess an air-sack.

They are natives of the mainland of Southern Asia and the islands of the Indian archipelago. They live in troops in the forests, usually near running water, and near villages and cultivated ground. Wallace gives a very vivid description of them in their native haunts. The traveler generally finds them in companies of twenty or thirty, busily engaged in seeking food. They seldom are seen on the ground, unless when picking up some fallen fruit. They pay no attention to the natives, but avoid Europeans. When alarmed they hide in the trees, or fly with extraordinary rapidity, springing from bough to bough. It is amusing to witness the attempts the less agile make to follow their leader; very often some of the last of the company hesitate about taking a daring leap, till the foremost are almost out of sight; then they are filled with despair at the prospect of being left, jump wildly into the air, and often fall to the ground. Their usual food consists of fruits of all sorts, buds and leaves; they seem to prefer the buds of the red Hibiscus even to bananas.

THE HULMAN.

This species, the HULMAN or Huneman of the Hindoos, *Semnopithecus entellus*, is the Sacred Ape of India. As it is carefully protected by the natives, it is very common in lower India. The tail is usually about three feet long, the body about two. The hair is of a yellowish white, the hairless parts dark violet. The face, hands and feet, as far as they are hairy, and a stiff rim of hair projecting over the eyes, are black; the short beard is yellow.

The Hulman or Huneman monkey occupies a high place among the thirty million deities of the Hindoos, and has enjoyed this honor for countless ages. Huneman is said in their mythology to have liberated Sita, the wife of Rama, from the giant Ravan, and to have brought from the garden of the giant the luscious Mango. For the theft of the Mango he was condemned to be burnt at the stake, but Huneman extinguished the fire, burning thereby his face and hands, which have remained black

among his descendants. A ruling family of Indian princes claim to be descendants of Huneman, and proudly claim the title of "the tailed Rama." High is the honor still paid to this sacred ape. Death is the punishment of any violence offered to him; and the Hindoos allow him to rob their gardens or steal from their houses with impunity. In Benares the streets are full, the houses covered with these holy animals, and any injury provokes a tumult. Hügel relates that a fakir called some of these apes to him, and then gave them nothing to eat; three of the oldest attacked him, he drove them off with his staff; the populace at once took the side of the apes, and gave the man a good beating. Bishop Heber relates that two English officers, who shot an ape near Bindrabund, were driven into the River Jumna and drowned by a fanatic mob of Brahmins and devotees. Great commotion was excited at Kishnagur when, in compliance with a petition of the reforming party in India, the government destroyed five hundred of these larcenous deities.

Apart from their thievish propensities these apes are attractive creatures. A crowd of them will assemble, disperse with magical celerity, and in a couple of minutes reassemble. They mount with incredible speed to the tops of the trees, descend with equal swiftness, leap from tree to tree, and in a few minutes traverse the whole garden backwards and forwards without touching the ground. In youth their head is round, and they are easily tamed; but as the shape of the skull alters, their disposition alters. The skull becomes flatter, the ape more brutal; he becomes dull instead of bright, violent instead of cunning, and has scarcely anything in common with his youth.

In the forests they form numerous bands under the leadership of an old male, under whose guidance they rob and plunder the neighborhood, or undertake distant expeditions. Strange tales are told of their wanderings; they are said to visit at regular intervals of many years certain holy groves, stay there a few days, and then mysteriously return to their distant home. Wherever they appear they become an object of solicitude to the pious Hindoo. The sacred fig-tree is their favorite dwelling, and snakes their chief aversion. They are said to watch till the reptile is asleep, then seize it behind the head, and dash its brains out against a stone.

Like all the apes the Huneman is devoted to its young. Duvancel shot one that had its young in its arms. The dying mother collected all her strength, took the little one and placed it on a bough. "I could

a long tail, a small head, a hairless face, a short muzzle, and very slight callosities. *Twenty-nine Species* are known.

The hands have long fingers, but the thumb on the fore limbs is very short, and of no use for grasping. Their hair is fine, and often very long on the head. The conformation of the stomach is peculiar, and distantly resembles that of the Kangaroo. All species possess an air-sack.

They are natives of the mainland of Southern Asia and the islands of the Indian archipelago. They live in troops in the forests, usually near running water, and near villages and cultivated ground. Wallace gives a very vivid description of them in their native haunts. The traveler generally finds them in companies of twenty or thirty, busily engaged in seeking food. They seldom are seen on the ground, unless when picking up some fallen fruit. They pay no attention to the natives, but avoid Europeans. When alarmed they hide in the trees, or fly with extraordinary rapidity, springing from bough to bough. It is amusing to witness the attempts the less agile make to follow their leader; very often some of the last of the company hesitate about taking a daring leap, till the foremost are almost out of sight; then they are filled with despair at the prospect of being left, jump wildly into the air, and often fall to the ground. Their usual food consists of fruits of all sorts, buds and leaves; they seem to prefer the buds of the red Hibiscus even to bananas.

THE HULMAN.

This species, the HULMAN or Huneman of the Hindoos, *Semnopithecus entellus*, is the Sacred Ape of India. As it is carefully protected by the natives, it is very common in lower India. The tail is usually about three feet long, the body about two. The hair is of a yellowish white, the hairless parts dark violet. The face, hands and feet, as far as they are hairy, and a stiff rim of hair projecting over the eyes, are black; the short beard is yellow.

The Hulman or Huneman monkey occupies a high place among the thirty million deities of the Hindoos, and has enjoyed this honor for countless ages. Huneman is said in their mythology to have liberated Sita, the wife of Rama, from the giant Ravan, and to have brought from the garden of the giant the luscious Mango. For the theft of the Mango he was condemned to be burnt at the stake, but Huneman extinguished the fire, burning thereby his face and hands, which have remained black

among his descendants. A ruling family of Indian princes claim to be descendants of Huneman, and proudly claim the title of "the tailed Rama." High is the honor still paid to this sacred ape. Death is the punishment of any violence offered to him; and the Hindoos allow him to rob their gardens or steal from their houses with impunity. In Benares the streets are full, the houses covered with these holy animals, and any injury provokes a tumult. Hügel relates that a fakir called some of these apes to him, and then gave them nothing to eat; three of the oldest attacked him, he drove them off with his staff; the populace at once took the side of the apes, and gave the man a good beating. Bishop Heber relates that two English officers, who shot an ape near Bindrabund, were driven into the River Jumna and drowned by a fanatic mob of Brahmins and devotees. Great commotion was excited at Kishnagur when, in compliance with a petition of the reforming party in India, the government destroyed five hundred of these larcenous deities.

Apart from their thievish propensities these apes are attractive creatures. A crowd of them will assemble, disperse with magical celerity, and in a couple of minutes reassemble. They mount with incredible speed to the tops of the trees, descend with equal swiftness, leap from tree to tree, and in a few minutes traverse the whole garden backwards and forwards without touching the ground. In youth their head is round, and they are easily tamed; but as the shape of the skull alters, their disposition alters. The skull becomes flatter, the ape more brutal; he becomes dull instead of bright, violent instead of cunning, and has scarcely anything in common with his youth.

In the forests they form numerous bands under the leadership of an old male, under whose guidance they rob and plunder the neighborhood, or undertake distant expeditions. Strange tales are told of their wanderings; they are said to visit at regular intervals of many years certain holy groves, stay there a few days, and then mysteriously return to their distant home. Wherever they appear they become an object of solicitude to the pious Hindoo. The sacred fig-tree is their favorite dwelling, and snakes their chief aversion. They are said to watch till the reptile is asleep, then seize it behind the head, and dash its brains out against a stone.

Like all the apes the Huneman is devoted to its young. Duvancel shot one that had its young in its arms. The dying mother collected all her strength, took the little one and placed it on a bough. "I could

not," he adds, "master my feeling of repentance for having killed a creature which even in death manifested the noblest and purest feelings."

THE BUDENG.

The BUDENG, *Semnopithecus maurus*, called also the Negro Monkey, furnishes the furs which were so fashionable with ladies a few years ago. His hair is glossy black, on the hands and face like satin, on the back like silk. The head is covered with a peculiar cap of hair which falls over the forehead and grows down both cheeks. The length of the Budeng is about three feet, fully one-half being tail.

The Budeng is found in Java in troops of from forty to fifty. At the approach of man they raise a loud cry and spring madly into the trees, and hurl on the intruder broken branches. But they soon lose their fear. The sacred fountain of Progo has from time immemorial been frequented by a tribe of half-tame Budengs, never exceeding fifteen in number, which come down from the trees on the approach of visitors, and surround them with an air of confident familiarity. At Amsterdam there were two Budengs which usually sat curled up together side by side, the hands crossed over the breast. Their grave appearance was enhanced by the thick mass of hair falling over the face. They came slowly to receive their food, but took it quietly and thoughtfully; their expression was sagacious, but not lively. They were terribly annoyed by two monkeys of the genus *Cynocephalus*. These latter delighted in teasing the solemn Budengs, who at the sight of their tormentors embraced each other closely. The foes seemed to take a malicious pleasure in loosening this close embrace; they jumped on the Budengs, rode on their backs, pulled their tails and hair, and climbed over them as if they had been part of a tree; their cruel sport became more cruel when their hapless victims screamed out. A Budeng at Antwerp showed a similar timidity in the presence of the little *Macacus*, which kicked and cuffed him at its pleasure.

THE KAHAU.

The PROBOSCIS MONKEY, or Kahau, *Semnopithecus nasica*, (Plate II), is so called from his nose. This organ hangs down over the upper lip, and is a caricature of the human feature; it has the peculiarity of being very movable. The Kahau has callosities, and the tail is

long. Its color presents a curious variety of hues. The hairs on the skull are short and thick, on the back of the head and on the sides of the face they are longer, and form a kind of collar round the neck. On these parts they are of a bright brownish red, on the back a brownish yellow, on the breast a light reddish yellow, on the extremities and tail, ash-gray. The Proboscis Monkeys live in Borneo, where, morning and evening, they assemble on the river banks, uttering howls which resemble in sound the word Kahau; they leap and climb with great agility. They are said to be difficult to tame, mischievous and savage, defending themselves fiercely when attacked. The natives of Borneo affirm that when they leap they keep one of their hands before the nose, to save that prominent feature from injury. This of course is a mere fancy, but argues a belief in the animal's sagacity. The natives furthermore believe that the Kahau is a man who has taken to the woods to avoid paying his taxes, and consequently they admire and envy him.

THE DOUC.

This monkey, *Semnopithecus nemæus*, is distinguished by the bright tints of his coat. The back, flanks, top of the head, and arms are gray, speckled with black; the thighs and the digits are black; the legs and tarsi a bright red; the fore-arms, the lower parts of the legs, the buttocks, and the tail are a pure white; and the throat is white, encircled with a ring of bright red, and the face is adorned with white whiskers. It is a native of Cochin China, and attains the height of four feet, but we know little of its habits in its state of freedom.

II.—GENUS COLOBUS.

The Colobus is an African representative of the Semnopithecus, and it obtains its name Colobus, or "maimed," from the fact that it possesses only four fingers on the fore-arms. The body is slender, the muzzle short, the tail very long; and the species has no cheek pouches. Many of them are remarkable for the color and growth of their hair.

THE GUEREZA.

The GUEREZA, *Colobus guereza*, is, in the judgment of some observers, the most beautiful of all the monkeys. It is a native of Abyssinia, and presumably of other regions of Central Africa. On the body

the hair is like satin, and deep black in color; but a band across the forehead, the temples, the side of the neck, the chin, throat, a mane-like girdle extending from the shoulders across the loins, and the bushy tip of its tail, are white. Each hair is ringed with slender brown bands, is very soft and fine and of considerable length. The mane, if mane it can be called, running down both sides of the body, hangs like a silver mantle, and is an ornament of indescribable beauty, as the jet-black hair of the body is seen darkly gleaming through its silvery fringe, which is very long over the back of thighs. The length of the body is about two feet, that of the tail without the tuft a little longer.

The Guereza is found everywhere in Abyssinia south of North Latitude 13° , in a chain of highlands six to seven thousand feet above the sea level. It lives in bands of from ten to fifteen in lofty trees near the clear-flowing mountain-streams, and loves the neighborhood of the churches, which usually stand under the shadow of consecrated trees. The Juniper (*Juniperus procera*) which grows there to a height that dwarfs our pines or hemlocks, is a favorite abode. The Guereza is very agile, and, till he has experienced the violence of man, anything but shy; he creeps like a cat towards the disturber of his peace. When in flight he presents a spectacle of grace and beauty as he leaps from bough to bough, with his white mantle floating around him like the white burnous of an Arab chief over his charger. In contradistinction to other apes he is regarded by the natives as harmless, for he seldom injures the crops. The skin is much prized as an ornament of the shields of the native warriors; a skin is said to be worth six fat sheep.

Two species, *Colobus ursinus* and the *Colobus satanas*, need little mention. The former has a white tail, but the rest of the body is covered with hair of a dirty yellow mixed with black. The latter is entirely black, and is perhaps only a variety. Both these species are found in Western Africa.



CHAPTER VI.

BABOONS AND MACAQUES.

THE FAMILY CYNOPITHECIDÆ—THE GENUS MYIOPITHECUS OR TALAPOIN—THE GENUS CERCO-
PITHECUS—THE GUENONS—THE GENUS CERCOCEBUS OR MANGABEYS—THE GENUS MERO-
PITHECUS OR GELADA—THE GENUS CYNOCEPHALUS OR BABOON—THE BABOON PROPER—THE
CHACMA—ITS USE IN FINDING WATER—THE SPHINX—THE HAMADRYAD—ITS PUGNACIOUS
DISPOSITION—DISGUSTING CHARACTER OF THE MANDRILL AND DRILL.

THE family of CYNOPITHECIDÆ comprehends all the monkeys with cheek pouches, and the baboons. The scientific name signifies "dog-apes," but only some of them, the *Cynocephali*, have much resemblance to our domestic favorite. The genera of this family amount to *Seven*, which will be treated in this and the succeeding chapter.

I.—GENUS MYIOPITHECUS.

This genus differs from the following genera by the development of the brain, the shortness of the muzzle, and the structure of one of the molar teeth. In the large ears and short face with an internasal septum it somewhat resembles the American monkey. There is only *one* species.

The TALAPOIN, *Myiopithecus talapoin*, is the smallest of the Old World monkeys; the fur is of a greenish hue, forming on the forehead a sort of tuft; the face is flesh-colored, the nose black, the whiskers yellowish. It is a very gentle creature, and exhibits in captivity intelligence and liveliness. It is a native of West Africa.

II.—GENUS CERCOPIITHECUS.

To this genus belong many of the monkeys seen in zoological gardens or menageries, here and in Europe. Their generic characteris-

tics are a slender form and limbs, a depressed cranium, delicate short hands with long thumbs, a long tuftless tail, large cheek pouches, and large gluteal callosities. These are generally vivid, in some species very varied. About *twenty-four* species are known, all natives of the tropical regions of Africa. They all choose for their abode woods near rivers; by preference in the vicinity of cultivated land. It is worthy of remark that this genus of monkey and parrots correspond not merely in form and manner of life, but in geographical distribution. Wherever in Africa these apes are found, parrots may be looked for; wherever there are parrots there *Cercopithecii* are found. Between the two continual war is waged, the cause of strife being the tail feathers of the parrot.

The motives that incite the monkeys to pluck out these feathery trophies are twofold, each of them dear to the very soul of the mischievous creature. The first and most obvious motive is that of sheer mischief, but the second is of rather a more complex character. When an immature feather is recently drawn from a bird, its quill portion is generally soft, and filled with the material by which the feather is supplied with nourishment. The monkeys take great delight in sucking these soft feathers; and in order to procure a supply of this curious dainty, chase the poor parrots, even to the tops of the trees. At first sight, it would appear that the legs and arms of the monkey would have little chance of winning a prize defended by the beak and wings of the parrots, which sit exultantly screaming on twigs that bear their weight easily enough, but are too slender even for the monkeys to venture upon. But the restless vigilance and quick hand of the monkey often win the day; and while the parrot is shrieking defiance to an enemy in front, it is suddenly startled from its fancied security by the loss of its tail, which has been snatched away by a stealthy foe from behind. The deafening din which is occasioned by the joint voices of parrots and monkeys, may be easier imagined than described.

They are the most social and active of all apes. They live in large bands; they form a state of their own, and acknowledge no chief but the strongest of their fellows; they make themselves at home everywhere, and seem to pass their lives without fear of hunger, and in continual cheerfulness. Infinite frivolity and a ridiculous seriousness unite in all their actions. No object is too remote, no tree-top too high, no treasure secure enough, no property respected, when these apes appear. The traveler hears the calls of the ape leader, and soon his ears detect the

rush of the band through the leafy forest; he then sees them running, clambering, playing, cleaning themselves, fighting; they never try to conceal themselves. A foray of these apes is a remarkable sight to an uninterested spectator. Under the lead of an experienced patriarch they make their approach to the cornfields; the females carry their young, who cling to their breasts, and at the same time take a turn with their tail round the tail of their mother. At first they are cautious. The patriarch goes first; the others follow step by step, and mount not only the same tree but the same branch as he does.

The leader sometimes climbs to the very topmost spray to get a good view of the neighborhood; if the prospect is favorable, a low gurgling note tells the good tidings to his subjects; if unfavorable, he utters a cry of warning. They alight from a tree near the field, and then with vigorous leaps advance into their paradise. Then their activity is prodigious. Heads of corn, ears of millet are plucked, the grains picked out and placed in their cheek pouches; when these capacious receptacles are full, the band relaxes a little from its labors and becomes more fastidious in what it steals. They carefully smell the ears they pick, and if the odor is not satisfactory, reject them; of ten heads of corn only one is really eaten. As a rule they take merely a couple of grains from each head and then the rest is flung away; they are fond of eggs and partial to honey.

When the troop thinks itself in perfect security in the cornfield, the mothers put down their little ones to play, but keep a sharp eye on them. All are careless except the leader. He, even in the daintiest repast, stops, stands erect, and looks around at short intervals. After each observation he utters his note of safety if nothing displeasing is seen, or an indescribable quavering note of warning if an enemy is in sight. When this last tone is heard, the band at once reassembles, the mothers call back their children, all are ready for flight, and hurriedly grasp as much food as they can carry off. If the danger presses they gradually unload, but do not part with the last of their burden till both hands and feet are necessary. Wide intervals from tree to tree, dense hedges, prickly thorns, are all unable to check their march. Their leaps are astonishing; in mid-flight they can change their direction by means of their long rudder of a tail; they leap from a tree-top to the earth, fly over the ditches and with lightning-like speed up another tree. Their leader conducts them through all their operations with his voice, now bid-

ding them to increase, now to diminish their speed. With all this bustle there is no symptom of alarm or cowardice, but a constant display of perfect presence of mind. Danger does not exist for them till man appears.

When the leader has satisfied himself by examination that his troop are once more in a safe spot, he utters his note of security. Then again his followers are busy; this time with ridding each other of thorns or splinters which have run into them during their flight. A monkey lays himself out at full length on a bough, another examines him carefully and thoroughly, every tangle is loosened, every thorn extracted, any vermin hunted out and eaten. These surgical performances over, the troop returns without delay to the field whence it has just been driven. Thus the natives can never leave their crops unwatched. No means are left untried to keep off their terrible enemies, but human resources and even charms or amulets are all in vain. "The apes," said a venerable Sheik of the Soudan, "are godless and respect not the words of the apostle of God. Other creatures of the Lord respect his prophet, the apes scorn him. If you hang an amulet in your field, the elephant will not touch it. He is a just creature; the ape is a being changed by God's wrath from a man into a horror; a son, grandson, great-grandson of the evil one."

The natives take them in nets; and it is easy to shoot them for one who has the heart. Brehm writes: "I shot one straight in the face; it fell from the tree, then sat up and without a cry or groan wiped away the blood trickling from its wounds in such a human fashion and with such noble, calm resignation, that I hastened to end its misery with my hunting-knife. From that day forward I have never shot an ape; the image of the dying creature haunts me; I felt as if I had murdered a man."

These apes are too active for most beasts of prey; the leopard alone at times catches some unwary youngster. Birds of prey they repel by combined action. A hooded eagle (*Spizaetos occipitalis*) was seen to seize a young monkey. The little one held on to the branch with legs and arms, screaming. At once there was an uproar; the eagle was surrounded by ten big fellows who attacked with angry visages and fearful yells. The eagle soon dropped his prey, to struggle for his own safety; the tail feathers and back feathers that began to fly were proofs that he found some difficulty in escaping. Birds' nests the monkeys rob without mercy; but in searching for nests in hollow trees they display great

circumspection, lest a snake be in it; for snakes are an abomination to them. As to moral qualities, no two are alike; some are quarrelsome, some quiet, some morose, some sly, some cheerful, others malicious—all, however, love to guard, tend and cherish smaller animals.

THE GUENONS.

The GREEN APE, *Cercopithecus sabæus*, (Plate II), attains a length of about forty inches, fully one-half being tail. The hair on the back is grayish-green, ringed and tipped with black; that of the arms, legs and tail ash-gray, the short whiskers whitish; the nose and eyebrows are black, the face light-brown.

Another species called DIANA or Bearded monkey, *Cercopithecus diana*, is a small slender animal, conspicuous by its long beard on cheek and chin, and a white crescent on its brow. The color is mainly gray, the back a purplish brown, the beard and under side of the body white. The species called the Nun, *Cercopithecus mona*, resembles the apes just described with the exception of wanting the pointed beard. From this name Mona it is probable that our word "Monkey" is derived.

THE WHITE-NOSE AND THE RED APES.

The WHITE-NOSED MONKEY, *Cercopithecus ptaurista*, is an inhabitant of Western Africa. It is a curious little creature, with an air of quaint conceit, for which it is indebted to the fringe of white hairs that surrounds its face, and the conspicuous white spot on the nose, which has earned for it the title of White-nose. As is so often the case in these animals, the under-side of the body and inside of the limbs is of a much lighter tint than the upper portions. This distinction is peculiarly well marked in the long tail, which is nearly black above, and beneath takes a grayish hue.

The RED APE, *Cercopithecus ruber*.—This species, commonly called the Hussar, is by no means so amiable as those we have just mentioned. It is nearly one-half as large again as the other species, the face is black, the nose whitish, the cheek whiskers white, the head is marked with a dark-red spot; the rest of the body is of a shining golden red color on the upper surface, but white on the inside of the limbs.

The Hussar ape extends from the West Coast of Africa to Abyssinia, but is much rarer than the Green apes. It is found in low thickets or tall grass, with which the color of its coat harmonizes. In character it is the very opposite of the Green apes. Its countenance is morose and unfriendly, and its actions do not belie its looks. Especially as it grows older, does its temper become more irritable; it never enters into friendly relations with other animals, not even with other apes; everything seems to annoy and provoke it; a look excites anger; laughter arouses rage and fury. Then it displays its immense teeth, and, if opportunity serves, makes use of them on the observer. Kindness is thrown away, severity makes the creature worse. An adult Hussar ape has never been seen tame.

III.—GENUS CERCOCEBUS.

This genus forms the transition between the Cercopithecus and the Macacus, and the name of MANGABEY is usually given to the animals embraced in it. They are almost the same size, and have nearly the same gait as the Guenons; but they are not so nimble. Their tail is long, and they usually carry it raised above their backs. Their habits differ but little from those of the majority of the Macacus, and they scarcely offer anything more distinctive in their character. All that can be positively asserted is that they are more gentle and familiar.

THE MANGABEYS.

The MOOR APE or Common Mangabey, *Cercocebus fuliginosus*, is the best known representative of this genus. It attains a considerable size, a little over four feet, including two feet of tail. The color on the back is a dull black, on the stomach and the inside of the limbs a dirty gray. The face and hands are black, and a peculiar look is given by the contrast of the upper eyelids, which are pure white.

The species *Cercocebus collaris* differs from the above by having the top of the head of a dark chestnut hue, the cheeks snow-white, the rest of the body a dull black. Both species come from the West Coast of Africa.

Among the peculiar habits which distinguish the Mangabeys, we may

especially notice the action of their lips, and the mode in which they carry the tail. They have a strange way of writhing their faces into a kind of quaint grin, in which they raise the lips, and exhibit the teeth almost as if they were laughing. When walking, they have a fashion of turning their tails over their backs, and carrying them reversed, in a line almost parallel with the direction of the spine.

Few monkeys can assume more *outré* attitudes than the Mangabeys, which seem to be, among monkeys, almost the analogues of the acrobats among mankind, and twist themselves into such strange contortions, that they seem to be able to dispense with the bones and joints with which other animals are furnished. They seem to be quite aware of their own accomplishments, and soon learn that their display will bring in a supply of nuts, cakes, and fruit to their exchequer. So they keep a vigilant eye on their visitors, and when they conceive that they have drawn attention to themselves, they execute a series of agile gambols, in the hope of meeting the reward which sweetens labor.

The apes which we are now about to give an account of, are distinguished from those already mentioned by possessing short tails, which instead of being raised and carried over the back are usually pendent, and do not assist in the movements of the animal.

The name *MAKAQUE* or *MACACO* is given on the west coast of Africa to all sorts of apes; scientifically it is restricted to a numerous group of apes, distributed between Africa and Southeastern Asia, which forms Genus VI., in the following chapter.

IV.—GENUS *THEROPITHECUS*.

The *GELADA*, *Cynocephalus gelada*.—This genus is distinguished by receding nostrils, a bare spot on the neck and breast, a rich mantle, and a long tuft to the tail. It is a giant, and attains the height of a man. Its rich fur is dark-brown on the back of the head and back; the mantle and tail-tuft are yellowish-brown; the breast is a brownish-black; the face is black. The two bare spots on the neck and chest are triangular, the points turned to each other. The callosities are small and dark-gray.

A variety of this ape, called the *Tokur Sinjcro*, is found in the same





GREEN MONKEY

SPIDER MONKEY

SAPAJOU

PROBOSCIS MONKEY

BABOON

MACACUS

PLATE II. QUADRUMANA.



words, *kyon*, *kynos*, "a dog," and *kephale*, "a head." They are large-sized animals, ungainly in shape, and possessed of great vigor. These various advantages, joined to their naturally brutal and ferocious disposition, make them dangerous to man, especially when full-grown. They have the supra-orbital arch largely developed, deep cheek pouches, and all the limbs nearly of the same length. Their hands are well formed, and all four provided with an opposable thumb. In general the coat is long and woolly, principally on the upper parts of the body. The callosities, as well as their face, are often tinted with the most brilliant colors. Their senses are highly developed; that of smell is particularly delicate.

As they approach maturity of existence, their primitive qualities, their relative gentleness and intelligence, are changed into savageness and brutality. In all their desires they then evince an incredible degree of violence and impetuosity, manifesting their appetites by the most revolting acts and gestures. At this period of their life, they are really formidable; for their upper canine teeth become transformed into long sharp tusks, which they use with such adroitness as to produce with them serious wounds. The dread they inspire in the countries they inhabit is such, that the natives will often permit their gardens to be ravaged by them in preference to running the danger of a conflict.

The Cynocephalus Monkeys almost exclusively inhabit Africa, a single species only being found in Asia. They live either in forests or low mountainous rocky localities, and subsist on fruits and insects. In captivity they are almost omnivorous.

The Cynocephali are sometimes found in innumerable bands in Senegal. A traveler in that country writes: "We found every landing-place literally covered with monkeys, in parts crowded one against another; and as we passed, they saluted us with incredible gambols and furious barking. In stating that this meeting-place did not contain less than six thousand Cynocephali, I believe I am not exaggerating."

The Cynocephali proper are distinguished from the Mormon or Mandrill by the length of their tails.

There is a wild Arab legend told about them which is given in the *Herat el Heiwan*, or "Life of Animals," by Kemaleddeen Demiri. "Once on a time there stood on the banks of the Red Sea a city, the name whereof was Aila. Its people were Jews. But these Jews violated the sabbath regularly by catching fish on that day. Pious men remonstrated

in vain, and when their words were unheeded, veiled their faces and left the godless town. Three days afterward they returned. They found the gates shut, but clambered over the walls, when they found themselves surrounded by baboons, some of which came to them with sad looks, and fawned upon them with a piteous and imploring expression of countenance. The returned natives thought that these baboons, which seemed to recognize them, might be some of their kinsfolk; and when they asked, 'Baboon, tell me, are you Abraham, my brother's son, or my cousin Moses or Achmed?' the creatures sadly nodded an affirmative reply."

The first species, *Cynocephalus babuin*, (Plate II) possesses the name of BABOON *par excellence*, and presents characteristics that are typical of the entire race. There is great uncertainty about the precise differences between the several species, as travelers too often use the term Baboon to designate not only this species, but also the CHACMA and the SPHINX. All of them have very similar modes of action and habits. The baboon has smooth, even, short hair, of an olive-green, each hair tinged alternately with black and yellow, lighter in color on the belly, and a whitish-yellow on the cheeks. The face and ears are bluish-gray, the upper eyelids whitish, the hands gray, the eyes light-brown. They grow to the height of two feet, or two and a half measured from the shoulder to the ground, and a total length, including one-third tail, of nearly five feet.

The baboon abounds in Africa, and annoys the natives, especially the women, who go to get water. In their rocky fastnesses their chief foe is the leopard, of whom they are in great dread. Yet this animal never attacks either a band of baboons or even an adult, but confines its exertions to slyly stealing the young ones.

Bold as are these monkeys, they will not dare to follow a leopard into its den; so that, if their dreaded foe succeeds in once getting clear of their outposts, it may carry off its prey with impunity. The constant dread which the leopard seems to excite in a baboon's mind appears to be occasioned by the stealthy craft and the persevering aggression of the animal, rather than by its physical powers alone. He is easily tamed, and becomes accustomed to man and most devoted to his master, soon recognizing any name given to him. He readily drinks wine or brandy, but rejects spirituous liquors.

A very quaint story is told of the same animal, which, if true, exhibits the strangest combination of cunning, simplicity, and ready wit, that

ever entered the brain of living creature. At all events, if it be not true, it deserves to be so.

It appears that the baboon was so tame, and had proved so apt a pupil, that its master had taught it to watch the pot in which he prepared his dinner, and was accustomed to leave it in charge of the culinary department while he was engaged in other business. One day, he had prepared a fowl for his dinner, and after putting it into the pot and the pot on the fire, went away for a time, leaving the baboon in charge, as usual.

For a time all went well, and the animal kept a quiet watch over the fire. After a while, it was seized with a desire to see what might be in the pot, and so, taking off the lid, peeped in. The odor that issued from the boiled fowl was gratifying to the animal's nostrils, and induced it, after a brief mental struggle, to pick just a little bit from the fowl, and to put the bird back again. This was done accordingly, but the experiment was so very successful that it was speedily repeated. Again and again was a morsel pinched from the fowl, until the natural consummation followed—the fowl was picked quite clean, and nothing left but the bones.

Now came remorse and sudden fear, causing the wretched animal to chatter with terror at the thought of the scarifying which was sure to follow so grievous an offence.

What was the poor thing to do? Time was passing, and the master must soon return for his dinner. At last a brilliant thought flashed through the animal's brain, and it immediately acted upon the idea.

Now, in order to understand the depth of the craft which was employed, it must be remembered that the baboons are furnished, in common with very many monkeys, with two callosities on the hinder quarters, which serve them for seats, and which are, in these animals, of a bright red color.

Rolling itself over and over in the dust, it covered its body with an uniformly sombre coating, and then, gathering itself well together, and putting its head and knees on the ground, it presented an appearance marvellously resembling a rough block of stone with two pieces of raw meat laid on its top. In those climates the birds of prey absolutely swarm, and, being encouraged by their well-earned impunity, crowd round every place where cooking is going on, and where they may have a chance of securing a portion, either by lawful gift, or lawless rapine.

Several of these birds, among which were some kites, being attracted by the scent of the boiling meat, came to the spot, and seeing, as they thought, some nice raw meat temptingly laid out for them, swept upon their fancied prize.

In a moment the baboon had sprung to its feet, and, with a rapid clutch, seized one of the kites. The cover was again taken off the pot, and the shrieking and struggling prisoner thrust into the boiling water in spite of its beak and claws. The lid was then replaced, and the baboon resumed its position of attention as if it had committed no offence.

THE CHACMA.

The CHACMA, *Cynocephalus porcarius*, sometimes called the Ursine Baboon, but more commonly the Chacma, is a native of South Africa. It is considerably bigger than the common baboon, and is more powerfully built, while its color is darker. It is most frequently met with on Table Mountain, in the neighborhood of Capetown, and on the Draakenberg range. Troops of from twenty to thirty individuals frequent the ravines and often enter cultivated grounds, where they commit the greatest ravages.

It is an accomplished robber, and baffles alike dogs and men. When young it is docile, and it can be taught to find roots or water, to blow the fire of a forge, or drive a pair of oxen. It possesses so acute a power of smell that it is almost impossible to destroy it by poison.

When the water begins to run short, and the known fountains have failed, as is too often the sad hap of these desert wells, fortunate is the man who owns a tame Chacma, or "Bavian," as it is called. The animal is first deprived of water for a whole day, until it is furious with thirst, which is increased by giving it salt provisions, or putting salt into its mouth. This apparent cruelty is, however, an act of true mercy, as on the Chacma may depend the existence of itself and the whole party.

A long rope is now tied to the baboon's collar, and it is suffered to run about wherever it chooses, the rope being merely used as a means to prevent the animal from getting out of sight. The baboon now assumes the leadership of the band, and becomes the most important personage of the party.

First it runs forward a little, then stops; get on its hind feet, and

niffs up the air, especially taking notice of the wind and its direction. It will then, perhaps, change the direction of its course; and after running for some distance take another observation. Presently it will spy out a blade of grass, or similar object, pluck it up, turn it on all sides, smell it, and then go forward again. And thus the animal proceeds until it leads the party to water; guided by some mysterious instinct which appears to be totally independent of reasoning, and which loses its powers in proportion as reason gains dominion.

Captain Drayson, an English artillery officer, gives some interesting accounts of the Chacma.

“During the shooting trip with the Boers, I awoke before daybreak, and as I felt very cold and not inclined to sleep, I got up, and taking my gun, walked to a little ravine, out of which a clear, murmuring stream flashed in the moonlight, and ran close past our outspan. A little distance up this kloof, the fog was dense and thick; the blue and pink streaks of the morning light were beginning to illuminate the peaks of the Draakensberg, but all immediately around us still acknowledged the supremacy of the pale moonlight. I wanted to see the sun rise in this lonely region, and watch the changing effects which its arrival would produce on the mountains and plains around.

“Suddenly I heard a hoarse cough, and on turning, saw indistinctly in the fog a queer little old man standing near, and looking at me. I instinctively cocked my gun, as the idea of bushmen and poisoned arrows flashed across my mind. The old man instantly dropped on his hands; giving another hoarse cough, that evidently told a tale of consumptive lungs; he snatched up something beside him, which seemed to leap on his shoulders, and then he scampered off up the ravine on all-fours. Before half this performance was completed, I saw that the little old man was an Ursine baboon with an infant ditto.

“A large party of the old gentleman’s family were sitting up the ravine, and were evidently holding a debate as to the cause of my intrusion. I watched them through my glass, and was much amused at their grotesque and almost human movements. Some of the old ladies had their olive branches in their laps, and appeared to be ‘doing their hair,’ while a patriarchal old fellow paced backwards and forwards with a fussy sort of look; he was evidently on sentry, and seemed to think himself of no small importance.

“This estimate of his dignity did not appear to be universally ac-

knowledged; as two or three young baboons sat close behind him watching his proceedings; sometimes with the most grotesque movements and expressions they would stand directly in his path, and hobble away only at the last moment. One daring youngster followed close on the heels of the patriarch during the whole length of his beat, and gave a sharp tug at his tail as he was about to turn. The old fellow seemed to treat it with the greatest indifference, scarcely turning round at the insult. Master Impudence was about repeating the performance, when the pater, showing that he was not such a fool as he looked, suddenly sprang round, and catching the young one before he could escape, gave him two or three such cuffs that I could hear the screams that resulted therefrom. The venerable gentleman then chucked the delinquent over his shoulder, and continued his promenade with the greatest coolness; this old baboon was evidently acquainted with the practical details of Solomon's proverb.

“A crowd gathered round the naughty child, who child-like, seeing commiseration, shrieked all the louder. I even fancied I could see the angry glances of the mamma, as she took her dear little pet in her arms and removed it from a repetition of such brutal treatment.”

THE SPHINX.

The species, *Cynocephalus sphinx*, is less brutal-looking than the Chacma. It is smaller even than the baboon proper, but more powerfully built, its muzzle is shorter, and it is remarkable for a peculiar thickening on the cheek bones. Its hair is dark-gray and reddish-brown, or chestnut; the paws are darker than the rest of the body. In the prime of existence its colors are the lightest, but as years begin to lay their burden on the animal, the hairs begin to be flecked with a slight grizzle, and, in process of time, the snows of age descend liberally, and whiten the whole fur with hoary hairs.

THE HAMADRYAD.

The HAMADRYAD, *Cynocephalus hamadryas*.—This baboon is remarkable for its form, its intelligence and its unamiable qualities; and from the peculiar length of its hair it has attained the name of Mantle Baboon. Like the common baboon it is frequently represented on the ancient monuments of Egypt, and was regarded as a symbol of the moon. Many

little images of the Hamadryad are to be seen in collections of Egyptian antiquities. The moon was supposed to have a powerful effect on this ape, which was said to hide itself and refuse all food during the dark phase of the moon. It is not now an inhabitant of Egypt, and perhaps even in the days of the Pharaohs was imported.

The Hamadryad inhabits the mountain ranges of Abyssinia and South Nubia as far north as the rains extend; water is a necessity for it. The troops at times descend into the foot-hills on the coast, but the bulk remains in the loftier mountains. Here each band occupies a territory of about two miles in diameter. Sometimes herds of fifteen to twenty are seen, but usually they reach the number of one hundred and fifty. Of these there will be ten to fifteen full grown males—monsters of great size with jaws that surpass in strength and length of teeth the jaws of the leopard—and about twice as many adult females. The face is a dull flesh-color, the gluteal callosities fiery red. The hair has the color of dry grass more than anything else. The old males have the mantle very long; a specimen, shot by Brehm, had hair measuring ten inches in length. This long hair is parted in the middle of the head, rises in bold sweeps to each side and stands out at right angles to the face, an arrangement which seems to have been adopted by many negro tribes. The tail is long, and ends in a tuft. Their dwelling-place is some inaccessible rock where caverns or holes afford good shelter, but they make considerable excursions in search of food. When undisturbed they keep silence; the approach of man provokes a cry of attention like the baying of a hound. If the approaching intruder seems dangerous, another cry is raised, more like the grunting of a herd of swine, through which the bellowing of a bull is heard. All the males fit for battle advance to the edge of the cliff and look to see what is coming. They have no fear of the natives, but are suspicious of white men.

Brehm relates: "When the troop first caught sight of us, a repeated monotonous bellow was heard; the old ones turned their heads toward us, but the young ones still played about. Our dogs, however, replied to the bellow by giving tongue, and the apes took flight. To our astonishment we discovered them again at the next turn of the valley, clinging in some inconceivable fashion to a wall of perpendicular rock. We fired at them; a terrible uproar, bellowing, howling, roaring and screaming ensued, and the whole troop ascended the cliff as easily as if they had been on level ground. The dogs came upon them as they were

crossing the valley ; as they ran up, the old males came down to meet them with grinning jaws, threatening claws, and flashing eyes. The dogs, courageous animals, accustomed to chase the hyena and to fight the wolf, were too glad to fly back to their masters. One young ape, half a year old, was cut off from his family ; the dogs had cornered him ; we were flattering ourselves that he would be caught. But a tall, powerful male appeared ; he advanced without noticing us or betraying any haste, proudly and with dignity walked straight up to the dogs, gave them a look of which they understood the meaning, and slowly reached the little one, which he carried off right past the dogs, who were glad enough to let him and his *protégé* escape." On another occasion, the same traveler and the Duke of Saxe-Coburg and his party had a battle with these baboons. The aggressors had to change their position, as the apes hurled stones at them with dangerous accuracy. One old male was seen to climb a tree with a big stone in his hand, to get a better shot at the Germans. The valley was impassable during the fight, as the stones hurled down were larger than a man's head. They will attack without hesitation opponents not armed with muskets, as Rüppell affirms.

THE MANDRILL AND DRILL.

These animals are perhaps the most disgusting creatures of the whole animal world. They are distinguished physically from the other species of this genus by a very short tail, and both belong to Western Africa.

The MANDRILL, *Cynocephalus maimon*, is remarkable for the deep anakles, brilliantly colored, on each side of the nose. The surfaces of two unprepossessing projections are deeply grooved, and are of a deep blue tint, through which lines of scarlet and deep purple run. The end of the nose is fiery red. The gluteal callosities are of a vivid scarlet and blue, and are displayed conspicuously by the exact manner in which the beast carries his apology for a tail. The chin is decorated with a small yellow beard ; the muzzle resembles a hog's snout. Only the male mandrill possesses these hideous additions to his face. What is more remarkable is that these diverse colorations are not permanent, but disappear after or even during disease. They seem to result from a particular vascular injection, which acquires its maximum of energy when the animal is under the influence of violent feelings.

The Mandrill, when old, is vindictive and malicious. Even when

taken young, and supposed to be tame, it should never be trusted, more especially in the vicinity of females. Captivity does not tone down in any way the violence of its character.

In its native country the Mandrill is hated and feared, and, unless in large numbers and well armed, the negroes hesitate about attacking them. Like other baboons, they assault human females, and even in captivity the male baboons always make a great distinction between their visitors of either sex. Sometimes they are so jealous in their disposition that they throw themselves into a transport of rage if any attentions be paid to a lady within their sight.

This curious propensity was once made the means of recapturing a large baboon that had escaped from its cage in the Jardin des Plantes, in Paris.

It had already baffled many attempts to entice it to its home, and when force was tried, repelled the assailants, severely wounding several of the keepers. At last a ready-witted keeper hit upon a plan which proved eminently successful.

There was a little window at the back of the cage, and when the keeper saw the baboon in front of the open door, he brought a young lady to the window and pretended to kiss her. The sight of this proceeding was too much for the jealous feeling of the baboon, which flew into the cage for the purpose of exterminating the offending keeper. Another keeper was stationed in ambush near the cage, and the moment the infuriated animal entered the den, he shut and fastened the door.

Cuvier observes of a Mandrill that he studied: "It recognized certain women in a crowd, and called them by voice and gesture, and there can be no doubt that, if it had been at liberty, it would have done them harm."

Among these animals, there are some which preserve their docility for a long time. We have an instance of this in the one which was exhibited some time ago in London, and which in consequence of its intelligence acquired considerable reputation. This monkey, named Happy Jerry, seated himself with an air of hauteur in a carriage, drank porter out of a pewter-pot, and smoked a pipe with all becoming gravity.

The DRILL, *Mormon leucophæus*, is smaller than the Mandrill, his hair olive-brown, the whiskers dirty-white, the face black, the hands and feet copper-colored, the callosities bright red. It was once thought to

be a young Mandrill, but its right to be a distinct species has been satisfactorily proved.

Of both these species we may truly say with Wood: "So odiously disgusting are the habits in which these animals continually indulge, that, as a general rule, their presence is offensive in the extreme, and excepting for purposes of scientific investigation, it is better to shun the cage that holds any specimen of these creatures.

"There are now and then exceptional cases, but they are few and far between; and it is hardly possible to watch an adult baboon for many minutes without incurring a risk of some shock to the nerves. Even their exceeding cunning, and the crafty wiles which are hatched in their fertile brains, cannot atone for their habitual offences against decorum.



CHAPTER VII.

GENUS MACACUS—THE COMMON MACAQUE—THE BONNET APE—THE RHESUS OR BUNDER—THE LAPUNDER—THE WANDEROO—THE MAGOTS—THE GIBRALTAR MONKEYS—GENUS CYNOPITHECUS—THE BLACK BABOON-APE OF THE CELEBES.

VI.—GENUS MACACUS.

THE general characteristics of this genus may be briefly summarized. A square body, the limbs moderately long and very powerful. A muzzle as protruding as that of the *Cercopithecus*, a facial angle of forty to fifty degrees, the nose prominent, the thumb short, the fingers long; the former on both the fore and hind limbs have flat nails; the latter strongly curved nails. The gluteal callosities are conspicuous. The tail is of considerable length and strength; in some species it attains the length of the body, in others is very short. The hair of the head is in some species parted in the middle, in others falls down from the almost bald cranium like a peruke; in some the beard is wanting, in others it is enormously developed.

In ancient times the Macaques extended over a great part of Europe. At present the short-tailed varieties inhabit the North of Africa, China, and Japan; the long-tailed ones, the continent and islands of Southern Asia. In habits they occupy a middle position between the *Cercopithecus* and the *Cynocephali*; like the former they are found in forests, like the latter in rocks; they are as amiable as the former in youth, as morose as the latter in advanced age. They readily endure captivity, and have brought forth young in zoological gardens.

THE MACAQUE.

The MACAQUE or Javanese Ape, *Macacus cynomolgus*, (Plate II), is the best known representative of the genus. It has a body longer than the other species, a long thin tail, and hair parted or wig-like. It is most

near to the Guenons. It attains a length of four feet, including nearly two feet of tail. The beard or whisker is very short; in the male the hair lies flat, in the female it forms a kind of comb. The hair on the back is of a brownish olive-green, mixed with black, on the belly of a whitish-gray. Hands, feet, and tail are black, the face a bluish-gray, white between the eyes, of which the iris is brown. The ears are black.

The common Macaque is found in all Eastern Asia, and in very great numbers. These apes are very common in menageries, as nearly every ship from India brings some back with it. The Macaque in his native abode is social, living in bands of ten to fifteen members. They live chiefly on fruits, but have been often met on the sea-shore collecting crabs and muscles. A traveler in Java describes a scene he witnessed: "Chairs were placed for us in a grove which seemed to be the remnant of a forest. A hollow cane of bamboo was struck; this was the drum for the apes. The sound had scarcely ceased, when we heard a rustling in the trees, and more than a hundred gray apes sprang out. Great and small, old bearded patriarchs, lively young ones, mothers with their sucklings at their breast, came out and played around us like old acquaintances. They were so free from all fear that they took from our hands the rice and provisions we had brought. Two splendid males opened the baskets our attendants were carrying, and helped themselves as it pleased them. They stalked about among the crowd of apes like haughty cavaliers, and were regarded by their fellows with great respect. Nor did they hesitate to enforce the respect due to them. If the crowd pressed on them, they laid about them lustily, and kept the rest at a distance till they had satisfied their kingly appetites. To each other they were studiously courteous. When we departed, the apes again dispersed into the wood." The Macaque is not quite so agile as the Guenons, but in other respects resembles them. There is the same liveliness and cheerfulness, the same tenderness to the helpless, the same changeableness of temper. He is grateful for good treatment, and becomes attached to his keeper or master. He is naturally very modest in his appetites—a piece of bread, a handful of corn, a branch with green leaves are devoured with satisfaction; he soon learns to eat fish. But when accustomed to the luxuries of the table he proves himself an epicure in his tastes, and soon learns to prefer spirituous liquors to any other beverage. They breed freely in captivity and are passionately fond of their young. On one occasion it was found necessary to clear a cage

full of apes, among which was a young Macaque that had been separated from its mother for several months. The mother was in a cage whence she could see the other. When the keepers began to drive the apes out, she exhibited great anxiety, and uttered doleful cries when any one came near her little one. It was caught and returned to her; she at once embraced it and tenderly caressed it. They evidently had not forgotten each other.

As a performing monkey the Macaque plays many roles, but is least often exhibited as a rider. He is easily taught; not so easily as the Sphinx, but more easily than the Magot; but he is of too volatile a disposition to remember his lessons long without constant repetition.

THE BONNET APES.

The BONNET APES, *Macacus sinicus*, the Mungas of the Indians, are less frequently seen. They are considerably smaller than their kindred, the body is slender, the muzzle is prominent, the hair on the head stands out like rays from the centre of the head, the brow is bare, the coat pretty short, the color a greenish-gray, the green effect being produced by the black and yellow rings with which each of the hairs is marked. The hands and ears are black.

The Munga has a happy life in his native home in the woods of Malabar. The natives regard him as holy, and allow him the run of their fields and gardens; nay, temples are built and orchards are planted to testify their respect.

The peculiar arrangement of the hair on the head from which this species derives its name of Bonnet Ape, gives it a very unique appearance, of which the animal is quite aware, and which it seems to love to increase by the frequent grimaces in which it indulges. A variety found in the island of Ceylon (*Macacus pileatus*) is a general favorite and pet of both the natives and Europeans. The serpent-charmers teach them to dance, and earn their living by exhibiting their tricks and antics, including in their attainments that of smoking tobacco. Most apes are passionately fond of inhaling this vapor.

Sir Richard Schomburgk tells in connection with a Bonnet ape a curious anecdote illustrative of the reasoning powers of the Macaque. A Bonnet ape had bitten his keeper, and was solemnly condemned to death. Next morning the keeper proceeded to the monkey-house with

his gun. The animals were all quite familiar with the sight of the weapon, which had often been used to kill rats and vermin near their house, and no alarm was created by its appearance in the keeper's hands, except in the breast of the criminal. The other monkeys sat still, but he hid himself in his sleeping-box, from which he refused to stir. When he was, after two or three fruitless attempts, tempted out by the offer of food, and the door of the box shut behind, he fully realized his position. He rushed to and fro, examined every corner of the cage to find a loop-hole of escape, and then flung himself on the ground to await the fate which he saw coming. His comrades showed no emotion, and watched with astonishment the terrified behavior of the condemned prisoner.

THE BUNDER.

The BUNDER, *Macacus rhesus*, is another sacred creature, exceedingly revered in India. It is of a powerful square figure, thickly haired on the back. His hide forms deep folds about his neck and breast; its color is greenish with yellow or reddish flecks on the buttocks, white on the belly; the tail is greenish on the upper, gray on the lower surface. The face, hands, and ears are copper-colored, the gluteal callosities bright red.

The natives of India pay the Bunder as much respect as is shown to the Hulman or Huneman already mentioned (p. 42). Captain Johnson gives an account of his own experience with them, which is here subjoined:

“At Bindrabun (which name, I imagine, was originally Baunderbund, literally signifying a jungle of monkeys), a town only a few miles distant from the holy city of Muttra, more than a hundred gardens are well cultivated with all kinds of fruit, solely for the support of these animals, which are kept up and maintained by religious endowments from rich natives.

“When I was passing through a street in Bindrabun, an old monkey came down to the lower branches of a tree we were going under, and pulled off my Harcarrah's turban, as he was running in front of the palanquin, decamped with it over some houses where it was impossible to follow him, and was not again seen.

“I once resided a month in that town, occupying a large house on the banks of the river, belonging to a rich native; it had no doors, and

the monkeys frequently came into the room where we were sitting, carrying off bread and other things from the breakfast-table. If we were sleeping or sitting in a corner of the room, they would ransack every other part.

“I often feigned sleep, to observe their manœuvres, and the caution with which they proceeded to examine everything. I was much amused to see their sagacity and alertness. They would often spring twelve or fifteen feet from the house to another, with one, sometimes two young ones under their bellies, carrying with them also, a loaf of bread, some sugar, or other article; and to have seen the care they always took of their young would have been a good lesson to many mothers.

“I was one of a party at Teekarry, in the Bahar district; our tents were pitched in a large mango garden, and our horses were picketed in the same garden at a little distance off. When we were at dinner, a Syce came to us, complaining that some of the horses had broken loose, in consequence of being frightened by monkeys on the trees; that, with their chattering and breaking off the dry branches in leaping about, the rest would also get loose, if they were not driven away.

“As soon as dinner was over, I went out with my gun to drive them off, and I fired with small shot at one of them, which instantly ran down to the lowest branch of the tree, as if he were going to fly at me, stopped suddenly, and coolly put its paw to the part wounded, covered with blood, and held it out for me to see: I was so much hurt at the time, that it has left an impression never to be effaced, and I have never since fired a gun at any of the tribe.

“Almost immediately on my return to the party, before I had fully described what had passed, a Syce came to inform us that the monkey was dead; we ordered the Syce to bring it to us, but by the time he returned, the other monkeys had carried the dead one off, and none of them could anywhere be seen.

“I have been informed by a gentleman of great respectability, on whose veracity I can rely (as he is not the least given to relating wonderful stories), that in the district of Cooch-Bahar, a very large tract of land is actually considered by the inhabitants to belong to a tribe of monkeys inhabiting the hills near it; and when the natives cut their different kinds of grain, they always leave about a tenth part piled in heaps for the monkeys. And as soon as their portion is marked out, they come down from the hills in a large body, and carry all that is allotted for them to

the hills, storing it under and between rocks, in such a manner as to prevent vermin from destroying it.

“On this grain they chiefly live; and the natives assert, that if they were not to have their due proportion, in another year they would not allow a single grain to become ripe, but would destroy it when green. In this account, perhaps superstition has its full influence.”

Of course Europeans do not acquiesce in the ravages of these apes with the equanimity or kindness of the Hindoos. It is almost impossible to keep a garden when these divinities are about. To shoot them would provoke a riot and lead to murder as it often has done; to set a guard is useless, for the apes driven off on one side return on the other; fires, scarecrows and the like do not in the least intimidate them.

One Englishman succeeded in keeping the monkeys away from his plantation for more than two years, without using any violence, or offending the prejudices of the natives.

He had planted a patch of sugar-canes, and preserved his growing crops from elephants, swine, deer, and other animals by means of a deep trench surrounding the cane-patch, and a strong palisading of bamboos just within the ditch. But the monkeys cared nothing for moat or wall, and carried off whole canes in their hands, eating them complacently as they proceeded to the shelter of the trees.

For a long time this state of things continued, and the planter was doomed to see the ripening canes devoured in his very presence, and the chewed fragments spit in his face by the robbers. This last insult proved too great a strain for his patience to endure, and after some thought, he hit upon a stratagem which answered even beyond his expectation.

He chased a flock of the monkeys into a tree, which he then felled; and by the help of his assistants, captured a number of the young, which he conveyed home. He then mixed some treacle with as much tartar-emetic as could be spared from the store, and after painting all the young monkeys with this treacherous mixture set them at liberty. The parents ran to embrace their returned offspring, and carried them off to a place of safety. There the first care of the elders was to clean the soiled coats of the little ones, by licking off the mixture with which they were smeared. The treacle delighted them, and grunts of satisfaction testified to the pleasure they felt. But only for a time; the tartar-emetic soon began to work, and reduced the apes to a piteous condition. After this

bitter experience they never came near the spot again, and left the Englishman's garden henceforth untouched.

The Bunder extends over a great part of the Indian continent, and is especially abundant in the valley of the Ganges. It is found too in the sheltered valleys of the Himalayas, and has been seen near Simla even in midwinter. But it prefers the thickets of bamboo which line the banks of streams. It swims well, and never hesitates, when pursued, about plunging into water and diving some distance. Its temper is irritable and furious, and grows worse with age; his courage, when roused, indomitable. Yet in spite of these bad qualities the Bunder is a favorite with tamers and jugglers; he learns easily, while the shortness of his tail admits of his appearing in ordinary pantaloons. They breed in captivity.

Many observers confuse with the Bunder a kindred species, *Macacus erythricus*, which is more slender, but taller, with limbs nearly twice as long as the Bunder's. The two species are both Indian and resemble each other in color and habits.

THE LAPUNDER AND NELBANDER OR WANDEROO.

The LAPUNDER, *Macacus nemestrinus*, is commonly called the Swine-tailed ape from its short, thin tail. It is remarkable for the length of its hind legs. Its color is olive-brown; the face, ears, hands and callosities are of a dull flesh color. It is a native of Sumatra and the Malay Peninsula, and it is said to be tamed by the natives, who train it to gather cocoanuts—a task it performs with great skill, selecting only those that are ripe. It breeds in captivity. The Zoological Gardens of Berlin possessed a young ape, the offspring of this species and the common Macaque.

The NELBANDAR, *Macacus silenus*, or Wanderoo of the Hindoos, is commonly known as the Bearded Ape. It is characterized by a rich full beard surrounding the whole face, and a moderate tail ending in a tuft. Its long hair is bright black, while the mane-like beard is white. It attains the length of three feet including ten inches of tail. It is a native of Malabar, not of Ceylon, and is very destructive to the gardens. The natives, however, value it highly, and train it to perform sundry tricks. It is good-tempered and possesses a good deal of sense. The Wanderoo, with his long white beard, is not unlike an old Hindoo. It is dignified,

thoughtful, and careful, knows when it has done wrong, and expresses its sorrow with tears. Other apes exhibit the greatest deference to the solemn Wanderoo, and always behave well when in his company.

THE MAGOTS AND GIBRALTAR MONKEYS.

Another species, *Macacus inuus*, is in some respects the most interesting of the Macaques. It is the only one found in Europe, and the absence of a tail has led some naturalists to form it into a genus by itself. The name usually given to it is the MAGOT or Barbary Ape.

Known to the ancient Greeks and Romans under the name of *Pithecus*, it seems to have been the first monkey brought into Europe; Pliny speaks of one that could play draughts, and perform other human actions, and Galen is supposed to have based his anatomy on dissection of the Magot.

As the name Barbary Ape implies, they are natives of Algeria and Morocco. They live in numerous bands on the wooded mountains which intersect these countries, and make frequent incursions into the gardens of the unfortunate natives, pillaging the orange trees and the fig trees, as well as the melon and tomato beds. These depredations are carried on with much intelligence and great precaution. They dispose themselves in *echelon* from the wall of the inclosure to a certain part of the garden, passing the plunder from one to another, as soon as collected by the most venturous. Two or three videttes, placed on an elevated spot, keep a lookout in the neighborhood. At the least sign of danger they give a cry of alarm, when the whole band quickly decamp.

When at liberty in its native lands, the Magot has a great predilection for hunting scorpions, insects, and similar creatures, and devouring them on the spot. It displays peculiar aptitude for discovering and pouncing upon its prey.

Scorpions and beetles are found in profusion under stones, logs, or in similar sheltering places, and are there secure from any ordinary foe. But the quick senses of the Magot detect them in their concealment, and the ready hands sweep away the shelter and make the insect prisoner before it recovers the sudden surprise of its violated roof.

To any ordinary animal the scorpion would be rather a dangerous prey, and would probably avenge its death most fully by a stroke of its torture-giving and swiftly-lashing tail. The Magot, however, has

hands which can overmatch even the scorpion's tail, and no sooner is one of these baneful creatures brought to light, than the monkey pounces upon it, twitches off the poison-joints of the tail, and then, grasping the disarmed scorpion, eats it as composedly as if it were a carrot.

The enemies which these creatures hold in greatest dread are the climbing felidæ; and on the approach of one of these animals, the colony is instantly in a turmoil. The leaders yell their cry of alarm and give the signal for retreat, the mothers snatch up their little ones, the powerful males range themselves in battle array, and the whole body seeks a place of refuge.

The color of the Magot is a clear gray. The head is strong and heavy, the eyes deeply set, the neck short and powerful, the teeth sharp, the nails strong; the face is always old-looking. It is not often seen in zoological gardens, but it displays in captivity a strong attachment to its master, and a fondness for nursing other animals, especially if they are young and helpless. It carries them in its arms, keeps their coats clean and free from vermin, and is jealous if interfered with.

Gibraltar is the spot in Europe where the Magots have been since time immemorial. Some writers suppose that they have been on the rock since the time when the Straits did not exist; the Moors assert that there is an underground passage between the Spanish and African shores which the Magots traverse. Most probably they were introduced by the Moorish invaders of the Peninsula. They live on the summit of the rock, and move about from place to place to escape the wind. Great care has been taken of them by the English authorities, and their numbers are reported to the Quartermaster of the garrison. In spite of all care, however, their numbers had dwindled down to ten in 1856, and in a few years had fallen to four, all of the same sex, and finally to three. Alarmed by this report, Brehm wrote to the English governor of the fortress, and had his fears removed by the following answer: "The number of apes which at present inhabit the Rock amounts to eleven. As it has been found that they can easily find sufficient food on the rock, they are not fed, but left to themselves. The signal-man looks after them, and prevents them from being chased or disturbed. He keeps an account of them, and, as they are always together, is well informed concerning them and their movements.

"When and how they came to the Rock nobody knows, but the most

opposite views are held. Six or seven years ago they were reduced to three; but Sir William Codrington, fearing that they would entirely perish, brought over three or four from Tangiers, and since then they have increased to the number above stated."

Europe, therefore, has not yet lost her apes.

VII.—GENUS CYNOPITHECUS.

This genus has one species, *Cynopithecus niger*, which is assigned by many writers to the genus *Macacus*: it resembles the Macaques, and also has several characteristics of the *Cynocephali*, and many naturalists follow Cuvier in classing it with the latter. Recent investigations, however, have led most naturalists to make a separate genus of it as above.

It differs from the Dog-heads proper by possessing a very rudimentary tail, and in its muzzle, which is broad, flat, and, unlike that of the species in the genus *Cynocephali*, does not overhang the upper lip. The face and callosities are bare, the body covered with long woolly black hair, which on the head grows pretty long, and forms a kind of crest, which curves backward over the neck like the crest of a cockatoo. The Budeng (p. 44) also possesses a crest, but it curves forward.

It attains the length of two feet, and is abundant in the Celebes, Philippine and Molucca Islands. Its habits in its native abodes are little known; in captivity it shows itself domineering and tyrannical toward the Guenons, pretty kind toward the Macaques, and quite friendly to a young female baboon.



CHAPTER VIII.

THE NEW WORLD MONKEYS.

THE AMERICAN MONKEYS OR CEBIDÆ—THE GENUS CEBUS OR SAPAJOU—THE GENUS LAGOTHRIX—
THE SPIDER MONKEYS—THE GENERA ATELES AND ERIODES—THE HOWLING MONKEYS—THE
SAKIS—THE NIGHT MONKEYS—THE TEE-TEES.

THE difference between the animals of the OLD and NEW WORLDS is most strikingly seen in those of the torrid zone. In America the land between the tropics forms a world of its own. Soil and climate, light and air, plants and animals all bear a peculiar stamp, only here or there calling up reminiscences of the Eastern Hemisphere. And this is to a great extent the case with reference to the animals we are now about to describe. The CEBIDÆ are PLATYRRHINI, or “flat-nosed” monkeys; they are more inoffensive, good tempered and melancholy than the apes of the old world; they are distinguished from their brethren in the Eastern Hemisphere by the conformation of their bodies and limbs, and by their teeth. The nostrils are very different from those of the monkeys which have already been described, as they open at the sides instead of underneath, and are separated from each other by a wide piece of cartilage. The body is slender, the limbs long, the tail is never absent, and in most genera is supplied with powerful muscles which enable the creature to seize anything by it. The thumb of the fore hands is not so truly “opposable” as in the feet. The nails are flat. The number of molars is increased by one on each side of each jaw; that is, the “dental formula” becomes

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, M. \frac{6-6}{6-6} = 36.$$

They have no cheek pouches or callosities. One member of the family alone attains any considerable size. Their colors are not so varied as those of Asia and Africa.

The CEBIDÆ are confined to South America. Their northern limit is the Caribbean Sea, but they are not found in any of the Islands, nor do they pass the Isthmus of Panama. To the West they are limited by the chain of the Andes, on the East by the Atlantic Ocean, and South by the twenty-fifth degree of latitude.

The APES OF AMERICA are exclusively arboreal, and the primeval forest is their natural home. They prefer well-watered regions. They never descend to the earth except in extreme need; even when they drink they climb on some bending branch which droops into a stream. Some of these apes can traverse hundreds of miles and never set foot on ground. The forest gives them all they want, buds and fruits, insects and birds' eggs, young birds and honey.

Most species are active by day, some are genuine night-animals. They all are timid and shy and cannot distinguish with the sagacity of OLD WORLD APES between real and imaginary danger. Hence they flee from everything unusual. They are weak, and only able to defend themselves from small beasts of prey.

In captivity they are docile and affectionate in youth, cunning and malicious in old age. Maternal affection is very strong in the females. They bear one or two young ones, and nurse, tend and guard them with that care and devotedness which always excite our admiration and esteem.

They do little damage to mankind; their home is usually remote from the operations of man, and those which do levy toll on the plantations are merciful in their exactions. Men hunt them for the sake of their flesh and their skin; the natives slay them by hundreds, using bows and arrows, or the blowpipe, by which they can project their poisoned darts that kill with a scratch, over a hundred feet. With the same weapon the Indians capture them. "If the Arecunas," writes Schomburgk, "wish to tame an old obstinate ape, they dip their dart in weakened Wurari poison. When the creature falls down, the wound is sucked, the animal buried in the earth up to the neck, and a strong solution of some saltpetre-bearing earth or of sugarcane-juice is poured over him. When the patient shows signs of revival he is taken out and wrapped like a child in swaddling-clothes. In this straight-jacket his drink for some days is cane-juice and his food is seasoned with Cayenne pepper, and boiled in saltpetre water. If this heroic treatment does not answer, he is hung up in the smoke. His temper then improves, his eyes become beseeching,

he asks for mercy. He is set free, and the most violent ape seems to forget that he has ever been a denizen of the forest."

The CEBIDÆ are divided into four sub-families which bear the names of CEBINÆ, MYCETINÆ, PITHECINÆ, and NYCTAPITHECINÆ, and contain *ten* genera in all.

The sub-family of CEBINÆ contains *four* genera, the first being the richest in species of all the American monkeys, and ranges from Costa Rica to Paraguay.

I.—GENUS CEBUS.

The SAPAJOUS are small, rather slim creatures. They live in bands in the forests of Colombia, Peru, Guiana, Brazil, and Paraguay, usually keeping to the highest branches of the trees. They feed on fruits, insects, worms, molluscs, eggs, and even small birds. Several species of Carnivora and serpents persecute them incessantly; the latter more particularly inspire them with terrible fear.

The Sapajous possess an unequalled amount of agility and petulance, and are capricious to excess. At the same time they are very intelligent, very gentle, and very familiar, and disposed to be affectionate towards those who take an interest in them. Thus it is that they are in demand in all civilized countries; in the hands of mountebanks and wandering musicians they become objects of amusement to the multitude. They are trained to a great number of tricks, which they execute with great coolness and imperturbable gravity. They may be called the Green Monkeys of the New World. They are sometimes styled the WEEPER Monkeys, from the low whining sounds they often utter. Plaintive and mournful as are these cries, they are expressions of satisfaction and good temper. The slightest emotion produces a screaming and screeching painful to listen to. They are also called Musk Apes from a musky odor which some of them exhale.

It is very difficult to ascertain the number of species in this family. Schomburgk writes: "No genus of apes shows in size, color and growth of hair more differences than these do, and hence a crowd of species is created which are mere varieties arising from a cross between the Capucin and the Apella." But the number of observations that have been made of these creatures in captivity lead us to prefer more numerous divisions than the two to which apparently the intrepid traveler would restrict us. We follow Wallace in regarding the genus as divided into *eighteen* species.

THE CAPUCIN MONKEY.

The CAPUCIN monkey, *Cebus capucinus* (Plate II., Sapajou), bears in its own home—the southern portion of Brazil—the name of CAI or SAI, a word which is said to mean in the language of the Guarani Indians, “a dweller in the forest.” It is one of the larger varieties of the group, and has attained in some instances a length of eighteen inches in the body and fourteen inches in the tail. It is distinguished by its bare, wrinkled, flesh-colored forehead. A brown, more or less deep, is the predominant color, the thinly covered temples, side-whiskers, throat and chest are somewhat lighter.

The *Cebus hypoleucus* resembles the Capucin in size, and differs only slightly in color. But the brow is hairy, and the color on the cheeks, throat and other parts are of a bright yellow color, contrasting strongly with the dark-brown hide.

A variety, *Cebus olivaceus*, is somewhat larger than those just mentioned; the body measures two feet in length, the tail twenty inches. The face and forehead are thickly covered with hair, a broad dark-brown stripe crosses the brow, and from it a gradually widening triangular patch of like color extends to the back of the head. The back is brown in color; the cheeks, shoulders and fore-limbs a pale olive-brown.

A thick growth of hair above the eyebrows covers as with a wig the head of *Cebus leucogenys*, a Brazilian species. Its long silky hair is of a grayish-black hue; the hair on the cheeks changes from bright yellow to yellowish-white.

These species differ little from each other. They are found everywhere in the torrid zone, from Bahia to Colombia and across the Andes. They pass their life in trees and are careful to avoid the observation of travelers. Usually they occur in bands of five to ten, most of which are females.

In their habits, too, all the species are very similar, so that the description of one will serve equally for any other. In consequence of their sportive manners they are frequently kept in a domesticated state, both by the native Indians and by European settlers. Like several other small monkeys, the Capucin often strikes up a friendship for tame animals that may happen to live in or near its home, the cat being one of the most favored of their allies. Sometimes it carries its familiarity so far as to

turn the cat into a steed for the nonce, and, seated upon her back, to perambulate the premises. More unpromising subjects for equestrian exercise have been pressed into the service by the Capucin. Humboldt mentions one of these creatures which was accustomed to catch a pig every morning, and mounting upon its back, to retain its seat during the day. Even while the pig was feeding in the savannahs its rider remained firm, and bestrode its victim with as much pertinacity as Sinbad's old man of the sea.

Their food is chiefly of a vegetable nature, but they are fond of various insects, sometimes rising to higher prey, as was once rather unexpectedly proved. A linnet was placed, by way of experiment, in a cage containing two Capucin monkeys, who pounced upon their winged visitor, caught it, and the stronger of the two devoured it with such avidity that it would not even wait to pluck off the feathers. Eggs are also thought to form part of the Capucin's food.

The *Cebus apella*. This species is the representative of the Capucin monkey in Guiana. It varies much in color; the hair over the brow and on each side of the head swells up into a tuft, and on the face is prolonged to form a beard. It is found in large troops of several hundreds; Schomburgk saw one consisting of four or five hundred members. The Indians shoot them with their blowpipes as articles of food, and keep numbers of tame ones about their huts.

It is this ape which we usually see accompanying the barrel-organ of our peripatetic musicians, and which climbs up our piazzas and spouts to reach the nursery windows, and collect the children's cents. Its health does not seem to suffer much in captivity, but it is dirty and melancholy and continually pulling frightful faces.

The species commonly called the HORNED SAPAJOU or MIKO, *Cebus fatuellus*, is found on the East Coast of Brazil, and is remarkable for the peculiar growth of the hair on its head. It attains the size of a large cat, has strong muscular limbs, a round head and face, a tail longer than its body and thickly covered with hair. The cheeks and sides of the temples are decked with fine whitish-yellow hair, while the face is surrounded with a ring of bright black hair; on the head there grows a thick tuft divided into two bunches. Between the bunches the hair is short and black, on the neck it is brown, beneath the chin dark-brown, on the throat, breast, neck, and sides yellowish-brown, on the rest of the body black-brown, almost black. The hairless face has a dirty flesh-colored

hue, the hands and feet are brown, and the fingers are clothed with light-brown hairs. The peculiar growth of hair on the head does not appear till middle age, when it is found in both sexes, but more developed in the males. It is exceedingly active and sagacious, travels in bands of thirty or forty, and plunders remorselessly the plantations of settlers near the forest.

The other species require no mention in a work of a popular character.

II.—GENUS LAGOTHRIX.

This genus is distinguished from the preceding one by its squarer figure, some peculiarities in the skeleton and teeth, and the woolly hair, from which latter characteristic it derives its name *Lagothrix*. It is found in the districts on the headwaters of the Amazon and Orinoco, and lives in groups in trees. All the kinds described by travelers are regarded by naturalists as capable of being embraced in *five* species. We give the best known and attested species.

The BARRIGUDO, *Lagothrix Humboldtii*, is when fully grown little less than the Howling Monkeys. Its soft woolly hair grows long on the tail, the thighs, and the upper arm, and becomes a regular mane on the breast; the head looks as if cropped. The face, and the hands, both palm and back, the bare spot on the tail, and the tongue are negro-black; the eyes dark-brown, the coat dull-black on the head, somewhat lighter on the back; on the further end of the tail a dark brownish-yellow.

Tschudi describes the BARRIGUDO—as the natives name them—as malicious and daring, often following for a long distance the Indians who carry the productions of remote plantations to market in the upper valleys. The apes pelt them with twigs and branches. They are bad climbers, and all their movements are slow and deliberate. When brought to bay, they put their backs against a tree and fight till death. The Indians hunt it for its flesh. In captivity it is a gentle creature, but seldom survives removal from its home; even the change to Para is usually fatal. One in the Zoological Gardens of London is described as amiable and attractive; in all its actions it equally avoided haste and sluggishness, and displayed grace and precision; a solemn attitude seems natural to it, and suits well. In distinction from the Spider apes and Cebidæ, which are always whimpering or whining, the Barrigudo utters only *one* cry like a sharp “Tsha” not repeated.

We now proceed to a genus the members of which may be described as the Gibbons of the New World. They have not, however, the lightning-like spring and activity of those acrobats of the Eastern Hemisphere.

THE SPIDER-MONKEYS.

This appellation, bestowed by early naturalists on the following genera, well expresses their leading features, which suggest the comparison to every observer.

III.—GENUS ATELES.

The various species of this genus inhabit South America as far as twenty degrees of South latitude. Their name *Ateles* is a Greek word signifying "imperfect," and is bestowed on them because the thumbs on their fore-limbs are useless. They are usually found in small bodies of ten or twelve. The *fourteen* species do not present much difference to each other.

THE COAITA AND THE MARIMONDA.

The COAITA, *Ateles paniscus*, is one of the larger apes of the genus; it attains the length of four feet, more than one half being tail. The hair is long on the shoulders, and forms a crest on the head; it is deep black, except on the face, where it is red. A pair of lively brown eyes give a pleasing expression to its visage. It is averse to the intrusion of strangers, and large bands assault the stranger by pelting him with sticks. It is a native of Guiana.

The MARIMONDA, *Ateles Beelzebub*, is a species which has been found in Guiana, and, according to Humboldt, chiefly in the Spanish province.

In captivity, the Marimonda is a gentle and affectionate animal, attaching itself strongly to those persons to whom it takes a fancy, and playing many fantastic gambols to attract their attention. Its angry feelings, although perhaps easily roused, do not partake of the petulant malignity which is found in the baboons. Very seldom does it attempt to bite, and even when such an event does take place, it is rather the effect of sudden terror than of deliberate malice.

On account of its amiable nature it is often brought into a domesticated state, and, if we may give credence to many a traveler, is trained to become not only an amusing companion, but a useful servant.

The color of this animal varies much according to the age of the individual.

When adult, the leading color is of a uniform dull black, devoid of the glossy lustre which throws back the sunbeams from the Coaita's furry mantle. On the back, the top of the head, and along the spine, the hair is of a dense, dead black, which seems to have earned for the animal the very inapposite name with which its nomenclators have thought fit to decorate the mild and amiable Marimonda.

The throat, breast, inside of the limbs, and the under side of the tail are much lighter in tint, while in some individuals a large, bright chestnut patch appears on each side.

It seems to be of rather a listless character, delighting to bask in the sun's rays, and lying in the strangest attitudes for hours without moving. One of the postures it best loves is achieved by throwing the head back with the eyes turned up, and its hands behind its head.

THE CHAMECK.

The CHAMECK, *Ateles pentadactylos*, is the representative of the genus in Peru and parts of Brazil. It bears the epithet of *Pentadactylos* or five-fingered (Greek, *pente* five, *daktylos* finger), because the thumb is slightly projecting; it has, however, only a single joint, and is not furnished with a nail, justifying its other designation of *ateles*. The body measures about twenty inches; its tail is over two feet in length, and is the most conspicuous member of the animal. For the greater part of its length it is thickly covered with long drooping fur, but the last seven or eight inches are nearly denuded of hair on the upper surface, and entirely so on the lower.

The color of the Chameck is nearly black, and of a uniform tint over the head, body, and limbs. Its hair is rather long and thick, in some parts taking a slight curl. The head is very small in proportion to the rest of the body. The face is of a deep brown color, as are the ears, cheeks, and chin, on which some long black hairs are scattered at distant intervals.

THE GOLD-BROWED APE.

BARTLETT'S MONKEY, *Ateles bartlettii*, is the prettiest of all the spider-monkeys. Its hair is long, of a deep black color on the back, and brownish-yellow on the belly; its whiskers are white, and across the brow runs a golden-yellow band. From this remarkable feature it derives an additional name to that given it in honor of its discoverer, and is styled the Gold-browed Ape.

IV.—GENUS ERIODES.

This genus, containing only *three species*, is intermediate between the two previous genera, and is confined to the Eastern parts of Brazil, South of the Equator.

THE MIRIKI.

The MIRIKI, *Eriodes hypoxanthus* (Plate II, Spider Monkey), inhabits the interior of Brazil, and is the largest of the Brazilian monkeys. It is strongly built, small-headed, short-necked, long-limbed, and thickly-haired. Its hair yellowish; the face in middle age flesh-colored, in old age gray. The hair of this species is very thick, short, and furry, of a tolerably uniform brown tint over the head, body, and limbs, the paws being much darker than the rest of the animal. There is a slight moustache formed by a continuation of the long black hairs which are scantily planted on the chin and face. On account of the thick coating of fur with which the skin of this animal is covered, water has but little effect upon it. Knowing this wet-repellent property, the hunters of Brazil are accustomed to make the skin of the Miriki into cases wherewith to cover the locks of their guns on rainy days.

This species is easily distinguishable from its companions by the presence of a better developed thumb on the fore-paws than falls to the lot of spider-monkeys generally.

The characteristics of these species are in the main the same. They are all climbers, and endowed with the same faculty of using the tail as a fifth hand. The story told by the old travelers, Dacosta and Dampierre, of their forming a bridge across rivers, has been doubted by later ob-

servers. In captivity they are gentle, but the following story of a Spider Monkey possessed by a British officer, shows that they are sometimes prone to human frailties :

At Belize, Sally was permitted to range the town at large for some days. One morning, as her master was passing along the streets, he heard high above his head a little croaking sound, which struck him as being very like the voice of his monkey ; and on looking up, there was Sally herself, perched on a balcony, croaking in pleased recognition of her friend below.

Once, and once only, poor Sally got into a sad scrape. Her master was going into his cabin, and found Sally sitting all bundled together on the door-mat. He spoke to her, and the creature just lifted up her head, looked him in the face, and sank down again in her former listless posture.

“Come here, Sally,” said the captain.

But Sally would not move.

The order was repeated once or twice, and without the accustomed obedience.

Surprised at so unusual a circumstance, her master lifted her by the arms, and then made the shocking discovery that poor Sally was quite tipsy. She was long past the jovial stage of intoxication, and had only just sense enough left to recognize her master. Very ill was Sally that night, and very penitent next day.

The reason for such a catastrophe was as follows :

The officers of the ship had got together a little dinner-party, and being very fond of the monkey, had given her such a feed of almonds and raisins, fruits of various kinds, biscuits and olives, as she had not enjoyed for many a day. Now of olives in particular, Sally is very fond, and having eaten largely of these dainties, the salt juice naturally produced an intense thirst. So, when the brandy and water began to make its appearance, Sally pushed her lips into a tumbler, and to the amusement of the officers, drank nearly the whole of its cool but potent contents.

Her master remonstrated with the officers for permitting the animal to drink this strong liquid ; but there was no necessity for expostulating with the victim. So entirely disgusted was the poor monkey, that she never afterward could endure the taste or even the smell of brandy. She was so thoroughly out of conceit with the liquid that had wrought

her such woe, that even when cherry-brandy was offered to her, the cherries thereof being her special luxury, she would shoot out her tongue, and with just its tip taste the liquid that covered the dainty fruits beneath, but would not venture further.

She seemed to bear the cold weather tolerably well, and was supplied with plenty of warm clothing, which stood her in good stead even off the icy coasts of Newfoundland, where, however, she expressed her dislike of the temperature by constant shivering. In order to guard herself against the excessive cold, she hit upon an ingenious device. There were on board two Newfoundland dogs. They were quite young, and the two used to occupy a domicile which was furnished with plenty of straw. Into this refuge Sally would creep, and putting an arm round each of the puppies and wrapping her tail about them, was happy and warm.

She was fond of almost all kinds of animals, especially if they were small; but these two puppies were her particular pets. Her affection for them was so great that she was quite jealous of them; and if any of the men or boys passed nearer the spot than she considered proper, she would come flying out of the little house, and shake her arms at the intruders with a menacing gesture as if she meant to annihilate them.

THE HOWLING MONKEYS.

The next sub-family, the MYCETINÆ, contains only one genus, MYCETES, which, however, is subdivided into *ten* species. They range from Guatemala to Paraguay.

V.—GENUS MYCETES.

Oken's *dictum* that the largest animals of each family is also the most perfect, is true in the case of these monkeys, which are better known by their English name of the HOWLING MONKEYS. They attain a length of three feet in the body, with a tail still longer. Their form is slender but compact, the limbs well proportioned, the hands five-fingered, the head large, the chin provided with a beard. They derive their common name from the howling with which they fill the forest, and which can be heard for miles.

The instrument by means of which the Howlers make night dismal with their wailings, is the "hyoid bone," a portion of the frame which is

developed largely in these monkeys. In man, the bone in question gives support to the tongue and is attached to numerous muscles of the neck. In the Howling Monkeys it takes a wider range of duty, and, by a curious modification of structure, forms a bony drum which communicates with the windpipe and gives to the voice its powerful resonance.

The larynx has six sacks connected with it, in which the voice is received; two of these are of considerable size, and resemble the crop of birds. The tail is long, bare at the extremity, nervous and muscular.

The HOWLERS inhabit almost all the countries of South America; even those elevated regions where heavy frosts occur in winter, and do not suffer from the cold rains. Cattle perish, but the first bright day brings out the voice of the HOWLERS, and they may be seen climbing to the tops of the trees to dry themselves in the warm sunbeams.

THE RED AND BLACK HOWLERS.

The ALUATE, or RED HOWLER, *Mycetes seniculus*, has a reddish-brown fur, inclining to yellow on the back; the hair is short, stiff, and uniform. The female is smaller and darker. It inhabits the whole East of South America.

The BLACK HOWLER, *Mycetes Caraya* (Plate III), is a native of Paraguay. The hair is long and black, inclining to red at the sides; in the female, yellowish on the belly. It is rather less than the Red Howler.

HABITS OF THE HOWLING MONKEYS.

The habits of the two species are so much alike that the descriptions of travelers apply equally to both. Schomburgk gives a lively account of his observations of a herd of Howlers. "I followed the sound, and after great exertions got within view of the troop without being perceived. They sat before me on a high tree and performed the most frightful concert that can be imagined, every beast of the forest seemed engaged in deadly strife; at times the tones were like the grunting of a pig, the next moment the roar of the jaguar as he springs on his prey, then the low, awful growling of that beast of prey when, surrounded on all sides, he recognizes the presence of danger. The performers would stop suddenly, as if a signal had been given, and then quite unexpectedly a singer would raise up his inharmonious voice, and the howling recom-

menced. The throat-drum which gives the voice its strength could be seen moving up and down during their yells. Yet this concert had its laughable aspect; the most misanthropic of mankind must have smiled had he seen the solemn gravity and earnestness with which the bearded performers looked at each other. The natives say that each band has a leader, distinguished by the shrillness of his voice and the gracefulness of his figure. The shrillness was evident; the gracefulness I looked for in vain. I saw, however, two apes that were silent, and whom I supposed to be sentinels."

Hensel writes: "The Howling monkeys live in little troops of five to ten members, and seldom quit the same spot. An old male appears to lead them." Humboldt, however, has seen as many as forty together, and reckoned that there might be as many as two thousand in a quarter of a mile square. He remarks the strange uniformity of the actions of all the members of a band. What one does, all do. When the leader quits a branch, all the family quit it. If the leader suspends himself by the tail and swings himself to and fro to reach a neighboring bough, the whole band assume the same attitude and perform the same motions. They do not, like the old world monkeys, spring from tree to tree; they never quit one branch with their tail till they have got good hold with their hands, and never let go their hands till their tails have a firm grasp. The muscles of the tail are like a watch-spring and coil up the end of that appendage when at liberty; the creature can hang by its tail till it is quite dead, and it possesses a tenacity of life unexampled except in some of the *Carnivora*.

The same writer, Hensel, describes the difficulty of dispatching one. The first shot broke a hind leg and injured the tail; a second, went through the belly, causing such a gaping wound that the entrails protruded; a third, through the chest; a fourth, through the throat, carrying away part of the underjaw and destroying the howling apparatus, and a fifth was necessary to put the miserable creature out of its anguish. To the last it hung by its wounded tail. As we have said, the under surface of the tail is devoid of hair and has a velvety surface, and when two turns of the tail are cast about a branch the animal remains suspended even in death. Hence Europeans are not very successful in procuring specimens of these apes. A musket-ball seldom hits a part so vital that consciousness is immediately destroyed, and as long as consciousness remains the ape instinctively grasps some limb with his tail; the poisoned

arrows of the Indians, on the other hand, produce an instantaneous loss of consciousness, and the insensible victim falls helpless to the ground.

They are sometimes caught by an ingenious stratagem. A certain plant, the "Lecythis," produces a kind of nut, which, when emptied of its contents, becomes a hollow vessel with a small mouth. Into one of these hollowed nuts a quantity of sugar is placed, the nut left in some locality where the monkey is likely to find it, and the monkey-catchers retreat to some spot whence they can watch unseen the effect of their trap.

So tempting an object cannot lie on the ground for any length of time without being investigated by the inquisitive monkeys. One of them soon finds out the sweet treasure of the nut; and squeezes his hand through the narrow opening for the purpose of emptying the contents. Grasping a handful of sugar, he tries to pull it out, but cannot do so because the orifice is not large enough to permit the passage of the closed hand with its prize. Certainly, he could extricate his hand by leaving the sugar and drawing out his hand empty, but his acquisitive nature will not suffer him to do so. At this juncture, the ambushed hunters issue forth and give chase to the monkey. At all times, these monkeys are clumsy enough on a level surface, but when encumbered with the heavy burden, which is often as big as the monkey's own head, and deprived of one of its hands, it falls an easy victim to the pursuers.

Young ones are often captured by the cruel device of shooting a nursing mother, who even when dying clasps her loved little one to her bleeding breast. At times, indeed, she rises to the tragic grandeur of sacrificing her maternal instincts, and dying without the consolations of her offspring's embraces in order that it may have a chance of liberty. Spix relates that he had mortally wounded a female, who carried her progeny on her back. The poor parent fell from branch to branch, and the young one would undoubtedly have perished with her, had not she, collecting all her strength, and desperate in her anxiety and tenderness, thrown it with a fast-failing arm, on to a high branch, and in this way succeeded in preserving it from the unhappy fate which befell herself.

By a strange, or rather by the natural injustice of human judgment, this action is often alleged as a proof that the female of the *Mycetes* is devoid of maternal affection.

In Paraguay these monkeys are regularly hunted for their skins and flesh. Francia, the dictator, had his grenadiers' caps made of skins from the Black Howler, and the natives use them for shabracques, saddle-bags

and the like. Travelers are sometimes compelled to eat the flesh, to their disgust at first. "Nothing can be more repugnant than the sight of such a repast," writes Schomburgk; "it looks as if one was a guest at a cannibal banquet where a child was the chief dish." They are spitted and roasted whole.

THE SAKIS.

The sub-family Pithecinæ is the next division of the American Apes, and embraces those genera in which the tail is covered with hair and is incapable of grasping anything, or coiling round a branch.

The apes of this sub-family, or Sakis, have a compact figure which appears thicker than it really is, owing to the long and dense covering of hair; the limbs are strong, the tail bushy and usually with very long hair down to the end. The hair on the top of the head is thick and parted in the middle; that on the cheeks and chin grows into a strong beard of less or greater length. They are distinguished by the dental structure: the three-cornered canine teeth are separated from the incisors, which are pressed closely together, fine at the points, and inclined towards each other.

The habitat of the few members of this group is confined to the northern part of South America. They dwell in high, dry woods free from brush, and avoid other species of apes. They are called by Tschudi twilight animals, whose active life begins at sundown and continues to sunrise. Schomburgk, however, states that his personal observations contradict this account of their nocturnal habits. "Wherever the foliage was thick I found herds of apes, in which the *Pithecia* formed the greatest number; their long, graceful hair, the dignified beard, and the bushy fox-tail give these creatures a pleasant, but laughable appearance."

VI.—GENUS PITHECIA.

The name SAKI, often applied to all the apes of the sub-family, belongs more properly to the second species described below.

The animals of the genus *Pithecia* bear much resemblance to the *Cebinæ*; they live on fruits and insects, and are very partial to honey, being always on the lookout for the hives of wild bees. The Sapajous,

who are aware of this weakness, follow them at a distance, watching for an opportunity to rob them of their booty. As soon as the Sakis sit down to eat the honey they have discovered, the Sapajous, profiting by their physical superiority, spring upon them, and put them to flight; after which they enjoy the booty they have obtained so easily.

The Sakis are generally gentle, but excessively timid, and for this reason are difficult to tame, though they are not destitute of intelligence. They manifest great solicitude for their young, and both male and female carefully occupy themselves in rearing them. But after a certain time they chase them away, and compel them to provide for themselves. The whole genus is often named, from their bushy tails, "The Fox-tailed Monkeys." The number of species is *seven*.

The SATAN APE or CUXIO, *Pithecia satanas*, the most common representative of the genus, is found on the upper Amazon and Orinoco rivers. It measures sixteen inches in length, and its tail is nearly as long. The quite round head is covered with a kind of cap of long, thick hair, which seems to radiate from a central pivot on the occiput, parting in front. The cheeks and chin are covered with a long black beard. The back is thickly haired, the tail very bushy. The adults are of a black color, inclining on the back to brown; the young are of a grayish-brown tint. Varieties are numerous.

This species has been named by the Europeans the Satan Ape; the Indians call it the Cuxio. It is said to be very careful of its beard, and will not put its face down to drink for fear of wetting it. It scoops up the fluid in the palm of its hand when it is living in freedom, but in captivity it drinks like other apes. It is fierce in temper, and easily provoked; when angry, it rubs the end of its beard and dashes on its foe. Its teeth are so strong that it can drive them into a stout plank.

The WHITE-HEADED Saki or BLACK YARKE, *Pithecia leucocephala*, (Plate III), presents very different appearances at different ages, and hence has obtained many different names. It is elegant in form, and more varied in color than the Cuxio. The head is surrounded with a thick fringe of white hair; the top of the head is deep black. It is a remarkable fact that the white hair round the face is short in the male, but long and drooping in the female.

The so-called SHAGGY APE, *Pithecia hirsuta*, or Paranam, attains the length of forty inches, of which half consists of the tail; the body is cov-

ered with hair nearly four inches long, the points of which turn forward; the hair hangs over the brow, partly hiding the face. Spix discovered this species near the Rio Negro, and describes it as nocturnal in its habits.

VII.—GENUS BRACHYURUS.

This genus is characterized by the short rudimentary tail (hence its name from the Greek, *brachys* short, and *oura* tail) and the slight beard, the egg-shaped head and the flat face. The teeth are peculiar. In the upper jaw the central incisors are twice as long and broad as the exterior ones; in the lower jaw they are shorter. The canine teeth are short and strong. Its short tail contains fourteen to seventeen joints. It embraces *five* species.

The BLACK-HEADED Saki or CACAJAO, *Brachyurus melanocephalus*, measures about two feet, including six inches of tail. Its shaggy coat is yellow-brown, brighter on the breast and stomach, but black on the head and tail and fore-feet; the ears are hairless and very large. Little is known of its habits when wild; in captivity it is docile and sluggish. Fruit is its chief food, and when eating it bends over its food in a peculiar manner, and is awkward in using its fingers. It is not common even in its native abodes on the Rio Negro.

Many names have been given it, the most common being the one we have mentioned; it is also called Chucato, Chucazo, Carniri, and Monofo, which is, by interpretation, "The Hideous Ape."

The species named the SCARLET-FACED SAKI, *Brachyurus calvus*, has a tail still shorter than the Cacajao; it is nearly a pear-shaped stump. The dull-yellow of his coat inclines to dull-white on the back, and to bright-yellow on the belly. In old specimens the color is almost white, from which the face stands out conspicuously; it is scarlet-red, with bushy yellow eyebrows and reddish-yellow eyes; the hair on the head looks as if it had been closely cropped, in marked contrast to the long hair on the back. From its appearance it has received the name given above; the native name is UAKARI.

It is found in a small district near the mouth of the Japura river, and can with great difficulty be removed from its home. The natives represent its motions as active, and capture it by means of the blowpipe and weakly-poisoned darts. It is hard to tame, and repulses all efforts to

caress it. After a few days or weeks of captivity, it becomes indifferent to everything, refuses food, and slowly pines away. Many of them die of inflammation of the lungs. During sickness the bright scarlet of the face becomes duller, but the red tint does not entirely disappear till about two hours after death. Deville saw one in captivity which was kindly disposed to white men, but could not endure Indians. It lived on fruits, and drank from a cup which it held in both hands. Although quite tame, it exhibited a great longing for freedom, and made every effort to escape.

The sub-family Nyctipithecinae contains *three* genera of small and elegant monkeys, with long hairy non-prehensile tails.

VIII.—GENUS NYCTIPITHECUS.

These night monkeys have large eyes, nocturnal habits, and are rather lemurine in appearance. *Five* species have been described; the best known is

THE DOUROUCOULI.

The DOUROUCOULI, *Nyctipithecus trivirgatus*. The word Nyctipithecus or Night Ape, which is used as the generic title of the Douroucouli, refers to its habits, which are more strictly nocturnal than those of the animals heretofore mentioned. The eyes of this little creature are so sensitive to light that it cannot endure the glare of day, and only awakes to activity and energy when the shades of night throw their welcome veil over the face of nature.

In its wild state, it seeks the shelter of some hollow tree or other darkened place of refuge, and there abides during the hours of daylight, buried in a slumber so deep that it can with difficulty be aroused, even though the rough hand of its captor drag it from its concealment. During sleep, it gathers all its four feet closely together, and drops its head between its fore-paws. It seems to be one of the owls of the monkey race.

The food of this Douroucouli is mostly of an animal nature; and consists chiefly of insects and small birds, which it hunts and captures in the night season. After dark the Douroucouli awakes from the torpid

lethargy in which it has spent the day, and shaking off its drowsiness, becomes filled with life and spirit. The large dull eyes, that shrank from the dazzling rays of the sun, light up with eager animation at eventide; the listless languor is discarded, and it commences its nightly chase.

The general color of the Douroucoulis is a grayish-white, over which a silvery lustre plays in certain lights. The spine is marked with a brown line, and the breast, abdomen, and inside of the limbs are marked with a very light chestnut, almost amounting to orange. The face is remarkable for three very distinct black lines, which radiate from each other, and which have earned for the animal the title of *trivirgatus*, or "three-striped." There are but very slight external indications of ears, and in order to expose the organs of hearing, it is necessary to draw aside the fur of the head. On account of this peculiarity, Humboldt separated the Douroucoulis from its neighbors, and formed it into a distinct family, which he named "Aötes," or "Earless."

It is rather uncommon, a fact which some writers attribute to its living in a state of virtuous monogamy; they affirm that a pair may be found snugly sleeping in one bed, but never greater numbers, unless there be a little family. But Bates, a very careful observer, denies this, and asserts that larger troops are not rare. It has a loud cry, and can hiss, spit, and mew like a cat.

IX.—GENUS SAIMIRIS.

The SAIMIRI or SQUIRREL MONKEYS are little quick-moving animals with a sprightly countenance, and not unlike the squirrels in character and size, as their name implies. They have the brain well developed, and are remarkably intelligent. Nocturnal, like the preceding, they live nearly in the same fashion, loving to seclude themselves in coppices and in well-wooded localities; they even occasionally inhabit holes in rocks. They are carnivorous, for they eagerly pursue not only small birds, but also certain species of Mammals. Guiana and Brazil are their native countries.

"Its physiognomy is that of a child; it has the same expression of innocence, sometimes the same sly smile, and always the same rapidity of transition from joy to sorrow; it feels disappointment very acutely.

and testifies it by crying. Its eyes become bedewed with tears when it is vexed or frightened. It is prized by the natives for its beauty, its amiable manners, and the gentleness of its disposition. Its activity is astonishing, though its movements are always full of grace. It is incessantly occupied in play, jumping, and catching insects, especially spiders, which it prefers to all kinds of food."

Humboldt informs us that the Saimiri listens with the greatest attention to people who ask it questions, and that it even stretches out its hands toward their lips, as if to catch the words that escape from them.

How many species there are is still disputed by naturalists. Wallace mentions *three*.

The DEATH'S HEAD Ape as it is called, *Saimiris sciureus*, has a slender form and beautiful colors. It lives in Guiana, in large companies like the Capucins, and is widely diffused. All its habits are graceful; it climbs with great activity, balancing or steering itself by its tail. Its hair is a reddish-black, sprinkled with gray on the limbs; in some varieties the head is coal-black, the body a greenish-yellow, and the limbs golden-yellow. It must have derived its name "Death's Head" from some very superficial observer, although the gray face, with its large eyes and jet-black muzzle, is startling enough.

X.—GENUS CALLITHRIX.

A slender body, slender limbs, a very long thin tail, a round head with a beardless face and short muzzle, bright eyes, large ears, and five-fingered hands and feet characterize the pretty creatures which form this genus. The generic title is derived from two Greek words, *callos* beauty, and *thrix* hair, and is expressive of the beauty of their fur. The common name for the animal is Tee-tee. The number of species is *eleven*.

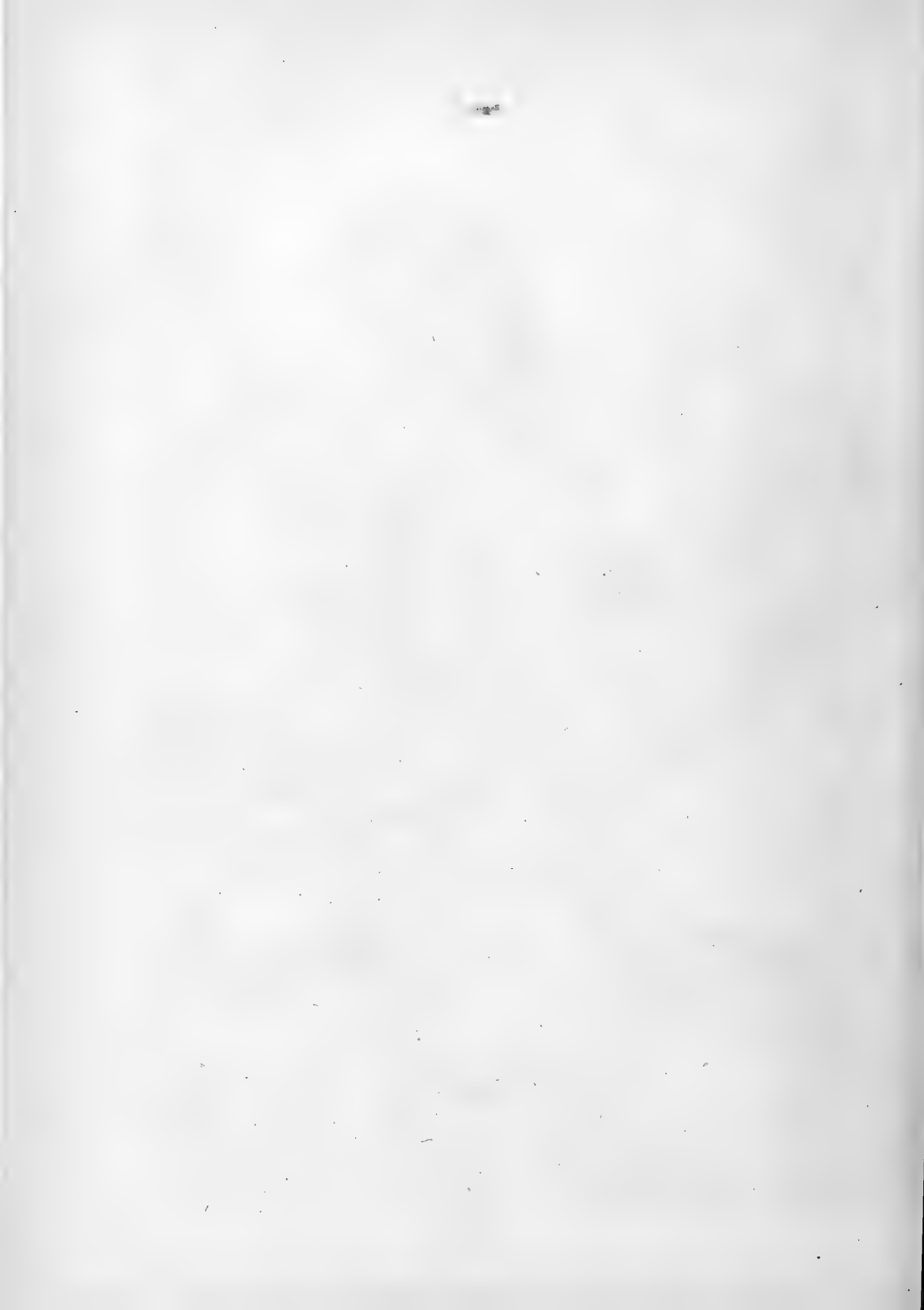
They live in small bands in the South American forests, and are noticeable for their loud voice, which almost equals that of the Howlers in carrying power. They are shy and timid in freedom, while in captivity they are engaging, intelligent, and affectionate.

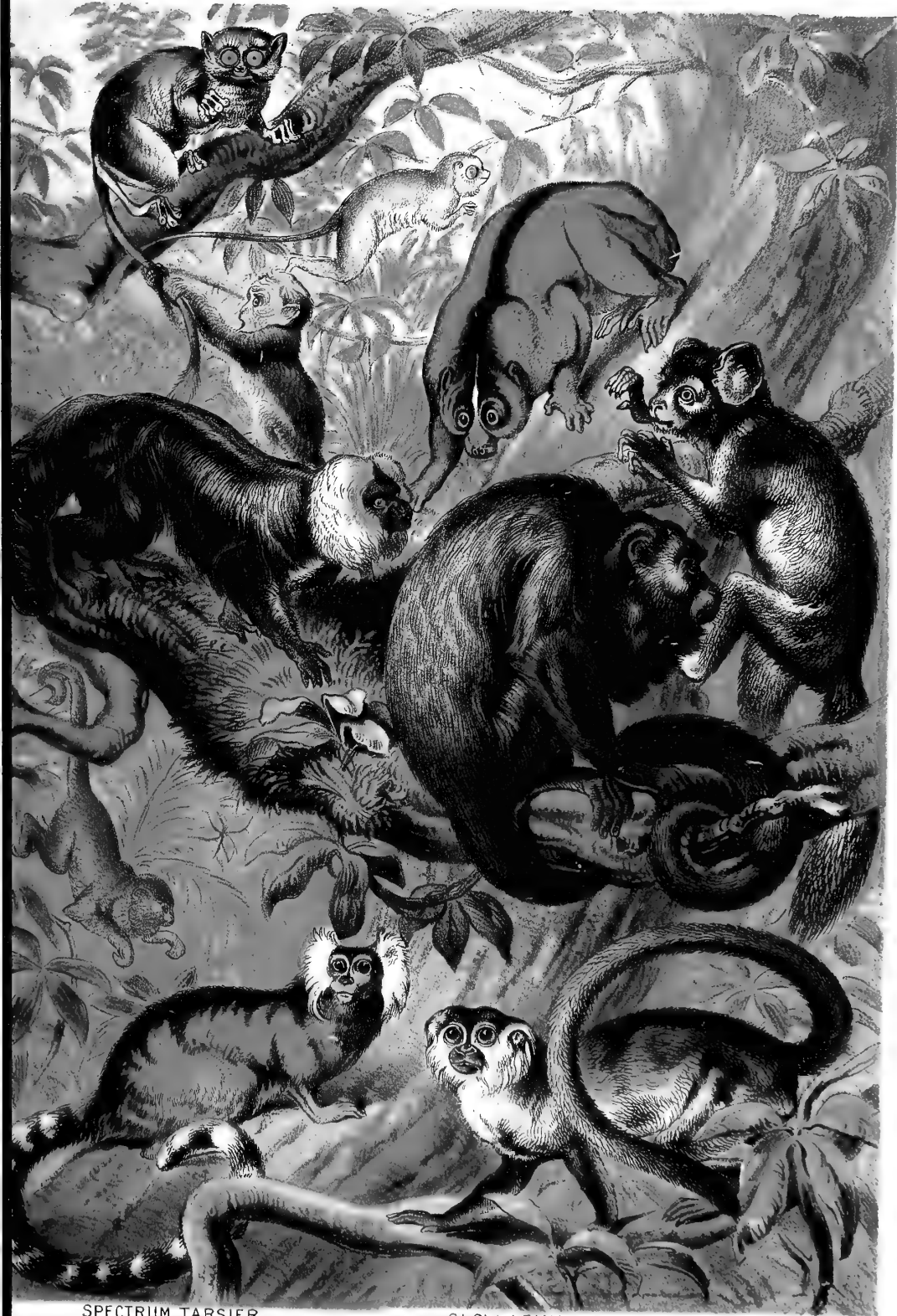
The TEE-TEE, *Callithrix personata*, (Plate III, Squirrel Monkey.) This species is of a brownish-black color from the breast upward to the middle of the skull; the back of the head and of the neck are yellowish-white, the rest of the body of a pale dull gray-brown. The hands and

feet are black, the tail of a reddish-brown. In the female these colors are fainter, and the white tint on the neck is wanting. The whole length of the animal, including the tail, is about thirty inches.

The COLLARED TEE-TEE, *Callithrix lugens* or *torquata*, is a beautiful little creature distinguished by much brighter colors. It has fine, shining, beautiful black hair; the face is nearly white, the ear small, well-shaped and almost hairless. In front of the neck is a white collar, nearly as broad as one's hand; the feet are black, the hands white on the upper surface. Its temper is most amiable, its eyes are bright and lively, and all its actions are graceful and tender. It never seems to allow its evil passions to rise, except when it sees a small bird, on which it then pounces like a cat. It is a native of the right bank of the Orinoco and is called by the missionaries the Widow Ape.







SPECTRUM TARSIER
SAKI
MARMOSET

SLOW LEMUR
HOWLING MONKEY
SQUIRREL MONKEY

AYE AYE

PLATE III. QUADRUMANA.



They prefer to live in the densest parts of the forests, where they run up and down the trees and along the branches more like squirrels than apes, often suspending themselves by their claws. Their food is insects, fruits, eggs, and small birds. Their chief enemies are the birds of prey. When disturbed they utter a feeble cry from which they derive their name of OUISTITIS.

"Audouin," writes Isidore Geoffroy Saint-Hilaire, "has assured himself, by experiments several times repeated, that these monkeys were well able to recognize in a picture not only their own likeness, but that of another animal. Thus, the drawing of a cat, and, what is yet still more remarkable, that of a wasp, caused them manifest dread; while at the sight of any other insect, such as a grasshopper or a May-bug, they threw themselves on the picture as if to seize the object represented.

"Audouin has also remarked that the Ouiditis were very curious; that they had acute vision; that they perfectly recognized the people who looked after them; and, lastly, that their cries varied considerably, according to the passions that animated them."

Another observer writes: "Their graceful tricks were always amusing, as they never were mischievous. With my cats and parrots they were on terms of the greatest intimacy, sharing, of their own accord, their food with the latter. They soon learned to drink wine, and, after a short experience, exhibited so marked a liking for the juice of the grape, that, if permitted, they would indulge till perfectly intoxicated. Nothing alarmed them so much as the appearance of a snake, and several times, for the sake of experiment, I had one brought into my residence to observe the effect. On seeing their enemy, instantaneously they became powerless, and the woe-begone expression of their countenance for the time being was the perfect personification of utter helplessness; and even after the object of their dread had been removed, it required the lapse of many hours before they recovered their vivacity."

At present, about thirty-three species of Marmosets are known, grouped into two genera, on very slight foundations.

I.—GENUS HAPALE.

This genus has the face and ears bare, a tail as long as the body, thin and tufted at the end, and a mane of greater or less length. The number of species is *nine*.

The LEONCITO MARMOSET, *Hapale leonina*, was discovered by the great traveler Humboldt on the warm plains which border the eastern slopes of the Cordilleras. He says: "It is one of the most beautiful creatures I ever saw—lively, merry, and playful, but like all little animals passionate and spiteful. When angry the neck swells, the mane bristles up and it looks like a lion in miniature." Bates saw a very tame one on the upper Amazon and relates: "It ran to my chair, climbed up to my shoulder, turned about to look into my face, showing its little teeth, and squeaking as if asking my will." This species attains a length of eight inches in the body, and about the same in the tail.

The next species differs from the others by having tufts of hair more or less developed before and above the ears.

The MARMOSET, OUISTITI, or SAGOIN, *Hapale Iacchus* (Plate III), the commonest member of this group, has a body nine to ten inches long, and a tail twelve to fourteen inches. The color of its long silky fur is black, white, and reddish-yellow. The tail is black, with about twenty small white rings around it and a white tip.

The PINCHE, *Hapale Œdipus*, has long hair on the top of its head, which hangs down over the forehead and neck, but the sides are bare. Specimens have been found to measure twenty-eight inches, including sixteen inches of tail.

The Pinche is remarkable for the tuft of white and long hair which it bears on its head, and which is so distinctly marked that the little creature almost seems to be wearing an artificial head of hair. The throat, chest, abdomen, and arms, are also white, and the edges of the thighs are touched with the same tint. On each shoulder there is a patch of reddish-chestnut, fading imperceptibly into the white fur of the chest, and the grayish-brown hair that covers the remainder of the body. Its eyes are quite black.

The tail of the animal is long and moderately full; its color slightly changes from chestnut-brown to brownish-black. Its voice is like the twittering of birds. Unfortunately this pretty creature cannot endure captivity, and soon dies.

To the same group belongs the smallest of all the apes, a little creature which measures at the utmost only twelve inches, including fully six inches of tail. Its fur is yellow and black, its paws reddish-yellow. Dark bands run from the back over the sides and thighs. The tail has slight rings. Spix discovered this dwarf species at Tabatinga, on the

banks of the Solimoen river, in Brazil ; Bates saw it near San Pablo, and remarks that on his return to England he was surprised to see a specimen in the British Museum, described as coming from Mexico. The scientific name of this specimen is *HAPALE PYGMÆA*.

II.—GENUS MIDAS.

The members of this genus are distinguished from the genus *Hapale* by the circumstance that the mane is less developed, and that the tail is longer. The number of species is *twenty-four*.

The MARIKINA, *Midas rosalia*, is larger than the animals just described ; the face is bare and brown ; the ear large and fringed with dark-brown hair ; on the cheeks and on the pointed brow fine, short, yellowish hair stands out ; the long hair of the head, divided in the middle by a streak of short brown hair, falls down like a mane, and has a dark-brown color, while the rest of the head, the throat, the breast, and the arms are dark orange-brown ; the remainder of the body is covered with a reddish-yellow fur which glistens like gold. This fur is smooth and silky to the touch, and the creature is hence sometimes designated as the "SILKY MONKEY." It is very fastidious about having its beautiful coat kept carefully clean, and soon dies if neglected. It is very timid, has a soft and gentle voice when pleased, but hisses when angry. It is described by Buffon under the name of "Marikina."

The SILVER SAGOIN, *Midas argentatus*, is one of the rarest of the American apes, and, according to Bates, is found only in Cameta, a province of Brazil. It is the most beautiful of all ; the long silky hair is silver-white, the tail dull-black, the almost bare face flesh-colored. It reaches the length of only eighteen inches, including ten inches of tail. Many naturalists regard it merely as a variety of the common Midas.

The TAMARIN, *Midas ursulus*, has a pleasing expression, and a face of considerable intelligence. It is black, but the hinder part is mottled with grayish-white. Bates says it never congregates into large flocks, seldom more than three or four being seen together. Like the squirrel it confines itself to the large boughs of trees, whence it peers down on the traveler. It seems, however, to have no fear of man.

The Marmosets do not seem to be possessed of a very large share of intelligence, but yet are engaging little creatures if kindly treated.

They are very fond of flies and other insects, and will often take a fly from the hand of the visitor. One of these animals with whom Wood struck up an acquaintance, took great pleasure in making him catch flies for its use, and taking them daintily out of his hand. When it saw his hand sweep over a doomed fly, the bright eyes sparkled with eager anticipation; and when he approached the cage, the little creature thrust its paw through the bars as far as the wires would permit, and opened and closed the tiny fingers with restless impatience. It then insinuated its hand among his closed fingers, and never failed to find and to capture the imprisoned fly.

The Marmoset has a strange liking for hair, and is fond of playing with the locks of its owner. One of these little creatures, which was the property of a gentleman adorned with a large bushy beard, was wont to creep to its master's face, and to nestle among the thick masses of beard which decorated his chin. Another Marmoset, which belonged to a lady, and which was liable to the little petulances of its race, used to vent its anger by nibbling the end of her ringlets. If the hair were bound round her head, the curious little animal would draw a tress down and bite its extremity, as if it were trying to eat the hair by degrees. The same individual was possessed of an accomplishment which is almost unknown among these little monkeys, namely, standing on its head.

Another chapter will complete our account of the Quadrumanous animals, with a description of the half-apes or LEMURS.



CHAPTER X.

THE LEMUROIDEA.

THE INDRIS—THE LEMURS—THE RUFFED LEMUR—THE CAT LEMUR—THE HAPALEMUR—THE CHEIROGALEUS—THE LORIS—THE TARSIER SPECTRE—THE AYE-AYE.

WE now have arrived at the second division of the order Quadrumana, and have to describe the very peculiar animals to which Linnæus, the father of Natural History, gave the name of Lemur. The Romans called by this appellation the spirits of the departed, and the restless ghosts that wandered about during the still hours of the night, and the naturalist applied it to these nocturnal animals, which seem indeed to be the ghosts of departed creations. They are the last surviving remains of a race which was once widely diffused; fossil specimens of numerous forms of LEMUROIDEA occur in various parts of Europe and North America, but the living specimens are found in Madagascar, Ceylon, and the islands of Sumatra, Borneo, the Philippines, and Celebes, with some scattered genera in the African continent. To explain the occurrence of these strange animals at points so remote, Mr. Sclater has supposed that a continent, now submerged, once extended from Madagascar to Ceylon and Sumatra, in which the Lemuroid type of animals was developed. To this hypothetical continent he gave the name of Lemuria, and it probably represents a zoological region in some long past geological epoch.

Older writers have classed the Lemurs with the Apes, and called them Prosimii, "Half-apes" or "False Apes," but their structure is different from that of the true Simians, and their dental arrangements peculiarly so. It is advisable therefore to keep them apart in a sub-order.

The Lemuroidea live in forest lands where fruit and insects furnish them with food; they are nocturnal in their habits, and during the day retire to the darkest part of the forests where they coil themselves up

and sleep; they are dead in the day, their life begins with the twilight. They are divided into three families, the first of which, the Lemuridæ, contains *eleven* genera, the others only *one* genus each.

THE LEMURIDÆ.

The animals of this family are characterized by an elongated head, analogous to that of certain carnivorous animals, from whence the name of Fox-headed Monkeys which some of the species have received; by opposable thumbs on the four extremities, and especially by the nail on the index finger of the hind-feet, which is long, compressed, and sharp, and singularly contrasts with those on the other digits. Although their brain is but little developed, they have considerable intelligence, and are susceptible of training. They are in general of small size, and furnished with a short or long tail, though some species are deprived of that appendage. Their eyes are very salient, as befits their nocturnal mode of life.

At the approach of twilight they rouse themselves, smooth their fur, utter their unpleasant cries and begin their nightly quest for food. The cry of some of the species is alarming, as it resembles the roar of a beast of prey. In hunting for food, they equal or even surpass the apes in agility in climbing; they seem to have wings, so powerful are their springs from bough to bough, so swift their ascent or descent of the tree-trunks, so restless their ever-changing motions. They eat much, they destroy more.

I.—GENUS INDRIS.

INDRIS is the name given to this genus by the traveler Sonnerat, and the word is said to be in the Malagasay language not the name of an animal, but an exclamation "See here! Look!" which the stranger misapprehended. The natives of Madagascar call the Indris the "Man of the Woods," because of its resemblance, though slight, to ourselves. It is the most highly developed of the family. The head is small, the fore-limbs not much shorter than the hind-ones, and its powerful thumbs, perfectly opposable on all feet to the remaining fingers, are admirable instruments for climbing. The tail is short, the eyes small, the ears hidden in the fur. This fur—thick, almost woolly—covers the

whole body, even the fingers and toes down to the nails. Its dental formula is

$$I. \frac{2-2}{1-1}, C. \frac{1-1}{1-1}, P. \frac{2-2}{2-2}, M. \frac{3-3}{3-3} = 30.$$

The genus contains *five* species, all natives of Madagascar.

THE BABAKOTO.

The BABAKOTO, *Indris brevicaudatus*, was for a long time the only known species. It attains a length of nearly three feet, including eight and a half inches of tail. Its almost hairless face is of a brownish-black color. The head, including the ears, shoulders, arms and hands, are black, the back is brown, the forehead, temples, throat, breast, tail and flanks are white. The creature is so little known that it is not yet ascertained whether these colors change at various ages, or whether they belong to both sexes.

The CROWNED INDRIS, *Indris mitratus*,—perhaps merely a variety—is somewhat smaller; the hair is more silky and the coloring of extraordinary beauty. The naked black muzzle and the cheeks thinly covered with gray hairs are set in a broad, gray, black-bordered frame which running down each side of the face unites at the throat, and joins a spot of dazzling white which dies away on the neck into grayish-white streaks. The ears, shoulders, upper part of the back, and the breast are black; a triangular patch, beginning at the lower part of the back and gradually broadening to the rump, is white; the tail is a reddish cream-color, the feet are light gray.

Sonnerat describes the Babakoto as active and a good leaper; it eats like a squirrel, holding its foot up to its mouth. Vinson, during his passage through the great Alanamasoatrao forest, was almost deafened by its cries, and inferred that it must collect into large bands. The natives reverence it as a holy animal, and believe the souls of their ancestors pass into it at death; hence they consider that the trees on which the Babakoto lives is an infallible cure for all diseases, and use its leaves as a remedy in dangerous cases. They say too that it is dangerous to hurl a lance at it, as the Indris can catch the spear in its flight and hurl it back on the aggressor, and that the mother after birth throws her young one to the male who throws it back again, and when this has been repeated

a dozen times without accident, the little one is taken up and carefully nursed. If, however, it fall to the ground it is left lying.

Pollen says that in certain parts of Madagascar it is trained to catch birds. But these seem "travelers' tales"; the latter seems especially improbable, for if the Indris had been thus tamed, living specimens could have been procured.

II.—GENUS LEMUR.

The name MAKI by which the natives of Madagascar designate this genus is said to be an imitation of the cry it utters. These animals are, of all the Lemuridæ, those whose heads are the most tapering; and therefore it is to them that the denomination of Fox-headed Monkeys is applicable. Buffon called them False-Monkeys. They stand somewhat high on their feet, and take rank, for size, between the Marten and the Fox. Their fur is soft and thick, and their tail long and bushy. They live in forests, and feed chiefly on fruits. Their movements are light and graceful; their voice is a low or a loud growl, according to the nature of their emotions. The female has only one at a birth, and testifies the greatest tenderness for it, keeping it concealed beneath her body, buried in her thick fur, until the period when its hair, having acquired a sufficient length, may efficaciously protect it against external vicissitudes. It is suckled for six months, after which it is left to its own resources.

These animals are sociable, and often collect into numerous bands. They select almost inaccessible places to sleep in; are readily tamed, and even reproduce in captivity. Their dental formula is

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, P. \frac{3-3}{3-3}, M. \frac{3-3}{3-3} = 36.$$

The number of species is *fifteen*.

Pollen gives a description of the habits of one species, the MAYOTTE, which will serve for them all. They live in bands of six to twelve, and travel about in search of their favorite food, the fruit of the Date palm; they are seen by day descending from trees to pick up fallen fruit. No sooner has the sun set than the whole band set up their lamentable cry. When chased by dogs they take refuge in a tree, where they remain with their eyes fixed on their enemy, moving their tails to and fro, and growling. If wounded they defend themselves stoutly, leaping on the dog's

back and biting the ears and neck. The flesh, somewhat resembling that of a rabbit in taste, is considered a great delicacy by the natives.

They endure captivity well. Buffon had a male Maki which was quite tame and a great thief. It used to lick his hand; but if its tongue, rough like a cat's, drew blood, it bit savagely. Another specimen lived in Paris a long time. It was very fond of warmth, and used to go so near the flame as to singe its whiskers; it was cleanly, and careful not to soil its fur, and was very curious and greedy, but kindly to all comers. Every evening it hopped or danced for about half an hour, and then lay down to sleep.

THE RUFFED AND THE BLACK-FRONTED LEMURS.

The RUFFED LEMUR, *Lemur varius*, is one of the largest species of the family, equaling in size a moderately grown cat.

The texture of the fur is extremely fine, and its color presents bold contrasts between pure white and a jetty blackness, the line of demarcation being strongly defined. The visage is black, and a fringe of long white hairs stands out like a ruff round the face, giving to the creature its very appropriate title. Its voice is a deep sepulchral roar, peculiarly loud considering the size of the animal, which can be heard at a great distance.

The ATUMBA or BLACK-FRONTED LEMUR, *Lemur macaco*, and the WHITE-FRONTED LEMUR, *Lemur leucomystax*, are sometimes classed as different species, but Brehm, who has studied them both in captivity, asserts they belong to one and the same species. He says that all the Black-fronted Lemurs he has seen are males, all the White-fronted are females, and that reports from the zoological gardens in London, Cologne, and Rotterdam, and from friends in Zanzibar, state that their experience is the same. A female under his charge brought forth a young one, which showed no sign of blending of color, such as hybrids usually do.

It is a gentle and engaging creature, and not at all shy, even to strangers, unless they alarm it by loud voices or hasty gestures. It is possessed of great agility, climbing trees, and running among the branches with perfect ease, and capable of springing through a space of several yards. So gently does it alight on the ground after its leaps, that the sound of its feet can scarcely be heard, nor can the eye follow its motions. When pursued, it displays incredible activity; it will

suddenly drop from the top of a tree to the underwood and run away before the hunter can realize the fact.

THE MONGOOSE AND THE RING-TAILED LEMUR.

The MONGOOSE, *Lemur mongoz*, is one of the commonest varieties; it measures about three feet, including a foot and a half of tail. The color, dark ash-gray on the back, becomes a grayish-black on the head; a white streak runs from beneath the neck up to the ears; the lower part of the back is light-brown.

The RING-TAILED or CAT LEMUR, *Lemur catta*, is not as large as the *Ruffed Lemur*, measuring only a foot from nose to tail, the tail being eight inches in length. The grace of its form, the beauty of its color, its large eyes, and its long ringed tail, render it one of the most beautiful of the species. It is found only in the Southwest of Madagascar, and lives like its congeners. Its cry, however, is not loud, but resembles the mew-ing of our "harmless, necessary cat." In confinement it becomes familiar, and when it chooses to exhibit its powers, is very amusing with its merry pranks. If several individuals are confined in the same cage, they are fond of huddling together, and involving themselves in such a strange entanglement of tails, limbs, and heads, that until they separate, it is almost impossible to decide upon the number of the animals that form the variegated mass.

The quartermaster of a French corvette possessed one which recognized its master among all the crew; it loved to play with the boys and the ship's dog. It nursed a little monkey as if it had been its own child, and amused itself by pulling the tails of the chickens till they screamed.

The RED LEMUR, *Lemur ruber*, possesses a fur which has somewhat of a woolly aspect, the hair separating into tufts, each of which is slightly curled. It is a beautifully decorated animal, displaying considerable contrast of coloring. The body, head, and the greater portion of the limbs, are of a fine chestnut, with the exception of a large white patch covering the back of the head and nape of the neck, and a smaller one in the midst of each foot. The face, the tail, and paws, are black, as is all the under side of the body. This latter circumstance is most remarkable, as it is almost a general rule that the under parts of animals are lighter in tint than the upper. Around the sides of the face the hair is of a paler chestnut than that which covers the body.

In habits it is similar to the Lemurs which have already been described. Being naturally a nocturnal animal, it passes the day in a drowsy somnolence, its head pushed between its legs, and the long, bushy tail wrapped round its body, as if to exclude the light and retain the heat. Should it be accustomed to be fed during the daytime, it shakes off its slumber for the purpose of satisfying the calls of hunger; but even though urged by so strong an inducement, it awakes with lingering reluctance, and sinks to sleep again as soon as the demands of its appetite are satisfied. Its entire length is nearly three feet, of which the tail occupies about twenty inches. Its height is about a foot.

III.—GENUS HAPALEMUR.

This genus, containing *two* species, is distinguished by a slender body and short limbs, but a tail as long as itself. The head is round and sharp-muzzled, the eyes small, the ears broad and short and hidden in the fur.

The GRAY LEMUR, *Hapalemur griseus*, called by the natives of the Northwest of Madagascar the BOKAMBUL, chooses for its abode thickets of bamboo. During the day it sleeps on the highest shoots, with its head between its legs and its tail over its back. Like all the tribe, it is lazy during the daytime but busy at night; its cry is like that of a pig grunting. Pollen had a captive which differed in no wise from other Lemurs; he remarks that, like some apes, it acquired the bad habit of gnawing its own tail.

IV.—GENUS MICROCEBUS.

The DWARF MAKIS have a compact form, a short head, a roundish muzzle, a tail longer than the body, and the hind limbs not longer than the fore ones. The eyes are large, the ears moderate, thinly covered externally with fine hair, pretty hands and feet, with short fingers but long *tarsi*. The dental formula is

$$I. \frac{2-2}{2-2}, \quad C. \frac{1-1}{1-1}, \quad M. \frac{6-6}{5-5} = 34.$$

Of the *four* species into which the genus is divided, the best known is the *Microcebus myoxinus*, which attains a length of six to eight inches

in the body. The back is a reddish yellowish-gray, with a golden lustre; the lower surface is white. We know very little of it, as its diminutive size and nocturnal habits enable it easily to escape observation. It lives in almost impassable forests, hiding itself during the day in a nest which it builds of straw and dry leaves; at night it roams like its fellows in quest of food, chiefly insects.

V.—GENUS CHEIROGALEUS.

This genus, like the preceding one, is remarkable for the greater roundness of the head, the shortness of the muzzle, and the great size of its eyes; the latter peculiarity indicating more decided nocturnal habits. It contains *five* species. The best known is the *Cheirogaleus Mili*, which measures nearly fourteen inches exclusive of the tail; the fur is tawny on the upper surface of the body, but white beneath. Its legs are very short when compared with the ordinary Lemur. A specimen in captivity made a nest for itself out of hay, in which it slept during the daytime. During the night its movements were ceaseless; it could leap a height of six or eight feet.

One of the species, the *Cheirogaleus murinus* or MADAGASCAR RAT, is the smallest of all the Lemuridæ, its body measuring only six inches in length.

VI.—GENUS LEPILEMUR.

Only *two* species are known. It has a slender body, a small, long, sharp-snouted head, short fore-limbs, moderately long hinder-limbs, and a tail longer than the body. The eyes are of moderate size, the ears large and bare; the white fur which thinly covers the face and hands, and is largely developed on the tail, is rather woolly.

THE WALAWY.

The WALAWY, *Lepilemur furcifer*, is nearly as large as the *Hapalemur*. A brownish-gray is the dominant tint on the back, a sharply marked-off light-gray on the belly; the head and neck incline to red, black stripes beginning on the cheeks, inclosing the eyes, and leaving a blaze on the forehead, unite on the head, and run down the spine to the tail; this

appendage, gray at the roots, is black at the tip. The eyes have the iris black.

Both species are found on the West side of Madagascar. The animals prefer as their abodes hollow trees with two openings, especially if also inhabited by bees. They are much more active than the ordinary Lemur, and their cry is a "kaka kaka ka."

The curious animal, which is known by the name of the DIADEM LEMUR, belongs rather to the Indris than to the Lemurs, but it has been placed by Mr. Bennett in a separate genus, which he names PROPITHECUS. The shoulders and upper part of the back are of a sooty tint, the head darker, the hindquarters pale-brown, the belly nearly white, the paws almost black, the tail nearly white at the tip. The thumbs of the hindlimbs are disproportionately developed, and the face is not so long as in the true Lemurs; the round, tipped ears are hidden in bushy hair, which surrounds the head. The species described is called the *Propithecus diadema*, and seems to be the same as the *Indris* (or *Lechanotus*) *mitratus*.

The species of the *Lemuridæ* already mentioned belong exclusively to that strange African Island, Madagascar. The next sub-family, the *Nycticebinæ*, have a more extensive range.

VII.—GENUS NYCTICEBUS.

The SLOW LEMURS (Plate III) are found from East Bengal to China, Borneo, and Java. *Three* species are known. These rare denizens of the forests have not been much observed in their life of freedom, but they have been repeatedly brought to Europe. They creep very slowly, and seldom take more than two steps erect; even in climbing, their slowness is remarkable. By day their eyes lose their lustre, but they see admirably by night. Their hearing is very acute; the slightest motion of a beetle wakens them from their sleep.

THE KAKANG.

The SLOW-PACED LEMUR, *Nycticebus tardigradus*, called by the natives the KAKANG, has a fur of a woolly texture, and of a chestnut tinge. A dark stripe surrounds the eyes, ears, and back of the head, reaching to the corners of the mouth, and running thence along the entire length

of the spine. The color of this dark band is a deep chestnut. The animal is a little more than a foot in length.

In the formation of these creatures some very curious structures are found, among which is the singular grouping of arteries and veins in the limbs.

Instead of the usual tree-like mode in which the limbs of most animals are supplied with blood—one large trunk-vessel entering the limb, and then branching off into numerous subdivisions—the limbs are furnished with blood upon a strangely modified system. The arteries and veins, as they enter and leave the limb, are suddenly divided into a great number of cylindrical vessels, lying close to each other for some distance, and giving off their tubes to the different parts of the limb. It is possible that to this formation may be owing the power of silent movement and slow patience which has been mentioned as the property of these lemurs, for a very similar structure is found to exist in the sloth.

The tongue is aided in its task by a plate of cartilage, by which it is supported, and which is, indeed, an enlargement of the tendinous band that is found under the root of the tongue. It is much thicker at its base than at the extremity, which is so deeply notched that it seems to have been slit with a knife. It is so conspicuous an organ that it has been often described as a second tongue. The throat and vocal organs seem to be but little developed, as is consistent with the habits of an animal whose very subsistence depends upon its silence. Excepting when irritated, it seldom or never utters a sound; and even then, its vocal powers seem to be limited to a little monotonous plaintive cry.

All its motions are exceedingly slow, but it possesses one skillful faculty which no other animal exhibits: it can climb slowly step by step backward up a pole placed nearly perpendicularly.

VIII.—GENUS LORIS.

There is only *one* species of this small, tailless, nocturnal Lemur, which inhabits Madras, Malabar, and Ceylon. It is called the BENGAL LORI, *Loris gracilis*. In Ceylon the natives call it Teivangu, or “the creeper.” The best account of it is given in Tennant’s work on Ceylon. “I possessed a living Teivangu which lived for some time; it ate rice, fruits, and leaves, but preferred ants and insects. It was very greedy for

milk and the flesh of birds. It can catch birds more easily than one would suppose from its appearance. The natives affirm that at night it will attack peacocks, choke them, and then suck the brains of its prey. My prisoner slept all day in a most peculiar attitude. He seized his perch with all his hands, gathered himself up into a hairy ball, and hid his head between his legs. The large and brilliant eyes of the Loris have attracted the attention of the Cingalese; they make amulets and love-charms from them, and hold the poor creature in the fire till its eyeballs burst."

The Loris is a small animal, measuring only nine inches in length; its limbs are very slender, the muzzle is abruptly sharp and pointed, the color is a rusty-gray, somewhat darker round the eyes, and a white streak runs down the nose. The absence of a tail is strikingly noticeable.

Wood gives an animated description of the mode in which it captures its prey. "The color of its fur is such that the dark back is invisible in the obscurity of night, and the white breast simulates the falling of a broken moonbeam on the bark of a branch. Its movements are so slow and silent that not a sound falls on the ear.

"Alas for the doomed bird that has attracted the fiery eyes of the Loris! No Indian on his war-path moves with stealthier step or more deadly purpose than the Loris on its progress toward its sleeping prey. With movements as imperceptible and as silent as the shadow on the dial, paw after paw is lifted from its hold, advanced a step and placed again on the bough, until the destroyer stands by the side of the unconscious victim. Then, the hand is raised with equal silence, until the fingers overhang the bird and nearly touch it. Suddenly the slow caution is exchanged for lightning speed, and with a movement so rapid that the eye can hardly follow it, the bird is torn from its perch, and almost before its eyes are opened from slumber, they are closed forever in death."

IX.—GENUS PERODICTICUS.

This is another genus containing only *one* species, the POTTO, *Perodicticus Potto*, a small Lemur with almost rudimentary forefinger found at Sierra Leone on the West Coast of Africa. The Potto has a slender body, roundish head, projecting muzzle, moderately large eyes and small ears; the arms and legs are nearly of the same length, the hands and feet large. The short fur is of a reddish-gray mixed with black, redder on

the head and limbs, mouse-color on the shoulders, and a grayish-red on the tail; its total length is about fourteen inches, the tail being about three inches.

Mr. Sclater writes of two specimens in the Zoological Gardens in London: "Our Pottos never voluntarily appear by daylight, but come out early in the evening for their food; they are then very active and leap about the perches of their cage all night long. Their food is ripe fruit of all kinds, cooked rice, milk and bread sweetened, and cooked meat chopped fine. They catch very cleverly little birds that are put in their cage, and tear them to pieces at once; they seem to be delighted with such a change of diet."

X.—GENUS ARCTOCEBUS.

The ANGWANTIBO, *Arctocebus Calabarensis*, the only species, is a native of Old Calabar. It is remarkable for the total absence of the forefinger, for the possession of a long claw on the first toe, and for an almost rudimentary tail. A thick and long woolly fur—somewhat shorter on the face and the backs of the paws—covers the body. It is of a brownish-gray on the back, but on the lower surface of the body and on the inner side of the limbs it is dark-brown.

Although the Angwantibo has been known since the year 1680, little has been ascertained respecting its habits.

XI.—GENUS GALAGO.

This solitary genus of the sub-family GALAGINÆ comprehends *fourteen* species, all found in Africa from Senegal to Zanzibar and Natal. While the Lemuridæ hitherto described are remarkable for the development of the power of sight, the Galagos are distinguished by the acuteness of their hearing. The body is slender, but looks stouter from its possession of a thick fur; the comparatively large head is remarkable for the largely developed naked ears, and by the close-placed large eyes. The limbs are of moderate length, the forefinger, the second toe, and in some species the middle finger and toe as well, are furnished with claw-like nails. The tarsus is elongated, the tail bushy. The dental formula is

$$I. \frac{2-2}{3-3}, C. \frac{1-1}{1-1}, P. M. \frac{3-3}{2-2}, M. \frac{6-6}{3-3} = 42.$$

The Galagos are strictly nocturnal animals, creatures whose sun is the moon; during the day they lie rolled up in a shady corner, and if by chance they are prevented from finding a spot obscure enough, they hide their head from the hated sunlight, and contract their ears to deaden every sound. If violently awakened from their sleep they stare dreamily about them, and exhibit signs of annoyance at having been disturbed. As soon as twilight spreads over the forest they rouse themselves, open their eyes, unroll their huge ears, and leave their lurking-places. Their life is that of a beast of prey with an insatiable thirst for blood, and a love for slaughter unexampled in the *Quadrupana*. Endowed with eyes as sharp as the lynx, ears as acute as the bat, with powers of scent like the fox, and the agility of the monkey, they are persevering in their attacks, and a terrible foe to smaller creatures.

THE MOHOLI AND THE KOMBA.

This species—*Galago Moholi*, (or *Otolicnus*)—attains a length of eight inches in the body and ten inches in the tail. Its short, thick, silky fur is dull gray, with a faint tinge of red on the head and back; the belly and inside of the limbs is yellowish-white, and the same color appears on the cheeks and a stripe running down between the eyes to the end of the nose. It has been found in Senegal and eastward in Kordofan. The natives call it *Tendj*, and say that it is an ape transformed to a lower shape on account of its sleepiness. It is usually found in pairs, and lives in the forests of mimosa. Startled by the traveler the creatures climb quickly up the trees but do not take flight; they remain there quietly watching and listening. They make long springs from bough to bough and seem not to regard the stiff prickles of the tree. By night their eyes gleam like burning coals. In captivity they display great liveliness. When they go to sleep the ears wrinkle and contract, and then the point turns over and in, till the whole ear is almost invisible. They can contract the face into strange grimaces like some of the apes.

The *Galago agisymbanus* is somewhat larger, attaining a length of from eight to twelve inches. The prevailing color is yellowish-gray, darker on the muzzle and the hands, becoming a grayish-white on the chin and cheeks. The tail, a brownish-red at the roots, is dark-brown at the tip.

The natives of Senegal capture these animals by taking advantage of their fondness of palm-wine; its sweetness attracts them, the spirit in

it intoxicates them, and the little lemur falls down from the tree and lies in a drunken sleep, to awake a prisoner. It is not difficult to tame, and soon learns to eat bread and milk, and to appreciate tea and coffee, well sweetened. But flesh is always its favorite food, and it displays immense energy in hunting mice. If its master visit it at night, it shows great attachment, and allows himself to be handled and stroked.

THE GIANT GALAGO.

The *Galago crassicaudatus* is the largest species, being nearly the size of a rabbit. Its hair is thick and woolly, its tail bushy. The top of the head is reddish-brown, the back grayish-russet, the belly gray or yellowish-white, the tail a brownish-red.

It extends over a large part of Southern Africa on the Mozambique coast. Its habits differ in no respect from those of its kindred. It sleeps all day, and is active all night. It sleeps rolled up with its head between its fore-legs, its bushy tail is then brought forward and kept in its position by the hind-legs, which are stretched out as far to the front as they will extend. The head is thus entirely covered. On waking it cleans its coat, and then begins to climb. Its movements are slow and careful, its steps quite inaudible, the fingers are spread out widely, the tail trails on the ground. It casts hungry glances at living birds, but in captivity will eat bread or fruits, which it sometimes takes squirrel-fashion in its hands. It is good-tempered and has a sagacious look in its pretty brown eyes.

THE TARSIIDÆ.

This family is represented by only *one* genus which contains but *one* species. It derives its name from the great length of the hinder feet, in which the tarsus is elongated. The tail is very long and possesses a tuft at the tip. Its dental formula is that of the genus *Lemur*, but the lower incisors are oblique.

THE SPECTRE TARSIER.

This most extraordinary-looking animal, the *Tarsius spectrum*, (Plate III) is a native of Borneo, the Celebes, the Philippine Islands and Banca. The head would be round if a short muzzle did not protrude; the face is

uncommonly broad, the mouth opens as far back as the eyes, and the lips are thick. The eyes are immense owl-like eyes, quite out of proportion to the size of the animal. They literally occupy the greatest part of the face and are close together. The ears are no less peculiar; they are like large broad spoons. The neck is scarcely to be distinguished, the shoulders are high, the breast narrower than the back. The fore-legs are remarkable for their shortness, the hinder ones for their length. The hands are very long in proportion to the arms, the middle finger is almost thrice the length of the thumb, which again is less than the little finger, and the tips of all the fingers have large cushions like balls. The thighs are powerful and thick, the lower leg thin, the tarsi dried up and fleshless. The color is a yellowish-gray, flecked with reddish-brown, the tuft on the tail is yellow, a stripe of deeper hue surrounds the back of the head, and the face and forehead have a warmer tint than the body. It lives in trees and skips about with short leaps like a frog.

The natives regard the Spectre tarsier as an enchanted animal, and affirm that it was once as large as a lion; they fly at once from their fields when one of these creatures is seen on a neighboring tree. In captivity it is cleanly, particularly in its food; it never tastes anything half-eaten, or drinks twice from the same water. Propped up on its thin legs and bare tail, with its enormous yellow eyes, it looks like a dark-lantern on a tripod.

THE CHEIROMYIDÆ.

This family consists of a species which must be considered the most extraordinary which is known to naturalists. It is a specialized form of the Lemuroid type, and like the Lemurs belongs to that isle of wonders—Madagascar.

THE AYE-AYE.

The AYE-AYE, *Cheiromys Madagascariensis*, (Plate III) was first seen about one hundred years ago. It was unknown at that period to the people of Madagascar, and the name of Aye-Aye given to it by Sonnerat, was due to the exclamation of the natives of that island when this traveler showed it to them for the first time.

For a long time it was undecided what place to assign to the Aye-Aye among the Mammalia. This indecision arose from ambiguous organic

characteristics in this quadruped, some of which pertain to Rodents and others to the Makis. At first sight, the Aye-Aye shows some striking points of resemblance to the Squirrels: it has their general form, the long bushy tail, and especially their dentition. It has, in fact, no canine teeth, but possesses, in front of its jaws, a pair of strong incisors, isolated from the molars by a vacant space, similar to the gap occurring in the Squirrels and all animals belonging to the Order of Rodentia. But, on the other hand, the large size and rounded form of its head, indicative of a voluminous brain, the conformation of its limbs, the length of the digits, and the opposable thumb in the posterior members, the complete state of the bony circle of the orbit, as in the majority of Quadrumana, the existence of only two mammae in the female, are characteristics which assimilate the Aye-Aye to the Makis, and ought definitively to cause it to be ranked in the Quadrumana.

But it may be observed as a marked difference between this animal and all the other Quadrumana, that in the Aye-Aye the milk-giving organs are placed on the lower portion of the abdomen, and thus a great distinction is at once made between this creature and the true Quadrumana. Indeed, there are so many points of discrepancy in this strange being, that it is difficult to make it agree with the systematic laws which have hitherto been laid down, and naturalists have placed it in one order or another, according to the stress which they laid on different points of its organization.

After its discovery in 1782, so little was heard of the Aye-Aye that many writers described it as extinct. But further news of it was heard in 1844, when De Castelle forwarded the skeleton and hide of one to Paris. This remained the only specimen in Europe, till 1862, when the Zoological Society of London received one alive. Since then several of them have been sent to various collections in Europe. From the time of Cuvier down to Giebel in 1859, most writers classed it among the *Rodentia*, but Owens and Peters have clearly established its right to the rank of a family; according to them its dental formula is

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{0-0}, M. \frac{2-2}{2-2} = 18,$$

for its first set of teeth, but for the permanent set,

$$I. \frac{2-2}{2-2}, C. \frac{0-0}{0-0}, P. M. \frac{1-1}{0-0}, M. \frac{3-3}{3-3} = 22.$$

The Aye-Aye is characterized by the following marks: The head is large, the neck short, the body powerful, the tail as long as the body. The limbs are of the same length. The eyes are small in comparison with the head, the ears very large. The elongated fingers and toes are remarkable. The thumb is strong and short, the index-finger weaker, the third finger as thick as the thumb, the little finger very strong, while the long middle-finger seems dried up. The tarsus is moderately long, the big-toe like the thumb, the other toes all of the same length. The face is of a reddish-gray with dark rings round the eyes and a light patch over them; the gray color continues on the cheeks and throat; elsewhere the color is a brownish-black sprinkled with white and with gray reflections. The adults reach the length of twenty-seven inches, of which more than half belongs to the tail.

Pollen in 1863 published an account of the creature's habits. "This remarkable beast lives in the bamboo forests of the interior of the island. The natives say it is so rare as to be seen only by accident; it lives alone or in pairs, never in bands, is seen only at night and sleeps by day in the densest thickets. It feeds on the sap of the bamboo and sugar-cane, as well as on beetles and larvæ. To get its food, it gnaws, with its strong incisors, an opening into the stem of the plant, and through it inserts its attenuated middle-finger, and brings out the insects or the liquid. At sunset it comes out and searches every opening, cleft or hollow in the trees, but at the approach of dawn hides itself in the thickest recesses. Its cry, a loud grunting, is often heard in the night."

The extraordinary character of the whole of the Lemuridæ, and their confinement to the island of Madagascar, has excited much attention. Geologists inform us that remains of Lemuroids have been found in the Eocene deposits in France, while in North America Mr. Marsh recognizes no less than twelve genera of extinct Lemuroids. The European forms are most allied to the West African group, the American to the Marmosets. Hence even in the Tertiary deposits we have not yet got far enough back to find the primeval type from which all the Primates spring.

Mr. Wallace considers that there is evidence for belief that in early Tertiary times a continuous sea from the Bay of Bengal to the British Islands isolated Southern and Central Africa, which continent extended as far as Southern India and Ceylon. During this period the higher types of Mammalia were absent, and lemurs, edentata, and insectivora

took their place. He adds that while there is every reason to negative a union between Africa and America, yet a moderate extension of their shores to each other is not improbable, and this with large islands in the place of the Cape Verd group, St. Paul's Rocks, and Fernando Noronha, would suffice to explain the amount of similarity that actually exists.



ORDER II.

CHEIROPTERA.

I.—FRUGIVORA.

9. PTEROPIDÆ - - - - FRUIT-EATING BATS.

II.—INSECTIVORA.

10. PHYLLOSTOMIDÆ - - - - LEAF-NOSED BATS.

11. RHINOLOPHIDÆ - - - - HORSE-SHOE BATS.

12. VESPERTILIONIDÆ - - - - TRUE BATS.

13. NOCTILIONIDÆ - - - - DOG-HEADED BATS.

A decorative title 'CHEIROPTERA' enclosed in a rectangular border with floral and leaf patterns. The letter 'C' is particularly large and ornate, featuring a small floral design within its curve. The rest of the letters are in a bold, serif font, also with some decorative elements.

CHAPTER I.

THE ORDER OF CHEIROPTERA—SUPERSTITIOUS DREAD OF BATS—THEIR USEFULNESS—THEIR FLYING APPARATUS—THEIR GENERAL CHARACTERISTICS AND HABITS—THE GENERA OF THE ORDER.

WE have hitherto been describing strange creatures which are not native to our country, and of which living specimens are seen by us only as prisoners in the cages of menageries, or as beggars accompanying some itinerant organ-grinder. The order of which we are now about to treat is one of which some of the members are well known to all our readers. In the summer days, as the sun declines, the bats begin to come out from the recesses where they have hidden themselves from the garish light of the sun. As the darkness deepens their numbers increase, and when night has come they are all busy, wheeling in their strange intermittent flight, as they pursue their insect prey. They seem to be half birds and half mammals, and to form a link between these classes. For a long time, indeed, they were regarded as birds. Moses describes them as "fowls that creep, going upon all fours," and adds that they are to be "an abomination." Aristotle defines bats to be birds with wings of skin, and his authority gave currency to this view of their relationship till comparatively modern times. The bats, however, have no other resemblance to birds than that they can fly.

But while philosophers agreed in calling the bats birds, the uneducated classes, who knew nothing of theory and were guided by their own observations, seem everywhere in Europe to have regarded them in their true light, as a form of mammal. The French name them "the bald shrew mouse"; the Spaniards, the "blind mouse"; to the German they are "fledermäuse"; to the English peasant, the "flittermouse," or the mouse that flits or flutters.

The dark dwellings of the bats, the strange, mouse-like body, the leathern wing, the melancholy squeak, the repulsive look, give to them a mysterious character. While good spirits appear with the wings of a dove, evil demons are, in popular superstition, provided with the wings of the bat; and fabulous creatures like dragons or griffons are supposed to bear themselves through the air on bat-like wings. Such views, instilled in childhood on uneducated people, have produced a hatred against a set of creatures which have claims for our protection, and which certainly do more good than harm, by continuing in the twilight the work of the swallow and keeping down the crowd of insect pests.

The wild superstitions connected with the name of Vampire deserve a longer notice. An eloquent writer has remarked: "Of all the creations of superstition a Vampire is perhaps the most horrible. You are lying in your bed at night, thinking of nothing but sleep, when you see by the faint light that is in your chamber, a shape entering at the door and gliding toward you. The thing moves along the air as if by the mere act of volition; it has a human visage and figure. The eyes stare wildly from the head; the hair is bristling; the flesh is livid; the mouth is bloody.

"When you awake in the morning you think it is all a dream, until you perceive a small, blue, deadly-looking spot on your chest near the heart. You say nothing of the matter, but you know you are a doomed man. Every night the shape returns, and, with a face horrified at itself, sucks your life-blood in your sleep. You pine and droop and languish till you die. When dead you yourself become a Vampire and create fresh victims, who, dying in turn, add to the phantom stock."

This belief that the dead body is sometimes animated by a demon who caused it to rise from the grave and behave like a mosquito, is very prevalent in the Southeast of Europe. Greece seems to have been its cradle, but it is still widely spread and firmly held in the countries bordering on Greece.

From about the year 1727 to 1735 there was an epidemic of Vampirism in Servia and Hungary. People died by hundreds under the belief that they were killed by phantoms. Commissions were appointed to investigate the matter, and the graves of alleged Vampires opened; the bodies were found undecomposed, with fresh skin and nails growing, with florid complexions, and blood in the chest. Voltaire tells us that "Vampires can be brought to reason only by being burnt when they

are caught; but the precaution must be taken not to resort to this measure till the heart has been torn out." An old German writer describes the execution of a Vampire: "When they opened his grave, after he had been long buried, his face was found with a color, and his features made natural movements as if the dead man smiled. He even opened his mouth as if he would inhale air. They held a crucifix before him and called, 'See, this is Jesus Christ, who redeemed your soul from hell.' Upon this tears began to flow from the dead man's eyes. Finally, when they proceeded to hack off his head, the corpse uttered a screech and turned and rolled just as if it had been alive." In fact the superstition caused the murder of a sufferer from trance.

Allusions to the belief are common in Byron:

But first on earth as Vampire sent,
Thy corse shall from its tomb be rent,
Then ghastly haunt thy native place,
And suck the blood of all thy race,
Yet loathe the banquet, which perforce
Must feed thy livid, living corse.

He refers for further particulars to Southey's notes on "Thalaba," and adds that the stories told in Hungary and Greece of these foul feeders are most incredibly attested.

Undoubtedly the application of this name Vampire to the blood-sucking bats of South America has increased the aversion with which all the order is regarded.

The Cheiroptera increase both in number and variety as we approach the tropics. In the torrid zone they come out by thousands. In Central and South America they people the twilight of the primeval forests, they live in hollow trees and in rocks, and wage relentless war on the tribes of insects. The traveler sees them by daylight hanging from the trees, by night they are found in the midst of the forests as well as on the banks of the rivers. In Southern Asia the swarms of bats literally darken the sky when evening comes. "The bats," writes Tennant, "form a decided feature in the evening landscape in Ceylon. They are found in crowds in every hollow, in every underground passage, in the galleries of fortresses, under the roofs of houses, in the ruins of every temple. When night has come and the lamps are lit they appear, flutter around the table, and catch their prey by lamp-light." Nor are they much less

numerous in the South of Europe, where the ruined edifices which abound in Italy, Greece, and Spain, send forth whole armies. They are quite as numerous occasionally in our own country. In a building in Maryland nine thousand six hundred and forty bats by actual count were destroyed by new tenants who entered the house after it had remained for some time unoccupied.

The scientific name given to this peculiar order of creatures is CHEIROPTERA; a word compounded of the Greek word *cheir* "a hand," and *pteron* "a wing," and expressive of the fact that they are mammals with winged hands.

This winged hand deserves our careful notice. All the fingers of the hand, with the exception of the thumb, which is short, has a nail, and is quite free, are immoderately long, and united by means of a transparent membrane, which is without hair. This membrane covers also the arm and fore-arm, and is nothing else than a prolongation of the skin of the flanks. It is composed of two very thin layers, one a continuation of the integuments of the back, the other that of the abdomen. It also extends between the posterior limbs, where it is more or less developed, according to the species, and there takes the name of the interfemoral membrane; but it never reaches the toes of the feet, which are short, and have nails.

It is owing to this membranous sail that Bats direct their course through the air in the same manner as Birds. When they are at rest, they fold their wings around them, enveloping their bodies as if in a mantle, just as we close an umbrella. The short, free thumb takes no part in extending the leathern wings, but it has to supply the place of fore-limbs when the bat is climbing or clinging. The foot has one striking peculiarity; it has a bone which is confined to the Cheiroptera. This spur-bone springs from the heel, and serves to stretch the membrane between the leg and the tail.

The nose in all varieties of the Cheiroptera is highly organized. Not merely are the nostrils well opened, and capable of being closed or distended by peculiar muscles, but many families have in addition most extraordinary nasal appendages.

The ear too is equally complex; it consists of a very large cochlea, which is susceptible of very easy motion. There exists too a large, movable, variously formed flap, the *tragus* or ear-cover, which serves to close the auditory canal and exclude sounds which the bat cannot endure,

or enables it to hear the lightest rustle. In fact bats hear the insects flying past them at a considerable distance, and this sense of hearing guides them in their course. Cruel experiments have been made to demonstrate this fact, and it has been found that the bat's flight becomes wild and uncertain when the ear or tragus is removed.

Their powers of sight and taste are less developed. But it is to a very exceptional delicacy of touch that must be attributed the ease with which bats fly about in their dark retreats without striking against the angles, rocky projections, or other objects. Spallanzani instituted experiments which were decisive in this respect. The celebrated physiologist destroyed the vision of several specimens, and on leaving them alone he saw them fly around the room without betraying the slightest hesitation, or without striking their heads against the furniture or the ceiling; in a word, without the deprivation of sight having changed in the slightest degree their condition of existence.

This fact induced Spallanzani to declare that bats are endowed with a sixth sense, which informs them of the proximity of solid bodies. But such an explanation is unnecessary. When we are aware of the prodigious sensibility of the tactile organs in these animals, we may admit that they are affected by certain movements of the air which are imperceptible to us, and that bats can thus be rendered conscious of the proximity of a body by the obstruction to the eddies and currents of air displaced by them in their flight.

The hair with which the bat tribe is furnished, is of a very peculiar character; and although closely resembling the fur of a rat or mouse when seen by the unaided eye, is so unique in aspect when seen under a microscope, that a bat's hair can be detected almost at a glance. Each hair is covered with very minute scales, which are arranged in various modes around a central shaft.

As might be expected from their structure, most of the bats walk very badly, all slowly and clumsily. Its mode of progression is as follows: The bat thrusts forward one of the fore-legs or "wings," and either hooks the claw at its extremity over any convenient projection, or buries it in the ground. By means of this hold, which it thus gains, the animal draws itself forward, raises its body partly off the earth, and advances the hind leg, making at the same time a kind of tumble forward. The process is then repeated on the opposite side, and thus the creature proceeds in a strange and unearthly fashion, tumbling and staggering along as if its

brain were reeling from the effects of disease. It steers a very deviating course, falling first to one side and then to the other, as it employs the limbs of either side.

In their general form the Cheiroptera resemble the *Quadrupana*, and like the latter the female has two teats. Their internal structure is peculiar, the skeleton is slightly but strongly built, the bones never have air-cavities as birds have, the vertebræ are broad and short, the ribs long, the legs very slender, the collar-bone and shoulder-blades thick and strong. The extraordinary development of the skin makes these creatures look larger than they really are, and in some species its immense growth in the nose and ears gives them their peculiarly repulsive look.

All the Cheiroptera sleep by day. They suspend themselves head downwards by the hind feet, frequently clinging to each other in compact masses.

In cold and temperate regions bats hibernate. They are then absolutely insensible, and may be handled, shaken, and even thrown in the air, without betraying the least movement. But if they are held for some time in the hands, or near a fire, under the influence of the heat they rapidly show signs of animation.

During the period of torpidity the vital functions are executed feebly, but they are not altogether abolished. They cannot dispense with nourishment during this portion of their existence, but as they are incapable of taking food, they devour their own substance, the fat that has accumulated in their bodies during the period of activity. In this way is explained their emaciation at the termination of their winter sleep.

Professor Owen writes: "The preservation of life in this passive state is due to the irritable property of the fibre of the heart, which is excited to contract by the blood in its carbonized state. The slow circulation of venous blood is the only recognizable vital act during hibernation, and the material conveyed by the absorbents is sufficient to counterbalance the slight waste. The bat is thus independent of supplies from without, but it purchases that independence by a temporary abrogation of its vital functions. Cold, senseless, motionless and asphyxiated, its entry into death's chamber is prevented only by its being brought to his very door."

Bats usually have only one offspring at a time. As soon as brought forth, the mother carefully cleans it, envelops it in her wings as in a

cradle, and holds it pressed against her breast to receive its first nourishment. After some days, the youngster can hang by the claws of its hind feet to the fur of the mother, and it is not rare to see her flying about with this strange burden. When, exceptionally, the progeny are double, then the winged nurse carries both in her aerial voyages.

The bats are a very difficult study, and it is quite uncertain how many distinct species are really known. The genera too are exceedingly numerous, and are in a very unsettled state, while the synonymy is exceedingly confused. We shall commence by dividing them into five families, the PTEROPIDÆ, or fruit-eating bats; the PHYLLOSTOMIDÆ, or leaf-nosed bats, among which the blood-sucking Vampire is found; the RHINOLOPHIDÆ, or horse-shoe bats; the VESPERTILIONIDÆ, or common bats, and the NOCTILIONIDÆ, or short-headed bats. We will mention their range of distribution under each family.



CHAPTER II.

THE FRUIT-EATING BATS OR FLYING FOXES—THE KALONGS—THE LEAF-NOSED BATS OR VAMPIRES.
—ORIENTAL SUPERSTITIONS—THE HORSESHOE BATS—THE RHINOPOMA.

THE Fruit-eating Bats or FLYING FOXES, *Pteropidæ*, are pretty evenly distributed over the tropical regions of the Old World and Australia. They range over all Africa and the East of Asia northward to China and the South of Japan. They are found also in Australia and Tasmania, and in the Pacific islands as far east as Samoa; but do not occur in New Zealand or the Sandwich Islands.

Naturalists have divided the *Pteropidæ* into *nine* genera and *sixty-five* species, but an account of them all would be wearisome. We shall therefore confine our notice to a few species of the most characteristic genus, the PTEROPUS, from which the family derives its name.

THE KALONG.

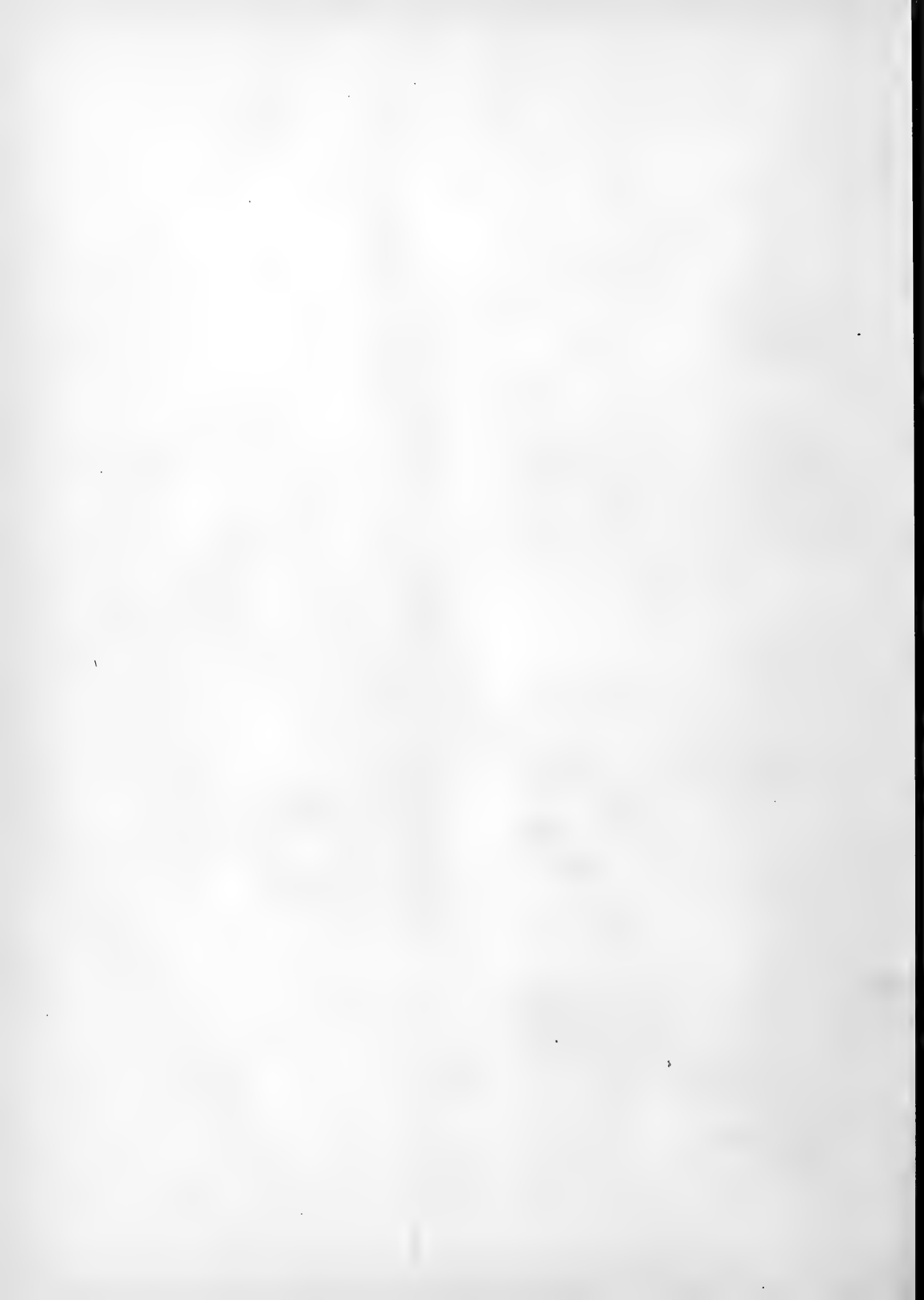
This species, the FLYING FOX or KALONG of English travelers, *Pteropus edulis*, is the largest member of the order, and sometimes attains the size of a squirrel, with wings measuring four feet across. It has a muzzle somewhat like a dog's, pretty large, naked and pointed ears, and a highly developed flying membrane, which, however, between the hind legs is reduced to a narrow strip. It has no tail. Its dental formula is

$$I. \frac{2-2}{2-2}, \quad C. \frac{1-1}{1-1}, \quad M. \frac{5-5}{6-6} = 34.$$

The color of the back is a deep brownish-black, that of the belly reddish-black, the head and neck of a reddish-brown.

It is found chiefly in the islands of the East Indian seas, and frequents the numerous orchards which surround the native villages, especially preferring the trees of the Durian, a fruit which Wallace says it is worth a voyage to the East to eat, so exquisite is its flavor. By day the Kalongs







COMMON BAT VAMPIRE BAT HORSESHOE BAT FRUIT EATING BAT
 COMMON BAT
 DOG HEADED BAT

PLATE IV. CHEIROPTERA



hang on the branches by hundreds and thousands and millions. By night they fly in bands so large that hours are required for the whole body to pass an observer.

Their food is fruit, chiefly the various kinds of figs and the mangoes; but occasionally they have been seen to eat little fishes, which they catch when they leap out of the water. The damage these enormous troops of creatures do is incalculable; but the natives pursue them less to restrain their depredations than to obtain a dainty for their kitchens. "At Batchian," Wallace writes, "these ugly creatures are considered a great delicacy and are much sought after. At about the beginning of the year they come in large flocks to eat fruit, and congregate during the day on some small islands in the bay, hanging by thousands on the trees, especially on the dead ones. They can be easily caught or knocked down with sticks, and are brought home by basketfuls. They require to be carefully prepared, as the skin and fur have a rank and powerful foxy odor. They are generally cooked with abundance of spices and condiments, and are really very good eating—something like hare."

The Kalongs are not the redoubtable animals represented by early travelers, who had the privilege of becoming first acquainted with them. These explorers allowed themselves to be imposed upon by their extraordinary dimensions, and their descriptions of them are ridiculous exaggerations. The truth is that the Kalongs never attack any animal, even the feeblest. They may, it is true, in the absence of their ordinary aliment, eat insects, but this is a rare exception; and they are only to be dreaded by man for the injury they do his gardens. Divers artifices are therefore resorted to, to prevent such destruction. For this purpose, in Java the fruit-trees are covered with network or wickerwork made with bamboo slips.

Another species, the *Pteropus Edwardsi*, is found in India and Madagascar. It is much less than the Kalong, and differs from it slightly in color, having on the back a broad stripe of yellowish-gray. It has been often brought to Europe, and Brehm has given an account of the behavior of a pair of them in captivity. They seemed to live in perfect harmony, and allowed themselves to be handled and stroked by those they knew; strangers they did not like, even of their own species. The Berlin Thiergarten was the scene of deadly combats between the flying foxes; difference of sex made no difference in the ferocity of the combats, in which one or both usually died from the bites

inflicted by the enemy. Even with the utmost care they rarely live long in confinement. Flight seems a necessity of their well-being, and, when kept prisoners, they contract ulcers on the wings and soon perish. Yet some specimens lived and produced young in the London Zoological Gardens, and Brehm's couple lived over two years in a cage.

The bats which belong to this genus are remarkable for the fact that they possess fewer vertebræ than any other known mammalian animal. In the entire spinal column, there are but twenty-four of these bones; this paucity of number being caused by the entire absence of a tail.

THE LEAF-NOSED BATS.

The PHYLLOSTOMIDÆ, or simple leaf-nosed bats, are found from Mexico and the Antilles to the southern limits of the forests east of the Andes and in Chili. One species, closely allied to the Mexican form, is found in California; and the Vampires, of which such terrible tales are told, belong to this family. The family has been divided by various naturalists into five groups; it is sufficient for us to say that it embraces *thirty-one* genera and *sixty* species. We will mention only the genera *Phyllostoma*, *Desmodus*, and *Macrotus*.

The members of this family are chiefly characterized by two nasal leaves, one in the form of a horseshoe, situated above the upper lip; the other disposed in the shape of a lance, and placed above the first. They have the mouth widely cleft, the tongue studded with horny papillæ, and in each jaw a pair of strong canine teeth, which project beyond the lips. They are of medium size, their hair is short and lustrous, and their interfemoral membrane is more or less developed, according to the genera; the tail varies in length, or is altogether absent, as the species differ.

It is probable that all the leaf-nosed bats are blood-suckers, but only under certain circumstances. Hence we have very conflicting accounts.

The naturalist Azara, who observed a large number of these American bats, has afforded us valuable information concerning their habits. It is usually on the croup, shoulders, or neck, that they bite beasts of burden, because there they find a secure resting-place. The wounds they inflict are neither extensive nor deep, but are small incisions made by the horny papillæ with which their tongue is armed, and which only puncture the

skin. The blood, therefore, with which they gorge themselves comes, not from the veins or arteries, but from the capillary vessels of the skin. They sometimes attack sleeping poultry, and bite them on the crest or the other appendages which decorate their heads. Most frequently gangrene of the wound supervenes in these subjects, and death follows.

Azara fully confirms their sanguinary proclivities with regard to man, having himself on several occasions experienced their effects. At four different times this naturalist had his toes bitten when he was obliged to sleep in the open air. But the sensation was so painless that he did not awake, and knew nothing of his mishap until morning. He suffered from the effects of these wounds for some days, although he did not think it necessary to pay any attention to them.

The same traveler adds that they do not live on blood except when insects are scarce. He also gives an opinion, but without mentioning it as his own, or expressing his belief in it, but which is credited by the natives, that in order to lessen the sensation of pain in their victims, these animals fan with their wings the part they are about to wound.

Humboldt writes: "During the cool long night the cattle and horses cannot rest; for monstrous bats suck their blood while they sleep, or fasten themselves to their backs, causing suppurating wounds in which flies and insects settle. The bats which bit our dogs had long tails like the Molossi, but I believe they were the leaf-nosed varieties which possess a tongue that is a real sucking machine. The wounds were small and round; the dog howled from fear rather than pain. Still I have slept many a night under the open sky without being bitten. The bite is not dangerous, and the pain so slight that the bat is off and away before the sleeper awakes." Rengger states "that the wounds are a quarter of an inch in diameter and about two lines deep, never reaching the muscles, and showing no traces of teeth. The loss of blood is about three ounces from each wound." Burmeister, however, says that the loss of blood is very slight, and that he never knew of any man being attacked, or any animal dying of the wound. Hensel tells us that in Rio de Janeiro the stables require to be furnished with lamps and punkas to keep the bats from the horses. He does not attribute blood-sucking propensities to all the leaf-nosed bats. "Most of them have teeth like Carnivora, and produce wounds resembling those inflicted by beasts of prey; but the wounds caused by the blood-suckers are quite different; they seem to be produced by raising up the skin and then severing it by a horizontal cut. Hence

numerous capillary vessels of the skin are divided, and an abundant, long-continued bleeding results. Such wounds can only be effected by peculiar organs such as the genera *Desmodus* and *Diphylla* are endowed with."

Waterton, in his travels in South America, writes: "In the morning I heard my friend Tarbot swearing in his hammock. 'What's the matter?' I asked; 'Anything wrong?' 'The matter!' he replied; 'the bats have sucked me to death.' I found on examination that the bats had attacked his great toe; the wound was less than the bite of a leech. I conjecture that my friend lost twelve ounces of blood."

Bates, who lived eleven years in Brazil, was once bitten. His narrative of a night in a South American forest is not very cheering: "Towards midnight I was awakened by the rustling sound produced by bats flying to and fro. They had put out my lamp, and when I had relit it I noticed that the whole room was black with them. I laid about me with a stick and they disappeared through the roof; next morning I found a wound, evidently inflicted by bats, on my hip. The negroes assert that the Vampire is the only species which attacks man."

GENUS PHYLLOSTOMA.

The VAMPIRE, *Phyllostoma spectrum* (Plate II), is the largest of the South American blood-suckers. The head is thick; the snout projecting; the ears large; the nose-leaf small for the size of the animal; the tongue is flat, elongated and extensile, covered with papillæ so as to form a kind of sucking organ; the upper lip smooth, the lower lip covered with two large, bare, warty excrescences; the soft fur is chestnut-brown on the back, yellowish-brown on the belly.

Nothing is more hideous than the front view of this creature. The great, leathern, projecting ears, the protruding spear-like nose, the sparkling black eyes, form a whole which calls up the goblins of legend, and fits well with the Vampire's bloodthirsty reputation. Our introductory remarks will have shown that there is considerable doubt whether the Spectre Vampire deserves its character as a sucker of blood. Bates expressly states that it is well known to the natives of Brazil for its harmlessness. Still there is no wonder that a superstitious race should find its monstrous appearance an index to its disposition. Both

Bates and Waterton affirm that it is mainly frugivorous. The former opened the stomach of several specimens and found that they contained various kinds of seeds mixed with the remains of insects; the guava fruit is an especial object of their attack. The latter observed these bats in a moonlit night fluttering round the tree-tops evidently eating the buds. It is difficult to discover in many cases what species a traveler describes under the name of Vampire, and in ordinary language it designates all the bats that suck blood.

GENUS DESMODUS.

This genus possesses nasal leaves in the form of the letter V, large ears that stand wide apart, no tail, and a mere strip of femoral membrane. The crowns of the molars form a long cutting-edge. The "tragus," or inner ear, is long and pointed.

The species *Desmodus rufus*, which is usually regarded as the representative of the genus, is russet-brown on the back, but silver-gray on the under surface. The nasal leaf, ears, arms, and legs are thinly clothed and appear flesh-colored; its length is about two inches and a half, its spread of wing twelve inches. It is abundant in Brazil. Hensel states: "In capturing these animals, I have often seen the wounds they inflicted on the noses of my dogs and on my own hands; they bite with lightning speed; even when they appear only to touch the skin, a part is soon felt to be removed. They do not hold on with their teeth like other varieties."

GENUS MACROTUS.

The CALIFORNIAN VAMPIRE, *Macrotus Californicus*, although a quite distinct species, is nearly related to some of the West Indian bats. It has a long head and a face covered with hair, which grows somewhat thinly on the large oblong ears, while the neck behind them is almost bare. The fur is white and fawn-colored, each hair being tipped with white, but that on the face is somewhat inclined to brown. Its dental formula is

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, M. \frac{5-5}{6-6} = 34.$$

THE HORSESHOE BATS.

The family Rhinolophidæ, which embraces *seven* genera and *seventy* species, derives its scientific name from a curious crest-like membrane on the nose. They are found most abundant and varied in Eastern Asia, where twelve species are found. Africa and Australia possess five, Europe one genus only.

The nasal appendage consists of three portions—the horseshoe, the longitudinal comb, and the lancet. The former begins at the end of the snout, and surrounds the nostrils with a deep fold of skin. The comb rises up inside the horseshoe behind the nostrils. The lancet rises up between the eyes under the posterior end of the horseshoe, and contains three cellular cavities. The ears are simple, without an inner ear; the flying membrane short, and the flight clumsy. The tail is short, and the interfemoral membrane entirely embraces it. At the flanks two glands are found which have the appearance of mammæ, and secrete an odoriferous substance. The Rhinolophidæ differ but little in size from the Vespertilionidæ; they have a long, abundant fur, generally of a light shade, which is sometimes remarkably handsome.

These Cheiroptera are widely spread in the Old World, in Europe, Africa, Asia, and the islands of Sunda; no species are found in America. They live in numerous bands during the greater part of the year. When the females are with young, they separate themselves from the males, to bring forth and rear their progeny. The following genus contains the "Horseshoe Bats" proper:

GENUS RHINOLOPHUS.

The LESSER HORSESHOE BAT, *Rhinolophus hipposideros*, is not uncommon in Europe. During its winter sleep it folds itself so closely in its wings that it seems a fungus rather than an animal. Its chief food is soft-bodied insects, like flies or moths, but it is said to be a blood-sucker, on very inconclusive observations. It attains the size of only two inches, with a spread of eight inches in the wings, and is distinguished from the following species by an additional appendage to the nose, placed in front of the ordinary lancet.

The GREAT HORSESHOE BAT, *Rhinolophus ferrum equinum* (Plate II), is much larger, sometimes measuring eighteen inches across the wings.

The NOBLE HORSESHOE BAT, *Rhinolophus nobilis*, is the largest of the genus, measuring four inches in length, and twenty inches from tip to tip of the wings. It is a native of Java, and has very fine and long hair, the color being brownish on the back and grayish beneath. The nasal appendage is a broad membrane, stretching transversely across the nose like a shelf. The sides are bounded by parallel folds, and the inferior portion is semicircular, with an obtuse point in the middle.

GENUS MEGADERMA.

The AFRICAN LEAF BAT, *Megaderma frons*, is more properly a member of the Horseshoe family than of the Vespertilionidæ, with which some writers class it. The nose has three leaflets—one horizontal, one vertical, and one of the horseshoe form. The ears are very large, furnished with a tragus, and united over the forehead so as to give a heart-shaped appearance to the head. They are blood-suckers.

Of the *four* or *five* species known, the most important are the Leaf-nosed Megadermes, which inhabit Madagascar, and the Lyre Megadermes, found in Senegal. The latter measures fourteen inches across the wings.

GENUS NYCTERIS.

This genus, with *three* species, is found in the Moluccas and Africa. The nose is pierced by a cavity in which the nasal-leaf is concealed; the tail is of medium size, and supports the interfemoral membrane throughout its length. They measure from eight to ten inches across the wings, and possess a contrivance by which they can increase their size without augmenting their weight. Two very small openings afford a communication between the mouth and the space between the skin and flesh, which are only tied to each other by a few membranous threads at each side of the neck and on the sides of the thumb; when, therefore, the bat desires to inflate its body, it closes its mouth and forces the air through the cheek-passages into the empty space between the skin and flesh. The result of this operation is that the skin is puffed out, so that the

creature looks like a little ball of fur to which the head and limbs had been artificially attached.

GENUS RHINOPOMA.

This curious Indian genus, which is sometimes classed with the Nocilionidæ, has a long tail, a narrow femoral membrane, and a peculiar dental formula,

$$I. \frac{1-1}{2-2}, \quad C. \frac{1-1}{1-1}, \quad M. \frac{4-4}{5-5} = 28.$$

The best known species, *Rhinopoma microphyllum*, is found in Bengal and Egypt. It is a small, long-haired, light-gray bat, about two inches long. The tail is remarkable for its length, and contains eleven vertebræ. It is found in great numbers in the old ruins on the Nile, and hangs in masses that quite hide the roof. In the evening they are seen skimming across the waters, especially during the inundation, in quest of insects.



CHAPTER III.

THE TRUE BATS.

THE COMMON BAT—THE TAPHOZOUS—THE PIPISTRELLE—THE BARBASTELLE—THE NEW YORK BAT—THE CAROLINA BAT—THE HOARY BAT—THE CALIFORNIA BAT—THE GREAT BAT OF BRITAIN—THE SHORT-EARED BAT—THE LONG-EARED BAT—THE BIG-EARED BAT—THE NOCTILIONIDÆ—THE GENUS NYCTICEIUS—THE GENUS NYCTINOMUS—THE GENUS NOCTILIO.

OF the numerous recognized species of bats, nearly *two hundred* belong to this family, the VESPERTILIONIDÆ. They are placed under *eighteen* genera, all agreeing in the following characteristics: the nose is simple, with leafy appendages, the ear has always a tragus or cover, the pointed molar teeth have an edge somewhat in the shape of a W. The dental arrangements are very varied, and on them the division into genera is founded. The incisors, which are pointed, are two, four, six, or more in the upper jaw; usually four, rarely six, exceptionally two, in the lower. The canines and false molars vary from one to three above, and from two to three below, while the molars are three on each side. Thus the number of teeth varies from twenty-eight to thirty-eight.

Equally various are the sizes of these bats. Some measure five inches in the body and two feet across the wings; others attain only a length of one inch and a half and seven inches of wing-spread. They are most numerous in America, but are found everywhere outside of the polar circles. They prefer to live in trees, on the branches, rather than in holes or caverns. Some live in large bands, some are solitary, or at most form very small societies. They live almost exclusively on insects, at times on small animals, but it is not ascertained whether any of them eat fruit. They may be described with justice as the most useful of the Mammalia. Their flight is abrupt and full of sudden turns, thus baffling birds of prey. They climb and run very well; their sense of hearing is highly developed. We will notice only the principal genera of this family.

GENUS TAPHOZOUS.

The animals belonging to this genus are natives of Africa and the hot parts of Asia. They are characterized by a hollow forehead and a somewhat short tail, which is detached and projects downward. Their wings generally have a span of from eight to twelve inches. It contains *ten* species.

GENUS VESPERUGO.

This genus is distinguished by short, thick, fleshy ears, set wide apart and rounded in front, the tragus or cover of the ear projects, the wings are pretty long with a thick membrane, and the tail is as long as the body.

The NORTHERN BAT, or *Vesperugo Nilsonii*, attains a length of about ten inches. Its color on the upper surface is dark-brown, on the lower somewhat lighter. It is found in the north of Sweden and Norway, probably extending to the Arctic circle, and in Russia. It does not suspend itself by the hind feet during its period of hibernation, but hides in crevices from which only its snout projects. It migrates southwards in the summer, because in the far north the days of June and July are too long to suit nocturnal animals.

GENUS VESPERTILIO.

This genus is found over the whole of the Northern Hemisphere, and contains many species. The wings are slender and capable of quick movement and great endurance; the covering of the ear is directed inwards, and the tail is included in the flying membrane.

THE PIPISTRELLE.

The PIPISTRELLE, *Vespertilio pipistrellus* (Plate IV), is the smallest European bat. It is only two inches and a half long, of which length full one inch is taken up by the tail. The fur is a yellowish red-brown above, inclining below more to yellow. The thick ears and membrane are brownish-black.

It inhabits almost all Europe and North and Central Asia, and extends from Spain to Japan. It is exceedingly common in Germany, where no town, no village, no farm does not harbor them. It is the COMMON BAT of Great Britain.

Its flight is marked by great adroitness. In the bright evenings it is seen sometimes skimming over the surface of small pools, but oftener flitting to and fro between the stems of the trees. In villages it seldom rises higher than the second story, and never flies far in the centre of the street, but keeps near the houses. It is fond of entering lighted rooms, but avoids low and small chambers.

They can be tamed to a certain extent, and soon become familiar with the people whom the relations of every day have taught them to recognize. Dr. Franklin says that he has seen, in several farms in England, bats which were perfectly tame. These little creatures lived in the same room with the farmer's family. If any one, holding an insect between his lips, imitated the buzzing of a fly, they perched upon his shoulder, sought for the insect around his mouth, and even seized it from between his lips.

Its mode of eating is peculiar. According to White's "History of Selborne," if you give it anything to eat, it brings its wings round before the mouth, hiding its head. It is capable of running on the ground, and is an agile climber.

They are exposed to many enemies; hawks attack them in summer, weasels and mice invade their hiding-places in winter, but it finds its bitterest enemy in man.

The SEROTINE, *Vespertilio serotinus*, has the ears pretty large, the fur long and soft, the color reddish-brown passing into dull-yellow beneath the body. Its flight is slow, and it is generally found solitary or in pairs.

The MOUSE-COLORED BAT, *Vespertilio murinus*, measures three inches and a half from the snout to the root of the tail. The head is narrow in front and elongated, the eyes conspicuous, the ears sharply pointed. It is described as a very pugnacious animal.

THE BARBASTELLE.

The BARBASTELLE or BULLDOG BAT, *Vespertilio barbastellus*, (Plate IV), measures three and a half inches, and has a spread of wing of ten inches. The color is blackish-brown, inclining to gray beneath. The

ear is tolerably large and wrinkled, with a sharp-pointed tragus. It is found all through Europe, and has been often observed in captivity. It is of more gentle disposition than most bats, and soon recognizes its keeper; a couple of days render it comparatively tame. It is not very active, and one kept by Bell, the naturalist, preferred lying on the hearth-rug to using its wings; it fed on meat.

During hibernation, they hang by their hind legs usually at the entrance of caverns, where they sometimes have been seen perfectly enclosed in icicles.

THE CALIFORNIA BAT.

The CALIFORNIA BAT, *Vespertilio nitidus*, is to be carefully distinguished from the previously-described California Vampire. The body is small, its spread of wing seven inches, the head and face hairy, the ears longer than the head, the foot small, the tail usually embraced in the interfemoral membrane. The fur is silky, of a brownish tint, becoming lighter in front. As far as known, it has never been found to the east of the Rocky Mountains.

THE NOCTULE.

The NOCTULE, *Vespertilio noctula*, is one of the largest species. Its length is sometimes four inches, including one inch of tail. When its wings are expanded they measure fourteen inches.

It is found over a great part of the Old World, preferring lowlands and valleys. During the summer days it sleeps in clefts of trees, but during their winter-sleep hundreds are found clinging to each other in old ruins. Its flight is strong and high, and it turns with such dexterity as to escape almost all attacks from birds of prey. The Noctule is commonly called in Great Britain the GREAT BAT, but it possesses a more popular appellation derived from its sharp and piercing cry, that of the "Jacky Screamer." It does not make its appearance till the end of April; it emits an offensive odor.

THE SHORT-EARED BAT.

DAUBENTON'S BAT, *Vespertilio* (or *Brachyotus*) *Daubentonii*, has ears which, when pressed down, scarcely reach the top of the nose. It measures an inch and a half in the body, and about one inch in the tail.

It is easily distinguished from bats of the same size by its short ears and the absence of wing-claws. In Germany it is called the WATER BAT, as it loves well-watered regions, where it is found occasionally in extraordinary numbers. It seems to prefer chalk quarries for the scenes of its hibernation, and it lives in societies.

Ponds near houses and gardens are their favorite haunts, and they skim within a hand's-breadth of the surface; if a bridge comes in their course they always pass under the arches. By day they hang in clusters on branches over the water.

The LITTLE BROWN BATS, *Vespertilio subulatus*, common throughout the Middle States, and the BLUNT-NOSED BAT, *Vespertilio lucifugus*, extending throughout the United States as far as Mexico, call for no remarks.

GENUS SCOTOPHILUS.

The CAROLINA BAT, *Scotophilus Carolinensis*, has oblong ears as long as the head and rather velvety. The projecting portion of the ear is heart-shaped. The fur is chestnut-brown above and yellowish below.

The GEORGIAN BAT, *Scotophilus Georgianus*, is of a dark-brown color on the back, brighter in front, and the fur is thick, soft, and long; the head is somewhat flat, and the point of the tail is not involved in the membranous wings.

GENUS LASIURUS.

The NEW YORK BAT, *Lasiurus noveboracensis*, has short and broad ears, and a rather pointed, short nose. The fur is soft and thick, and there is a white spot at the origin of the wings. It is sometimes called the RED BAT, and is found in New York, Pennsylvania, and on the Missouri.

“Godman's Natural History” relates: “In June, 1823, a son of the keeper of a city park in Philadelphia brought home the young one of one of these bats. Three hours afterward its mother made her appearance and followed the boy two blocks, finally alighting on his breast. Both were brought to the museum, the young one firmly adhering to the mother's teat.”

The HOARY BAT, *Lasiurus cinereus*, is common in the Rocky Mountains. The ear is large, but shorter than the head; the tragus obtuse and bow-shaped. The nostrils are wide apart, the canine teeth large, and there is only one incisor on each side. Its fur is long and of a black-brown at the base, then of a brownish-yellow, then blackish, then white, and from the mixture of these tints is derived its name. It is nearly four and a half inches long—that is, it is nearly twice the size of the New York Bat, with which it has much affinity.

GENUS PLECOTUS.

The LONG-EARED BAT, *Plecotus auritus*, derives its name from its highly developed ears. These appendages are nearly as long as the whole body, and are remarkable for their transparency. The wearer has the strange power of contracting and expanding his ears, producing sometimes graceful folds and festoons, at other times a feathery appearance. When flying they usually curve them backward, so that merely the long, pointed tragus stands up. When it hangs itself up to sleep, it covers its ears with the arms.

The Long-eared Bat bears captivity better than most of his fellows, can be easily tamed, and exhibits a very amiable disposition. The prisoners soon become bold and familiar; they are very cleanly, not only cleaning themselves after their meals, but occasionally assisting each other. They are playful and pretend to bite one another, but they never harm their companions of the same species.

GENUS SYNOTUS.

This closely allied genus is one of the genera peculiar to the South-eastern and Central States. It is characterized by very large ears, the inner border of which continues as a nasal excrescence, and has no tongue-shaped development, as in the genus *Plecotus*.

The BIG-EARED BAT, *Synotus macrotis*, is found in the South Atlantic States. It measures ten inches from wing-tip to wing-tip; the hair is long and fine, of a blackish-brown color. A very similar species, the *Synotus Townsendii*, is found on the Upper Missouri.

GENUS ANTROZOUS.

This genus possesses a large head, high tapering nose, slender truncated snout, large eyes, and ears longer than the head.

The PALE BAT, *Antrozous pallidus*, is found in the Pacific States and Texas, and exhibits two varieties—one fawn-colored, the other yellowish-brown; in the latter the interfemoral membrane is bare.

THE NOCTILIONIDÆ.

The DOG-HEADED BATS are very unequally distributed. Their headquarters are in the tropical regions of America, where most of the genera into which the family is divided are to be found. They range from Mexico to Chili on the West Coast, and Buenos Ayres on the East, and one species occurs in California. New Zealand and Norfolk Island each possess one species. The New Zealand species, *Mystacina tuberculata*, seems to form a connecting link between the Noctilionidæ and the Phyllostomidæ.

The Noctilionidæ have the ears usually joined, the lips are pendulous, the nose sharp, the tragus is broad and square. The tail extends beyond the interfemoral membrane, and the great toes are fringed on the outside. Various classifications of this family have been made; some authorities include in it the *Rhinopoma*, which we have placed with the Rhinolophidæ, and the *Taphozous*, which we class with the Vespertilionidæ.

The genera are *fourteen* in number, but their differences are only interesting to the professed student of natural history.

GENUS NYCTICEIUS.

This North American genus contains only *one* species. The head and ears resemble those of the *Vesperugo*.

The CREEK BAT, *Nycticteius crepuscalons*, is found from New York to the Rocky Mountains, and southward to New Orleans. The fur is rather short, and brown, with yellow tips to the hair.

GENUS NYCTINOMUS.

This genus has pointed ears, thick hanging lips, and a sharp nose. The great toes are separated from the others and fringed on the outside.

The *Nyctinomus nasutus*, called likewise *Molossus* or *Dysopes nasutus*, is found in South Carolina, but most extensively in South America. As befits its name of *nasutus*, the nose is well defined; the head is large, the lips pendulous; the ears are as broad as they are long, and almost join at the base. The fur is soft and thick, of a yellowish-brown, tipped with white, and covers the lower part of the ears. The tail projects some distance beyond the interfemoral membrane, and the toes are supplied with long hairs.

Another species, the *Nyctinomus obscurus*, is nearly the size of the *Barbastelle*, and measures three inches. The head is short, the muzzle swollen, the ears large.

GENUS NOCTILIO.

The DOG-HEADED BAT, *Noctilio Americanus* or *leporinus*, is the best known of the *two* species of this genus. The ear is short, narrow, and pointed; the muzzle conical, the nose overhanging the lips; the upper canines very long. The fur is of a reddish-yellow, and does not extend to the flying membrane. The second species, *Noctilio albiventer*, is much smaller, and the fur on the belly is yellowish-white.

The bats are a very difficult study, and it is quite uncertain how many species are known; the most probable estimate is that of Mr. Murray, who gives a list of four hundred species. For American Bats, the reader who desires to pursue the subject is referred to the exhaustive monograph of Dr. Allen, in the Transactions of the Smithsonian Institute. For the Cheiroptera in general Mr. Dobson's elaborate Catalogue is the latest authority.



ORDER III.

INSECTIVORA.

14. GALEOPITHECIDÆ - - - - FLYING LEMURS.
15. MACROSCOLIDIDÆ - - - - ELEPHANT SHREWS.
16. TUPAIADÆ - - - - - SQUIRREL SHREWS.
17. ERINACEIDÆ - - - - - HEDGEHOGS.
18. CENTETIDÆ - - - - - TENRECS.
19. POTAMOGALIDÆ - - - - OTTER SHREW.
20. CHRYSOCHLORIDÆ - - - GOLDEN MOLES.
21. TALPIDÆ - - - - - MOLES.
22. SORICIDÆ - - - - - SHREWS.

Insectivora

CHAPTER I.

CHARACTERISTICS OF THE ORDER—ITS DIVISION INTO NINE FAMILIES—THE GALEOPITHECIDÆ—THE FLYING LEMURS—THE MACROSCOLIDIDÆ OR ELEPHANT SHREWS—THE GENUS RHYNCHOCYON—THE GENUS PETRODROMUS—THE TUPAIADÆ—THE BANGSRING—THE PRESS—THE GENUS HYLOMYS—THE GENUS PTILOERCUS—THE PENTAIL.

THE third order of Mammalia, the INSECTIVORA (from *Insecta* “insect,” and *voro* “to devour”), embraces numerous animals which, like many of the Cheiroptera, feed on insects, for the consumption of which they are specially adapted by the formation of their teeth.

The distribution of the INSECTIVORA over the habitable globe is remarkable; they are completely absent from South America and Australia; some genera only found in Madagascar have allies in the West Indian islands; the hedgehogs, so common in Europe, are unknown in North America, and the majority of the species of the order belong to one genus, *Sorex*. From these facts it is evident that they are the detached fragments of a much more extensive group of animals which are gradually diminishing in number and which are now almost extinct. In the terrible struggle for existence which has gone on since life first made its appearance on the globe, the INSECTIVORA have not held their ground, except in special localities or by the favor of special circumstances. Some have been saved from the severe competition with other mammals by their isolation in regions like Madagascar; the MOLES have escaped extermination by their habits; the HEDGEHOGS by their prickly armor; and others, like the ELEPHANT SHREWS and SQUIRREL SHREWS, owe their safety to the likeness they present to dominant groups in their own districts. It is only under special conditions that they can maintain themselves against more highly organized forms.

The animals of this order exhibit remarkable deficiencies and remarkable developments of particular parts. The body as a rule is compact, the head long, the nose prolonged into a snout; the limbs, with the exception of the tail, and, in some species, of the hind-leg, are shortened excessively; the clothing of the body varies from the velvety skin of the mole to the sharp, stiff, erectile spines which defend the hedgehog. Their limbs are adapted for walking, swimming, and digging. They are all plantigrade, that is, in walking they apply the whole sole of the foot to the ground.

Their intelligence is very slight; they are dull, shy, and distrustful, loving solitude, yet of violent tempers. Most of them live a subterranean life, but some frequent the waters, some the trees. Their astonishing energy is an essential check on the increase of worms and insects, and even of the smaller rodents.

A look at the jaws of an insectivorous animal immediately convinces us that the creature is carnivorous to a greater degree than such Carnivora as cats or dogs. The jaws bristle with pointed teeth, daggerlike spears take the place of canines, and sharp pyramids resembling a double saw complete their dentition. The whole structure is formed to seize and hold fast even hard-shelled insects like cockchafers. The jaws of a shrew-mouse enlarged to the size of a lion's, would be far more terrible and appalling in the ferocity of their appearance.

In spite of the benefits conferred on us by these creatures in destroying our insect pests, the prejudice of man accuses them of divers imaginary crimes. In England the shrew is considered venomous, and every village has a mole-catcher.

Many of the INSECTIVORA hibernate. As cold approaches thousands upon thousands of the victims destined to feed the members of this order, are removed from their clutches. Hence, as the INSECTIVORA cannot, like the birds, migrate in quest of food, they are providentially given the faculty of hibernation. Of course, those that prey on creatures which do not disappear in winter, have no need to pass the cold season in torpid slumber.

We follow the latest authorities in classing the animals of this order in *nine* families, and commence with the family of the FLYING LEMURS or COLUGOS, which present a striking resemblance to the "Flying Foxes," and seem to form an intermediate link of transition.

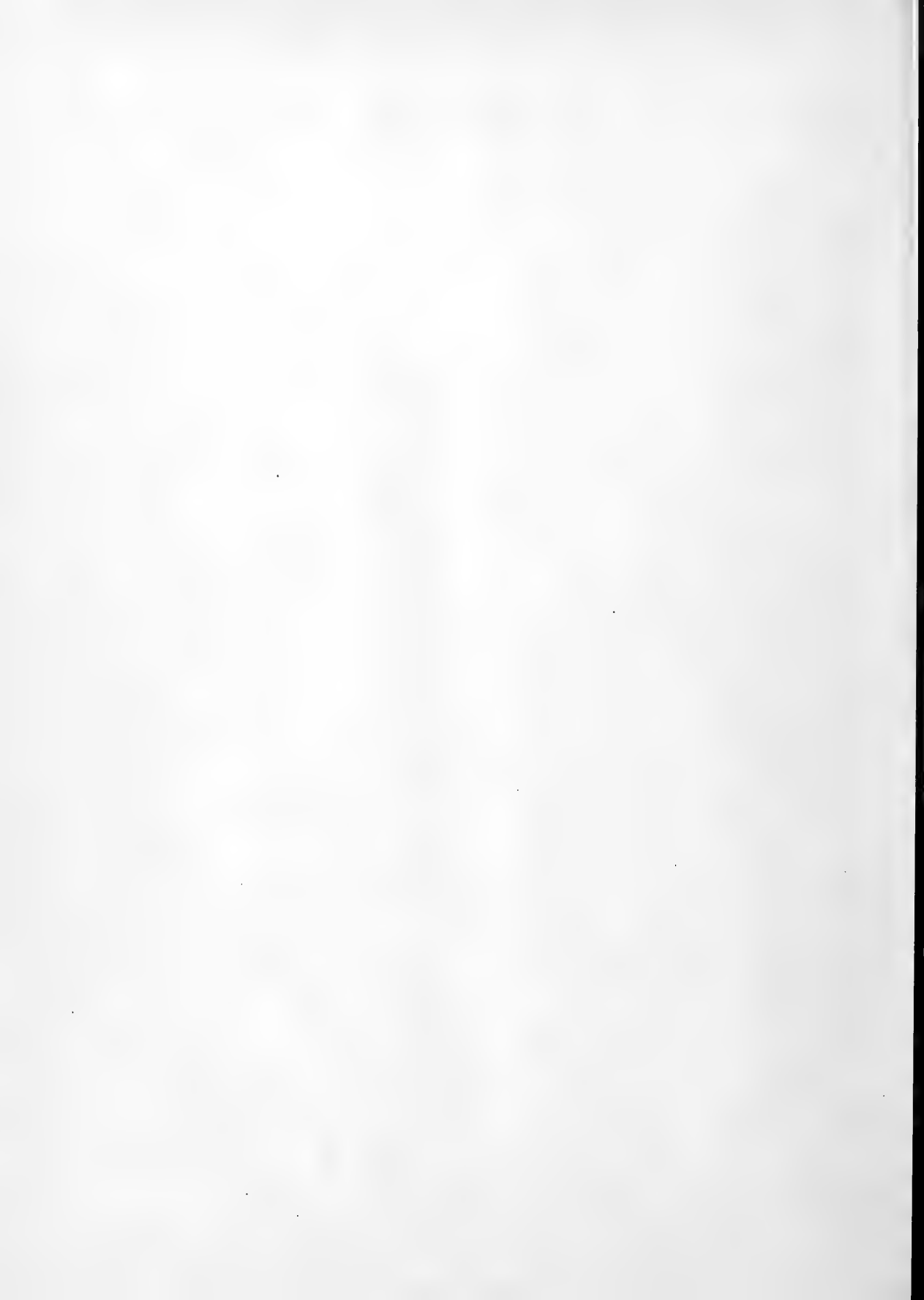
THE FLYING LEMURS.

The family GALEOPITHECIDÆ contains only *one* genus, which again contains only two species. For a long time the COLUGO, *Galeopithecus volans*, (Plate V) was placed among the Lemuroidea. Its food seems to be entirely vegetable, and its flying membrane shows some relationship to the Cheiroptera. Its dental formation settles its place among the Insectivora, but the fact that the young are born very small, blind and naked, and are closely attached to the wrinkled skin of the mother, indicates some affinity to the Marsupialia. This animal indeed seems to be a lateral offshoot of some low form which has survived during the process of development of the Insectivora, Lemuroidea and Marsupialia from an ancestral type.

The FLYING LEMUR is as large as a cat, with a slender body and limbs of moderate length. Attached to the extremities of these limbs is a membrane which envelops the animal from the neck to the extremity of the tail, and which permits it to sustain itself in the air. The fingers of all the feet have retractile claws and the thumbs are not opposable. The head is small, the muzzle prominent, the eyes moderately large, the hairy ears small. The membrane between the limbs is merely a parachute. When the Colugo desires to make a leap it spreads its limbs so that the membrane may present as large a surface as possible. The membrane is not used as a wing, and the Colugo cannot rise. At every leap the spot it aims at must be lower than that from which it starts; hence after a few aerial voyages it is compelled to climb a tall tree and begin afresh. At rest the membrane folds so closely as to be almost indistinguishable. The Colugo has two mammæ. The lower incisors are set pointing forward, and are notched like the teeth of a saw, and the molars are studded with points like those of all the Insectivora.

The Galeopithecii are essentially nocturnal. They are seen at night moving actively through the trees. On the ground they run with agility. Their flight is noiseless. Insects constitute the staple of their food, but they are fond of fruit, and even devour small birds.

In order to rest, these animals suspend themselves by their hind paws to the branches of trees, like bats. The people of the regions they inhabit choose this opportunity for capturing them; and not-





SQUIRREL SHREW

FLYING LEMUR
COMMON MOLE
COMMON SHREW

HEDGEHOG

TENREC
OTTER SHREW

PEN TAIL SHREW

PLATE V INSECTIVORA.



the still night; the natives drew up around our fires; fear of spirits silenced their merry chatter. But the secret was soon betrayed: the spirit whose voice resembled a distant cry of pain came in sight and hovered slowly over our heads. It was a Flying Lemur."

A female that lived for some time in captivity is described as a harmless, stupid creature. "It lay on its stomach with all its legs stretched out, and then slowly and awkwardly hopped to the wall of the room, which it tried to ascend. As the wood was planed it could not take good hold of the surface, and after climbing a few feet it fell down again, but the fall was always broken by the expanded membrane with which nature has provided it." We do not possess much further knowledge respecting the Flying Lemur.

THE ELEPHANT SHREWS.

The animals of the family MACROSCOLIDIDÆ are extraordinary little creatures, and are called "elephant" on account of their trunk-like snout, and "long-legged" because their hind-legs resemble somewhat those of the Kangaroo. They are almost confined to South Africa, and extend up the East Coast as far as the Zambezi and Mozambique. They are divided in *three* genera and *ten* species; but two of the genera, PETRODROMUS and RHYNCHOCYON, are each represented by a single species.

The ELEPHANT SHREWS are essentially leaping animals; the hind-legs are enormously elongated, and they possess usually five, sometimes four short toes, with short, weak claws. The thin, short-haired tail is a little shorter than the body; the fur is thick and soft; the teeth number forty; the long, proboscis-like nose is perforated at its extremity by the nostrils which are placed obliquely, and it doubtless aids the animal in its search for food, while the enormous length of its hinder-limbs enables it to catch its prey with wonderful agility.

I.—GENUS MACROSCOLIDES.

The typical ELEPHANT SHREW, *Macroscolides proboscideus* (Plate V), attains a length of nine inches, of which four and a half belong to the tail. The snout is nearly an inch in length, and reddish-black at the end. The coat is a reddish-brown or mouse-gray, more or less bright, with shades of white on the lower surface of the body; the ears are white

inside. They frequent stony mountains; and under stones, in deep and almost inaccessible recesses, in clefts of the rock, and holes of the earth, they find refuge from danger. They love the sunlight, and are most active during the scorching hours of noon; their food consists mainly of insects, which their long legs enable them to catch or their long snout to find in rifts and clefts. They are very timid, and the slightest motion sends them into their hiding-places; after some time, one after another sallies out, hops about, looking and listening on every side; then they begin to snuffle at the stones or catch, at a spring, some passing insect. Their habitations are made below the surface of the ground, and consist of a deep and tortuous burrow, the entrance to which is a perpendicularly sunk shaft of some little depth.

The rapidity of their movements and the speed with which they take flight render it a difficult task to capture them; but when captured they endure confinement pretty well, are gentle and graceful and soon gain the sympathy of man.

Seven of the species are found in Southern Africa; one, the TRUNKED RAT, *Macroscelides Rozetti*, has been found in Algeria. It is said that some ingenious soldiers of the French army, quartered there, have at times been induced to meet the demand for specimens by a manufactured supply. An erudite naturalist was delighted at purchasing from a Zouave a magnificent specimen of the Trunked Rat, till closer examination showed him that it was a common rat with an inch of its own tail grafted by a little incision on the end of its nose.

II.—GENUS RHYNCHOCYON.

The RHYNCHOCYONS are also leaping animals, consequently have the hind quarters more elevated than the fore ones, but their bodies are more slim, and they are altogether larger than the *Macroscelides*. Besides this, they are "tetradactylous"—that is, their limbs are terminated by only four toes.

The only species known, the *Rhynchocyon cirnei*, was discovered in Mozambique by the traveler and naturalist Peters. Its muzzle is prolonged into a very conspicuous proboscis; the eyes are large, the ears moderate, while the tail is considerably developed. The outer toe is widely separated from the others in the fore-feet. It possesses thirty-six teeth.

The third genus—*Petrodromus*—is represented by one species which inhabits Mozambique. It has the general characteristics of the family, and, as its name implies, is most frequently found in rocky neighborhoods.

THE SQUIRREL SHREWS.

The family TUPAIADÆ embraces *three* genera divided into *ten* species. They are often called Squirrels, and have a superficial likeness to these denizens of our forest. They are all natives of the Indian Archipelago and the adjoining continent. The head is pointed and ends in a snout usually bare at its blunt extremity, the body is slender, the tail long—sometimes very long and bushy, having two rows of hair hanging equally on each side; the fur is thick and soft. They have from thirty-eight to forty-four teeth, which are remarkable from the fact that the canines are shorter than the incisors. The eyes are large, the ears rounded, the limbs regular, the feet have bare soles, and the five toes are separated and armed with short, curved claws. The female has four teats.

The development of the eye indicates their diurnal habits, and the curved claws, that they can climb.

I.—GENUS TUPAIA.

The TUPAIA TANA, *Tupaia Tana*, is the largest of the *seven* species of this genus. It has a bushy tail with the hair hanging evenly down on each side, large prominent eyes with a bony ring closing in the orbit behind, and thirty-eight teeth. It is distinguished from other species by the great length of its tail, and it wears a dark-brown blackish fur which displays on the underside a ruddy tinge and appears mixed with gray on the head and muzzle. A gray stripe crosses the back of the head, and a dark-brown line runs down the back. Each hair consists of gray and dark-brown rings alternately. It is very nearly the size of the common squirrel. We know little of its wild habits. It is described as an agile, active, merry creature, which uses its crooked claws excellently, and climbs with all the skill of an ape. It is not strictly insectivorous—it sometimes eats fruits which it picks from the branches or off the ground.

THE PRESS.

The PRESS, or SQUIRREL SHREW, *Tupaia ferruginea* (Plate V), is a very pretty creature so like the squirrel that, as it runs about, it can be distinguished only by the elongated outline of the head. It measures about thirteen inches, including five inches of tail; the length of the head being two inches. Its height, as it stands or all-fours, is about three inches.

The coloring of its fur is a brownish-maroon, which in some parts, as the spine, is deepened into a rich brownish-black, and in others, as the ribs and flanks, is warmed into a reddish tint. Hence the epithet of *ferruginea* or "rusty" has been applied to the animal. This change of color is caused by the mode in which the hairs are marked in alternate rings of black and maroon. Those which run along the back are black, with a fawn-colored ring in the middle, but those which grow upon the ribs are fawn, with a black ring in the middle. The ears are black. Upon the under surface of the body the fur is of a whitish-yellow, fading into gray. The long and bushy hairs which decorate the tail are so dotted with white that they give a grayish-brown effect.

Although the teeth of all the Tupaias are evidently of an insectivorous description, the Press, as well as its congeners, feeds chiefly on coleopterous insects, but varies its diet with certain fruits. It is affirmed that the Press partakes so far of the carnivorous propensities of the mole, that it will sometimes pounce upon small birds as they are hopping among the branches, and make a meal upon their bodies. One of these animals that was tamed, and accustomed to roam about the house at will, was very fond of milk and fruits, and used to attend at every meal for the purpose of obtaining these coveted luxuries.

THE BANGSRING.

The BANGSRING, *Tupaia Javanica*, abounds in the dense forests of Java. It differs from the preceding species by the length of its tail, which is fully as long as its body, of a uniform thickness and clothed with hairs that spread out like those on the squirrel's tail. The fur is close and fine, with a few longer and darker hairs interspersed in its prevailing hue of grayish-brown. It is easily tamed. Sir Stamford Raffles describes one which behaved like a pet spaniel, and ate fruits and milk at the table of its owner.

II.—GENUS HYLOMYS.

This genus is characterized by the shortness and bareness of its tail, and by the absence of the bony ring around the orbit of the eye, which is such a peculiar feature in the genus *Tupaia*. Two species only are known.

The HYLOMYS, *Hylomys suillus*, is a small species which is found in Sumatra and Java, where it lives on the hills, two thousand feet above the sea-level. It is by no means common. The muzzle is developed into a movable proboscis, turning in a downward curve at the tip, where the nostrils are placed laterally. The eyes are not prominent or large, but the ears are of considerable size. It possesses forty-four teeth; the three central toes in the feet are longer than the rest.

III.—GENUS PTILOCERCUS.

This genus is known only by *one* species, a specimen of which is preserved in the British Museum.

THE PENTAIL.

The PENTAIL, *Ptilocercus Lowii* (Plate V), is an extraordinary creature which was first described by Mr. Low, who captured one of them in the house of Sir James Brooke, the Rajah of Sarawak. It derives its name from the resemblance borne by its tail to the old quill pen of our ancestors. It is about the size of a rat, but appears to be of greater dimensions, on account of its extremely long tail with the remarkable appendage at its extremity. As represented in the plate, the tail is of extraordinary length when compared with the size of the body, and is devoid of hair, except at its extremity, where it is furnished with a double row of stiff hairs on each side, which stand boldly out, like the barbs of an arrow. The remainder of the tail is covered with scales, which are square in their form, like those of the long-tailed rats, and of considerable size. The color of the tail is black, and the bristly barbs white, so that this member presents a peculiarly quaint aspect.

The fur which covers the body of the Pentail is extremely soft in texture, and is of a blackish-brown tint above, fading into a yellowish-

gray beneath. As the tips of the hairs are tinged with a yellow hue, the precise tint of the fur is rather indeterminate, and is changeable, according to the position of the hairs which are exposed to view.

It is presumed that the long tail of the Pentail is used for the purpose of balancing itself in its progress among the branches of trees; but this conjecture is only problematical, as the habits of the animal are not yet known.

The Tupaiadæ are an interesting family of Insectivora in a scientific point of view on account of the presence of several well marked anatomical peculiarities. As already stated the most important of these is the osseous ring that completes the posterior part of the orbit of the eye. In all other specimens of the order Insectivora a communication exists between the orbits and the spaces occupied by the temporal muscles which act upon the lower jaw. In this peculiar conformation of the Tupaiadæ, therefore, we observe an approach to the structure of the insectivorous monkeys. The eyes project sufficiently to enable the animal to see backward almost in a straight line. The small but sharp nails that arm the five toes of the plantigrade feet are sufficiently elevated to be spared from friction against the ground. The name *Tupaia* is given by the natives of Sumatra both to the members of this family and to the squirrels which they so strongly resemble. The fossil remains of the *Omomys* have been found in the Pliocene deposits of the United States.



CHAPTER II.

THE HEDGEHOGS, MOLES AND SHREWS.

THE ERINACEIDÆ—THE HEDGEHOGS—THE GENUS GYMNURA—THE CENTETIDÆ—THE TENREC AND TENDRAC—THE GENUS SOLENODON—THE AGOUTA—THE POTAMOGALIDÆ—THE CHRYSOCHLORIDÆ OR GOLDEN MOLES—THE TALPIDÆ—THE MOLES—THE GENUS TALPA—GENUS CONDYLURA—THE STAR-NOSED MOLES—THE GENUS SCALOPS OR AMERICAN MOLE—THE GENUS MYOGALE—THE DESMANS—THE UROTRICHUS—THE SORICIDÆ OR THE SHREWS.

THE family ERINACEIDÆ is not represented on the American Continent. It consists of *two* genera—one comprising the Hedgehogs proper, the other the Gymnura.

I.—GENUS ERINACEUS.

The HEDGEHOGS are scattered somewhat capriciously over the Eastern Hemisphere. Their most remarkable feature is the coat of stiff-pointed spines covering the back; another is the power of rolling themselves up into a ball, by placing the head on the breast, drawing up the legs, and curling the body round them. When thus rolled up the creature is almost invulnerable, and can with difficulty be unrolled; an enormously developed muscle with a thick margin spreads over the back and sides, and contracts with an immense force, capable of resisting the efforts of its enemies while the spines inflict severe wounds. The only method readily available for making the creature unroll, is to fling it into water.

The spines, which the animal can erect at will, are confined to the back; the other parts of the body are either, like the face and feet, hairless, or covered with hair of a more or less dense character, according to the species. The food of the Hedgehogs consists of insects, worms, snails, and the like.

The LONG-EARED HEDGEHOG, *Erinaceus auritus*, is found in Siberia and the East of Asiatic Russia, and has also been discovered in Egypt. It is smaller than the common European Hedgehog; the limbs are longer and more slender, the hair on the lower surface of the body is extremely fine. The spines on the back do not extend so far as in the European species, and are of peculiar color—the base being white, the centre brown, the tip yellow. The species derives its name from the large size of its ears, which project in such a manner as to produce a very pig-like look.

The HEDGEHOG or URCHIN, *Erinaceus Europæus* (Plate V), is found in every part of Europe, where it is often kept in gardens to kill snails and insects, and in houses to kill cockroaches.

The under surface of the body, together with the limbs, is covered with long bristles and undulating soft hair, which passes rather abruptly into the stiff quills that defend the back, and is so long that it almost conceals the limbs when the animal is walking. The quills cover the entire back and top of the head, and are of a grayish-white color, diversified with a blackish-brown ring near the middle. In the young animal the spines are few in number, soft in texture, and nearly white, so that the little creatures look like balls of white hair or young birds. The young are born not only with the eyes, but with the ears closed also—a fact said to be quite unique. The nest in which they are produced and nurtured is most ingenious in its structure, being so admirably woven of moss and similar substances, and so well thatched with leaves, that it will resist the effects of violent showers.

The Hedgehog is very fond of milk, and is accused by the ignorant peasantry of sucking cows. But it does not despise strong liquor. There is a widespread belief that the easiest way of taming it is by making it drunk; and Dr. Ball, who tried the experiment, found it perfectly successful. He gave some sweetened whiskey to one, and writes of the result: "He did not go far before his potation produced all its effects; he tottered, then fell on his side—he was drunk in the full sense of the word, for he could not even hold by the ground. We could then pull him about, open his mouth, twitch his whiskers, etc.; he was unresisting. There was a strange expression in his face, of that self-confidence which we see in cowards when inspired by drinking.

"We put him away, and in some twelve hours afterward found him running about, and, as was predicted, quite tame, his spines lying so

smoothly and regularly that he could be stroked down the back and handled freely. We turned him into the kitchen to kill cockroaches, and know nothing further of him."

The Hedgehog is the only animal which can eat Cantharides flies without inconvenience, and it is quite impervious to most kinds of poison, including that of venomous snakes.

II.—GENUS GYMNURA.

This genus is represented by only *one* species, the BULAU or TIKUS, *Gymnura Rafflesii*, found in Sumatra, and somewhat like our own opossum. All the feet have five toes, the three middle toes being longer than the others. The muzzle is lengthened, but is cut off abruptly at its termination. The eyes are small, and the ears small, rounded, and devoid of hairy covering.

One peculiarity of the animal is, that the fur on the body and head is pierced by a number of very long, bristling hairs, which are much longer on the neck and shoulders. The color is a mixture of black and white, as follows: the greater part of the body, the upper portion of the legs, and the beginning of the tail, are black; while the head, the neck, and flanks, and the remainder of the tail, are white. There is also a black stripe over each eye, which forms a bold contrast with the white fur of the head. It emits a musky odor. Nothing is known of its habits.

THE TENRECS.

The family CENTETIDÆ contains a number of small animals, many of which have a spiny covering. Of the *six* genera into which it is divided, all but one inhabit Madagascar, and the animals are often called MADAGASCAR HEDGEHOGS. In general they may be described as having a long head and pretty long muzzle, small eyes, moderate ears, short legs, with five toes and strong claws, while their coat is like that of the *Gymnura*—half hair, half bristles. The tail is either almost or entirely wanting in five of the genera, while the two species embraced in the genus *Solenodon* are endowed with a very long, bare, and scaly caudal appendage.

I.—GENUS CENTETES.

This genus is subdivided into *two* species, which differ very slightly. The TENREC, *Centetes ecaudatus* (Plate V), has a slender body, and a long head taking up nearly one-third of the animal's whole length. The ears are short, the eyes small, the neck short and thinner than the body; the hind-legs are slightly longer than the fore-legs. The body is covered with spines, bristles and hairs, which clearly show, by the progressive changes in their structure, that the spines are merely hairs transformed. At the back of the head real spines, not very hard and bending, grow to the length of nearly half an inch. Down the flanks these spines become longer, thinner, softer, and more pliant; and on the back, bristles predominate. The under side of the body is covered with hair, and long, sharp hairs project from the muzzle. The spines, bristles or hairs are of a yellowish color; the former are tipped with black. The Tenrec is not adorned with a tail. It attains a length of eight to ten inches. It cannot coil up into a ball like the hedgehog.

The Tenrec has been carried from Madagascar to the Mauritius and neighboring islands. It is shy and timid, and only comes out at sundown, but never ventures far from its burrow. There is some doubt as to its becoming torpid at certain seasons; the best evidence is to the effect that during the dry season the Tenrec retires to the deepest part of its burrow, and there sleeps from April to November.

Although this creature exhales a musky odor very offensive to most nostrils, the natives regard it as a great delicacy, and the markets on feast days display numbers of Tenrecs in all stages, alive, slaughtered or ready for the spit.

The BANDED TENREC, *Centetes variegatus*, is also a native of Madagascar, and has derived its title of Banded, or Varied, from the bold coloring of the quills and hair.

The color of the back is a blackish-brown, diversified with three bold stripes of yellowish-white. The centre one of these stripes extends along the entire length of the animal, and the two others commence by the ear and terminate by the flank. The hair that covers the under portion of the body is of a yellowish-white color. The generic name, *Centetes*, is of Greek origin, and signifies "thorny," in allusion to the short and thorn-like spines with which the body is covered.

II.—GENUS HEMICENTETES.

The TENDRAC, *Hemicentetes speciosus*, is smaller than the Tenrec, attaining a length of little more than five or six inches. The color of this animal is rather rich and varied, owing to the deep tinting of the quills and the soft hues of the long and flexible hairs which stud the body intermixed with the quills. The hair is of pale yellow, and the quills are of a deep red or mahogany tint toward their points, and white toward their bases. The long coarse hairs which cover the abdomen and the legs are annulated. This animal is generally found in the neighborhood of water, whether fresh or salt, and makes deep burrows near the bank. The natives esteem it highly as an article of food.

The genera III. ERICALUS, IV. ECHINOPS, and V. ORYZORYCTES, are based on very slight distinctions, and call for no remarks.

VI.—GENUS SOLENODON.

This genus is found only in the Antilles, one species occurring in Cuba, the other in Hayti. We have thus in this genus as compared with the preceding genera, a most remarkable case of discontinuous distribution, two portions of the same family being separated from each other by an extensive continent as well as by a deep ocean.

THE AGOUTA.

The AGOUTA, *Solenodon cubanus*, is one of the few indigenous mammals of the West Indian Islands. Its length of body is about twelve inches, of tail about eight inches. The head, neck, and stomach are of a dirty yellow-ochre color, the tail blue-black, the rest of the coat, black.

This animal is nocturnal and sleeps during the day. Peters accuses it of being guilty of the piece of folly which is usually attributed to the ostrich. When pursued it hides its head, and then stays so quietly that the hunter can seize it by the tail. In captivity it does not refuse food, but requires its meat cut up fine; perfect cleanliness is indispensable for its existence; it seems to take pleasure in plunging into water. Its voice is a grunt, or a scream. When angry its hair stands up. It

catches little animals that come within its reach, and tears them to pieces with its powerful claws just as a hawk tears his victim with his talons.

THE ALMIQUI.

The ALMIQUI, *Solenodon paradoxus*, is peculiar to Hayti. The fur of the Almiqui is long, harsh, and coarse, and its color is an undecided red, tinged with yellow. The nose is elongated, and strengthened at its base by a slender bone, so that it appears to be intended for digging in the earth. The nostrils are placed at the extremity, and divided by a furrow. The cheeks and lips have hairs of very great length; the eyes are small; the ears are moderate, rounded, and almost devoid of hair. The feet are terminated with five toes, and the long claws are curved, and evidently fitted for scraping at the soil.

The tail is moderately long, measuring about nine inches in length, and is rounded throughout, the head and body being rather more than a foot long. The tail is not covered with hair, but is rather naked, and for the greater part of its length is scaly. The lower jaw is somewhat shorter than the upper. The teeth are very peculiar. The two middle incisors of the lower jaw are small and narrow, placed between two long conical ones, which are hollowed on the inside by a deep groove; there are no true canines.

THE OTTER SHREW.

The family POTAMOGALIDÆ consists of *one* genus and *one* species, and is founded on a curious otterlike animal from West Africa, discovered by Du Chaillu at the Gaboon; it has affinities with several groups of Insectivora, but is sufficiently peculiar to require a distinct family for its reception.

The OTTER SHREW, *Potamogale velox*, is thus described: "The head is long and very flat, the nose sharp, eyes very small, ears small and sparingly covered with hair; whiskers stiff, and white-colored, neck thick, body stout, extremities small, feet five-toed, plantigrade behind, tail stout, compressed laterally. Fur short, dense and soft, with coarser hair mixed with the fine fur on the upper part of the body; three-fourths of the tail is covered with very short, bristly and closely applied hairs forming a crest along the upper edge. Color dark-brown on back,

pale-yellow below, almost white on the throat. Length of body fifteen inches; of tail, nine inches.

It is found along the water-courses of clear streams, and hides under rocks waiting for fish. It swims very fast. The great motive-power of the animal seems to be in its tail."

THE GOLDEN MOLES.

The family CHRYSOCHLORIDÆ is divided into *two* genera of very remarkable mole-like animals with a beautiful silky fur of a metallic lustre and changeable golden tints. Their dentition clearly distinguishes them from the true moles. The teeth are separated from each other by an interval equal to their thickness, so that when the jaws are shut, the teeth of one jaw fall into the interstices between the teeth in the other. This is the only known example of such an arrangement. The skeleton, too, has nineteen pairs of ribs. The fore-feet have four toes; the fourth is small, the other three have powerful claws fitted for digging, while the claw of the middle toe is of formidable dimensions. The hind feet are small and five-toed. The eye is invisible, being covered with skin. The limbs are very short, the tail rudimentary, and the snout abruptly truncated. These moles are found in South Africa. The two genera differ chiefly in the lustre of their fur. The first, *Chrysochloris*, has a golden reflection; the second, *Calchochloris*, has a more coppery tinge. The *three* species come from the Cape of Good Hope, Natal, and Mozambique.

The CHANGEABLE MOLE, *Chrysochloris holosericea*, is the most common species, and is distinguished by the long silky texture of its fur.

THE TALPIDÆ OR MOLES.

We now come to a family which comprises many extraordinary forms of small mammalia, especially characteristic of the temperate regions of the Eastern Hemisphere. It is divided into *eight* genera.

I.—GENUS TALPA.

This genus is quite unknown in America, but is exceedingly common in Europe. It forms *seven* species.

The Mole is a burrowing animal, and passes its life underground. Digging with head and paws, it makes a system of communicating passages, which can be traced on the surface of the ground by a slight elevation of soil. These passages radiate from a central dome, which is marked by the mole-hill; to reach it, the animal enters a circular gallery on the same level as the numerous radiating passages; then it passes into one of five conduits, which ascend obliquely toward another circular gallery of a smaller circumference than the first, and placed a little higher; lastly, it enters its dwelling by a passage which opens into the latter gallery. From the floor of this chamber a tunnel runs and connects with some of the radiating galleries.

The body of the Mole is a cylinder terminating in a cone; there is no neck, and the nose is a boring instrument. The eyes are nearly imperceptible. The sense of hearing is very acute; there is no external ear, but the internal ear is highly developed. Its powers of smell, too, are excellent. The tail is very short, the coat black, thick, and silky. Their food is chiefly insects and earth-worms, and the dead bodies of small mammals or birds. The Mole is essentially carnivorous; it does not experience a mere sense of hunger like other animals, but a craving of the most powerful description—a kind of frenzy.

The COMMON MOLE of Europe, *Talpa Europæa*, is, as its name implies, found everywhere in that continent, and is the type of the genus. A species called the BLIND MOLE, *Talpa cæca*, occurs in Italy, and in it the eye is quite invisible, and the snout is somewhat longer than in the common species.

II.—GENUS SCAPTOCHEIRUS.

This genus is represented by *one* species, a recent discovery in Northern China, and calls for no remark.

III.—GENUS CONDYLURA.

This genus consists of only *one* species, which inhabits the Eastern States from Nova Scotia to Pennsylvania. Its most striking characteristic is a peculiar membranous appendage to the snout, which has a star-shaped termination.

The STAR-NOSED MOLE, *Condylura cristata*, (Plate V) is of a dark-brown or blackish color; the tail is long and hairless, and nearly as long as the body without the head.

The most remarkable point in this animal is the muzzle, which is produced into a long, slender proboscis, round the extremity of which are arranged a number of soft, fleshy rays, of a bright rose-color, radiating like the petals of a daisy or the tentacles of a sea-anemone. These curious rays, or "caruncles," as they are more scientifically termed, can be spread or closed at pleasure, and present a strange spectacle when in movement. Their probable object is that they may serve as a delicate organ of touch, to aid the animal in its search for food. The number of these caruncles is about twenty, and the openings of the nostrils are placed in the centre of the star.

IV.—GENUS SCAPANUS.

The *two* species of this genus extend from New York to San Francisco, and are mere varieties of the Scalops.

V.—GENUS SCALOPS.

This genus, which seems to form a link between the MOLES and the SHREWS, is peculiar to North America. East of the Rocky Mountains, it ranges from the Great Lakes to Mexico; but on the Pacific slope it is found only to the north of Oregon.

Its characteristics are an elongated nose, invisible eyes, five toes, armed with large claws and somewhat webbed, and a naked tail. The number of species well defined is *three*, but varieties are numerous.

The COMMON MOLE, *Scalops aquaticus*, (Plate V) has thirty-six teeth, approaching in some points to those of the Rodentia. The eyes are very small, but not covered with skin. The naked tail and webbed feet are white. The body is shapeless; the claws immensely large and strong. The hinder feet and legs are much smaller than the fore ones. The Mole passes the greater portion of its existence below the surface of the ground, and finds a subsistence among the worms and other creatures which it captures during its subterraneous meanderings. The muzzle

of the American is even more remarkable than that of the European Mole, being much longer in proportion to the size of the animal, and is cartilaginous at its extremity. The length of the animal is about seven inches. They come to the surface daily at the hour of noon, and can then be caught by thrusting a spade underneath them. Mr. Peale had a tame one which followed his hand by the scent, and fed freely on fresh meat. It would burrow for amusement in loose earth, and after making a small circle, return to its keeper.

The PRAIRIE MOLE, *Scalops argentatus*, is very similar to the Common Mole, but it is rather larger, and its fur is lead-colored.

The HAIRY-TAILED MOLE, *Scalops Brewerii*, differs by possessing a tail densely covered with hair, a membranous covering over the eye, and large ear openings. In color it resembles the Prairie Mole. Other varieties are the OREGON MOLE, *Scalops Townsendii*, and the BROAD-HANDED MOLE, *Scalops latimanus*.

VI.—GENUS MYOGALE.

The *two* species of this genus are widely separated, one being found in the Pyrenees, the other in Southeast Russia. The animals comprehended in them are specially organized for an aquatic existence. The hind-paws are palmated, and their tail is flattened at a certain portion of its length, in such a manner as to play the part of an oar. Their eyes are very small, and their ears scarcely visible. The body is elongated and covered with silky hair of an iridescent hue. At the base of the tail are numerous glands, which exhale an excessively penetrating odor. The nose is terminated by a small, compressed trunk; the paws are formed of five toes, and are furnished with strong claws.

The PYRENEAN DESMAN, *Myogale pyrenæa*, which the Spaniards call Almizilero, or the "Musky Rat," attains a length of ten inches, of which one-half belongs to the tail. It is chestnut-brown above, brownish-gray on the sides, silver-gray on the belly, white on the snout, the tail dark-brown, with some white hairs. This creature has been found not only in the Pyrenees, but in the Sierra de Gredos, and is probably common to all North Spain.

The RUSSIAN DESMAN, *Myogale moschata*, (Plate V) is nearly twice as long as its Spanish congener. The eyes are small, the auditory

passages thickly covered with hair, the nose is elongated into a proboscis and the nasal aperture can be closed with a small flap.

On account of its aquatic propensities, and the peculiar aspect of its incisor teeth, the Desman was formerly thought to be a rodent animal, and allied to the beavers, among which creatures it was classed under the name of *Castor moschatus*, or Musky Beaver. Its fur is much esteemed on account of its rich color, long silky texture, and warm character. The color of the Russian Desman is brown on the upper portions of the body, becoming darker on the flanks, and fading suddenly into silvery-white on the abdomen. The peculiar warmth of the fur is owing to a thick, inner coating of fine hair beneath the long, silken hairs of the exterior.

The tail of this animal is shorter than the body, and very remarkable in its shape, for at its base it is compressed, but rapidly becomes rounded and swells with such abruptness that it may almost deserve the term of bulbous. It then decreases in size as rapidly as it had increased, and, in proportion as it becomes smaller, it becomes vertically compressed. The entire member is, like that of the beaver, thickly set with scales, through the intervals of which protrude a number of short and bristly isolated hairs.

VII.—GENUS NECTOGALE.

Some specimens of Desman-like animals found in Thibet, have been described by the eminent French naturalist Milne-Edwards, and raised to the dignity of a separate genus, to which he has given the name of Nectogale. They are closely allied to the members of the genus Myogale. The remoteness of the locality in which they were discovered seems to have had some influence in suggesting the creation of a new genus, just as the wide separation of the two Desmans has led to the division into two species.

VIII.—GENUS UROTRICHUS.

This genus is represented by a shrew-like mole, which was discovered about twenty years ago in Japan, and a species more recently found in Washington Territory. It seems to form a link, through the *Condylura*, between the Shrews and the Moles.

The JAPANESE MOLE, *Urotrichus talpoides*, has a muzzle prolonged

into a tube which terminates in a naked bulb. The eyes and ears are concealed. The tail is long and hairy; all the feet covered with small plates; the fur is brown.

GIBBS' MOLE, *Urotrichus Gibbsii*, is the name given to the species found near the White River, Cascade Mountains. It is of a sooty color, and smaller than the Japanese variety. The skull is broader, and narrows anteriorly more abruptly than in Scalops; but the specimen examined by Professor Baird was injured and not quite mature, so that he could not make out many of its characteristics.

THE SORICIDÆ OR SHREWS.

This family contains *one* genus, and *sixty-five* species. We content ourselves with a description of the more important species, especially those belonging to our own country.

GENUS SOREX.

The SHREWS offer examples of the smallest animals in the class Mammalia, some species being much smaller than the mouse. Like Moles, they have defective vision; the hair is silky, thick, and varying in color between a gray and a brown; they feed on worms and insects, leading a solitary life in holes, which they seldom leave during the day. They are furnished with glands in the flank which secrete a musky odor. Their bite was for a long time considered poisonous; and our ancestors gave the name to a scolding woman, whom, on account of the venom of her tongue, they called a *shrew*.

The SHREW MOUSE, *Sorex vulgaris*, has a long head and a long and flexible snout; the incisors are extremely long, the lower ones projecting almost horizontally. It is common in all parts of England. A Natural History published in 1658 gives the following quaint account of it:

“It is a ravening beast, feigning itself gentle and tame, but, being touched, it biteth deep, and poysoneth deadly. It beareth a cruel minde, desiring to hurt anything, neither is there any creature that it loveth, or that loveth him, because it is feared of all. The cats, as we have said, do hunt it, and kill it, but they eat not them, for if they do, they consume away and die. They annoy vines, and are seldom taken, except in cold;

they frequent ox-dung, and in the winter time repair to houses, gardens, and stables, where they are taken and killed.

“If they fall into a cart-road, they die, and cannot get forth again, as *Marcellus*, *Nicander*, and *Pliny* affirm. And the reason is given by *Philes*, for being in the same, it is so amazed, and trembleth, as if it were in bands. And for this cause some of the ancients have prescribed the earth of a cart-road to be laid to the biting of this mouse as a remedy thereof. They go very slowly; they are fraudulent, and take their prey by deceit. Many times they gnaw the oxes hoofs in the stable.

“They love the rotten flesh of ravens; and therefore in *France*, when they have killed a raven, they keep it till it stinketh, and then cast it in the places where the Shrew-mice haunt, whereunto they gather in so great a number, that you may kill them with shovels. The *Egyptians*, upon the former opinion of holiness, do bury them when they die. And thus much for the description of this beast.”

The WATER SHREW, *Sorex fodiens* (or *Amphisorex Linneanus*), is, as its name implies, found near the banks of streams. It is a good diver, and its ears are admirably adapted to protect it under water, as they are so constructed that the pressure of the water completely closes them.

The ETRUSCAN SHREW, *Sorex Etruscus*, is the smallest of all known mammals. It measures only an inch and a half in length. Its habitat is Italy, but it is said to have been found in Algeria.

The HOUSE SHREW, *Sorex araneus*, is common in Central Europe, but is not found in England. It frequents barns and often enters houses.

THE AMERICAN SHREWS.

FORSTER'S SHREW, *Sorex Forsteri*, is a very well-known species, found in all the Eastern States and quite common in New York. De Kay describes it in the following terms: “Body slender, more elongated and divided at the tip, whiskers long, fur short but fine, feet slender, with five toes; tail four-sided, with a small pencil of hair at the tip, and nearly as long as the body. The color is dark-gray tipped with brown. Length four inches.”

The THICK-TAILED SHREW, *Sorex pachyurus*, is found in the Northwestern States. Its fur is longer than that of most Shrews, and gives the creature a stout appearance. The feet and claws are large, the tail

very thick, and all the teeth are chestnut-colored at the tips, like those of a confirmed tobacco-chewer.

The BROAD-NOSED SHREW, *Sorex platyrrhinus*, is one of the smallest quadrupeds on this continent. It is found in the Northeastern States, and a specimen has been captured in Rockland County, N. Y. The ears are large, the tail is almost bare, the color is dark-brown on the back and gray below. Length two inches.

The MASKED SHREW, *Sorex personatus*, allied to the preceding species, is the one called by Audubon *Sorex longirostris*. It is smaller even than the Broad-nosed species.

THOMPSON'S SHREW, *Sorex Thompsoni*, is, however, the smallest Shrew yet described. Professor Baird has seen a specimen weighing less than twenty-two grains. Its color is a dark olive-brown, the ears are large, the incisors fewer than usual.

The NAVIGATOR SHREW, *Sorex navigator*, is characterized by the length of the tail, which is one half longer than the body. The fur, too, is long and very soft and thick; the color is a grayish-brown.

The CAROLINA SHREW, *Sorex talpoides*, is a large species, measuring nearly four inches, with a tail not half an inch in length. The nose and feet are flesh-colored; the rest of the body covered with bright gray fur. It is found in all the Northern States, and as far south as Georgia, being the commonest of all the North American Shrews.

The SHORT-TAILED SHREW, *Sorex brevicaudus*, is the largest of all our Shrews; its fur is leaden in hue, with a slight shade or gloss of purple. The head is broad and obtuse. The tail is about half an inch in length.

CAROLINA SHREW, *Sorex Carolinensis*. This species, though usually known by the same name, is smaller than the species just described as *Sorex talpoides*, and its color is darker; the fore-feet are broader than the hind-feet, and have much longer claws. It is common in the South.

BERLANDIER'S SHREW, *Sorex Berlandieri*, is the most southern species, not passing the Rio Grande. It is small, with a stout body and small ears. Its fur is soft and thick, resembling long-piled velvet.



ORDER IV.

CARNIVORA.

23. FELIDÆ - - - - - CATS, LIONS, ETC.
24. CRYPTOPROCTIDÆ - - - - CRYPTOPROCTA.
25. VIVERRIDÆ - - - - - CIVETS.
26. PROTELIDÆ - - - - - AARDWOLF.
27. HYÆNIDÆ - - - - - HYÆNAS.
28. CANIDÆ - - - - - DOGS, FOXES, ETC.
29. MUSTELIDÆ - - - - - WEASELS.
30. PROCYONIDÆ - - - - - RACCOONS.
31. ÆLURIDÆ - - - - - PANDAS.
32. URSIDÆ - - - - - BEARS.
33. OTARIIDÆ - - - - - EARED SEALS.
34. TRICHECIDÆ - - - - - WALRUS.
35. PHOCIDÆ - - - - - SEALS.

CARNIVORA

CHAPTER I.

THE CARNIVORA OR FLESH-EATERS—GENERAL CHARACTERISTICS OF THE ORDER—ITS FUNCTION IN THE ECONOMY OF NATURE—ITS GEOGRAPHICAL DISTRIBUTION—ITS DIVISION INTO FAMILIES.

NO division of the Animal Kingdom presents such a variety of forms as the order at which we have now arrived; it embraces the lordly lion and the stealthy weasel, the domestic cat and the faithful dog, the ponderous bear and the unwieldy walrus. Yet these creatures that seem to differ so widely, some of which are fitted to live on the ground, some on trees, some in the waters, are most closely akin.

The title CARNIVORA is derived from two Latin words, *caro*, *carnis*, "flesh," and *voro*, "to devour," and indicates the most striking characteristic of the order. Strictly speaking, no doubt the epithet is applicable to many of the animals which we have described in preceding chapters; but the diet of the bats and shrews is confined to small animals, such as worms and insects, while the CARNIVORA not only possess the appetite for blood, but the strength to gratify it in larger victims. The Carnivorous Quadrupeds are distinguished by the possession of four large and long canine teeth, which can seize and hold fast their struggling prey, and the cheek teeth are either entirely constructed for tearing and cutting or have their crowns more or less blunted; behind the false molars is a large tooth denominated the "lacerator," and it may be remarked that those genera which have the fewest false molars have the shortest, and consequently the most vise-like jaw.

With the exception of the human race and a few of our domestic pets, no animal in a state of nature arrives at old age; that is, at such age as permits decline and feebleness to take the place of strength and vigor. Throughout the whole creation violent death awaits alike all

living things. Do the feebler animals betray a lack of cunning or a want of speed? The destroyer is at hand; the executioner stands ready. Does the tyrant fail in strength or courage to pursue its prey? The foe awaits it and its doom is fixed. No maudlin pity interferes with this dread duty; no decay, no disease, decline or decrepitude are allowed to sully Nature's works. The agents appointed in the general struggle for existence to destroy and live upon the flesh of their fellow-creatures are the most highly gifted and intelligent of the brute creation, the CARNIVORA; their special function seems to be that of limiting the multiplication of the herbivorous species, and their disappearance from the earth might lead to serious inconvenience.

The Carnivora combine in a very high degree strength and agility; and their appearance, while it may strike terror, does not awaken those feelings of repugnance which many other animals excite. They are usually handsome and graceful, and we find in the order very few of those strange forms which meet us, for example, in the Cheiroptera. They live in all parts of the globe, in mountain and plain, in field and forest, in the North as well as the South, and many of them are nocturnal animals, seeking their prey by night as well as by day. Hence, even if we exclude from our present consideration the marine families of the order, it is difficult to give anything but a very general sketch of their structure.

Their limbs are well-proportioned, and their toes, which are entirely separated from each other, are terminated by stout and strong claws, more or less sharp according to their habits of life; these, with the teeth, constitute their means of attack and defence. In all the members of the cat tribe the claws are retractile, that is, they may be withdrawn into the interior of the paw at the will of the animal. This faculty is owing to the peculiar arrangement of the claws, and the action of a special muscle.

The Carnivora vary very much in their mode of placing their feet on the ground. Some, such as bears and badgers, tread upon the whole surface of the foot, and are remarkable for their thick-set forms,—these are called *Plantigrades*; others, as cats and dogs, only touch the ground with their toes, and have a more slender body and a more agile gait,—these are called *Digitigrades*. Between these well-marked types are ranked various species, which more or less partake of both characteristics.

The intelligence of the Carnivora does not contradict their bodily structure; it is the intelligence of beasts of prey, in which cunning and perseverance are combined. The feeling of their strength gives them courage and confidence such as no other creatures possess, but these qualities are accompanied by bad ones; the Carnivora too often display cruelty as well as courage, and some seem to be possessed by a thirst for blood.

One of the most marked features presented by the group of the terrestrial Carnivora is its comparative scarcity in South America, only four families being represented there, not counting the Andean species of the Ursidæ, and both genera and species are few in number. We may therefore, from these considerations alone, conclude that the Carnivora are a development of the Northern Hemisphere. North America is distinguished from Northern Europe and Asia by its possession of at least six species of skunks and the racoons. Another marked feature is the total absence of bears in Southern Africa. The great mass of the generic forms of the Carnivora are found in Asia and Africa.

The marine Carnivora form three families; the terrestrial, ten—the most important of the latter being the Felidæ or cats, the Canidæ or dogs, and the Ursidæ or bears. Between the two former is placed the family of the Viverridæ or civets, connected with the cats by the single genus of the Cryptoproctidæ, and with the dogs by the single genus of the Hyænidæ. Next to the dogs are the Mustelidæ or weasels, which are linked to the Ursidæ by the Procyonidæ or racoons and the Æluridæ. The Ursidæ are followed by the sea-bears or Otariidæ, and then we pass through the walruses or Trichecidæ, to the seals or Phocidæ. The modification of form is not very great, and the occurrence of several families, consisting of but one species, is an indication of a great amount of recent extinction.

THE CATS.

We commence our description of the Carnivora with the family of CATS or FELIDÆ. They are not only the most perfect beasts of prey, but perhaps, with the exception of man, the most perfect of all animals. The common cat may be taken as a type of the family, for in no other family is the fundamental form preserved so closely by all its members; the Lion with his mane, and the Lynx with his tufted ears, are as cat-like as the Leopard; the Cheetah, or Hunting Leopard, alone presents

any important variation, and seems to form a link between the Felidæ and Canidæ. The Cats present a wonderful combination of suppleness, agility, and strength; the head is round, the neck and jaws powerful, and the limbs muscular. The canine and lacerator teeth are large and strong; compared with them the incisors are insignificant, and even the molar teeth, which have ceased to be grinders, appear weak and inconsiderable. The tongue is thick and fleshy, and armed with spines that curve backward. But the teeth are not the only weapons of attack possessed by the cats; they possess in their claws a terrible weapon wherewith to seize their prey or hold the struggling victim while the pointed teeth are doing their work. The foot appears short, because the last joint is curved upwards so that it does not touch the ground, an arrangement which ensures perfect safety to the curved and pointed claws. These claws have an additional safeguard in being retractile, or capable of being withdrawn into a sheath. A little observation of the foot-prints of a cat in comparison with that of a dog will show how complete a protection Nature affords to these powerful and delicate instruments. The cats walk well, but slowly, cautiously, and silently; they can run rapidly, and make springs ten or fifteen times the length of their body. The larger species are too heavy to be good climbers, but the majority are expert in the art. Although they have a repugnance to water, they can swim well, and are exceedingly difficult to drown. The tenacity of life in all species is proverbial.

Their senses of hearing and sight are highly developed; it is the former which guides them on their hunting expeditions. They hear at great distances the lightest footfall, or the gentlest rustle. Their sight, though less developed, is excellent; they probably cannot see far, but see well all that is in their range. In the smaller species the eyeball is contractile; in the bright light of day the aperture of the iris contracts into a mere slit, at night it dilates to a full circle. The whiskers which project on each side of the face seem to be instruments of touch. The cats all seem remarkably sensitive to all external influences, and are very careful to keep their fur clean. Their senses of taste and smell do not seem highly developed; the latter, indeed, is quite subordinate, if we may judge from the delight they exhibit in strong smelling plants, such as *Valerian*.

The Felidæ are found in all parts of the Old and New Worlds, with the exception of Australia and Madagascar. They live in the most

varied localities. Some are found at great heights in mountain regions, others roam over plains or deserts, some haunt the reedy banks of rivers; the most, however, are denizens of the forest, in which the trees afford them a shelter and a vantage ground. They usually avoid the dwellings of man, unless hunger compels them. Then they commence at nightfall to prowl about, or lie in wait near frequented paths for animals or for men. By day they seldom attack. Their food is not confined to any one species of animal; some of them prefer birds, a few eat reptiles, others even catch fish. As a rule they do not disturb the Invertebrata, and prefer prey that they have killed themselves.

All the species of Felidæ attack in the same manner. With silent, cautious tread they creep along, listening and looking in every direction; a rustle attracts their attention, they crouch low and advance up the wind, till they are near enough for a spring. One or two bounds carry them to their victim, a blow on the neck from their frightful paw hurls it to the ground, and the sharp teeth are buried in its throat. Most of the Felidæ have the habit of tormenting their victims, letting them go, then catching them again, and repeating this cruel proceeding till they die from their wounds. It is probable that by a marvellous provision of Nature the sense of pain is driven out of the victim as soon as it is seized or struck by its destroyer. Dr. Livingstone had personal experience of this fact. He writes: "The lion caught my shoulder as he sprang; growling horribly he shook me as a dog shakes a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake by a cat. It causes a sort of dreaminess in which there was no sense of pain or terror, though I was quite conscious of all that was happening. The shake annihilated fear, and allowed no sense of horror in looking round at the beast."

The family has been made by some naturalists identical with the genus *Felis*, others again divide it into seventeen generic groups. The most convenient arrangement is to regard it as embracing *three* genera, the CATS, the LYNXES, and the HUNTING LEOPARDS



CHAPTER II.

THE LION.

THE AFRICAN LION—THE CAPE LION—THE GAMBIA LION—THE LION OF NORTH AFRICA—THE ASIATIC LION—THE MANELESS LION—THEIR SIZE AND STRENGTH—THEIR ROAR—THEIR HABITS—DIFFERENT OPINIONS OF THEIR CHARACTER—MODES OF DESTROYING—TAME LIONS—DANGEROUS PETS.

WE may premise with regard to the three genera into which the FELIDÆ are divided that the third is distinguished from the first two by having non-retractile claws, and the second from the first by the shortness of its tail, and the possession of pencils of hairs which tuft its ears.

I.—GENUS FELIS.

The true cats are the most beautiful and terrible of animals, and at their head stands that magnificent creature which has been styled from time immemorial the “King of Beasts.”

THE LION.

The LION fully justifies by his appearance the royal title which he has received. He carries his head high and walks with an air of stately gravity, his visage is calm and dignified, and bespeaks a confidence in his strength. But his most striking feature is the bushy mane which, in most varieties, overshadows his head and neck, and gives to his remarkable appearance an air of grandeur which commands awe. From the mane alone the home of the lion can be discovered; in the Persian lion it is long and consists of brown and black hair mixed, in the lion of Guzerat it is thin and short; it is most developed in the proudest and most royal variety, the African lion. With the excep-

tion of the mane and a tuft at the end of the tail, the coat of the lion is entirely smooth, and in adult life of a uniform tawny color, while in the cubs it is faintly marked like a tiger or our domestic cat. Owing to this uniform tawny color, the lion is hardly distinguishable from surrounding objects even by daylight, and at night he walks secure. Even skilled hunters, who have heard him lapping water at twenty yards distance, have been unable to make out his form. The female never acquires a mane, and the male does not possess it in its full glory till he is three years old. Some naturalists regard the Cape lion and the Gambia lion as different species, but they do not rise higher than the dignity of varieties. It is amusing to see how national pride influences even the philosophic minds of natural historians. The English regard the specimen of the lion which comes from the British possessions as the type of the heraldic supporter which holds the shield of England, and is famous in our nurseries as having fought with the unicorn. The French writers, on the other hand, sing the praises of the "Monarch of Mount Atlas," and accept with exemplary faith the stories of Jules Gerard. Perhaps no African lion can justly claim to be the old original lion of fable, for there is no doubt that the species was once much more widely distributed than at present, and was not unfrequent in the Southeast of Europe. But as man advanced the lion has receded; when pastoral life succeeded nomad life, flocks and herds were no longer left unguarded to become the prey of any nocturnal prowler, and the lion was driven to seek his sustenance elsewhere or lose his life in the attempt. At present even in Africa the lion is not commonly seen, and in a few generations, as civilization extends over the now unknown interior of that vast continent, it is probable that the lion will be as extinct as the Dodo or the Mammoth, and known only by description. Herodotus tells us that lions attacked the baggage-train of Xerxes in Macedonia, and Aristotle distinctly says that lions are not found in Europe beyond the Achelous, the present Aspropotamo. The Bible mentions the lion as ravaging the herds of Palestine, and it was once as common in Egypt as it is now in Algiers or Morocco.

Some lions have attained the length of ten feet from the muzzle to the root of the tail, and measure four feet in height from the ground to the shoulder. Their strength is prodigious, and with a single blow of the paw they will break the back of a horse; they can leap a space of thirty feet, and can carry off a bullock in their jaws. Nothing can be more

dreadful than the lion preparing for combat; he lashes himself with his tail, his mane becomes erect, and envelops the whole head, his enormous eyebrows half conceal his flashing eyes, while he protrudes claws as long as a man's finger. It has often been doubted whether the end of the lion's tail was armed with a claw as Aristotle described it; but the existence of a strange appendage is demonstrated by Mr. Bennett, who exhibited a claw-like formation taken from the tail of a specimen living in the London Zoological Gardens: it was about a third of an inch in length, solid for the most part, sharp at the apex, and hollowed out at the base.

The roar of the lion has passed into a proverb; when heard within a distance of a mile or two during the silence of the night, it awes all living creatures. Not knowing whence the sound proceeds, they leave their lairs, and in the confusion one or two will probably pass within reach of his spring. Livingstone, however, affirms that the roar of the lion may be mistaken for the cry of the ostrich, and that the voice of the ostrich has never frightened anything. Both Europeans and natives told him that the sounds were indistinguishable, and that the only difference is that one is heard by day, the other by night. Figuié suggests that the lion of the British possessions may roar "like a sucking-dove," but that the lion of the French colony has a much more powerful voice.

The lioness produces from two to five cubs at a birth, and is a devoted mother, defending them from all aggressors, among whom their majestic father is numbered, for the "King of Beasts," like the Tom cat of our homes, devours his helpless offspring as soon as they come into the world.

As a rule the necessity of procuring food prevents lions from assembling in large numbers, but Livingstone asserts that troops of six or eight have been seen. These were probably two lionesses with their cubs. Delegorgue relates that in winter twenty to thirty lions have been seen to assemble and drive their prey into narrow passes. Five have been seen in the chase of one giraffe, two pulling the victim down, the others waiting close by. These also were probably two females with their families.

Generally the lion does not hunt during the day; not that his eyes are unfitted for diurnal vision, but indolence and prudence keep him at home till evening. When the first shadows of twilight appear, he enters upon his campaign. If there is a pool in the vicinity of his haunt, he places himself in ambush on the edge of it, with the hope of securing a

victim among the antelopes, gazelles, giraffes, zebras, buffaloes, etc., which are led thither to slake their thirst. These animals, well aware of this habit of their enemy, will not approach a pond without extreme caution. If one, however, places itself within reach of their terrible foe, its fate is generally sealed. One enormous bound enables the lion to spring on its back, and one blow with his paw breaks its spine. If the lion misses his aim, he does not endeavor to continue a useless pursuit, well knowing that he cannot compete in speed with the children of the plains. He therefore skulks back into his hiding-place, to lie in ambush until some more fortunate chance presents itself, or complete nightfall shuts out all hope of success.

The audacity of the lion increases in proportion to his requirements. When he has exhausted all means of procuring subsistence, and when he can no longer put off the cravings of hunger, he sets no limit to his aggressions, and will brave every danger rather than perish by famine. In open day he will then proceed to where herds of oxen and sheep pasture, entirely disregarding shepherds and dogs. At such times he has been known to carry his rashness so far as to attack a drove of buffaloes, but the latter can repel him; the bulls forming a ring around the cows and calves, and keeping him off with their horns. Unlike most felines the lion will eat carrion, contrary to the usual opinion that "'tis the royal disposition of the beast, to prey on nothing that doth seem as dead."

The "King of Beasts" seems, like other kings, to have fallen on evil times; not only is he sedulously shot down, but even his character is taken from him. Buffon ascribed to him courage, magnanimity, generosity, nobility, gratitude, and sensibility, and adds that he is so gallant as never to eat till the lioness has satisfied her hunger. More recent observers, however, seem to have arrived at the conclusion that "the lion is a very fox for his valor, and a goose for his discretion." He is not an open foe, he creeps stealthily on his victim, and never attacks large animals. He is accused of indolence, and to this indolence these learned men attribute a bad habit he sometimes acquires of becoming a man-eater. Unarmed, they say, man is weaker of limb, slower of foot, and less vigilant of sense than any wild animal, and is therefore an easy victim. From the moment the lion becomes a man-eater, he is a scourge to the neighborhood, paying, night after night, visits to the village, instead of as usual flying from the presence of man. The lion is exceedingly distrustful; they have been known to surround an escaped horse,

and to prowl round it for two entire days, not daring to attack so apparently defenceless a prey, simply because its bridle was dangling from its neck, and made the creatures suspicious, even though the rein had accidentally been hitched over a stump. On another occasion a lion crept close to a haltered ox, saw the halter, and did not like it, crept away again until he reached a little hillock about three hundred yards away, and there stood and roared all night.

The hunters take advantage of this extreme caution to preserve the game which they have killed. A simple white streamer tied to a stick, is amply sufficient to prevent the lion from approaching. Sometimes, when no streamer can be manufactured, a kind of clapper is substituted, which shakes in the wind, and by the unaccustomed sound, very much alarms the brute. It does truly seem absurd, that so terrible a beast as the lion should be frightened by the fluttering of a white handkerchief, or the clattering of two sticks—devices which would be laughed to scorn by a tomtit of ordinary capacity.

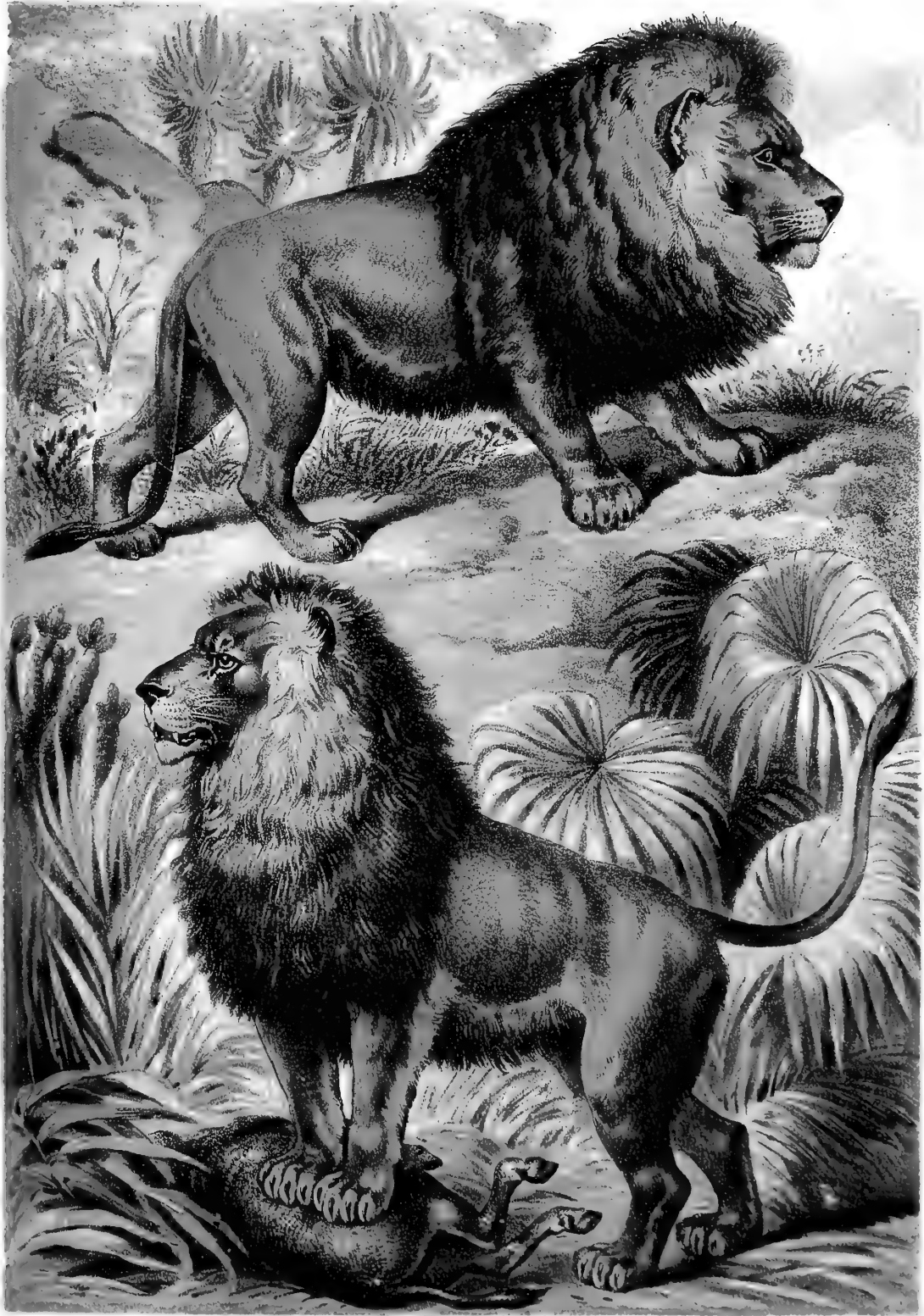
Various means are adopted to destroy lions. The negroes dig a pit, which they roof over with branches that give way at the slightest pressure, on which they place a lamb as a bait. When he has fallen into the pit, his enemies destroy him at leisure. The Arabs adopt a similar device, but sometimes prefer an opposite method; three or four men hide themselves in a hole about three feet deep on the margin of a path frequented by their prey. The roof is covered with heavy stones and earth; narrow openings are made in the sides, in order to see what may be passing without, and on which to rest their fire-arms; lastly, a lure is placed in front of this sanctuary to induce the lion to stop, and when he does a volley of bullets is his welcome. It is rare that he falls dead immediately, he springs towards the ambush, hoping to find the foe; but the construction is too strong to permit him to enter, and he staggers off, probably to die in his den.

At other times, the hunters conceal themselves in a tree, to which they even add more branches in order to make a safe hiding-place. From this post they operate in precisely the same manner as in the subterranean plan.

In South Africa the lion is hunted by dogs, and shot down when he is driven from his hiding-places into the plain. There is another method recommended by Jules Gérard. You must study the lion's habits and movements, and discover his favorite haunts; then you go alone on some







AFRICAN LION ASIATIC LION

PLATE VI. CARNIVORA



fine night, attack him and kill. This is very easy to say; but it seems to be quite as easy to do, at least for French sportsmen; for M. Chassaing by this method killed fourteen lions in ninety-six hours, four of them falling in one night.

The AFRICAN LION, *Felis leo*, var. *Barbarus* (Plate VI), is a native of the ranges of the Atlas. He is the type of the species, and the CAPE LION and the GAMBIA LION are merely varieties; the former being remarkable for his size and dark mane. One or other of these varieties is found from Algiers to the Cape of Good Hope, and from Senegal to Abyssinia.

As far as is known the ASIATIC LION, *Felis leo*, var. *Persicus* (Plate VI) is very similar in habits to that which inhabits Africa. One variety only, the MANELESS LION, or *Felis leo*, var. *Goojratensis*, deserves special mention; it derives its English name from the scanty nature of its mane.

When first this animal was brought before the notice of naturalists, it was supposed to be merely a young male, whose mane had not yet reached its full development. It is now, however, allowed to be either a distinct species, or a permanent variety. The mane is not altogether absent, as the popular name might give cause to suppose, but is very trifling in comparison with the luxuriant mass of hair which droops over the shoulders of the African lion. The limbs do not appear to be quite so long in proportion as those of the last-named animal, and the tail is shorter, with a more conspicuous tuft. This tuft, by the way, is the readiest point of distinction which separates the lion from the other cats.

We have selected two accounts of a single combat with a lion; the first is from the Cape of Good Hope, the actor a Dutch Boer.

“The Boer had penetrated scarcely fifty yards into the bush when he had reason to suspect that he was close upon the lair of the lion. After remaining silent for several minutes, he saw an indistinctly outlined object moving behind some large, broad-leaved plants. This was the lion, whose head only was clearly visible. The lion was evidently aware that some person had approached, but, after a careful inspection, appeared to be satisfied and laid down behind the shrubs. The Dutchman cocked his rifle, and turned the muzzle slowly round to cover the lion. But even this slight movement was perceived by the lion, who rose to his feet. The Boer fired at a spot between the eyes; the bullet struck high, but the lion fell over on its back, rising again immediately, and uttering a fierce roar. As he regained his feet, the Boer sent a

second bullet into its shoulder. The lion bounded off through the bush, and the Dutchman went home and sent his servants and dogs to look for the wounded animal, which he concluded would be found dead. Before sunset the hide of the lion was pegged down outside the Boer's house."

It is amusing to contrast this plain narrative, and the Dutchman's prudence in retiring from the field when he knew his enemy was mortally wounded, with the highly-spiced relation of Jules Gérard, who winds up with a hand-to-hand combat.

"The wood, in the middle of which I found myself, was so dense that it was impossible to see for more than eighteen or twenty feet around. I had taken the precaution to assure myself, by the spoor, of the direction the lion had taken when retiring, so as to face that point. Afterward I relieved myself of my turban, the better to hear the slightest noise. At sunset all the animal life in my vicinity was on the move, so that I was often falsely alarmed—at one time by a lynx, at another by a jackal, and sometimes by creatures of less importance. For each alarm I experienced as many fancies; and I may truly say that, in the space of half an hour, I felt as many as would satisfy the most fastidious adventure-hunter. Toward eight o'clock in the evening, at the moment when the new moon half lighted up the edges of the black scud overhead, I heard a branch snap. This time there could be no mistake; only the weight of a large animal could make such a noise. Shortly after, a hollow, suppressed roar re-echoed through the forest. Then I could distinguish a slow heavy tread. With my rifle to my shoulder, elbow on knee, and finger on trigger, I waited the moment when his head would appear. But I could not perceive the foe until he had reached the bull, on which he began to ply his enormous tongue. I aimed at his forehead and fired. The lion fell roaring, then sprang up on his hind-legs, as a horse when rearing. I had also risen, and taking a step to the front fired a second shot at close quarters. This brought him head over heels, as if struck by a thunderbolt. I then withdrew in order to reload; which having done, and seeing that the animal still moved, I advanced on him, dagger in hand. Certain of the spot where his heart was situated, I raised my hand and struck. But at the same moment the fore-arm of the tawny savage made a backward movement, and the blade of my dagger broke in his side. My presence had renewed his vitality. He raised his enormous head. I retired two paces, and administered a final shot. My first

bullet entered about an inch above the left eye and came out behind the neck, but was inefficient to produce death."

The lion, on his part, refuses sometimes to be hunted. One traveler relates that he and his companions one day saw, at two or three hundred yards distance, two large lions, which fled away as soon as they perceived the hunters. The latter pursued them on horseback, shouting loudly; but the lions doubled their pace, and plunged into a wood, where they disappeared.

A wealthy farmer was walking over his land, armed with his gun. Suddenly he saw a lion. Making certain of killing it, he aimed. The gun, however, hung fire; the man, alarmed, turned to the right-about and scampered off with all his might, pursued by the lion. A little mound of stones presented itself, and on this he jumped, wheeling round to face the brute, and threatening it with the butt-end of his gun. In turn the animal halted, and withdrew some paces, looking very composed, but the farmer did not venture to descend. At last, after nearly half an hour had passed, it slunk slowly away as if it had been stealing; and as soon as it got a short distance off, took to rapid flight.

One more lion story and we have done:

"A Boer, a very humorous fellow, told me that he was returning to his wagons one evening when he was far in the interior; at the time he had with him only the single charge of powder with which his gun was loaded, as he had been out buck-shooting all day.

"Straight in his path he disturbed a lion, which jumped up and turned to look at him. Very naturally his first impulse was to fire, but remembering that he had but that one charge in his gun, he changed his tactics.

"The Dutchmen usually wear large broad-brimmed felt hats, around which several ostrich feathers are fastened. The Boer jumped from his horse and pulled off his hat, which he held with his teeth by the brim, so that the upper part only of his face could be seen above the conglomeration of feathers. He then dropped upon his hands and knees, and commenced crawling toward the lion. Such a strange animal had never before been seen by the astonished *Leeuw*, which turned and fled without a moment's hesitation."

Few animals have been the subject of such fables as the lion from time immemorial. The ancient Egyptians knew both the African and Asiatic lion, and knew how to tame them; but it is to the Greeks and

Romans that we owe our stories of the magnanimous nature of the brute, how "the lion knows the true prince," or how

The lion will turn and flee
From a maid in the pride of her purity ;

and how an ointment made of a cock and garlic is a certain protection against his attacks. The Romans must have known the lion well from his frequent appearance in the circus. The first fight of lions was exhibited by the Ædile Scævola. Sulla exhibited one hundred lions, Pompey six hundred, Julius Cæsar four hundred, which fought either with each other or with the gladiators. M. Antony had tame lions; and he and his mistress Cytheris rode the streets in a chariot drawn by a pair. Hanno, the Carthaginian, employed lions to carry his baggage; and tame lions are still sometimes seen in the East.

In 1825 there were, in the menagerie in the Tower of London, two young lions, a male and female; they had been obtained in India, where they were captured when only a few days old, and a goat had been employed to suckle them during the early months of their existence. So docile were they, that they were allowed to wander about the courtyard, and visitors caressed and played with them with impunity. At a later period it was deemed proper to shut them up, to prevent accidents; but this more rigorous captivity did not alter the character of the male. With regard to the female, she became intractable when suckling—a circumstance perfectly explained when we know the violent affection this creature displays toward its progeny.

In menageries, the keepers who look after these ferocious beasts perform every day as great feats as the professional trainers, for they enter the cages and are received by the occupants with much affection—a truly curious interchange of greetings between the man and beast.

There is still preserved the remembrance of a deep friendship which arose between two lions, male and female, brought to the Jardin des Plantes in 1799, and a man named Felix, the keeper at that period of the menagerie. When he became unwell, and it was necessary to replace him, the male lion persistently refused to have anything to do with the stranger, and would not even allow him to approach the place of confinement. When Felix reappeared, the lion, accompanied by the lioness, rushed to meet him. They roared with pleasure while licking his face

and hands, and in all their movements demonstrated the greatest joy at seeing him once more.

A lioness has been exhibited in England which would allow her keeper to get upon her back, and, with a still greater degree of familiarity, drag her about by the tail, or even place his head between her teeth.

The following story, however, is a warning to those who intend to indulge in such dangerous pets. A gentleman had a lion cub which was very fond of its master and would play with him like a kitten. One day the gentleman fell asleep, leaving one of his hands hanging over the side of his couch. His pet lion came up to the couch when its master was slumbering, and by way of showing its affection, began to lick the exposed hand. In a very short time the rough, file-like tongue cut through the delicate skin of the hand, and caused some little pain and a slight effusion of blood, which was eagerly licked off by the animal. The pain which was caused by the too affectionate creature awoke its master, who naturally began to withdraw his hand from the caresses of the lion. But at the first movement the lion uttered a short, deep growl, which was repeated in a menacing manner at each attempt to remove the hand from its dangerous and painful position. Seeing that the lion cub had become suddenly transformed from a domestic pet to a wild beast, which had for the first time lapped blood and thirsted for more, its owner quietly slipped his other hand under his pillow, where he kept a ready-loaded pistol, and shot the poor lion through the head. It was an act that went sorely against his will, but was the only course which he could have adopted in such an extremity, when there was no time for reflection, and when the hesitation of a moment might have cost a life.



CHAPTER III

THE TIGER.

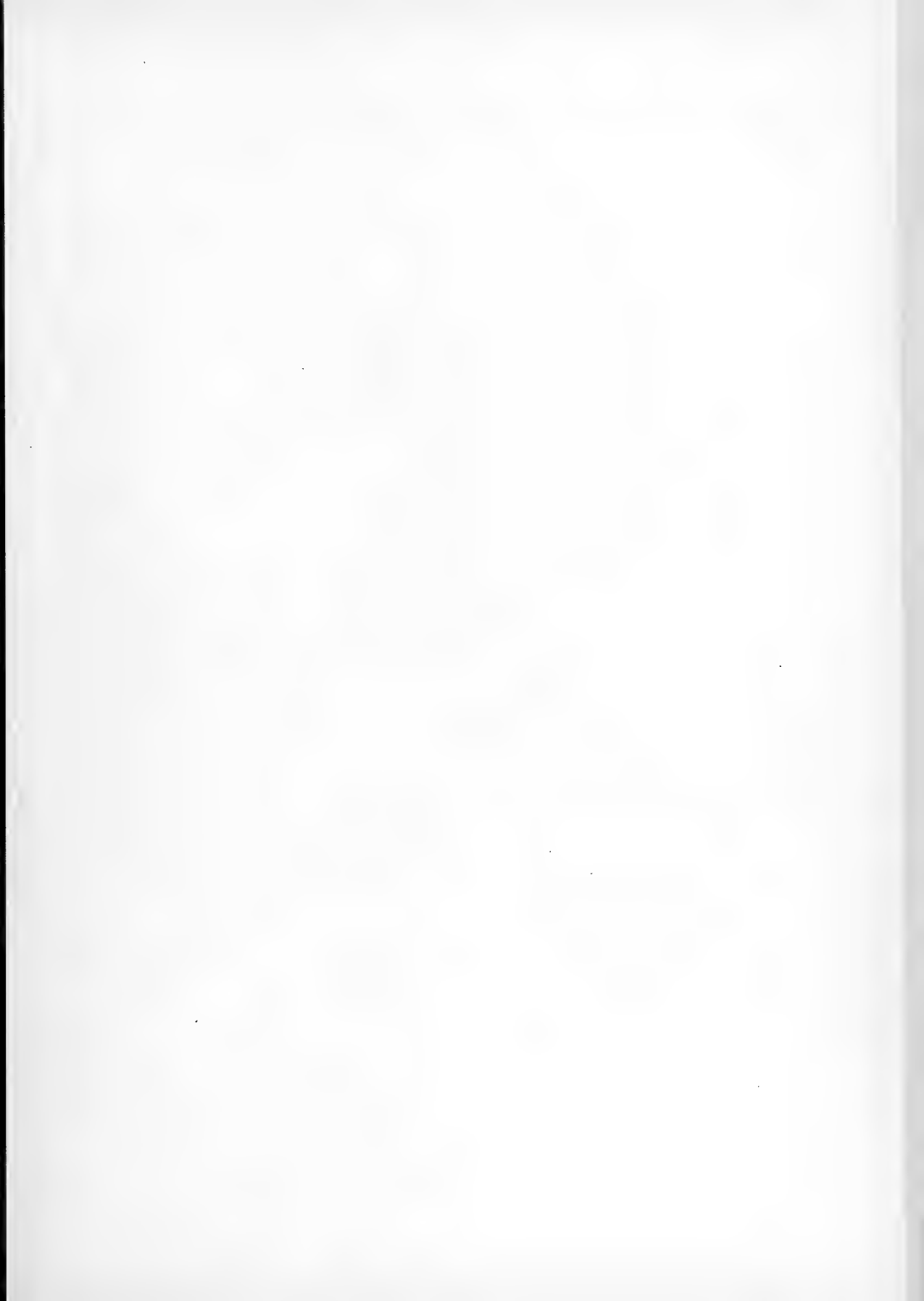
THE TIGER—ITS FAVORITE HAUNTS—ITS DESTRUCTIVENESS—TIGER HUNTING—MODES OF KILLING
THE TIGER—TAME TIGERS—THE TIGER IN ANCIENT TIMES.

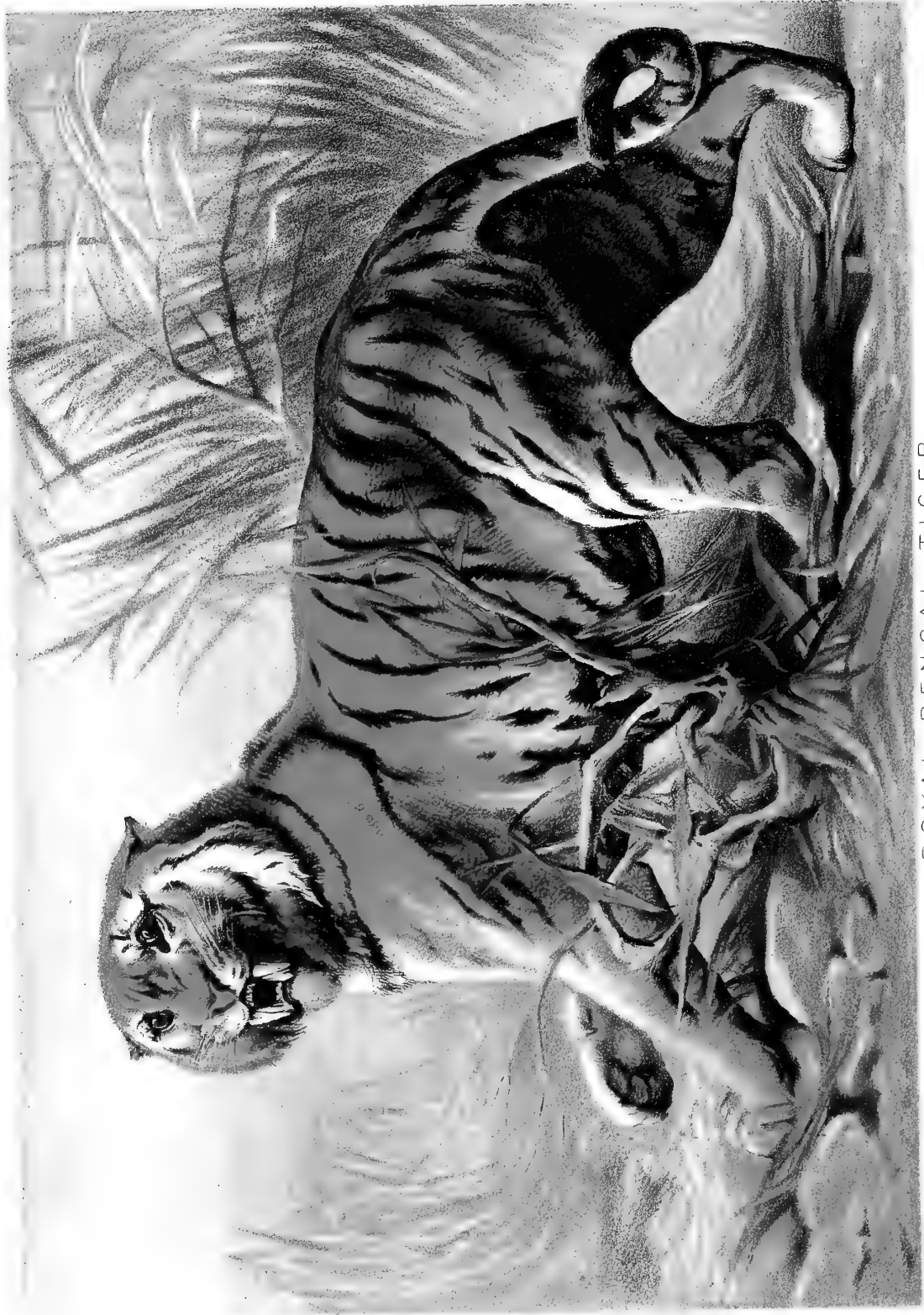
IF in Africa the lion reigns supreme, in Asia his claims to empire are disputed by an animal which equals him in size, and exceeds him in beauty of fur.

The ROYAL TIGER, *Felis tigris* (Plate VII), stands as high as the lion, but is more slender and lighter built, while the absence of a mane gives it more of the typical cat-look. It is peculiar to Asia, and inhabits Java, Sumatra, a great part of Hindostan, China, and Southern Siberia as far north as the banks of the river Obi; it approaches sometimes the confines of Europe, one having been killed near Tiflis in 1853.

In its color the tiger presents a most beautiful arrangement of markings and contrast of tints. On a bright tawny yellow ground, sundry dark stripes are placed, arranged, as may be seen by the engraving, nearly at right angles with the body or limbs. Some of these stripes are double, but the greater number are single dark streaks. The under parts of the body, the chest, throat, and the long hair which tufts each side of the face, are almost white, and upon these parts the stripes become very obscure. The tail is of a whiter hue than the upper portions of the body, and is decorated with dark rings.

The bright hues of the tiger harmonize admirably with the dusky jungle grass and dark stems of the Eastern forests in which he dwells, and enable him to approach his victims without being perceived, while even skilled hunters have overlooked him when close at their feet. The tiger is met not only in the grassy thickets of the jungle, but also in large, heavily timbered forest lands; but his favorite haunts are the reedy banks of rivers, the impervious bush of bamboos, and such like cane-brakes; he loves above all spots, however, those where the shady





ROYAL BENGAL TIGER.





“korinda” tree grows; the branches of this tree are not merely closely intertwined, but hang on all sides down nearly to the ground, and thus furnish him with concealment from his foes and shelter from the sun. Here he reposes during the heat of the day, and hence he sallies out or springs upon his prey. In the steppes of Siberia he hides in corners of the rocks, or scratches away the snow between the clumps of grass.

The tiger is not exclusively nocturnal in his habits; he is often seen by day, but prefers the twilight hours. In the southern parts of his domain he lies in wait near roads, forest paths, or rivers where he knows that both men and beasts come to drink. In India the holy rivers, to which crowds of votaries go to perform the ceremonies of their religion, supply him with many a victim. In Siberia he is found near the salt-licks, for he knows as well as the hunters do that the game he seeks for can be found there. In Java, where the wild swine are a plague, he keeps their numbers down, but repays himself for any benefit he confers on man by levying contributions on his horses or dogs. He is, in that island, generally found in the same thickets as the peacock. “When the peacocks cry, the tiger is nigh,” is a saying of the Dutch colonists; the Javanese natives say the peacock tells the dwellers in the wilderness that the tiger is leaving his lair. The tiger’s mode of attack is like that of the lion; the wounds he inflicts are extremely dangerous, for even when they are comparatively slight, lockjaw is apt to supervene; as in the case of wounds from the lion, they are said to open again periodically.

Anecdotes of the monster’s strength and audacity are numerous. One attacked a regimental baggage camel and broke its skull with one blow, another is said to have pulled down an elephant. Horses become paralyzed with fear and quiver in every limb when the dreaded foe appears; the very scent of a tiger’s presence, or the sight of a dried skin, is sufficient to set them plunging and kicking in their attempts to escape from the dreaded propinquity. One horse, which had been terrified by a tiger, could not afterward endure the sight of any brindled animal whatever, and was only restored to ordinary courage by the ingenious device of his master, who kept a brindled dog in the same stable with the horse until the poor beast became reconciled to the abhorred striped fur.

The buffalo, however, faces him and often slays him. A tiger had sprung on to the neck of a buffalo; the latter rushed with such violence against a tree that the aggressor was hurled to the ground, and before

he recovered consciousness the courageous ruminant had hurled him repeatedly in the air. According to the Tungusians the bear and tiger often fight, and then the latter usually comes off second best. In Hindostan, where many sects of natives reverence the tiger as an incarnation of the destructive powers of Nature, the roads would be impassable in many regions unless for the creature's extraordinary dread of fire; yet hunger drives it to contemn even fire, and an English officer was carried off by one when he was sitting with his companions by the camp-fire. The sentries of troops in the field are often victims. Forbes knew of three well-armed soldiers killed in one night. At the great fair of Hurdwar, where hundreds of thousands of natives assemble, a tiger sprang into the crowd from a thicket and struck a native who was peacefully preparing curry. Another sprang upon an elephant, tore the English sportsman out of the howdah, and plunged with him into the jungle; the man had been rendered senseless by the fall and shock; but was revived by the scratches he received from thorns as the brute carried him away; with great presence of mind he remembered he had a brace of pistols; he drew one, but it missed fire, and the tiger only bit the deeper. A second shot just behind the shoulder-blade was lucky enough to reach the heart; the officer recovered, but was lame for life. The postal service in India is rendered very dangerous by the attacks of these Carnivora; at one ford across the Goomea in Guzerat a letter-carrier was carried off every day for fourteen days, and at Cutcam Sands a tigress stopped all postal communication for several months. But the island of Singapore seems the spot where men are most frequently attacked. Wallace states that there are always tigers near the town, and they kill a Chinaman every day. Another traveler puts the number of Chinese killed annually at four hundred. The Dutch government returned the loss of life by tigers in Java in 1862 at three hundred.

It is a remarkable fact that the tiger is quite a new arrival in Singapore. During the early years of its occupation the beast was never heard of; at present, in spite of all the efforts of the English government, they increase instead of diminishing. New immigrants come from the mainland, and in doing so have to swim a strait fully an English mile wide. The tiger is an admirable swimmer, and never hesitates to pursue its prey in water. A sportsman on Saugor Island came upon a tiger and immediately fled into the river; the tiger followed, and gained rapidly till the man dived and swam some distance under water. When he

reached the surface again the tiger had turned back. Another swam out from the land to a boat and climbed into it; the crew partly jumped overboard, partly locked themselves in the cabin; the tiger sat quietly on the fore-castle till he was convinced that his prey had escaped him, when he plunged into the river, reached the bank, shook his coat dry, and disappeared in the jungle. Like the lion, the tiger, when he has once tasted human flesh, becomes a confirmed man-eater; he usually eats only a small portion of his victims; as the Singapore journal remarks: "If he would only eat more, there would be a great saving of human life."

While Europeans regard the tiger as a plague to be extirpated, the Hindoos, as already remarked, regard it as a divinity. Very similar sentiments are held even by the tribes of Eastern Siberia. They call the tiger the "Man-beast," or the "Lord-beast"; they do not like to speak about him, and never mention his proper name. The tribes on the Amoor River designate him by the word they use for God. In the Chinese mountains, hunters who find the tracks of a tiger leave half of their game on the spot to propitiate him; the Tungusians believe whoever kills a tiger will be eaten by one. In Sumatra the natives believe him to be the form assumed by some dead man, and therefore will not hurt him. In addition to the superstitions which thus preserve the tiger, we must remark that in some parts of India he is carefully preserved as game by the princes and rajahs, in spite of the hundreds of lives his maintenance may cost. The English authorities tyrannically interfere with this style of game preserving. In Candeish alone they procured the destruction of one thousand in four years.

In the East the chase of the tiger is an affair of state and conducted with all the elaborate care of a campaign. The Emperor of China sometimes sends thousands of men to the hunt; the King of Oude used to go hunting with more pomp than Louis XIV used to display in making war. He went afield with cavalry, infantry, and artillery, thousands of elephants, an immense train of carts, camels, and beasts of burden. His women accompanied him in covered cars; bayaderes, singing women, jugglers, peddlers, hunting-leopards, hawks, fighting-cocks, doves, and nightingales were carried in the grand procession. With all this preparation only one tiger was slain on the occasion described.

The Indian princes also take their royal game in nets. A series of strong bamboo poles are placed about five or six yards apart, and a strong net stretched between them. The line of nets extends in a circular form

for a considerable distance; the beaters then drive the game into the circle toward a platform where the shooters are stationed. All means imaginable are employed to drive the animals in the proper direction—guns are fired, drums beaten, fires lit; sometimes even the grass is set on fire. The flames, as they hiss and roar, fill the tiger with terror, and soon he is seen stealthily creeping away. He sees the nets; they are too high to leap over, too strong to burst through, the bamboo poles too weak for him to climb up. He is compelled to advance inside the net till he comes within range of the guns of the sportsmen.

The English officials give tiger-hunts on a grand scale. Sometimes as many as forty or fifty elephants are employed. Some bear the sportsmen, some are used to drive the game; an infallible sign of the neighborhood of a tiger is given by the elephant elevating his trunk and trumpeting. The tiger has often been known to pull the hunters from their seats on the elephant.

A very ingenious mode of tiger-killing is employed by the natives of Oude.

They gather a number of the broad leaves of the *praus* tree, which much resembles the sycamore, and having besmeared them with a kind of bird-lime, they strew them in the animal's way. Let a tiger but put his paw on one of these innocent looking leaves, and his fate is settled. Finding the leaf stick to his paw, he shakes it in order to rid himself of the nuisance; and finding that plan unsuccessful, he endeavors to attain his object by rubbing it against his face, thereby smearing the bird-lime over his nose and eyes, and gluing the eyelids together; then he rolls on the ground, and rubs his head and face on the earth in his efforts to get free. By so doing he only adds fresh bird-lime to his head, body, and limbs, agglutinates his sleek fur together in unsightly tufts, and finishes by hoodwinking himself so thoroughly with leaves and bird-lime, that he lies floundering on the ground, tearing up the earth with his claws, uttering howls of rage and dismay, and exhausted by the impotent struggles in which he has been so long engaged. These cries are a signal to the authors of his misery, who run to the spot armed with guns, bows, and spears, and find no difficulty in dispatching their blind and wearied foe.

Those who have hunted the tiger in a genuinely sportsmanlike manner assert that it is a very cunning animal, and the color of the sportsmen's dress is a matter of some importance. Experience shows

that there is no tint so admirably suited for the purpose as that warm reddish-brown which is assumed by dried leaves.

If a tiger be fairly traced to its ordinary lair, the sportsmen prefer to lie in wait at some convenient point, and either to await the voluntary egress of the quarry, or to send in the beaters and cause the animal to be driven out in the proper direction. When this mode is adopted, it is found best to have, besides those which are held in hand, a whole battery of guns, eight or ten in number, which are laid on the ground, ready loaded and cocked, their muzzles all pointing toward the spot where the tiger is expected to make its appearance. It is so usual an occurrence for two tigers to make their sudden appearance where only one was expected to lie, that the precaution is an absolutely necessary one.

Contrary to the habits of most animals, which take the utmost care of their young, and in their defence will expose themselves to the direst peril, the mother tiger is in the habit of making her young family her pioneers, and when she suspects anything wrong, of sending them forward to clear the way. Knowing this curious propensity, the experienced hunter will not fire upon a cub that shows itself, for the mother will, in most cases, be waiting to see the result of her child's venture. Therefore they permit the cub or cubs to pass with impunity, and reserve their ammunition for the benefit of the mother as she follows her offspring.

Should the tiger not fall to the shot, but bound away, the hunters know whether the wound is a mortal one by inspecting the marks made in the ground by the feet of the retreating animal. It is a curious fact that, however hard a tiger may be hit, yet, if the wound be not a rapidly mortal one, the claws are kept retracted and the foot-prints show no mark of the talons. But should the injury be one which will shortly cause death, the tiger flings out its limbs with the paws spread to their utmost, and at every leap tears up the ground with the protruded talons. A very slight wound causes the death of a tiger; the wound soon becomes inflamed and covered with flies, and the poor beast dies of a swarm of devouring maggots. It is sometimes difficult to tell whether a tiger has been wounded; the loose and movable skin covers the wound as the creature moves away, and checks the effusion of blood. The dead body of the tiger very soon decays, and if the hunters wish to preserve the hide in all its beauty, it must be immediately covered from the sun's rays.

The tigress gives birth to two or three cubs, choosing some sheltered spot for her home. During the first weeks of their existence she never leaves them except when hunger compels; as soon as they are larger she takes them abroad, and then is doubly dangerous and destructive; nothing, however, can exceed her care and loving-kindness for her offspring while they are at the breast.

Tigers, like lions, have been often tamed; we have all seen circus performers enter the cages where they are confined, but in all cases great caution must be exercised in dealing with a creature so treacherous. In the East they have been used for the purposes of the chase. "The Khan of Tartary," writes Marco Polo, "keeps in his city of Cambolu many lions greater than those of Babylon, having beautiful hair and beautiful colors, namely, white, black and red stripes, which he uses to catch wild boars, bears, deers, and other beasts." Some of the Indian fakirs have been seen accompanied by a tiger which followed them like a dog; they are careful to give their favorite no animal food, but feed them on boiled rice and butter.

The Indian princes usually keep tigers for their wild beast fights. A fight in Siam is thus described: "Three elephants, whose heads were defended by a species of armor, were brought into the arena; the tiger was there already, held by two ropes; at the sight of the elephants he tried to escape and crouched down, but received two or three blows from their trunks, which knocked him over. He was then let go; with a terrible roar he sprang at the elephant's head, but it received him on its tusks and flung him high into the air. The tiger fled and tried to clamber over the paling of the circus; failing in his attempt, he laid down and let the elephants beat him with their trunks till the fight was put a stop to."

When he wants to fight, however, the tiger shows vigor and courage enough. One menagerie was the scene of a deadly combat between a lion and a tiger. The two creatures had been put into one large cage or box, which was divided by a partition in the centre, so as to separate the two animals. While the attendants were at their breakfast the tiger battered down the too frail barrier, and leaping into the lion's chamber, entered into fierce combat. Not even the keepers dared interfere to stop the battle, which raged until it was terminated by the slaughter of the lion. The poor beast never had a chance from the beginning, for it was weakened by three years' captivity, and had lost the swift

activity of its wild nature. Its heavy mane defended its head and neck so well that the tiger could not inflict any severe injury on those portions, and the fatal wounds under which it sank were all upon the flanks and abdomen, which were torn open by the tiger's claws. It was a serious loss to the proprietor, for the lion had cost three hundred, and the tiger, which, although the victor, did not escape unscathed, four hundred pounds. The lion was six or seven years of age at the time.

The tiger was not known in Europe so early as the lion. He is not mentioned in the Bible. Nearchus, the famous admiral of Alexander the Great, had seen a tiger-skin, but not the animal itself. A tame tiger was exhibited at Rome about 24 B. C. The Emperor Claudius had four; the Emperor Heliogabalus had four tigers yoked to his chariot to represent Bacchus. Avitus had five killed in the amphitheatre. Nero had a tame tigress named Phœbe, which he used to set at those of his guests who had displeased him.

Tiger, tiger, burning bright
In the forest of the night!
What immortal hand or eye
Could frame thy fearful symmetry?

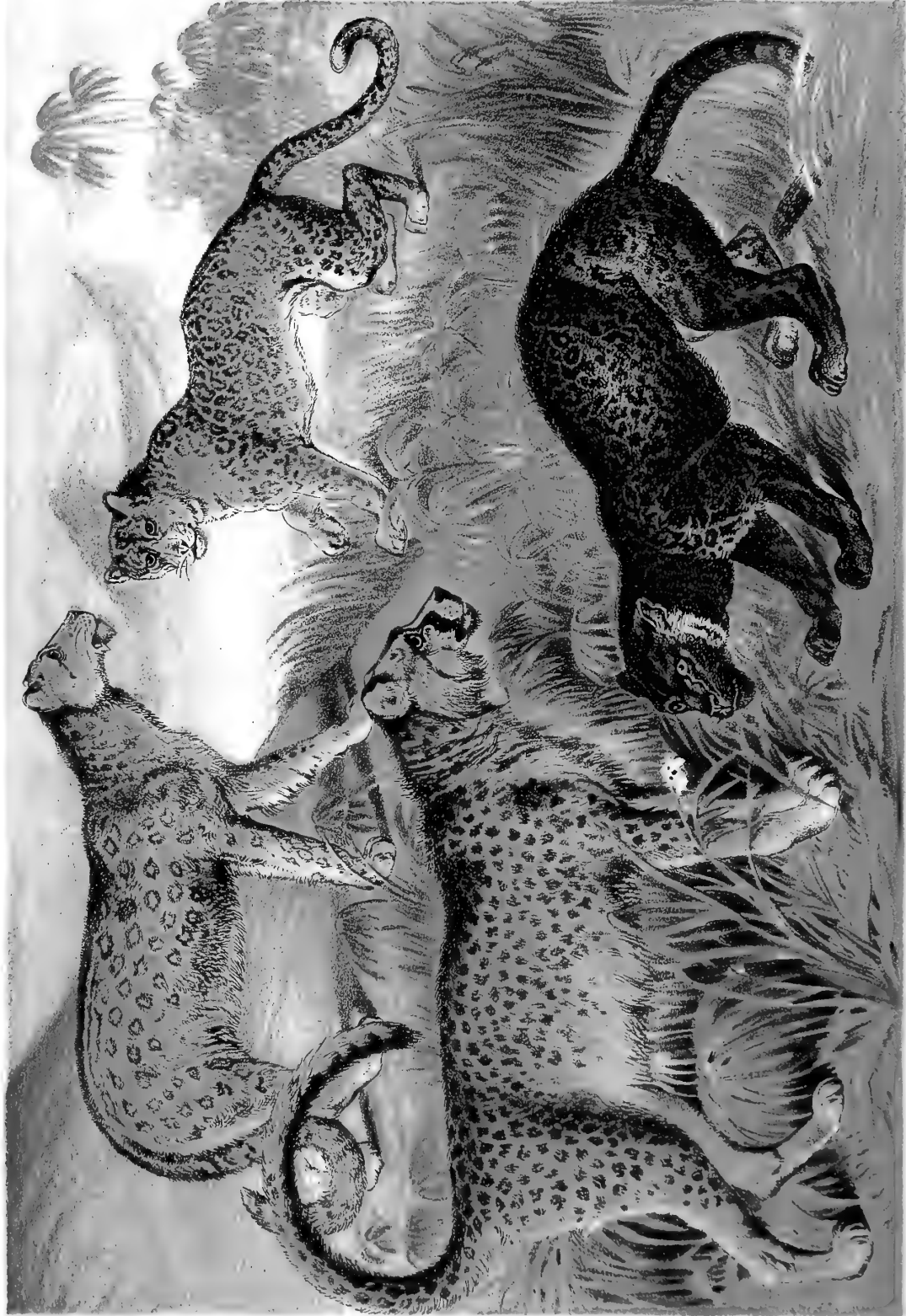
In what distant deeps or skies
Burnt the ardor of thine eyes?
On what wings dare he aspire—
What the hand dare seize the fire?

And what shoulder, and what art,
Could twist the sinews of thy heart?
And when thy heart began to beat,
What dread hand formed thy dread feet?

What the hammer, what the chain,
In what furnace was thy brain?
Did God smile his work to see?
Did he who made the Lamb make Thee?







AFRICAN LEOPARD

ASIATIC LEOPARD

CHETAH

OUNCE

PLATE VIII. CARNIVORA.



the latter climbs like a cat, the cougar leaps at one spring into the branches. All his movements are light and powerful; he can easily clear a distance of six yards. His eyes are large and tranquil, without any expression of wildness; and although he can see better by night than by day, the sunlight does not dazzle him. His sense of hearing is very sharp, and when hunger calls, his courage is great. All the weaker quadrupeds dread his attacks; even the agile monkeys fall victims to his appetite. He steals, cat-like, up to his prey, and then makes his spring; if he fails, he, unlike the cats, pursues it by long leaps for some distance. A traveler observed one engaged in the chase of a monkey. While he was waiting to get a shot at a Capucin monkey, the whole tribe of apes suddenly set up a terrible scream and took to flight, swinging from bough to bough and tree to tree, betraying at the same time every mark of the wildest terror. A cougar was after them; he took leaps of nearly seven yards from tree to tree, and crept with incredible skill through the climbing plants and intertwined boughs of the Brazilian forest.

When his prey is caught, the cougar bites the throat and sucks the blood, and then eats a portion of the victim, burying the rest in the sand or under leaves. He is very destructive, and hence is everywhere pursued with vigor. The Guachos of the Pampas are expert in destroying him by the lasso or the bolas. One of our own sportsmen said that he always ran away from a grizzly, but that painters were of no account. If the traveler faces round on the animal and looks it steadily in the face, it always retreats. Although the cougar or painter is not an object of personal dread to the settler, he is a pestilent neighbor to the farmer, committing sad havoc among his flocks and herds, and acting with such consummate craft, that it can seldom be arrested in the act of destruction or precluded from achieving it. No less than fifty sheep have fallen victims to the panther in a single night. It is not, however, the lot of every puma to reside in the neighborhood of such easy prey as pigs, sheep, and poultry, and the greater number of these animals are forced to depend for their subsistence on their own success in chasing or surprising the various animals on which they feed. As is the case with the jaguar, the cougar is specially fond of the capybara and the peccary, and makes a meal on many smaller deer than even the latter animal.

The cougar is a good swimmer, and can cross from the mainland to Terra del Fuego, and was seen swimming out to one of the Florida Keys. In Florida, authentic reports tell that children have been carried off by

the rapacious brute from the very fields where their parents were working. It is by no means uncommon in the Adirondacks, and De Kay writes that he remembered the appearance of one of these animals in Westchester County, New York State. It is occasionally seen in the Catskills, and has been shot in Vermont and Massachusetts.

The YAGUARUNDI, *Felis Yaguarundi*, resembles the American panther in being of a uniform color; it is a much smaller animal—not much larger indeed than a cat, but with a more weasel-like body. It extends from Paraguay as far north as Matamoros.

THE LEOPARDS.

The most beautiful members of the whole cat tribe are the graceful and mottled species which are usually grouped together under the name of leopards. They are moderately large creatures, with short, glossy fur marked with spots, but without mane or tail-tuft, with short ears and beautiful, large, round-pupilled, brilliant eyes. They are to be found in both the Old and New Worlds, and their habits and conditions of life are pretty uniform wherever they are found. Most of them possess a talent unknown to either lion or tiger—they can climb trees, not mounting by a bound, but by the aid of their claws, like the common cat. The noblest, the largest, and the most dreaded of all the leopard tribe is the species found in the New World, and with it we will commence our description.

THE JAGUAR.

The JAGUAR, *Felis onca* (Plate IX), has been celebrated by all travelers in South America, and as the cougar has been called the American lion, he has been styled the American tiger. Indeed, as regards size he is not much inferior to the lord of the Indian jungles, and surpasses all the other members of the cat tribe excepting the lion. He is somewhat heavily built, the body is not so long as that of the tiger, and his legs are shorter in proportion; but he, when full grown, measures on an average about five feet from the muzzle to the root of the tail, and stands about three feet high. Humboldt, however, says that he saw jaguars “which in length surpassed all the Indian tigers he had seen in European collections.” The tail of the jaguar is comparatively short, averaging a little less than three feet in length. The color of the fur is not quite the same

in all specimens. In general it is of a bright tawny hue; across the breast run two or three bold black streaks; the rest of the body is covered with spots somewhat angular in form, and increasing in size from the head to the tail. These spots have a yellowish-red and black border, and the centre of each displays one or two black points. Along the back runs a line of black spots which in the last third of the tail form rings. A black variety is sometimes found, the spots being still visible, like the pattern in damask.

The jaguar is found from Buenos Ayres and Paraguay through all South America as far as Mexico, and has been seen in the United States as far as the Red River in Texas. It is gradually becoming scarcer. It haunts the wooded banks of streams, the edge of woods, and the bottom lands where the tall grasses grow. During the daytime he sleeps in the shade of the forest or in the long grass of the pampas. The morning and evening twilight is the hour of his exertions, and then no animal comes amiss to him. His strength equals that of the lion or tiger, his eye is sharp and flashing, his hearing excellent, his sense of smell, as in all the cat tribe, only slightly developed. He attacks horses, deer, and tapirs; he has been known to swim across a wide river, to kill a horse, drag it sixty yards to the water-side, then swim across the river with his prey, drag it out of the water, and finally carry it off into a neighboring wood. The natives assert that he has been known to kill one of two horses that were fastened together, and drag off with the dead one the living horse also, in spite of all its struggles.

His powers of climbing like a cat make him a deadly foe to all the monkey race, whom he usually tries to surprise when sleeping; a few sweeps of his paw knock the unfortunate quadrumana from their perch to the ground, whither he then descends to banquet at his leisure. The peccary is seldom attacked openly; this courageous, sharp-tusked creature never hesitates to charge the powerful jaguar, and a herd of peccaries would soon make him repent of his rashness.

It is said that the jaguar kills horses and larger animals in an ingenious manner, which reflects great credit on his understanding. Leaping on the shoulders of the doomed animal, he places one paw on the back of the head, another on the muzzle, and then, by a tremendous wrench, dislocates the neck. His most remarkable feat, however, is the way in which he catches and kills the large turtles. Humboldt relates: "The jaguar follows the turtle to the shore where she lays her eggs; he

attacks her on the sand, and turns her on her back to be devoured at his leisure. The shells are often found quite emptied apparently by the claws, with very little injury to the carapace. We cannot sufficiently admire the power of the jaguar's foot, which clears out the double shells as if the muscular bands had been loosened by a surgical instrument." Hamilton tells a traveler's tale about him: "The jaguar and the alligator are deadly foes; when the jaguar perceives one of these enemies sleeping on a warm sand-bank, he catches him by the under part of the tail, where the soft and most vulnerable parts lie. Usually the alligator is too much astonished to resist or fly; sometimes, however, he drags his aggressor into the water, drowns him, and eats him up." The jaguar can also catch fish. Rengger saw one plunge his paw into the water and bring out a good-sized "dorado." Unlike the cats in general, the jaguar has no dread of fire; he has been known to scare the Indians from their meal, and help himself to the meat on the embers.

Rengger, who landed in Asuncion in Paraguay in 1819, and spent several years there, states that the jaguar is sometimes driven by inundations to enter the cities. He was told when he arrived during the floods at Santa Fé, in 1824, that a few days before a Franciscan monk, who was going to sing morning mass, had been eaten by a jaguar at the door of the sacristy. This story is developed by the "Report of the Mexican Boundary Survey" into a thrilling narrative with four victims, and the scene in Santa Fé of New Mexico.

When the jaguar once tastes human flesh he becomes a confirmed man-eater. It is a comfort to know that he prefers negroes and Indians to white folk; hence a white sportsman has always to provide himself with a negro attendant, if he is going to sleep in the bush.

The jaguar is easily tamed, and young ones are often seen in the houses in Paraguay, where they play with the cats and dogs. Captain Inglefield, of the British navy, had on board his ship a jaguar so tame that he could use its body as a pillow. He never gave it raw meat.

When "Doctor," as it was called, received his daily food, he used to clutch and growl over it like a cat over a mouse, but was sufficiently gentle to permit the meat to be abstracted. It was a very playful animal, and was as mischievous in its sport as any kitten, delighting to find any one who would join in a game of romps, and acting just as a kitten would under similar circumstances. As the animal increased in size and strength, its play began to be rather too rough to be agreeable, and

was, moreover, productive of rather unpleasant consequences to its fellow voyagers. For, as is the custom with all the cat tribe, he delighted in sticking his claws into the clothes of his human acquaintances. This jaguar remembered Captain Inglefield after an absence of two years.

THE LEOPARD AND THE PANTHER.

From the time of Aristotle, the founder of the science of natural history, down to the present day, there have been disputes as to the identity or distinction of the panther and the leopard. From this uncertainty great confusion has arisen, and nothing but the examination of the living animals has enabled modern investigators to finally establish the distinction between the two species. The leopard has a brighter coat than the panther, the spots being further apart and the centre darker, and its tail has only twenty-two vertebræ, while that of the panther has twenty-eight. They have also different habitats; the true panther is found in India and the Indian islands; the leopard is found in Africa. Hence the title "African Panther" is a misnomer in one direction, and "Japan Leopard" in the other.

The LEOPARD, *Felis pardus* (Plate VIII), resembles the jaguar in figure. His total length is over seven feet, including one-third of that length in the tail. The head is large and round, the muzzle slightly prominent, the neck very short, the body powerful, the limbs of moderate length, the paws very large. The ground of his beautiful coat is of a reddish-golden hue, darker on the back, and becoming a light yellow on the throat and belly. Perpendicularly over the upper lip broad black stripes are seen, as well as a large oval spot at the corner of the mouth, and a smaller one over each eye. The rest of his body is covered with black, round or roundish spots, about the size of a walnut. Some of these spots on the shoulders and all those of the back consist of a dark centre surrounded by two crescent-shaped lines, which usually coalesce; on the flanks, where the spots are arranged rather transversely than longitudinally, the centres are surrounded by three or four semicircles.

The leopard is a terrible animal, and will make a bound of forty feet with surprising ease. It keeps by preference in places covered with brushwood, and near streams or arms of the sea. The leopard, perhaps, does not climb on trees; but every day, before commencing his search for prey, he sharpens his claws on a tree, just as our cats do in the carpet

or elsewhere. He never hunts in the middle of the day, but his nocturnal depredations make him as destructive as the lion.

When attacked, the leopard will generally endeavor to slink away, and to escape the observation of its pursuers; but if it is wounded, and finds no mode of eluding its foes, it becomes furious and charges at them with such determinate rage that, unless it falls a victim to a well-aimed shot, it may do fearful damage before it yields up its life. In consequence of the ferocity and courage of the leopard, the native African races make much of those warriors who have been fortunate enough to kill one of these beasts, and the fortunate hunter is permitted to decorate his person with the trophies of his skill and courage. The teeth of the leopard are curiously strung, with beads and wire, into a necklace, and hung about the throat of the warrior, where they contrast finely with their polished whiteness against the dusky hue of the native's brawny chest. The claws are put to similar uses, and the skin is reserved for the purpose of being dressed and made into a cloak, or "kaross," as this article of apparel is popularly termed.

The PANTHER or ASIATIC LEOPARD, *Felis leopardus* (Plate VIII), has equal ferocity, but not the same amount of strength as the African leopard. The spots of the panther differ from those of the leopard by their considerable size, and are formed of five or six black patches grouped around a centre somewhat brighter than the ground color of the coat, and are very appropriately called "rosettes."

The panther ascends trees with agility; into which it pursues monkeys and other climbing animals. It is a ferocious and untamable animal, and inhabits only the wildest forests; not even the tiger is more unconquerable, and its pursuit is proportionably dangerous. It rarely attacks man without being provoked; but it is irritated at the merest trifle, and its anger is manifested by the lightning rapidity of its onset, which invariably results in the speedy death of the imprudent being who has aroused its fury. Its power, nimbleness, and stealth surpass anything that can be imagined.

The JAPANESE PANTHER, *Felis Japonicus* (Plate IX), is merely a variety of the common panther; it differs in having a thicker fur and a bushier tail.

The SUNDA PANTHER, *Felis variegatus*, sometimes called the ASIATIC LEOPARD (Plate VIII), has a small, long head, longish neck, short legs, and a very different coat. The spots are much smaller, darker, and

thicker; the hide thus obtains a black-blue lustre; the ground is dark loam-yellow, so thickly set with dotted spots as to appear almost black.

The BLACK PANTHER, *Felis melas*, which has been sometimes described as a separate species, seems to be merely a variety of the Sunda panther, and is often produced in the same litter as the lighter varieties.

The strength of the panther is marvelous when compared with its size. One of these animals crept by night into the very midst of a caravan, seized two wolf-greyhounds that were fastened to one of the tent pegs, tore up the peg to which they were tethered, and although both the dogs were linked together, and were of that powerful breed which is used for the pursuit of wolves and other fierce game, the panther dragged them clean out of the camp, and carried them for some three hundred yards through dense, thorny underwood.

The panther has a distaste for trees around which there is no underwood; the long grass jungle, which is so favored by the tiger, is in no way suited to the habits of the panther; so that if the hunter seeks for tigers, his best chance of success is by directing his steps to the grass jungles, while, if panthers are the objects of his expedition, he is nearly sure to find them among wooded places where the trees are planted among underwood reaching some seven or eight feet in height.

When a panther is driven to take refuge in a tree, it displays great skill in selecting a spot where it shall be concealed so far as possible from the gazers below, and even when detected, covers its body so well behind the branches, that it is no easy matter to obtain a clear aim at a fatal spot. Its favorite arboreal resting-places are at the junction of the larger limbs with the trunk, or where a large bough gives off several smaller branches. The panther does not take to water so readily as the tiger, and appears to avoid entering a stream unless pressed by hunger or driven into the water by his pursuers. When fairly in the water, however, the panther is a very tolerable swimmer, and can cross even a wide river without difficulty.

The panther has often been tamed, and, indeed, almost domesticated, being permitted to range the house at will, greatly to the consternation of strange visitors.

The OUNCE, *Felis unciæ* (Plate VIII), which was once thought to be but a longer-haired variety of the leopard, is now known to be truly a separate species.

In general appearance it bears a very close resemblance to the leopard.

but may be distinguished from that animal by the greater fulness and roughness of its fur, as well as by some variations in the markings with which it is decorated. From the thickness of its furry garment it is supposed to be an inhabitant of more mountainous and colder districts than the leopard. The rosette-like spots which appear on its body are not so sharply defined as those of the leopard; there is a large black spot behind the ears. The spots exhibit a certain tendency to form stripes, and the tail is exceedingly bushy when compared with that of a leopard of equal size. The general color of the body is rather paler than that of the leopard, being a grayish-white; in which a slight yellow tinge is perceptible, and, as is usual with most animals, the upper parts of the body are darker than the lower. In size it is intermediate between the leopard and the panther.

The ounce is an inhabitant of some parts of Asia, and specimens of this fine animal have been brought from the shores of the Persian Gulf. Its home, however, seems to be the central plateau of Thibet, and it occurs not rarely in West Siberia and the Altai range, but is very uncommon in the region of Lake Baikal. The ounce has seldom been seen in captivity. Two living ones were in the Zoological Gardens of Moscow in 1871, but like the other animals in that establishment, they died from neglect.



CHAPTER V.

THE OCELOTS AND THE CATS.

THE MARBLED CAT—THE TIGER CATS—THE COMMON OCELOT—THE PAINTED OCELOT—THE EGRA—THE CHATI—THE LONG-TAILED CAT—THE PAMPAS CAT—THE CLOUDED TIGER—THE COLOCOTS—THE EUROPEAN WILDCAT—THE MANOL—THE DWARF CAT—THE EGYPTIAN CAT—LETTING THE CAT OUT OF THE BAG—THE COMMON CAT—THE MALAY CAT—THE WEASEL CAT—THE SERVAL.

WE now have arrived at the smaller members of the genus, which are usually grouped together under the title of OCELOTS or TIGER CATS. They are all most beautiful creatures, their fur being diversified with brilliant contrasts of a dark spot, streak or dash upon a lighter ground, and their movements graceful and elegant. The link between the panthers and the cats is perhaps to be found in the Marbled Cat.

The MARBLED CAT, *Felis marmoratus*, is about three feet in length, including a foot and a half of tail. The color of its fur is yellow, with a light red shade marked with dark spots. On the forehead and over the top of the head two black stripes run and unite to form one longitudinal band along the spine, which, however, again divides before reaching the tail. Other dark stripes run obliquely from the back of the neck downward; the shoulders are covered with horseshoe-shaped spots, and the limbs are covered thickly with black dots. The ears are short and rounded, externally of a silver-gray color with a black border. The bushy tail is yellowish and ringed.

The Marbled Cat inhabits the mountains of Southeastern Asia, including Borneo and Sumatra. Nothing is known of its habits when wild; in captivity its conduct resembled that of the Ocelot.

THE TIGER CATS.

The OCELOT, *Felis pardalis* (Plate IX), is common in the tropical regions of America, and is found in Texas as far north as the Red River.

In length it rather exceeds four feet, including the tail. Its height averages eighteen inches. The ground color of the fur is a very light grayish-fawn, on which are drawn broken bands of a deep fawn-color, edged with black, running along the line of the body. The band that extends along the spine is unbroken. On the head, neck, and the inside of the limbs the bands are broken up into spots and dashes, which are entirely black, the fawn tint in their centre being merged in the deeper hue; the ears are black, with the exception of a white spot upon the back and near the base of each ear. Owing to the beauty of the fur, the Ocelot skin is in great request, and is extensively employed in the manufacture of various fancy articles of dress or luxury.

In its habits the Ocelot is quick, active, and powerful, proving itself at all points a miniature leopard. It is a good climber; not equal, however, in this respect, to the jaguar; and a good swimmer, but only takes water in the direst extremity. It rarely approaches the settlements of mankind; at the utmost its courage only reaches to the robbing of a hen-roost. It is very shy, and takes to the trees when the dogs come near, but defends itself savagely when brought to bay. In captivity it is lazy and lifeless, learns to play with the domestic cats and dogs, and purrs when stroked.

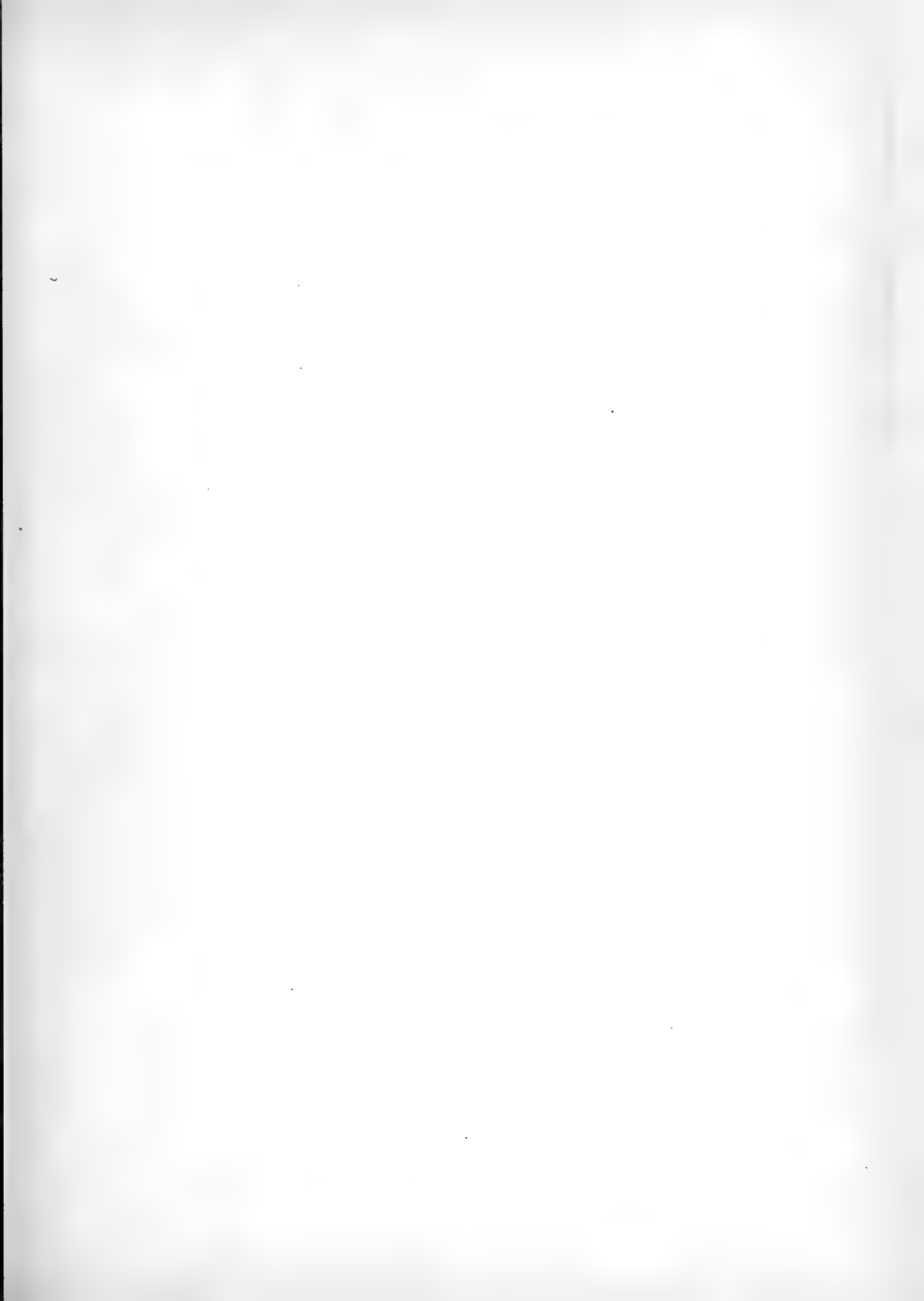
Of the numerous varieties of these pretty and agile animals, we mention only the most conspicuous.

The GRAY OCELOT, *Felis griseus*, has comparatively light-colored fur, with few, not very distinct spots, and the whole throat an unbroken gray.

The PAINTED OCELOT, *Felis pictus*, is, as befits its name, much more richly varied than the common Ocelot. The black markings of the tail are very deep in color, and the throat has one or two bold black streaks extending toward the shoulders. The spots on the spine are of a deep, velvety black.

The MARQUAY, *Felis tigrinus*, is about the size of the domestic cat. Its soft and beautiful coat is of a fawn-yellow color, with two stripes running along the cheeks, and two others from the corners of the eyes to the neck. Between these, two other stripes make their appearance, and six may be counted on the neck. A long line runs along the back, and on each side are spots either solid or with a bright centre. The ears are black; the tail bushier at the end than at the root.

Waterson had a pet one which had been captured when a kitten; it followed him about, and waged continual war on the rats.







JAGUAR

OCELOT
COUGAR

JAPANESE PANTHER

PLATE IX. CARNIVORA.



The SYRA, *Felis syra*, resembles the lion and the cougar in being uniform in color. Its body is so long, and its limbs comparatively so short, that it seems to be a link between the cats and the weasels; and it indeed displays the agility of one family and the cruelty of the other. No member of the cat tribe can carry off its booty with greater rapidity than this little marauder. It has never been tamed. Berlandier obtained one at Matamoras, but it seems, like the Yaguarundi, to belong properly to Guiana and Brazil.

The CHATI or MARACAYA, *Felis chati*, is more like the jaguar than the ocelot. It measures about three feet in length of body, and resembles the leopard in the color of its skin, but the spots are disposed irregularly and are of irregular shape. Some are round, some oblong; in places they are in lines, in others scattered without any order. Two black streaks appear on the cheeks and a brown one on the throat; the latter half of the tail has black rings.

It is a courageous beast, and attacks pretty large animals, such as small deer. But like the rest of its kin, it prefers to devastate a well-filled hen-roost, and usually chooses a very dark and stormy night for its visit.

It is easily tamed, and becomes amiable and attached to its owner, but nothing can eradicate its propensity to catch and kill chickens. In Brazil the Indians and negroes eat its flesh, but it is said to have a very unpleasant odor.

The LONG-TAILED CAT or KUICHUA, *Felis macrouros*, is about the size of a large cat. It is distinguished from the Chati by a longer tail, a small head, large eyes, pointed ears, and the great curvature of its claws. Its color is reddish-gray, flecked with grayish-brown or black-brown. The back is marked with five longitudinal stripes; on the crown there are two dark stripes with a black spot between them.

It is found nearly everywhere in Brazil, and is hunted for its skin. It is one of the most beautiful of the whole cat group, and is much more agile than the Chati.

The PAMPAS CAT, *Felis pajeros*, resembles the ordinary Wild-cat, but it stands higher, its head is smaller, its tail longer, and its hair stiffer and longer. The color of its coat is silver-gray, on which brownish-red streaks are visible, running obliquely backward and downward from the shoulder, but forming a girdle round the chest, and appearing as rings on the limbs; the tail has four to six dark rings, and is short and bushy.

The male attains the length of three feet. As its name indicates, it is found in the plains of South America, its food being the small rodents that abound there. It is a harmless creature.

The CLOUDED TIGER or RIMAU-DAHAN, *Felis macrocelis*, is marked very irregularly—some spots are oval, some angular; some open, some solid. It has stripes like the tiger, spots like the jaguar, rosettes like the leopard, and black-edged spots like the ocelots. Its color is gray, and it always has two bold, uninterrupted bands of velvety-black running the whole length of its back. The hair is long and very fine, and thus its tail is peculiarly capable of that curious expansion which is familiar to us in the domestic cat. When full grown its body measures about forty inches, its tail about twenty-five.

In spite of its size it is a gentle creature. Two specimens, possessed by Sir Stamford Raffles, were very playful, rolling over on their backs the better to enjoy the caresses of those who would pat or stroke their beautiful soft fur. Nor did they confine their sportful propensities to human companions. One of them, while on board ship, struck up a great friendship for a little dog that was its co-voyager, and used to gambol with its diminutive playfellow in the most considerate manner, taking great care to do no damage through its superior strength and size. While on board, it was fed chiefly on fowls, and generally used to extract a little amusement out of its dinner before it proceeded to the meal. When it received the fowl, it was accustomed to pounce upon the dead bird just as if it had been a living one, and tear it to suck the blood. It would then toss the bird about for hours, just as a cat tosses a mouse, tumbling over it, and jumping about it.

The natives of Sumatra, where it is found, assert that it is by no means a savage animal, and that it generally restricts its depredations to the smaller deer and to birds, including domesticated poultry. The curious name which is given to this animal is of native formation, and has been assigned on account of its arboreal propensities. It spends much of its time upon the tree branches, and lies in wait for its prey, crawling along a bough, with its head resting in the fork of the branches. The word "Dahan," or "Dayan," signifies the forked portion of a bough.

The COLOCOLO, *Felis ferox*, is a small savage creature. Its color is gray, with the exception of the under parts of the body, the throat, and inside of the limbs, which are white. Black streaks, occasionally diversi-

fied with a deep tawny hue, are drawn at intervals over the body and limbs; the legs are of a darker gray than the rest of the body, and the tail is covered with a series of partial black rings, which extend only half way round that member. These black stripes are almost invariably edged with a deep tawny hue, and, on the shoulders, flanks, and thighs, they are entirely tawny. The legs themselves are darker than the rest of the body, being of a very deep gray. In size, the Colocolo equals or surpasses the ocelots, and, to judge from collateral evidence, is a terrible enemy to the animals among which it lives.

A specimen of this creature was shot on the banks of a river in Guiana by an officer of rifles, who stuffed it, and placed the skin to dry on the awning of his boat. As the vessel dropped down the river it passed beneath some trees on which monkeys were perched. Monkeys usually never hesitate to indulge their curiosity, and venture as near as they can to passing boats, but the stuffed skin of the Colocolo was too much for them and they fled in dismay.

THE WILD-CATS.

We must warn our readers that they must go on and consult our next chapter if they wish to learn anything about our native Wild-Cats. Neither the so-called "American Wild-Cat, nor the "Texan Wild-Cat," nor the "Red Cat," are cats at all, but lynxes: such is the perversity of scientific classification. By the true cats, we mean the domestic cat with its varieties, and two wild species from either of which our domestic cat may be a descendant.

The EUROPEAN WILD-CAT, *Felis catus*, has for a long time been regarded as the original form of our household pussy, and this view has still some defenders. But some very striking differences, not to be explained by domestication, exist; one very apparent one is the different shape of the tail. In the domestic cat this appendage is long, slender and tapering; in the wild-cat it is shorter, truncated at the end and bushy. The wild-cat is one-third larger and much stronger than the domestic cat. The hair is stronger, the whiskers more ample, and the teeth stouter and sharper. The color of the creature is pretty uniform, the ground tint of the fur being yellowish or sandy-gray, marked with streaks like the tiger at right angles to the spine. A dark row of spots runs along the back; the tail has numerous black rings and a black tip.

The fur in the colder regions, such as North Germany and parts of Russia, becomes very long and thick.

The wild-cat is not found in Denmark, Sweden or Norway, nor in Northern Russia, where the lynx takes its place. In Germany it inhabits all the well-wooded central mountain regions, such as the Harz, the Thuringian, Bohemian and Black Forests, and the mountains of Upper Hesse. From these head-quarters the wild-cats pass from wood to wood in the plains, and it is probable that they might be found in such localities much oftener than one fancies. In England it is almost extinct, but it still lingers in the North of Scotland and in Ireland, in which last country it bears the name of the "Hunting Cat." It is very common in Southeastern Europe, from the Alps to the Black Sea and the frontiers of Asia. But it does not pass the limits of Europe, and has never been caught south of the Caucasus. It loves dense and lonely forests, especially selecting rocky localities, as the crags and boulders furnish it with safe shelter; it often occupies hollow trees, and does not despise to take up its abode in the hole of the badger or the den of the fox.

At night the wild-cat sallies out on his foray, and any one who has observed the sly, stealthy, silent way in which the common cat hunts birds, can form a good notion of its actions, and judge how it climbs into the nests of the birds, pounces on the hare on its form or the rabbit sporting near its burrow. But it attacks even young fawns, and kills them, leaping on their back and biting the veins of the neck; while it is most destructive to dovecots and hen-roosts, where it kills many more than it can eat. When driven to extremity or wounded the wild-cat is a dangerous foe for dog or man. A German forester tracked one into a hollow tree, and struck the trunk to start it out again. While he was hammering away the cat appeared; before he could raise his gun it was on his back, tore off his thick leathern cap with its claws, and bit through his neckerchief. His cries brought his son to his assistance, but the cat held on to its victim till its head was broken in. In spite of every care the forester died in great agony. An English sportsman who attacked a wild-cat in Scotland, writes: "As soon as I was within six or seven feet of the place, she sprang straight at my face, over the dogs' heads. Had I not struck her in mid-air as she leaped at me, I should probably have got some severe wound. As it was, she fell with her back half broken amongst the dogs, who, with my assistance, dispatched her.

I never saw an animal fight so desperately, or one which was so difficult to kill. If a tame cat has nine lives, a wild-cat must have a dozen."

The MANUL, *Felis manul*, is a Siberian wild-cat, somewhat lower than the European one in stature, and clad in a very thick coat of yellowish and dark-brown hair growing out of a close gray fell. It is found on the North of the mountainous border of Central Asia, exclusively on the steppes. It is mentioned here because some naturalists perhaps justly regard it as the original of the Angora cat.

THE MALAY CAT.

The MALAY CAT or KUWUK, *Felis Javanensis* (Plate XI), is of a grayish-brown color with dark black bands. During the day it hides in hollow trees, sallying out to plunder by night. The natives describe it as very sagacious, but fierce and untamable; they affirm that, in order to approach fowls unsuspected, it imitates their voices.

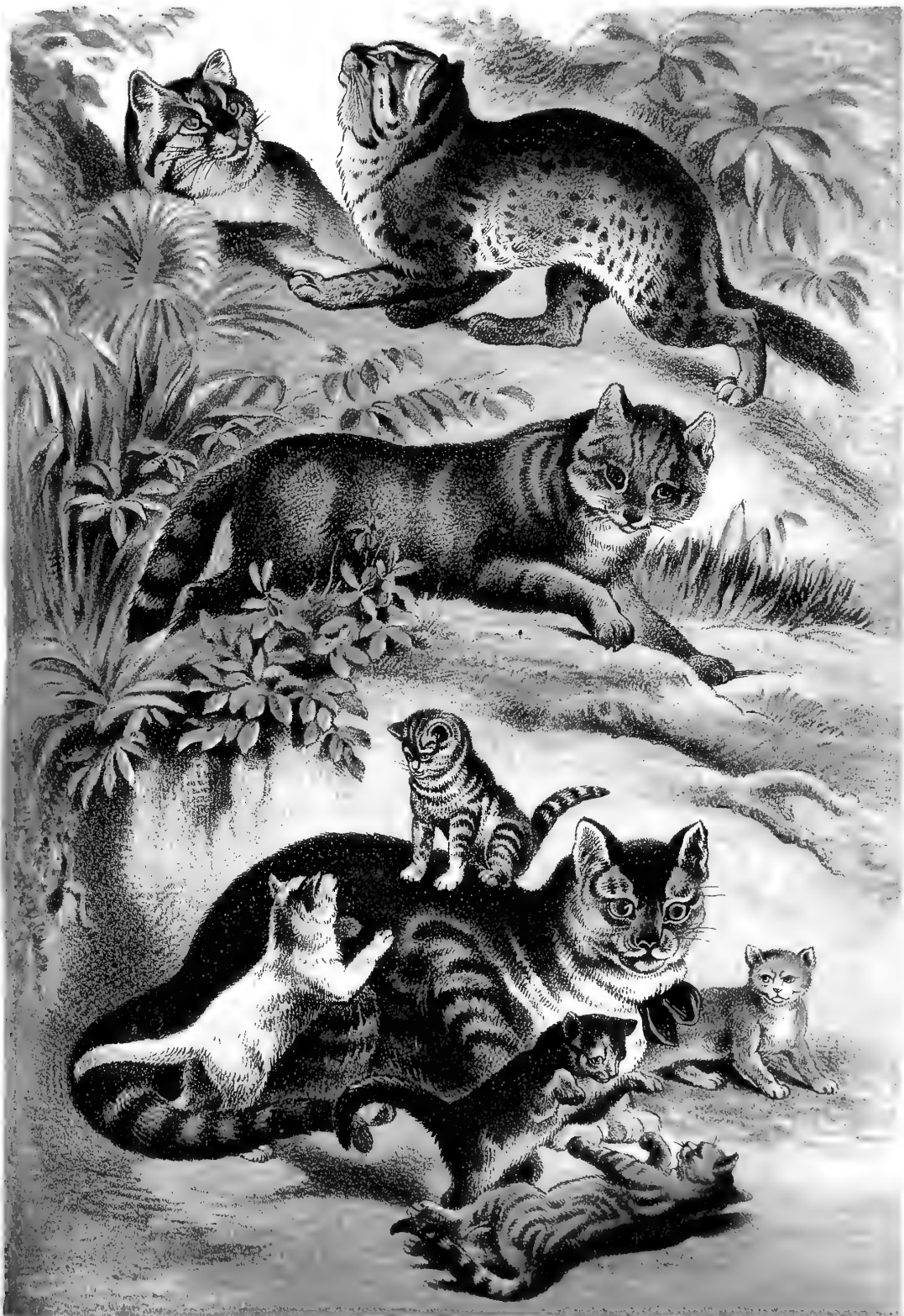
The CHINESE CAT, *Felis undatus* (Plate XI), is a dwarf variety, reaching a length of barely two feet, including tail. Its color is a brownish-gray, and four longitudinal stripes, two over the eyes, two on each side of the nose are very conspicuous. The stripes from the eyes turn toward the shoulders; those from the nose run along the back on each side of a row of oblong spots: the flanks are covered with small round spots which extend also over the tail.

This dwarf cat is found in India, the Sunda islands and Japan, and in China is the representative of the wild-cat. It is one of the wildest and bloodiest species of the family, and resists all attempts at taming.

THE DOMESTIC CAT.

There seems to be little doubt that we must regard as the ancestor of our household cat, the Nubian Cat, which, in the hoariest antiquity, all Egypt revered, worshipped and embalmed. While other animals were worshipped locally, the cats were deemed holy everywhere. If a house took fire, the cat was the first thing saved; if a cat died, the Egyptians went into mourning; whoever purposely or accidentally killed one was put to death; not even the name of a Roman citizen could save the offender. The bodies of the cats were carefully embalmed and placed in the tomb, and they are still the most common mummies found in the sepulchres.





CHINESE CAT
MALAY CAT
COMMON CAT WITH KITTENS

PLATE XI. CARNIVORA.



length is about twenty inches, its tail about ten. Its color is a dull-yellow or gray, reddish on the head and back, lighter on the sides, the hind-legs are marked with stripes, and some narrow lines appear on the forehead. Brehm in vain sought to tame a grown up one, but two young ones in the Zoological Gardens of London seemed peacefully inclined, and the eminent traveler Schweinfurth found that among the Njam-njams of Central Africa, the *Felis maniculatus* did the mouse-catching of their households. There can be little doubt, then, that this is the species which the ancient Egyptians undertook to tame. The mummies of cats from the earliest monuments of that extraordinary people prove that very little change has been effected in the animal by domestication.

The descendants of the Egyptian cat are found as household pets in all countries of Europe, in India, Japan and China, in which last empire it is used to tell the time of day by the size of the pupil of its eyes. In Modern Egypt it is still regarded with affection as the favorite animal of Mohammed, and funds exist the interest of which is devoted to feeding cats. In South America it is not found in the Andes, as it cannot endure the cold and thin air of the mountains; in New Zealand it has relapsed into a wild state, and is hunted by the settlers as zealously as they hunt its wild congeners. In the North of Asia it is an article of commerce, the Mantchoos do a large trade in it, selling kittens for sable skins to the neighboring tribes, but it is not found among the Nomad tribes of Eastern Siberia. Whenever the population quits a roving for a settled life the cat makes its appearance; it was introduced into the regions at the mouth of the Amoor in 1853, and by 1857 had reached the settlements half-way up that stream. The Danish ladies carried cats with them to Greenland. In North America it is in every household.

The cat is thus a living witness of the progress of mankind, of settled life and incipient civilization. Yet under all circumstances the cat asserts its independence, and submits to man only as far as it chooses. If cared for, it becomes attached to the family; if neglected, it becomes attached to the house. We are too frequently in the habit of ascribing to the cat treachery and want of affection, as well as of undervaluing its intelligence; we apply to it the same epithets that a dominant race always applies to a weaker one when it obstinately refuses to resign its independence, and sink into contented slavery. The cat refuses to be our slave or lick the hand that flogs it; and it will not place its qualities unreservedly at

our disposal. As far as mere brain power is concerned it is higher than the dog. Gratiolet, who has classed all the mammalia in groups according to the development of the brain, places the cats in the class above that to which he assigns the dog.

The DOMESTIC CAT, *Felis domesticus* (Plate XI), appears in various colors. We have them white, black, almost always with a white spot on the breast, yellow, bluish-gray, gray with dark stripes, and the so-called tortoiseshell cats in whose coats three colors combine. We may remark as a curious fact that all white cats with blue eyes are deaf, and that all tortoiseshell cats are females.

There are few varieties of the cat; two only deserve mention here.

The ANGOLA Cat, *Felis domesticus angolensis*, is distinguished by its size, its long silky hair, and its flesh-colored lips and soles. Pallas regards it as descended from the Manul (p. 211). It is generally of a uniform color, and is a very handsome creature. It is very lazy, and prefers being supported for its beauty to working for a living.

The MANX CAT, *Felis domesticus ecaudatus*, has the hind-legs disproportionately developed, and is remarkable for the want of a tail, the absence of which member is only indicated by a rather wide protuberance. This want of the usual caudal appendage is most conspicuous when the animal, after the manner of domestic cats, clammers on the tops of houses, and walks along the parapets. How this singular variation of form came to be perpetuated is extremely doubtful, and at present is an enigma to which a correct answer has yet to be given. It is by no means a pretty animal, for it has an unpleasant weird-like aspect about it, and by reason of its tailless condition is wanting in that undulating grace of movement which is so fascinating in the feline race. A black Manx cat, with its glaring eyes and its stump of a tail, is a most unearthly apparition.

We need not burden our pages with anecdotes of cats, nor endeavor to refute the ignorant belief that they can perform the impossible feat of sucking an infant's breath. We may, however, add a few lines on two points.

The extraordinary electrical character of the Cat is well known. On a cold, bright day, if a cat be stroked, the hairs of the fur bristle up, and electrical sparks issue therefrom, accompanied with a slight crackling.

It appears, too, that the animal may be so surcharged with electricity that it will give a severe shock to the holder. In order to obtain this

result, the cat should be placed on the knees, and one hand applied to its breast while the other is employed in stroking its fur. Cracklings and sparkles soon make their appearance, and in a short time, if the party continues to stroke the animal, he will receive a sharp electrical shock that may be felt above the wrists. The cat seems to suffer as much as the experimenter, for on giving forth the shock she springs to the ground in terror, and seldom will permit a repetition of the same process.

The other point is the "homeing" power of the cat. No difficulties or dangers seem to prevent it from finding its way home, even from a considerable distance and under circumstances which would cause any other animal to fail. Eighteen cats, belonging to different persons, were put in baskets and carried by night to a distance of three miles, when they were set at liberty at a given moment. A wager was laid upon them, and the cat that got home first was to be the winner. One of the animals arrived at its residence within an hour, and carried off the prize. Three only delayed their arrival until the next morning.

Whether the cat can ever be used, like the carrier-pigeon, to carry intelligence in time of war through the enemy's lines, remains to be seen.

THE MARTEN CAT AND SERVAL.

Before we pass to the next genera two other species of cats must be mentioned, one a link between the cats and civets, the other between the cats and lynxes.

The MARTEN CAT, *Felis viverrinus*, attains the length of three feet, ten inches of which must be reckoned to the tail. It is longer and lower than the ordinary cat, and has a smaller head. It is found in the East Indies and the adjacent islands as far as Formosa.

The SERVAL, *Felis serval*, is commonly called by the Dutch colonists of the Cape the "Bush cat." It is a very pretty animal, and on account of the bold variegations of its fur, its skin is in great request, and finds a ready sale among furriers, who know it by the name of the Tiger-cat.

The ground color of the Serval's fur is of a bright golden tint, sobered with a wash of gray. The under portions of the body and the inside of the limbs are nearly white. Upon this ground are placed numerous dark spots, which occasionally coalesce and form stripes. In number and size they are very variable. The ears are black, with a broad white band

across them, and from their width at the base, they give the animal a very quaint aspect when it stands with its head erect.

In disposition, the Serval appears to be singularly docile, and even more playful than the generality of the sportive tribe of cats. It is not a very large animal, measuring about eighteen inches in height, and two feet in length, exclusive of the tail, which is ten inches long, and covered with thick, bushy fur; the body is slender, but stands high, the head is long, the ears remarkably large, the eye small and placed obliquely.

According to Mr. Anderson some of the African tribes believe that the real Tiger exists in their country, but they evidently refer to the Serval. When attacked the Serval displays great ferocity; the traveler just mentioned had one of his best and strongest dogs nearly killed by a Serval. On being discovered the beast took refuge in a tree, and was not dispatched before it had received sixteen wounds, some of the arrows employed for the purpose having been poisoned.



CHAPTER VI.

THE LYNXES AND CHEETAHS.

THE GENUS LYNX—THE PERSIAN LYNX—THE CARACAL—THE EUROPEAN LYNX—THE BOOTED LYNX—THE CANADIAN LYNX—THE AMERICAN WILD-CATS—THE GENUS GEPARDUS—THE CHEETAH OR HUNTING LEOPARD.

ALMOST all naturalists now place the lynx in a separate genus from the cats proper, although in common parlance many lynxes are called cats. In our family of the Felidæ the Lynxes form the second genus.

II.—GENUS LYNX.

The Lynxes are characterized by a large head with tufted ears, a powerful body on long legs, and usually a short tail. All quarters of the globe, except Australia, are blest with Lynxes. They haunt dense, almost impassable forests and thickets, but are found also in steppes and deserts; they may be regarded as highly developed cats, and are as rapacious as any leopard, and must be classed among the creatures which do more harm than good. Dr. Gray classes together as a genus two small lynxes in which the ear tufts are not developed and the tail hangs down to the heel. One of them is an African, the other an Indian animal, which we prefer to regard as species only.

THE PERSIAN LYNX.

The PERSIAN or MARSH LYNX, *Lynx chaus* (Plate X), our first example of the Lyncine group, is not unlike the lion in the general tawny hue of its fur, but is extremely variable both in the depth of tint and in certain indistinct markings which prevail upon the body, limbs, and tail. The fur, however, is always more grizzled than that of the lion, and there seem to be in almost every individual certain faint stripes upon the legs

and tail, together with a few obscure stripes or dashes of a darker color upon the body.

Along the back, the hue is deeper than on the sides, and on the under parts of the body the fur is of a very pale tint. The extremity of the tail is black. The markings which are found on this animal are caused by the black extremities of some of the hairs. When these black-tipped hairs are scattered, they produce the grizzly aspect which has been mentioned as belonging to this animal, but when they occur in close proximity to each other, they produce either spots, streaks, or dashes, according to their number and arrangement. On the tail, however, they always seem to gather into rings, and on the legs into stripes. There is an undercoating of soft woolly hair through which the longer hairs stick up.

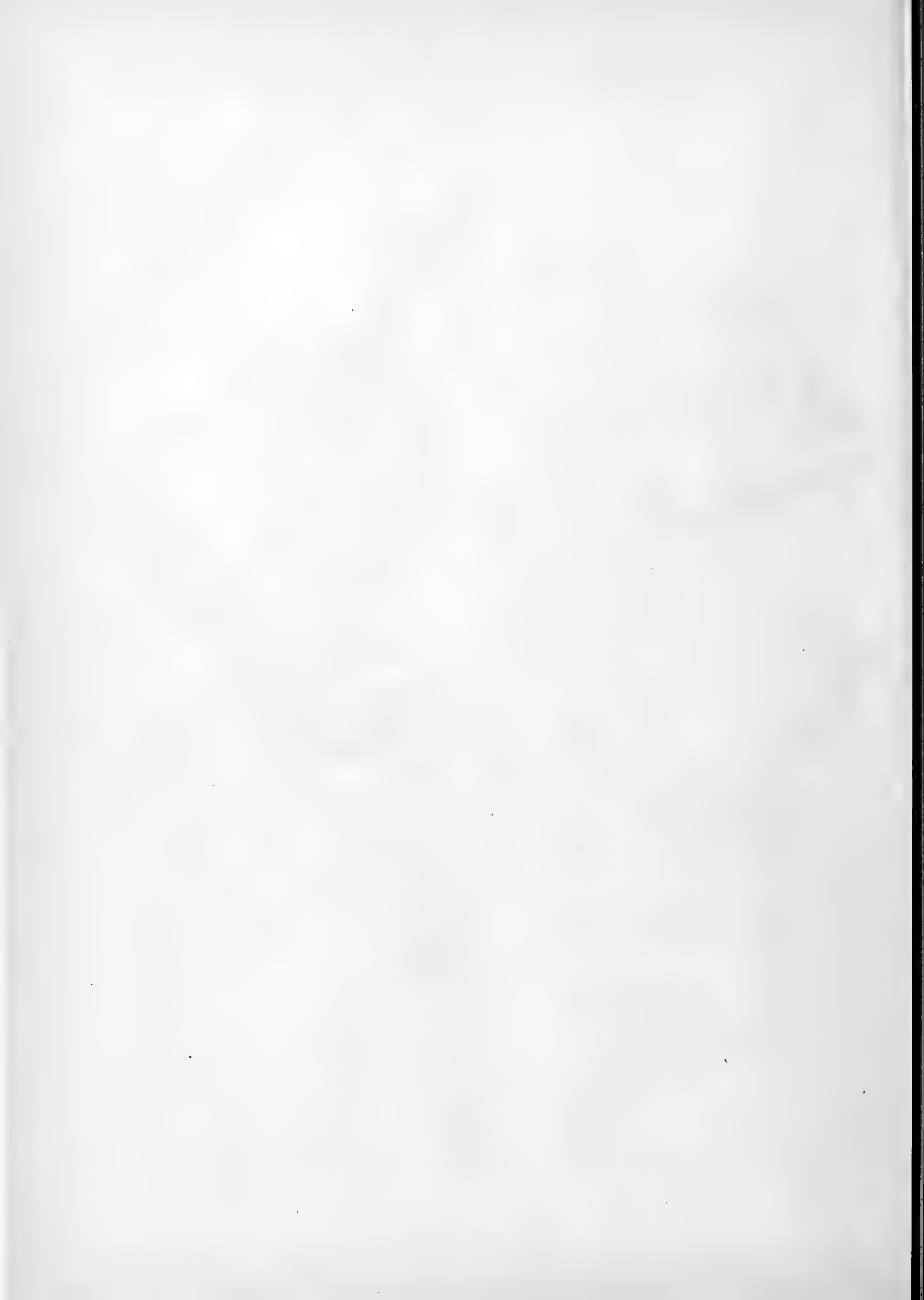
The Chaus is found in Eastern and Southern Africa, Persia and India. It frequents, as its name indicates, marshy ground; its food consists chiefly of the smaller quadrupeds and birds, but it is also fond of fish, which it catches very adroitly by a sweep of its paw.

The Chaus was known to the ancient Egyptians, who embalmed and entombed it as they did the cat, and some authorities even incline to regard it as the ancestor of the cat.

THE CARACAL.

The CARACAL, *Lynx melanotis* (Plate X), is distinguished by a slender body, long legs, narrow pointed ears with black tufts. Both its common and its scientific titles, the Turkish *cara-cal*, and the Greek *melan-otis*, mean "black-eared." It is widely extended, being found in Africa, Asia Minor, and India; it avoids woodlands, and prefers the steppes and deserts, where it lives usually on small birds and animals; sometimes, however, it attacks the lesser kinds of antelopes. Its color is pale-brown, warmed with a tinge of red, varying slightly in different individuals. The under parts of the body are paler than the upper, and slightly besprinkled with spots. The color of these spots is very variable, for in some individuals they are nearly black, while in others they are a reddish-chestnut. The lower lip, the tip of the upper lip, and the chin are quite white. The tail is very short. It is not a very large animal, being about equal to a rather large bull-terrier dog in size, but very much more active.





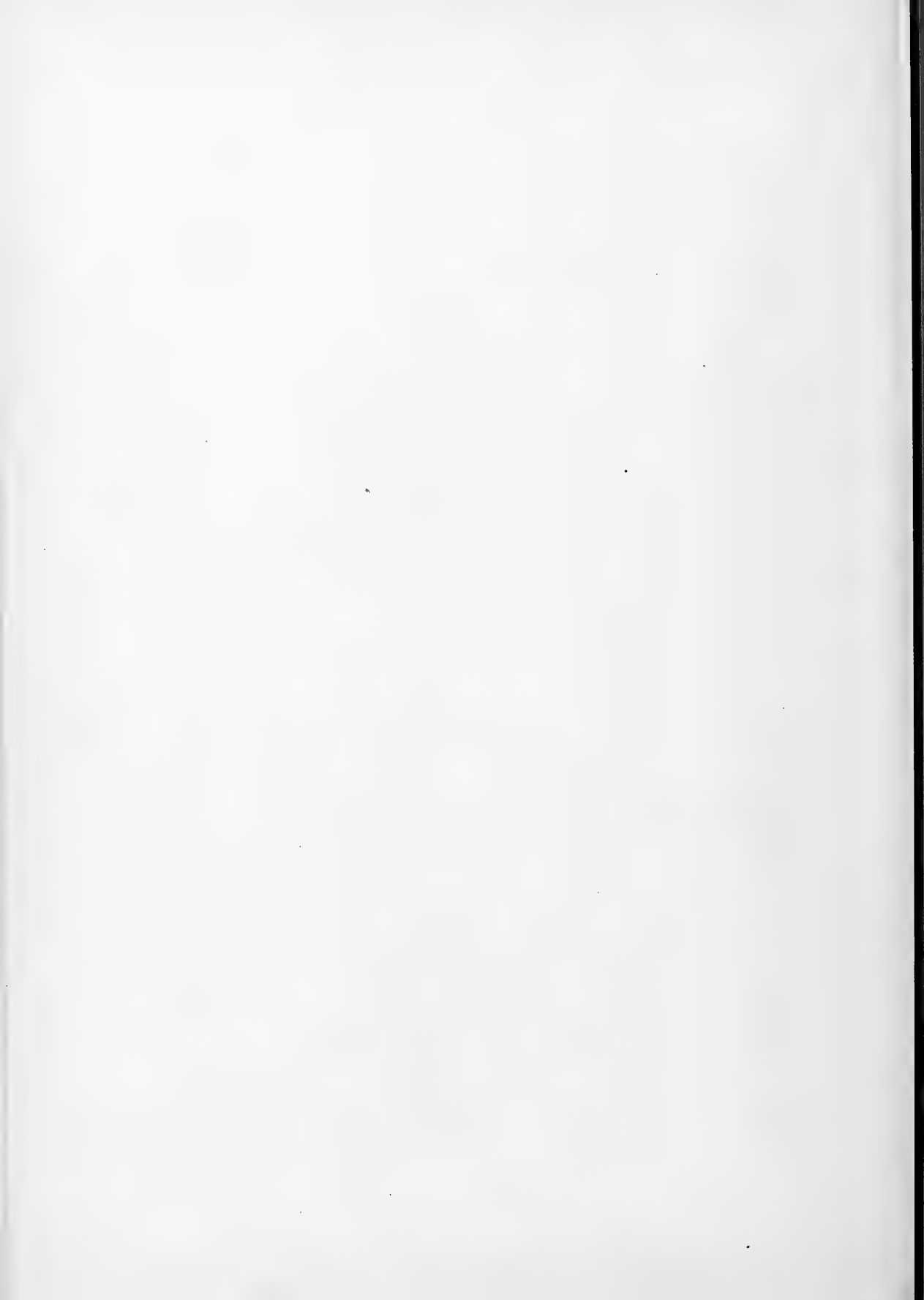


PERSIAN LYNX
CANADIAN LYNX

CARACAL

BAY LYNX OR COMMON WILD CAT

PLATE X. CARNIVORA.



It is a peculiarly ferocious and surly animal, wearing a perpetual expression of malevolence, and always appearing to be, as it truly is, ready for a snarl and a bite.

It is said to hunt in packs occasionally like wolves or wild dogs, and it possesses very great strength in comparison to its size, being capable at the same time of making surprising springs and of climbing trees.

THE EUROPEAN LYNX.

The COMMON LYNX, *Lynx vulgaris*, has a strong beard and a short rudimentary tail. A full-grown lynx attains the length of three feet, or even three and a half feet, the tail measuring six to eight inches. The animal has a very powerful, compact figure, strong limbs, paws resembling those of the leopard, long ears ending in black hairs an inch and a quarter long. The fur is thick and soft, forming on the face a white beard which hangs down in two points; its color is usually reddish-gray and grayish-brown mixed, and marked on the head, neck and back with darker spots; the inside of the ear is white. The tail is thickly covered with hair, and the latter half is black. Its coat is shorter in summer and reddish in hue, but becomes longer and whiter in winter. The varieties of color are very numerous; indeed, scarcely two individuals are precisely alike.

However common this animal may have been in the Middle Ages, it is now comparatively rare; and Brehm states that the last lynx in Germany was killed in 1846. It is found, however, in Hungary and Russia, and is represented by a kindred species in the South of Europe.

The lynx was known to the ancients; the Greeks consecrated it to Bacchus, and Pliny has placed to its credit several absurd stories. Among others, he endows it with the faculty of seeing through walls; hence the expression *Lynx-eyed*, which is adopted in our language to designate very keen vision.

This animal resembles the caracal in its habits and mode of obtaining prey. Sheep often fall victims to the lynx, but it finds its chief nourishment among hares, rabbits, and other small animals. Like the caracal it is an excellent climber of trees, and chases its prey among the branches with ease and success.

The fur of the lynx is valuable for the purposes to which the feline skin is usually destined, and commands a fair price in the market. Those

who hunt the lynx for the purpose of obtaining its fur, choose the winter months for the time of their operations, as during the cold season the lynx possesses a richer and a warmer fur than is found upon it during the warm summer months.

The SOUTHERN LYNX, *Lynx pardinus*, is a smaller but more beautiful animal, found in Spain and Portugal. Its fur is of a ruddy chestnut color, with black spots and stripes, and from these leopard-like markings it derives its scientific appellation. Its flesh is regarded in Spain as a great delicacy; it is beautifully white and tastes like veal. Madrid receives yearly about three hundred lynx-skins, which are made into caps much admired by gipsies, stableboys, and bull-fighters. The name of "Loup-cervier," sometimes given to it, probably originated from its howling like a wolf during the night. It nimbly climbs trees in pursuit of prey. Martens, ermines, hares, and rabbits also enter into its alimentation. It does not, however, eat the flesh of large victims, unless its hunger is extreme; but generally is satisfied by sucking out the brain.

Taken young, it becomes accustomed to captivity, and is fond of being caressed; but it will return to its wild life if opportunity offers, so really never becomes attached to its master. It is an extremely cleanly animal, and like the cat, passes a large portion of its time in washing and cleansing its fur.

THE BOOTED LYNX.

The BOOTED LYNX, *Lynx caligatus*, derives its name from the appearance of its hind-legs, which are covered with black hair. The general tint of the fur is gray, plentifully besprinkled with black hairs. It is found in the southern parts of India and the greater part of Africa, from Egypt and Morocco to the Cape. It is very probable that the Booted Lynx is not a species, but only a variety of the Persian Lynx.

THE CANADIAN LYNX.

The POLAR or CANADIAN LYNX, *Lynx Canadensis* (Plate X), is called by the French Canadians *Le Chat* or *Peeshoo*. It is the largest of the American lynxes, and sometimes attains the length of four feet, including the tail. It is one of the most important fur-bearing animals of the continent; the hair is longer and thicker than in the European lynxes, the

beard and ear-tufts are more developed, and each hair is of two colors. A brownish silver-gray is the prevailing hue, marked on the flanks very indistinctly with spots; in some specimens the fur takes a slight chestnut tinge. The ears are edged with white. But it is probable that considerable changes of the coat take place according to the season of the year.

When running at speed it presents a singular appearance, as it progresses by a series of bounds, with the back arched and all the feet coming to the ground nearly at the same time. It is a good swimmer, being able to cross the water for a distance of two miles or more. Powerful though it be, it is easily killed by a blow on the back, a slight stick being sufficient weapon wherewith to destroy the animal. The flesh of the Peeshoo is eaten by the natives, and is said, though devoid of flavor, to be agreeably tender. It is not so prolific as the generality of the feline tribe, as the number of its young seldom exceeds two, and it only breeds once in the year. The range of this animal is as far south as the Great Lakes and eastward to the Rocky Mountains, but it is not uncommon in Northern New York. It frequents wooded regions, and in its manner of life differs in no respect from the other lynxes. Some authors describe it as a timid animal easy to destroy, but Audubon calls it a strong, bold creature, which can take good care of its hide. Audubon writes; "The Canada lynx is more retired in its habits than our common wild-cat, keeping far from the habitations of settlers. Its fine, long fur enables it to withstand the cold of our northern latitudes. When alarmed, it leaps or bounds rapidly in a straight direction, and if hard pressed, takes to the trees, which it climbs by the aid of its powerful fore-legs and claws. It swims well, and will cross the arm of a lake two miles wide." He adds: "The stories told of the great cunning of this species in throwing mosses from the trees in order to entice the deer to feed on them, and then dropping on their backs, may be omitted as requiring no refutation." He evidently discredits the common belief to which we have referred above that this lynx "is easily destroyed by a blow on the back with a slender stick."

The food of the Canada lynx consists of grouse and other birds, hares, rabbits, squirrels, the Arctic fox, and the lemming. It is said to pounce on the wild goose at its breeding-places, and Audubon heard with skepticism an account of its having killed a deer, but confirms the statement that it kills young fawns.

THE AMERICAN WILD-CATS.

The so-called wild-cats consist of three small species of lynxes which are somewhat difficult to distinguish. Baird writes: "In the study of the North American lynxes I have found it very difficult to come to satisfactory conclusions, owing to the imperfect condition of some specimens and the uncertainty as to date of collecting others. Northern skins of wild-cats have generally longer and softer hair the year through than the southern, while, as in the deer, the hair will have a reddish or bay tinge, which is replaced by grayish in winter. As a general rule, the further south we go the smaller the species. There appear to be at least *three* species of smaller American lynxes in North America—the Common Bay Lynx, which reaches from the Atlantic to the Pacific throughout nearly the whole latitude of the United States, but is replaced in Texas and Southern California by the *Lynx maculatus* (Texas Wild-cat), and in Northern Oregon and Washington Territory by the *Lynx fasciatus* (Red Cat). The precise limit of the last mentioned species, other than as indicated, has not been ascertained."

Audubon regards the two latter species as merely varieties of the common wild-cat.

THE WILD-CAT OR BAY LYNX.

The WILD-CAT OR BAY LYNX, *Lynx rufus* (Plate X), is described as follows: "The fur moderately full and soft, above and on the sides pale rufous overlaid with grayish—the latter color most prevalent in winter—a few obsolete dark spots on the sides, and indistinct longitudinal lines along the middle of the back; color on the throat like the sides but much paler; beneath, white spotted; inside of the legs, banded; tail, with a black patch at the end with indistinct subterminal half-rings; inner surface of ear with a white patch." Length of head and body twenty-seven inches; tail, seven inches; height at shoulder, fifteen inches. The Bay Lynx is fond of swampy situations, and is abundant in the cane-brakes of the Southern States, where at times they have become a great nuisance by the havoc they make among the poultry. It is generally cowardly when attacked, and always flies from its pursuers; and Audubon says that he always found it very timid, and unwilling to attack anything larger than a hare or a young pig. Dr. Coleman witnessed a fight be-

tween an eagle and a wild-cat. After a fierce struggle, in which the eagle was so badly wounded that he could not fly, the cat, badly scratched and having one eye gouged out, was found lying dead.

In parts where their destruction is necessary, the wild-cats are hunted by dogs or caught in traps, and if a cat is "treed," the hunters shake it off as they would a racoon. These cats hunt just like common cats, and mew and purr in the same way. They are not good swimmers, but are not averse to taking to water.

Audubon tried to domesticate a young wild-cat; it showed, however, no disposition to improve its habits and manners, but became daily more wild and vicious.

THE TEXAS WILD-CAT.

The TEXAS WILD-CAT, *Lynx maculatus*. We quote again from Baird: "Fur short and rather coarse, color light reddish-brown overlaid with gray in winter, quite distinct darker spots on back and sides; color on throat paler than on sides; beneath, white spotted; inside of legs, banded; black patch at end of tail; inner surface of ear black, with a white patch; an obscure dark line runs on each side of the neck, with two round, black spots between their extremities; the ears large and pointed." Length from nose to root of tail, three feet; tail, six and a half inches. This variety is found in Mexico, Texas, and California.

THE RED CAT.

The RED CAT, *Lynx fasciatus*. Fur very full and soft; back, chestnut-brown, a little paler on sides and throat; no spots or bands on the back; dusky spots beneath. Ears black inside, with slight grayish patch. Last third of tail black on upper side. Size same as the common wild-cat.

This variety was first described by Lewis and Clark in 1814 as the "Tiger Cat."

III.—GENUS CYNÆLURUS.

This genus, CYNÆLURUS, which is by interpretation "Dog-cat," contains only *one* species. The animals thus described well deserve their name, for they indeed seem half-dog and half-cat. Catlike is the head and long tail; but the rest of the body is doglike, especially the long

limbs, the claws of which are only imperfectly retractile; the muscles for shooting out and drawing back the claws are there, but they are so weak and powerless that the claws always protrude and consequently are worn blunt. The teeth, on the other hand, are unmistakably those of a member of the family of Felidæ, but the tail is curled over on itself at the extremity like the tail of a dog. Not only in external appearance are the members of this genus intermediate between the feline and the canine families, but they also display the qualities of both; they have the sharp eye and the cunning of the cat combined with the docility, mildness, and attachment of the dog.

THE CHEETAH.

The CHEETAH, *Cynælurus jubatus* (Plate VIII), is popularly called the "Hunting Leopard," but it can lay no claim to be considered a leopard, and has been so called on account of its spotted hide. Its scientific name *jubatus*, or "maned," has been assigned to it because a quantity of long hair grows on the back of the head and neck. Some writers needlessly distinguish between the African and Asiatic varieties, but the animals are essentially the same.

The Cheetah, with its slender, narrow body, stands higher than the cats proper; the head is small and somewhat rounded like a dog's, the ear is broad and short, the eye has a round pupil, the hide is rough and of a yellowish-gray color, marked with black and brown spots, arranged close together on the back and partly extending along the tail, which is ringed with black toward the end. The body measures about three feet, the tail about two. The African variety, called in Arabic *Fahhad*, has no mane, the predominant color of the fur is orange-yellow, and the tip of the tail is white.

The Cheetah is found in all Southwestern Asia, and is a genuine beast of the plains, depending for its food on its speed and activity. It can creep on the ground, but does so more like a wolf or fox than like a cat; when it quickens its pace it runs with the long leap of the greyhound. It is quite unable to climb. It purrs like a cat, but in a deeper and rougher tone, and at times utters a very peculiar cry, so like the word Cheetah that we are justified in supposing that it derives its name from it. Its usual food consists of small ruminants; its speed alone would not enable it to take an antelope, but its catlike cunning comes to its aid. When its prey is visible, it creeps snakelike along the ground till it comes

within twenty or twenty-five yards, when a few of its long leaps places it on its victim's back, and it buries its teeth in the throat.

Being docile as a dog, the Cheetah has allowed these natural gifts to be developed and trained by man; and in the East it is as much a part of a hunting establishment as a falcon or a pack of hounds. It is usually the female that is thus used; and when it is taken out to hunt, it is hooded and placed on a light car in company with its keepers.

The places which gazelles frequent are sought out. As soon as one is perceived, the hunters stop, the Cheetah is unfastened and its eyes unbandaged, and the game is pointed out to it. Immediately, under cover of the high vegetation and brushwood, the beast glides off in pursuit, taking advantage, with unequalled tact, of the slightest breaks in the ground to conceal its movements. When it considers that it is sufficiently near its victim it suddenly shows itself, dashes on with terrible impetuosity, springs on the prey after a succession of prodigious bounds, and immediately pulls it to the ground.

Its master, who has followed the events of the chase, then enters upon the scene. To detach it from its victim he throws it a piece of flesh, speaks gently to it, and caresses it; after which he again covers its eyes, and replaces it on the saddle or in its conveyance, while the assistants carry off the quarry.

This amusement is greatly in vogue in Mongolia, and a well-trained hunting-leopard attains an extraordinary price among the inhabitants. In Persia this method of hunting is not conducted in quite the same way. Men and dogs beat the woods and drive the game toward the hunters, who let the Cheetahs loose as the quarry passes them.

The Cheetah can be tamed perfectly, so that it can be allowed to ramble about like a dog; it knows its master's voice and comes when called, nor does it betray any objection to the caresses of strangers. A Cheetah at Paris had a most excellent temper, and after a considerable lapse of time, recognized a negro who had traveled on board the same ship from Senegal.



CHAPTER VII.

THE CIVET CATS.

THE CRYPTOPROCTIDÆ—THE GALET—THE VIVERRIDÆ—THE CIVET—THE ZIBETH—THE GENETS—THE PALE GENET—THE LINSANG—THE HEMIGALE—THE BINTURONG—THE NANDINIA—THE POUGOUNE—THE MUSANG—THE MASKED PAGUMA—THE MAMPALON—THE ICHNEUMONS—THE MUNGOS OR MANGOUSTE—THE EGYPTIAN ICHNEUMON—THE CRAB-EATING MANGOUSTE—THE ZEBRA MANGOUSTE—THE MEERKAT—THE ZENICK—THE MANGUE—THE BANDED MUNGOS.

THE family CRYPTOPROCTIDÆ forms a link between the Cats or Felidæ and the Civets or Viverridæ, and contains only *one* genus, and that genus but *one* species. In figure this animal resembles the Yaguarundi, in color the Cougar; it has the build, the appearance and dentition of the felines, the long body, short legs, short ears, long whiskers and naked soles of the Civets, as well as the remarkable inguinal glands that characterize the latter.

THE GALET.

The GALET, *Cryptoprocta ferox* (Plate XII), attains the length of nearly three feet in the body with a tail about two feet and three quarters. Its fur is short, thick and stiff, and seems shorn on the head and feet; the color is a reddish-yellow, darker on the back; its eyes are like those of the common cat.

The Galet or the Ferret Cat, as the Germans have named it, comes from Madagascar, where it is dreaded to a laughable extent. It attacks the Lemurs, and is a foe to domestic fowl, and occasionally to swine. Its flesh is highly prized as a delicacy by the Malagaseys.

Pollens, the traveler, relates that his native huntsman one day came face to face with a Galet. The creature was surprised and began to spit at him. The huntsman in terror flung away his gun, climbed up a tree and stayed there, trembling in every limb, till the animal had disappeared in the thickets.

Gentle and quiet as the creature appears, it is one of the fiercest known; it is very muscular and active, and is inflamed with an insatiable thirst for blood.

The name of *Cryptoprocta* is given it on account of the manner in which the hind-quarters taper down into the tail. The word is Greek, the first two syllables signifying "hidden," the second two "hind-quarters."

THE CIVET CATS.

The family of the VIVERRIDÆ comprises a number of small and moderate-sized carnivorous animals known as Civets, Genets and Ichneumons, which differ from the Carnivora hitherto mentioned, by their slender, elongated, round body, their short legs, their long, slender neck and elongated head, as well as by their long, usually pendent tail. The eyes are small, the ears of various sizes; some species have four toes, some five, and many possess retractile claws. But the most remarkable peculiarity about them is the presence near the tail of two or more glands and receptacles, which secrete and store up a fluid of a peculiar, sometimes agreeable odor. While the Viverridæ in many respects resemble the Martens and Skunks, in many others they resemble the Felidæ and seem to connect the two groups. They are found in the southern regions of the Old World, chiefly in Africa and Asia; for the so-called American Civet, *Bassaris astuta*, finds its proper place in the family of the *Procyonidæ* or Racoons. Throughout the family we find great variety of form, and equally great variety in their haunts; many live in wastes and steppes, or the scanty thickets of the driest portions of Africa and Asia, others prefer fruitful lowlands and the banks of rivers, some approach the settlements of man, others shyly retire into the darkness of the forests, some frequent trees, some never leave the earth.

The Viverridæ are mostly nocturnal in their habits, active and lively, but many prowl about during the day. Their movements are characterized by suppleness and grace; and no animals equal these in the serpentine manner in which they glide over the ground, and few in the rapidity with which they spring upon their prey, a rapidity in striking contrast with their usually deliberate gait. Some species have been quite domesticated, the Ichneumons and Mangoustes being used to keep the houses in Eastern countries free from serpents and other animal pests. Their sense of smell is very acute; their powers of sight vary according

to the habits, nocturnal or diurnal, of the animal; their sense of hearing is less developed.

All species of this family are intelligent and docile, and express by their movements gratitude for kindness; even the wildest varieties soon become tame, and learn to answer to their name.

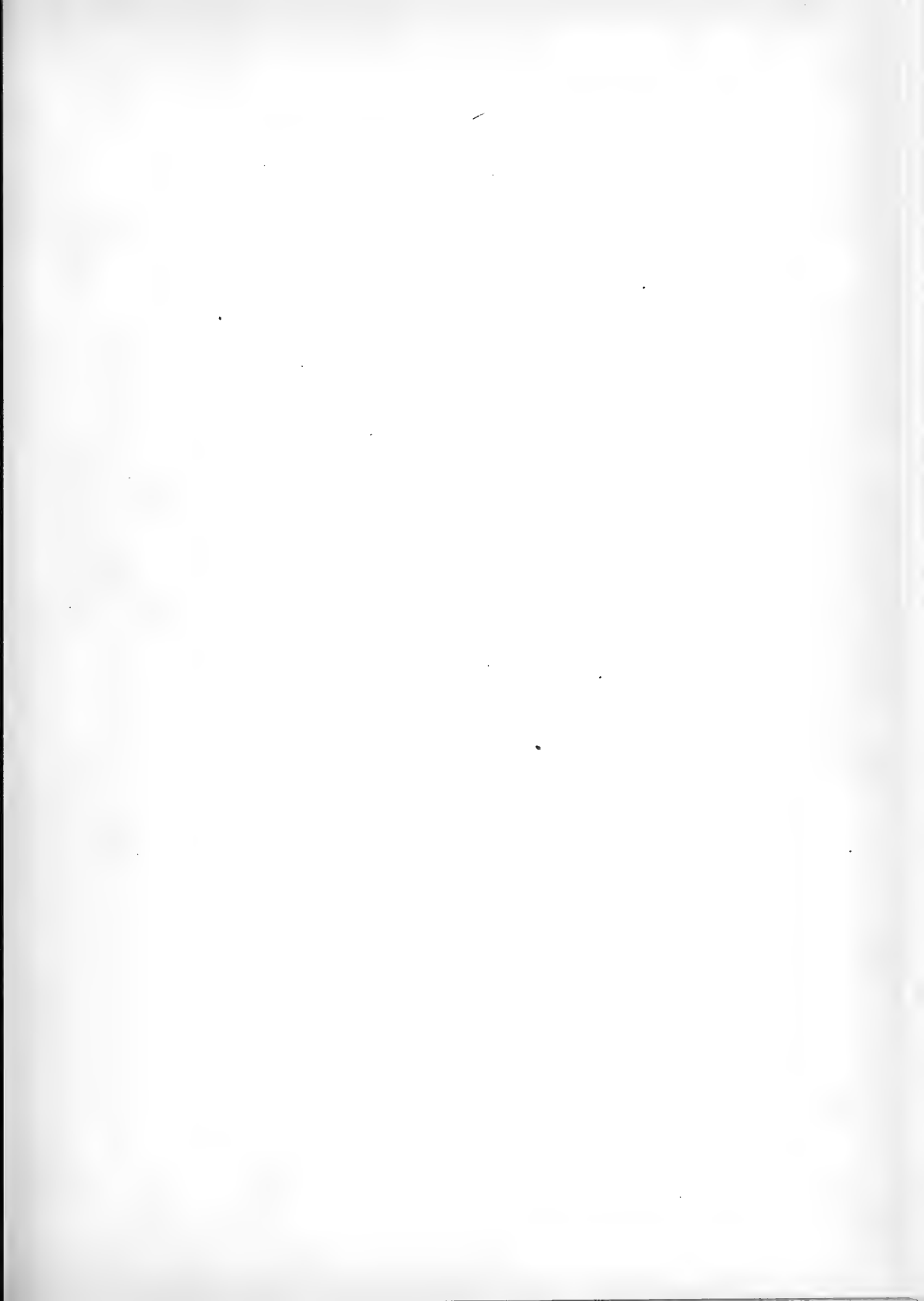
The great variety of form in the Viverridæ has led to numerous systems of classification; older writers are content with eight genera, but Gray, who has made an exhaustive study of the family, subdivides it into *thirty-three* genera, and *one hundred* species. Of these we shall mention only the most important.

GENUS VIVERRA.

The members of this genus have a long slender body, a long drooping tail, pretty long legs, feet of five toes with half retractile claws, and hairy soles; short broad ears, moderately large eyes with a round pupil and a pointed snout and nose; the soft fur and the highly developed odoriferous glands complete the characteristics of the genus. It is distributed over North and Tropical Africa, and Southern Asia, as far as the Molucca Islands. According to Gray's classification it contains *three* species.

THE CIVET AND THE ZIBETH.

The CIVET, *Viverra civetta*, and the ZIBETH, *Viverra zibetha* (Plate XII), are remarkably alike. The Civet has transverse bands upon a gray ground, narrow and parallel with each other on the shoulders, larger on the body and the thighs, while the Zibeth has the body covered with small round black spots upon a gray ground, sometimes tinted with brown. The tail of the Zibeth has eight or ten rings of a blackish-brown with about two inches of black fur at the tip; that of the Civet has only four or five rings with six inches of black tip. The Zibeth has four black bands on a white ground on the neck, the Civet in the same place, only three; the Zibeth has a white spot under the eye and a gray muzzle, the Civet has no spot under the eye, and the head is entirely black except the upper lip, which is white; in general the Zibeth has more brown than the Civet, whose tints are pure white, while the Civet has a rougher coat than the Zibeth. The words Civet and Zibeth are both European pro-







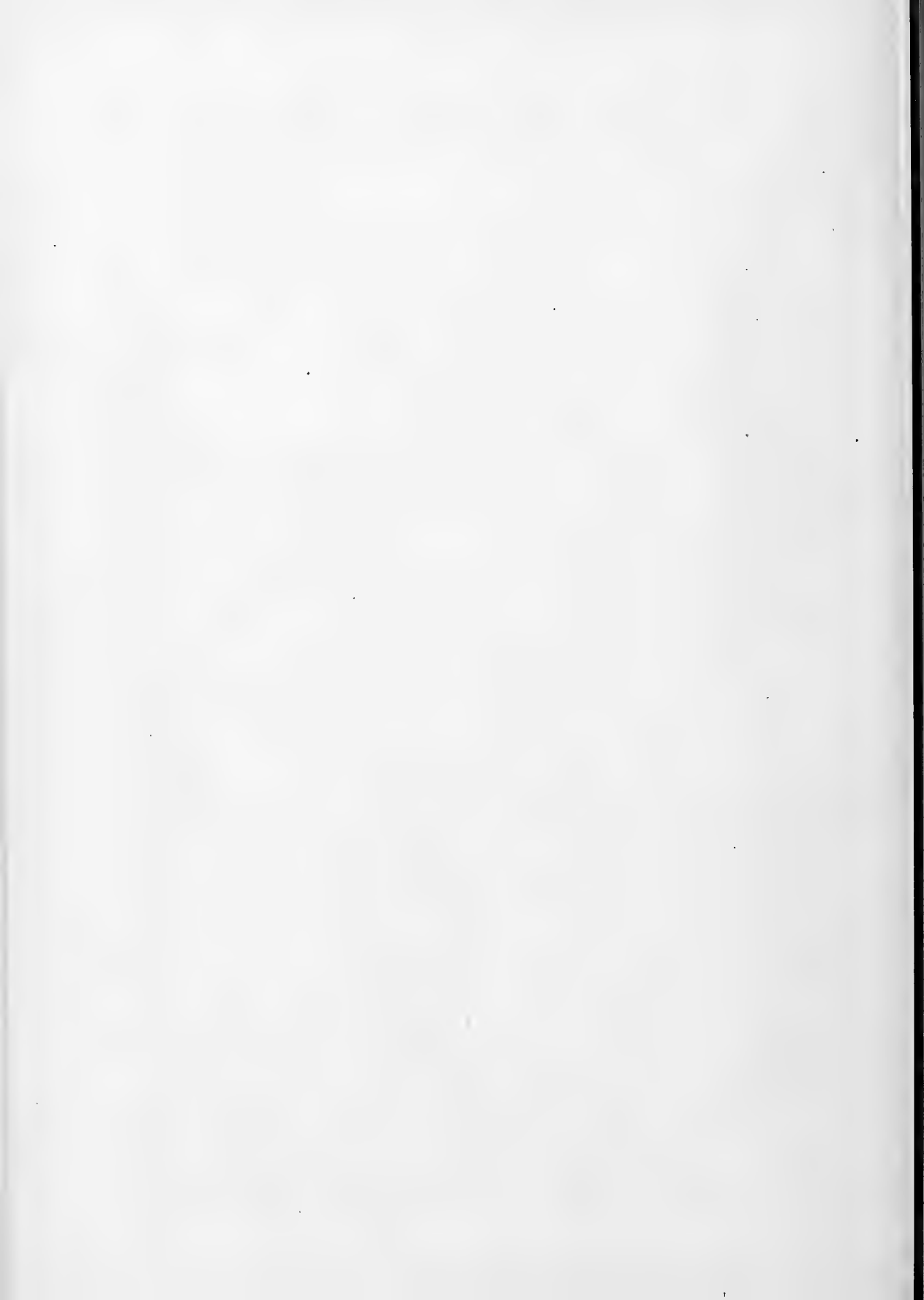
CRYPTOPROCTA
CIVITT

ICHNEUMON
ZIBETH

PALE GENET
HEMIGALE

ZENICK

PLATE XII. CARNIVORA.



nunciations of one and the same Arabic word. The former is a native of Africa, the latter of Asia.

The TANGALUNG, *Viverra tangarunga*, has rather more distinct markings than the preceding species, the three black bands on the throat being very conspicuous. The body has a thick downy covering of soft hair next the skin, which gives the tail a cylindrical aspect. The Tangalung is a native of Sumatra.

The Civets in their natural wild state are rather nocturnal than diurnal creatures, and live on small birds and animals. Numbers are kept in captivity for the sake of obtaining the odoriferous substance they produce. Civet was long a favorite perfume. "He rubbeth himself with civet, a sign that the sweet youth is in love," and "An ounce of civet, good apothecary, to sweeten my imagination," are well known quotations from Shakespeare, who describes it correctly as the "most unclean flux of a cat." This substance is contained in two glands, each of which will hold about the size of an almond; as the civet is formed it is pressed through small orifices into the pouch, which the animal can compress at will. When at liberty it discharges the substance in pieces about the size of a nut every fourteen or twenty days; when captive it is deprived of the secretion by means of a spoon, care being taken to secure the creature so that it cannot bite. Usually the civet is removed twice a week, to the quantity of a drachm each time. When fresh it is white in color, but turns brown. To prepare the civet of commerce, the substance is carefully freed from hairs, washed with water and lemon-juice, and finally dried in the sun. The best kind comes from the Moluccas. When civet was the scent in fashion, large numbers of the animals were kept in Italy and Holland as well as by the traders in Abyssinia.

GENUS VIVERRICULA.

The RASSE, *Viverricula malacensis*, the *only* species of the genus, is the Javanese Civet. Its head is wedge-shaped and the ears close together, the fur is rigid, coarse and scanty, and is marked along the back with eight parallel lines. It is found usually in forests slightly elevated above the sea-level; it preys on small birds and animals, and has the sanguinary appetite of the family in a high degree. It preserves, unlike the Zibeth, the natural ferocity of its disposition in captivity. Its perfume is highly valued by the Javanese.

GENUS GENETTA.

This genus differs from the preceding by the fact that the pouch is reduced to a slight hollow formed by the projection of the glands, and that there is no sensible secretion although there is a most manifest odor. It embraces *five* species.

The body is slender and elongated, the muzzle pointed, the limbs short, the whole appearance, indeed, that of the marten. The Genets live in low grounds and are easily tamed. The eye resembles that of the common cat, and the claws are retractile; like the Civets they live on a mixture of animal and vegetable food.

THE GENETS.

The COMMON GENET, *Genetta vulgaris*, is found in Africa, and even in the South of France. It is a very beautiful and graceful animal, of a gray color mixed with yellow, on which dark patches are lavishly scattered, and the full bushy tail is covered with alternate bands of black and white. The muzzle is black except a white patch on the upper lip.

The PALE GENET, *Genetta Senegalensis* (Plate XII), has a whiter fur and different markings; the spots having a tendency to form stripes, and the hinder legs are quite black at the ankle-joint.

GENUS LINSANG.

This genus contains *two* species found in Malacca and Java, and differs very little from the general characteristics of the Genet group. The head is pointed, the body uncommonly elongated, the legs short, the tail as long as the body, the fur smooth and close.

The LINSANG, *Linsang gracilis* (or *Prionodon gracilis*), is of a gray or yellowish-white color with black-brown spots and bands; the tail exhibits seven broad dark rings and has a white tip.

GENUS HEMIGALE.

This genus from Malacca and Borneo is represented by only *one* species, the *Hemigale Hardwickii* (Plate XII). The color of its fur is

grayish brown, with six or seven bold stripes across the back; these bands are broad on the back but narrow to a point on the flank, and are unconnected with each other. The latter half of the tail is black.

GENUS ARCTITIS.

The BINTURONG, *Arctitis binturong*, is of a dead black color, with long coarse dull hair; the head is gray and each ear is furnished with a long tuft of black hair, the tail is longer than the body and covered with exceedingly bushy hair. The muzzle is short and sharp, rather turned up at the extremity and covered with long brown hairs which radiate round the face.

The Binturong is a good climber of trees, being assisted by its thick and powerful tail, which is prehensile at the end.

The *only* species known extends from Nepal to Java and Sumatra.

GENUS NANDINIA.

This is another genus that contains only *one* species, the *Nandinia binotata*, which some writers have classed with the Civets, some with the Ichneumons. It derives its epithet *binotata* from the double row of spots on the body. The general color of the fur is a rich dark brown, and the tail is marked with obscurely defined blackish rings.

GENUS PARADOXURUS.

This genus has the dentition and general characteristics of the Genets, but the walk is almost plantigrade, and its tail coils spirally although it is not prehensile. It contains *nine* species.

The POUGOUNE, *Paradoxurus typus*, comes from the East Indies, and is of a brownish-yellow color with some browner markings; the feet, muzzle and part of the tail are black; on each side of the spine there are three rows of elongated spots, which, when viewed in certain lights, are merged into lines.

The MUSANG, *Paradoxurus fasciatus*, is a native of Java, Borneo and Siam, and is commonly called the "Java Cat." It is smaller than the

Pougouné, and has a coarser and shorter fur, which presents great varieties of color in different specimens.

The MUSANG is, although a destroyer of rats and mice, a great pest to the coffee-plantations, which it ravages in such a manner as to have earned the additional title of the "Coffee Rat." It feeds largely upon the berries of the coffee-shrub, and it is a remarkable fact that the berries thus eaten appear to undergo no change by the process of digestion, so that the natives, who are free from over-scrupulous prejudices, collect the rejected berries, and are thus saved the trouble of picking and clearing them from the husk. However, the injury which this creature does to the coffee-berries is more than compensated by its very great usefulness as a coffee-planter. For, as these berries are uninjured in their passage through the body of the animal, and are in their ripest state, they take root where they lie, and in due course of time spring up and form new coffee-plantations, sometimes in localities where they are not expected. The Musang is not content with coffee-berries and other vegetable food, although it seems to prefer a vegetable to an animal diet. When pressed by hunger, it seeks eagerly after various small quadrupeds and birds, and is often a pertinacious robber of the hen-roosts.

GENUS PAGUMA.

This genus containing *three* species is found in Nepal, China and Borneo, and Singapore.

The MASKED PAGUMA, *Paguma larvata*, used to be placed among the weasels, and called the Masked Glutton. The name *Larvata* or Masked, is given to it on account of the white streak down the forehead and nose, and the white circle round the eyes, which gives the creature an aspect as if it was endued with an artificial mask. There is a pale olive-gray band extending from the back of each ear and meeting under the throat, and the general color of the fur is an olive-brown, sprinkled with gray. In China it bears the name of Yu-min-mao. It is a good climber of trees and is nocturnal in its habits. The other species are the WHITE WHISKERED PAGUMA and the WOOLLY PAGUMA.

The genera we have hitherto described have been formed by Gray into the sub-family of the VIVERRINÆ; we now proceed to his second sub-family, that of the HERPESTINÆ.

GENUS CYNOGALE.

Another genus of only *one* species.

The MAMPALON, *Cynogale Bennettii*, has a thick compact body, a long head, pointed muzzle, very short tail and legs, and is remarkable for a strong beard of long yellowish-white bristles, behind and above which there are brown bristles, while the cheeks are adorned with two bundles of long, strong, whitish hairs. The animal is plantigrade, but can climb trees. It is a native of Borneo and Sumatra, and lives on fish, birds and fruits.

GENUS GALIDICTIS.

Madagascar furnishes the *two* species which constitute this genus. Little is known of either, except the account furnished by Dr. Gray in the Zoological Transactions of London.

The *Galidictis Vittata* is gray, with eight black-brown streaks on the back and sides, and attains the length of fourteen inches, with a tail of twelve inches. This animal is remarkably agile, keeping its long bushy tail erect as it runs about, and uttering a chirp like a rat. One that was kept on board ship for six months soon became tame, and preferred raw eggs for food. Its method of breaking them was amusing: it would roll one toward a projecting timber, then lying down on its side, it grasped the egg with all its feet and threw it with a sudden jerk, repeating the process till the contents were obtained.

THE ICHNEUMONS.

Under the popular name of Ichneumon, numerous genera are embraced. The word Ichneumon is Greek, and signifies the "tracker," from the fact that the best representatives of the group display remarkable patience and skill in tracking their prey to its hiding-place.

GENUS HERPESTES.

This is a well-defined genus containing *twenty-two* species, of which we need mention only two or three. In this genus the pouch is voluminous, and single instead of double.

The GARANGANG, *Herpestes Javanicus*, abounds in the teak forests of Java; it attacks and kills serpents with great boldness; and it is said by the natives that, when the snake has coiled itself round the Garangang, the latter inflates its body to a considerable extent, and when the reptile is about to bite contracts again, slips from between the folds and seizes the snake by the neck. It burrows in the ground, and is expert in pursuing rats. It is easily tamed and becomes very docile, following its master like a dog.

THE MUNGUS.

The MUNGUS or MANGOUSTE, *Herpestes griseus*, is a native of the East Indies; it measures about a foot, and its tail is about the same length; but it is difficult to ascertain its exact size, as it can contract or elongate its body several inches.

Its color is a dirty-gray; the circumference of the eye, the ear, and the muzzle are naked and violaceous; the tail is the same color as the body, very thick at the root, and terminating in a yellowish point, and the hairs bristle up like the cat's when the animal is irritated.

The NYULA, *Herpestes Nyula*, has its fur marked in a singularly beautiful manner, the pattern resembling fine basket-work; on the back the pattern is tolerably large, but it becomes smaller on the head, and on the nose is microscopically fine, although as perfect and uniform as on the body. The paws are dark.

The MELONCILLO, *Herpestes Widdringtonii*, deserves notice as the only European Ichneumon. It was long known to Spanish sportsmen, who hunted it for the hairs of its tail, which were used to form paint-brushes. It is probable that it occurs also in Africa.

It lives in river bottoms, chiefly in the provinces of Estremadura and Andalusia, where the Esparto grass abounds. It measures, including a tail of twenty inches, about three feet and a half. The fur is short on the body, the lower surface being almost bare, but becomes longer on the spine and tail; a dark-gray is the prevailing color, but the tip of the tail is black.

The Mungus proper is a cleanly, lively, good-tempered creature, and keeps the house of its owner free from rats and mice, and such creatures, as well as from those horrible nuisances in all tropical countries—snakes and scorpions. It is from its combats with the latter that it obtains its fame. The name it bears has been given it because, according to native

reports, when it is bitten by a poisonous serpent, it digs up a very bitter root named the Mungo-root, which it eats, and then with renewed vigor resumes its combat with its foe. European observers who have watched the animal when it leaves the field of battle, say it eats either grass or any other herb in the neighborhood. An eye-witness writes: "The snake—a Spectacled Snake—was a yard and a half long; the Mungus attacked it immediately, and a terrible struggle ensued. At the end of five minutes the snake struck the Mungus with its poison-fang. The animal fell, lay for some time like a dead thing, and foamed at the mouth; then suddenly rose and rushed into the jungle. In twenty minutes it returned and renewed the attack with greater spirit than ever, and killed the snake within six minutes."

In 1871 the governor of one of the West India Islands consulted the Zoological Society of London how to get rid of the terrible Lance-snakes. Mr. Sclater recommended the Mungus, and sent two living ones to Santa Lucia. On their arrival Governor Des Vœux resolved to try their powers. A snake was brought in in a glass bottle; the Mungus at once displayed great animation, and tried to open the glass bottle by pulling out the rags which served as a stopper. He succeeded; the snake came out, the Mungus sprang at it, the snake drew back quickly, then struck like lightning, and the Mungus leaped into the air screaming. But it at once rushed afresh to the attack, and after a few minutes dragged the serpent to its cage, where it devoured its captive at leisure. After the lapse of an hour nothing but the tip of the reptile's tail was left, and the Mungus was as well as ever. He suffered no inconvenience from the poison.

The ICHNEUMON, *Herpestes Ichneumon* (Plate XII), has been famous for ages. Herodotus relates that the Ichneumons were embalmed and entombed in the shrines of every city of old Egypt. Strabo affirms that it never attacks its foes—the serpents—without calling its companions to its aid. Ælian maintains that, before going into the battle, it rolls itself in the mud, and then dries this coating in the sun till it can resist the serpent's fangs. Pliny asserts that the crocodile sleeps with its ponderous jaws wide open, and that the Ichneumon seizes this opportunity to jump into its mouth, eat its way to the heart, and then out of the monster's belly. The Roman writer adds that the Ichneumon creeps about till it finds the hidden eggs of the crocodile and eats them all, thus deserving the gratitude of mankind. All these pretty stories unfortunately are devoid all foundation in fact.

The Ichneumon, when fully grown, is as large or larger than our domestic cat, but seems smaller owing to its short legs. The body is slender, but by no means so graceful as that of the Genet; the feet have naked soles, and are partially webbed. The long tail appears, in consequence of its long hair, to be very thick at the root. The eyes are prominent, the ears short, broad and rounded. The fur consists of a thick, woolly, russet-colored felt, covered with long hair marked with black and yellowish rings, and having a dull yellow tip.

The Ichneumon, or Pharaoh's Rat, extends over all North Africa and Northwestern Asia, and is always found near the habitations of man, frequenting the reedy banks of rivers or the hedges which surround the fields; through these reed-beds it forms narrow roads which lead to its nest, where the female brings forth her young. Brehm describes the Ichneumon as strictly diurnal in its habits, and as timid and suspicious, possessing the evil odor and bloodthirstiness of the marten. It eats everything—snakes, worms, lizards, mice, reed-birds; its plunder of the nests of hens and pigeons renders it hateful to the fellaheen. At present it does not come into contact with crocodiles, the latter being nearly exterminated in Lower Egypt. Its mode of progression is very serpent-like: it seems to glide over the ground without using its legs. In the summer, when the young ones have been born, the whole family may be seen together, following each other in Indian file so closely that they seem to be one snake-like creature. The sense of smell is highly developed, and is the means by which the Ichneumon tracks his prey.

The Ichneumon was, in the land of the Pharaohs, an emblem of the Deity as the destroyer of evil; in the Egypt of Turkish Pachas and Greek traders it is considered a charitable action to kill it. When a report spreads that some traveler is going to kill a Nims, as the Arabs call the beast, young and old rejoice; the peasant drops his hoe, the weaver quits his loom, the waterwheels stop, and all the population flock to witness the destruction of the murderous little thief.

The sportsman must use a strong charge of powder and fire at a short range if he wishes to kill, for the Ichneumon possesses incredible tenacity of life, and will certainly escape if only wounded. The Ichneumon is easily tamed and is as playful as a cat, but it is not of much use to its master.

Like other illusions of our youth, belief in the virtues of the Ichneumon is torn from us by modern philosophers.

GENUS URVA.

The only species of this Eastern genus is the CRAB-EATING MANGOUSTE, *Urva cancrivora*. It seems to occupy a position between the Mangoustes proper and the Gluttons. It is easily distinguished by the narrow stripe of long white hairs that runs from the mouth to the shoulders, and the bushy base of the tail. It was discovered in the swampy jungles of Nepaul, but beyond its passion for crustaceous food nothing is known respecting its habits.

GENUS ARIELA.

The ZEBRA MANGOUSTE, *Ariela tæniata*, is again the only species of the genus. It is one of the smaller members of the family, and does not much exceed a foot and a quarter in length. The fur is rich, of a fawn-gray color; on the head and neck the hairs end in black or brown and white; on the back, in dark and fawn-colored tips; thus producing nine to ten pairs of regular dark and light transverse bands.

The Zebra Mangouste is found in all Eastern Africa, from the Cape of Good Hope to Abyssiniâ. It can be easily tamed, and soon becomes attached to its masters. It is said to attract some small birds within its reach by imitating their cries.

Brehm describes two Mangoustes which he had in his possession: "As soon as I let them out of the cage they rambled through the whole house, and in a few minutes had explored it all. They first visited the milk-bowl, lifting the lid up with their snout: they then collected all the bones they could find, preferring marrow-bones; they extracted the marrow as far as possible with their claws, but when they could reach no further they took the bone in their fore-paws, stood up on their hind-legs, and threw it between their hind-legs against the wall with violence sufficient to dislodge the marrow."

GENUS CYNICTIS.

This genus, comprising *three* species, is closely allied to the Ichneumon, but differs in the formation of the feet—the animals comprehended

in it possessing five toes on the front and four on the hinder legs, and the soles of the feet are partly covered with hair. The body is slender, the ear short and round, the hair long on the sides of the tail.

The MEERKAT, *Cynictis Levaillantii*, attains a length of two feet and a half; its fur is smooth, its tail bushy; its color is reddish, whence it is called sometimes the Ruddy Ichneumon; the tail is sprinkled with silver-gray and has a white tip; long black hairs project over the eyes and on the lips.

It is found from the Cape of Good Hope northward in the lowlands and plains of South Africa, living on mice, birds, and insects; it is savage, cunning, and agile.

Its specific title has been given it in compliment to the well-known African traveler Le Vaillant.

The following genera belong to Gray's third sub-family, the Rhinogalidæ:

GENUS SURICATA.

This remarkable genus resembles the *Herpestes* in the color and markings of its fur, but it is distinguished from them and all the Carnivora hitherto mentioned by possessing only four toes on each foot, and these are covered with a fine skin like the human hand. The odoriferous glands are not developed into a pouch with separate external apertures. Only *one* species is known.

The ZENICK, *Suricata zenick* (Plate XII), is of a dull-brown color, crossed transversely by slight bands; the tail is brown, and the length of the body from the tail to the muzzle is about a foot. It moves quickly with the body arched, not low like the Mangoustes; it is plantigrade, and can stand up on its hind-legs and carry food to its mouth with its fore-paws. The Zenick is easily tamed, and acquires a cat-like affection for the house it inhabits. It is a native of Africa.

The Zenicks are less carnivorous than the rest of the Viverridæ, and seem to form an intervening link between the Mangoustes and the family of the Mustelidæ or Martens.

A specimen lived for some time in the Jardin des Plantes at Paris, but nothing is known of the animal's habits in its wild state.

GENUS CROSSARCHUS.

The animals of this genus have the teeth, the muzzle, the pouch, the gait of the Zenicks, but the toes and other organs of the Mangouste. Only *one* species is known.

The MANGUE, *Crossarchus obscurus*, is a native of Sierra Leone. The body is compact, the head round with a pointed muzzle, the tail of medium length, the legs moderately long, all the feet have five toes, the ears are small, the eye has a round pupil with a third undeveloped lid, the tongue is long. The color of the animal is a ruddy-brown, which in certain lights presents a yellowish tinge, owing to the alternate rings of white and brown with which each hair is marked.

GENUS MUNGOS.

This African Genus contains *three* species, of which we need mention only the most typical.

The BANDED MUNGOS, *Mungos fasciatus*, is a small animal not much larger than a water-rat. The color is a blackish-grizzle with a chestnut tinge on the hind-quarters and a row of darker lines across the back. It is very lively in its movements, and utters continuously a curious sound like a frog's croak; when excited it spits like a cat and bites furiously at its companions. The fore-paws are armed with long claws, and it is an admirable climber.



CHAPTER VIII.

THE AARD-WOLF AND THE HYÆNAS.

THE FAMILY PROTELIDÆ—THE AARD-WOLF—THE FAMILY HYÆNIDÆ—FABLES AND SUPERSTITIONS ABOUT THE HYÆNA—THE STRIPED HYÆNA—TWO TAME ONES—THE BROWN HYÆNA—THE SPOTTED HYÆNA OR TIGER-WOLF—RAPACITY OF THIS SPECIES—ITS HORRID LAUGHTER.

THE family PROTELIDÆ is limited to *one* genus and *one* species, which is found only in South Africa.

The AARD-WOLF, *Proteles cristatus* (Plate XIII), is a highly modified form of the hyæna, and seems to form a link between that family and the civet-cats. Some naturalists, indeed, have called it the Civet-hyæna, but it is usually known by the appellation bestowed upon it by the Dutch colonists of the Cape of Good Hope. It is much smaller than the hyænas, and larger than the civets; in appearance it bears a striking resemblance to the striped-hyæna, possessing the same powerful and well developed fore-quarters with the low sloping hind-quarters, and coarse rough fur; the tail is very large in proportion to the animal's body, and covered with thick bushy hair which is black at the tip of the tail; like the hyæna it has a thick bristling mane on the back of the neck and shoulders, and it can erect this hirsute appendage when excited. Its ears, however, are larger than those of the hyæna, and its fore-feet are armed with powerful claws, the thumb being, as in dogs, very slightly developed. The Aard-wolf attains the length of about three feet and a half, including the tail, which measures about one foot. The fur consists of a soft woolly coating, through which the stiff rough hairs grow, and it is marked with black vertical stripes on a dull yellow ground; the head is chiefly black, the mane is black and yellow mixed.

The Aard-wolf is nocturnal in its habits, and passes the day in a burrow which it digs skillfully with its powerful claws. From this practice of burrowing it derives its Dutch name, which means Earth-wolf.

These burrows differ from those of the fox and other animals, in being the habitations of several individuals. Several deep tunnels are dug which converge to one small chamber where three or four Aard-wolves take up their residence. Verreaux, the companion of Lalande, who first described the animal, drove some from their abode; he remarked that one in place of running away began to burrow in a new spot with remarkable dexterity. The same observer states that the favorite food of the Aard-wolf consists of lambs, but that at times it kills a sheep, of which, however, it devours only the tail; carrion seems to form its staple article of diet; it sometimes makes a meal of the white ants.

It is probable that the Aard-wolf is more widely distributed than is commonly assumed. A traveler in Nubia reports that he found there a civet-hyæna, which had been killed by some natives, and which seemed to resemble perfectly the Aard-wolf of the Cape.

THE HYÆNAS.

The HYÆNIDÆ constitute another small family of *one* genus and *three* species, of which one only is found out of Africa.

The Hyæna is one of the animals which the showmen of menageries love to dilate upon; blood-thirstiness, rapacity and cunning are the least crimes laid to its charge; it is accused of beguiling travelers by imitating the laughter of human revellers, and then falling upon them and devouring them; and represented as digging human corpses out of their graves to gratify its loathsome hunger. Some ancient authors give the hyæna three rows of teeth like the shark (*des Mccres Hyæne*), and prickly darts at the end of its tail; some affirm that its eyes become stone after death. The Arabs regard the animal as a disguised magician who, by day, assumes a human form, but, by night, appears as the hyæna, and they warn travelers from shooting them. "These bewitched men," said an Arab, "who are cursed by God, the most High, can, by the mere glance of their evil eye, stop the blood in the veins of the righteous and make his heart cease to beat. Our Lord, Kurshid Pacha—may God be gracious to him!—burned several villages in which these magicians dwelt, but he died suddenly—the glance of the evil eye slew him. Listen to their cries! are those the cries of a beast? Assuredly not; they are the lamentations of a human being, or rather this voice is the laughter of the devil. I knew a young

man who killed a hyæna—next morning he had become a girl; I knew another whose leg withered after he had slain one of these magicians. Refrain, O my brother," he continued, addressing the traveler; "point not thy musket at what thou deemest a beast; for it is a son of the accursed one."

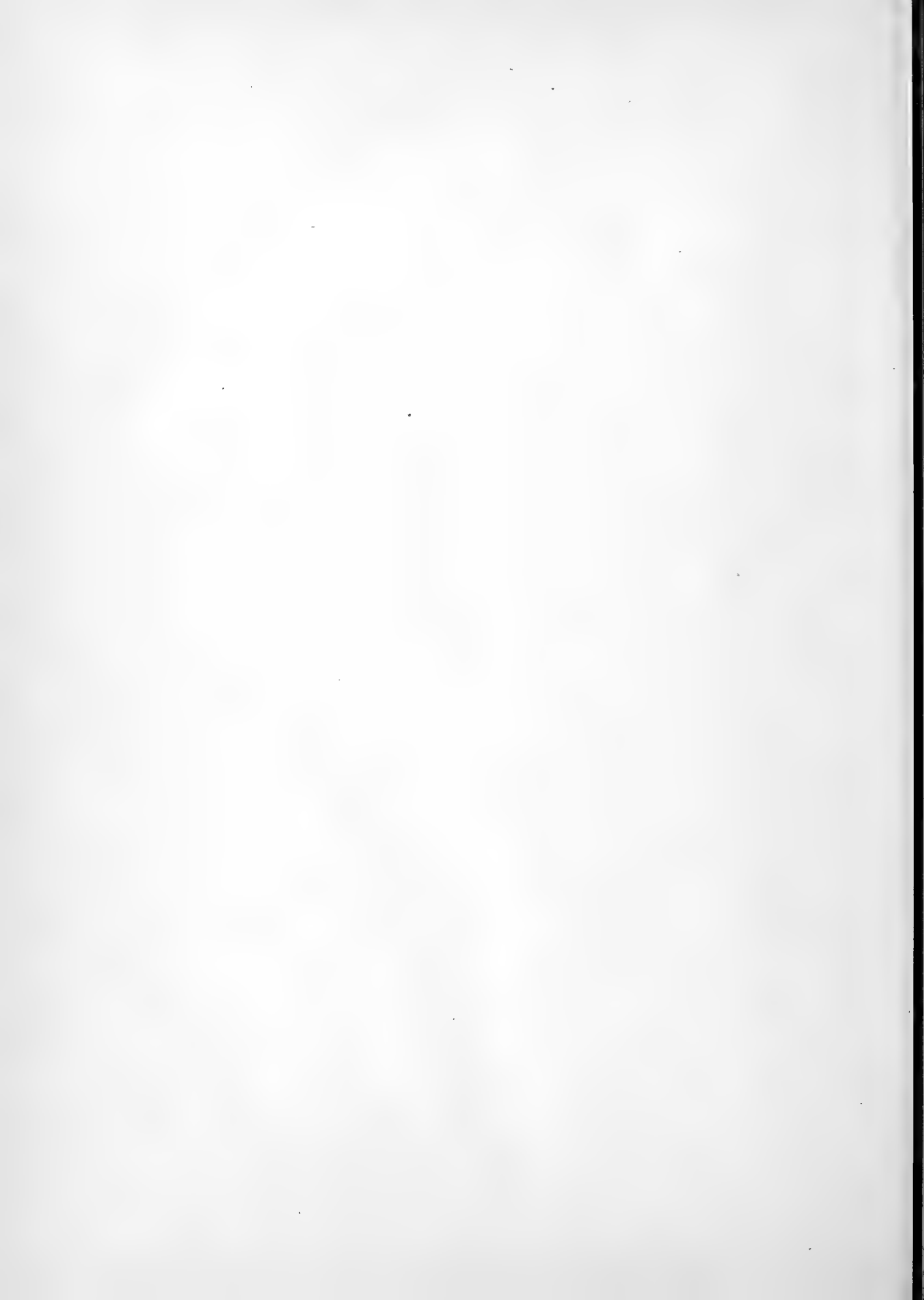
The appearance of the hyænas justifies the dislike of mankind; they resemble dogs, and yet are repulsively dissimilar. The fore-legs which are used for digging are powerful, the hind-legs short; the disproportion between the limbs gives them a shambling, slouching gait, and the sloping line of the back has a sneaking, cowardly look. The teeth and jaws are remarkably strong, and crash through the thigh bones of an ox with savage force; the muzzle is short, the tongue rough like a tiger's; the feet have four claws.

The hyæna is nocturnal, and usually avoids populous neighborhoods. It is in darkness and solitude that the traveler hears the peculiar cry of the prowling troop that makes night hideous till the dawn is breaking. A piece of stinking carrion attracts them in numbers, but they seldom attack powerful animals; and never unless the latter take to flight. Thus they often destroy healthy cattle that can run away, but are afraid to touch the sickly or maimed ones which are forced to stand at bay. Schweinfurth the African traveler, however, says that in the country of the Njam-njams they pursue and run down the antelope as wolves run down their prey. But this must be quite an exception. The voracity of the hyæna is frightful to witness, and the noise made by a pack over their favorite carrion, scarcely to be described. The screams, the growls, the piercing shrieks of laughter easily suggest to the natives that hell has broken loose. They are useful as scavengers by removing decaying animal matter, especially in the interior of Africa where the corpses are simply flung outside the villages. Further to the South in the Hottentot country, they dig up the remains of the dead which are interred in shallow graves. They everywhere follow the caravans that cross the deserts, as they know some victim will fall into their clutches.

THE STRIPED HYÆNA.

The STRIPED HYÆNA, *Hyæna striata* (Plate XIII), is distinguished by its peculiar stripes. The general color is grayish-brown with blackish stripes running along the ribs; a large black patch covers the front of







AARD WOLF

BROWN HYENA

SPOTTED HYENA

STRIPED HYENA

PLATE XIII. CARNIVORA.



the throat, and black hairs are sprinkled abundantly over the whole fur; the mane on the crest and shoulders has hairs with black tips. The length of this species is about three feet and a quarter, in the body.

The Striped Hyæna extends from Sierra Leone in Africa as far east as the Altai Mountains in Asia. It is the least injurious of its kind, and the abundance of carrion and bones it finds everywhere, saves it from being driven to attack living things. Its cowardice is incredible, although they will prowl close to a village or camp. It can be easily tamed. Brehm had a pair which behaved just like dogs—leaping up and gamboling around him. During the sail down the Nile they were fed every third day, but on one occasion had to fast eight days. Some of the wild Eastern dogs were shot for them. When the carcasses were brought, the hyænas laughed aloud and rushed like mad creatures on the food. A few bites tore away the covering on the breast, and then they plunged their black muzzles into the entrails till their heads were all besmeared and clotted with gore.

The hyæna always eats rapidly and in large mouthfuls, and has been seen to swallow a bone nine inches long; a wise instinct; food thus swallowed takes a longer time to digest, and hence hunger recurs less soon. It lives in holes or in clefts of the rock; its smell is so offensive that no other animal will come near its carcass, and dogs, when they come across the trail of a living one, exhibit every mark of fear and keep as close as they conveniently can to their master's heels.

THE BROWN HYÆNA.

The BROWN HYÆNA, *Hyæna brunnea* (Plate XIII), is distinguished from the other species by a long, rough mane hanging down on both sides. The color is uniformly dark-brown, with a few white lights on the legs; the hair of the mane has a whitish-gray ground, the rest being blackish-brown. It is about the size of the Striped Hyæna.

The Brown Hyæna inhabits the South of Africa, usually in the vicinity of the sea. It is less common than the striped species, but resembles the latter in its habits; it feeds chiefly on carrion cast up by the waves, and hence is sometimes called the Strand Wolf. It does not possess the horrible laughter-like cry of its congeners.

Some specimens have been seen in which the brown fur has a warm chestnut tinge.

THE SPOTTED HYÆNA.

The SPOTTED HYÆNA, *Hyæna crocuta* (Plate XIII), is the largest of the tribe, and is distinguished by its powerful frame and spotted fur. The latter consists of a whitish-gray ground, inclining more or less to fawn-color, with brown spots on the sides and limbs. The head is brown, the cheeks reddish, the tail ringed with brown, and tipped with black. Some trifling varieties of these colors are found, some specimens being lighter, some darker. The animal attains a length of over four feet, and stands nearly three feet high.

The Spotted Hyæna inhabits Southern and Eastern Africa, from the Cape of Good Hope to the 17th degree North Latitude. It is common in the Soudan and Abyssinia, and when it is found in large numbers it drives away the Striped Hyæna. Its size and strength render it much more an object of dread than the latter, and many observers agree in stating that it will attack men, especially if they are asleep or weary, and that, when hunger conquers its native cowardice, it will enter villages even in the daytime, and carry off children or the sheep returning from the pasture to the folds or enclosures.

The title Tiger Wolf was given it by the farmers of the Cape of Good Hope, where it is very common, and where every farm-house has a trap set for this prowling marauder. One method of killing it is to fix a loaded musket on a couple of posts about thirty inches from the ground. A string is then carried from the trigger through a ring at the butt, and then forward to the muzzle, where it is attached to a piece of meat. The hyæna scents the meat, seizes it between his teeth, and thus draws the trigger and lodges the bullet in his brain. The natives regard it with dread, and justly. Strodtmann relates that in a few months he heard of forty deaths of children caused by the Tiger Wolf; these hungry hyænas enter the kraals of the Kaffirs, venture even near the blazing fire where the family is sleeping, and carry off a child from under its mother's cloak before they can be intercepted.

It is this species which is the subject of the fables we have already mentioned, and which deserves to be called "The Laughing Hyæna." Of all the Carnivora it is the most repulsive and voracious: it is stupid, malicious, and only capable of being tamed to a certain degree by the whip. In captivity it lies for hours like a log, then leaps up, rubs itself

against the bars, and utters its horrid peals of laughter, which seem to be an expression of a pleasurable sensation. It accompanies this maniacal, mirthless, hysterical laugh with most absurd gestures—dancing about in a state of frantic excitement, running backward and forward, spinning round on its hind-legs, and nodding its head to the ground.

This Hyæna usually lives in holes, or amongst rocks in retired localities, and when the sun has set he comes forth and searches for food. He then utters a long melancholy howl, which finishes with a sort of bark, and occasionally that fiend-like laugh which, when heard in the desert, amid scenes of the wildest description, calls up in the imagination of the solitary traveler the forms of some spectral ghouls searching for their unnatural feast.

One of these animals was discovered in a state of sad laceration. The two fore-paws were gone, and the legs themselves had been frightfully torn, evidently by some powerful beast of prey. The natives said that it had been thus punished by the lion for interfering with his arrangements, and stated, moreover, that the lion frequently corrected the forward conduct of the Hyæna by biting off every one of its paws. This statement, curious as it may seem, was corroborated by several experienced hunters.

It has already been mentioned that the Hyæna is in no wise fastidious in its diet, and that it will habitually consume the most indigestible of substances. Yet there seems to be something capricious about the function of assimilating food, which is subject to remarkable fluctuations. To one of these animals, after a fast of thirty-six hours, a dead rat was given, which, as might be expected, it immediately swallowed. In fifteen minutes the creature rejected the skin and bones of the rat, though the same animal would have eaten with impunity the heavy bones or tough hide of a veteran ox, or even would have made a satisfactory meal on a few yards of leathern strap.

But enough respecting these repulsive creatures—these hideous caricatures of the nobler *Canidæ*.



CHAPTER IX.

THE WOLVES.

GENERAL DESCRIPTION OF THE GENUS CANIS—THE COMMON EUROPEAN WOLF—THE JACKAL WOLF—THE KABEROO—THE STRIPED WOLF—THE AMERICAN WOLVES—THE GRAY WOLF—THE COYOTE—THE RED WOLF—THE SOUTH AMERICAN WOLVES—THE CRAB-EATING WOLF—THE AGUARACHAY.

THE family of the CANIDÆ, comprising the animals commonly known as dogs, wolves, and foxes, has an almost universal range over the earth, being only absent from the island sub-regions of Madagascar, the Antilles, Austro-Malaya, New Zealand, and the islands of the Pacific. With the exception of the HYÆNA DOG and the GREAT-EARED FOX, all the species are usually placed in the genus CANIS. The family is pretty clearly defined, but in its structure does not differ from the Felidæ so widely as is commonly supposed. As a whole, the animals embraced in it do not attain the size of the large species of the cat family, and are far inferior to the latter in cruelty and love of slaughter. They are nearly equal to them in agility; their blunt claws, indeed, do not permit them to climb, nor can they perform the enormous leaps which the cats execute; but they are excellent runners, and their wonderful perseverance far exceeds anything of the kind displayed by the Felidæ. They are all swimmers, and some of them are masters in the art, and love to be in water. Their senses are all highly developed, that of smell in particular attaining a wonderful degree of acuteness.

All the species of the CANIDÆ exhibit great intelligence; the lower ones betray remarkable cunning and slyness, sometimes at the sacrifice of courage; but the higher varieties, especially those which have been long associated with mankind, prove that their faculties have been cultivated to an extent which no other animal has reached. The tame dog and the untamed fox act with reason and deliberation, and execute carefully-prepared plans, the result of which they have foreseen. The

very wildest species exhibit this quality of foresight, and act with circumspection; only the most violent pangs of hunger ever changes this characteristic.

Their food usually consists of mammals and birds, but all the species have a preference for carrion; nor do any members of the family refuse to make a meal of reptiles, fish, or molluscs. In addition they will eat honey, fruit, roots, buds, grass, and moss. The females usually bring forth four to nine at a birth, and are always most devoted mothers.

The family is divided into *three* genera and *fifty-four* species.

I.—GENUS CANIS.

This genus contains *fifty-two* species; and the one with which we shall begin our account is that which plays so important a part in our nursery tales and in the mythology of many nations, the Wolf.

THE WOLF.

The Greek and Roman writers speak of the wolf with a kind of superstitious awe, on account of the supernatural qualities they attributed to it. In Greece the wolf was especially connected with the worship of Apollo, and near the great altar at Delphi, the chief seat of the worship of that divinity, there stood an iron wolf. In Rome the wolf was regarded as the nurse of the founders of the city; and the brazen she-wolf, with Romulus and Remus sucking her, is still one of the ornaments of Rome. In the mythology of our ancestors the wolf occupies a distinguished place as the favorite animal of Woden. Two wolves sit before his feet, and when the end of all things is at hand, one of them shall devour the sun, the other the moon. Then comes the "Twilight of the Gods." The wolf Fenris breaks loose; his lower jaw reaches to the earth, the upper one to heaven; he swallows up Woden himself, and fire and flame spread over the earth and the whole universe is consumed. Christianity modified these stories. Woden and his wolves became the Wild Huntsman and his dogs; and the wolf became, in popular superstition, one of the forms assumed by magicians and witches, or imposed by them on their victims. Gervase of Tilbury writes: "We have often seen in England men changed at the full moon into wolves, which kind of men

the English call werewolves." In the great beast-epic of the Middle Ages, "Reynard the Fox," the wolf appears as Isengrim; and the wolf in "Little Red Riding Hood" is still a terror to countless children.

The WOLF, *Canis lupus*, as it is found in Europe, may be taken as a type of the group. It possesses the form of a large, long-legged, thin dog, and carries its tail drooping; the head is thick, the muzzle pointed, the eyes oblique, the ears always erect. The fur varies according to climate, both in thickness and color: in northern countries it is long, rough, and dense, bushy on the tail, erect on the neck; in southern regions it becomes shorter and rougher. The color is usually gray, with a tinge of fawn color, but mixed with a great deal of black. This color becomes somewhat reddish in summer; in winter more yellowish. In the north, the lighter tints are predominant; in the south, the darker. Wolves that live in mountainous districts are generally large and strong; those that live in plains are smaller and weaker, but equally rapacious and audacious.

The wolf is still widely diffused in Europe, with the exception of the British Isles and Northern Germany. In England it was extirpated, according to some accounts, by the Saxon king Edgar, and in Scotland during the seventeenth century, while in the Prussian provinces it is now rare. In Russia, Southern Austria, Hungary, and the Slavonic principalities, as well as in the three Scandinavian kingdoms, it still ravages to a terrible extent. In France, regular wolf-hunts are legally ordered to take place every three months. The prefect of the department issues directions to the mayors of each commune, who name the inhabitants who are to take part in them; a fine of sixteen to one hundred francs is imposed on all who shirk this duty, and a bounty is paid of six francs for a whelp, twelve for a male wolf, fifteen for a female wolf not in young, and fifty for a female if pregnant. M. d'Houdetot gives the number of wolves annually destroyed in France as twelve hundred. Under the old regime an office of *Grand Louvetier* or Grand Wolf-hunter existed, while each province had a subordinate *louvetier*, who levied a tax on each inhabitant residing within a radius of two miles of the place in which a wolf was killed.

In spring and summer the wolf is found alone or in pairs; in autumn he appears with his young family; in winter he unites with his neighbors into packs. The members of these packs work in company, range the country in every direction, and become a terrible scourge.

In those plains of Siberia that are infested by wolves a sledge journey is far from agreeable, for frequently a band of these ferocious brutes persistently follows travelers. If the sledge stops for *only* a second, the men and horses are lost; safety exists only in flight. The struggle on such occasions is fearful. The horses, mad with terror, seem to have wings. The wolves follow on their track, their eyes flashing with fire. It is a terrible situation to be placed in, to behold these black spectres tearing across the surface of the white shroud of snow, thirsting for your blood. From time to time a report is heard; a wolf falls. More audacious than the others, the victim had tried to climb the sledge, and one of the travelers has shot it. This incident gives some advantage to the fugitives; for the carnivorous troop halt for a few seconds to devour the body of their companion. But the end is nigh: the village or castle appears against the gray sky, and the wolves are deprived of their anticipated prey. At other times the adventure terminates in a tragical manner: after a pursuit of some hours, the team, exhausted and incapable of progressing farther, is overtaken; the sledge is surrounded and carried by assault; the rest may be imagined!

Certain wolves—fortunately they are rare—show a marked preference for human flesh. Such was the notorious animal which desolated Gévaudan, in the second half of the eighteenth century, and whose evil reputation yet survives. This animal was of enormous size (measuring about six feet from the point of the nose to the tip of the tail), and for several years defied all efforts made for its destruction. In India, where wolves are classed among sacred animals, they levy tribute on mankind, carrying off every year numbers of children.

Bold as the wolf usually is, it is exceedingly suspicious; a stick and a piece of rag will keep it at a distance from the carcass of a deer, and a piece of rope trailed from a carriage is always an object of much fear.

All methods are justifiable for the destruction of the wolf: snares, traps, even poison. It is said that a trapped wolf will permit itself to be handled without attempting to resist, and will even lie passively by the hunter's side till he resets his trap. The bite of the wolf is peculiar; it is a short, fierce snap delivered with such energy that when it misses its mark the jaws clash like a closing steel trap.

The wolf can be tamed; Cuvier relates the history of a wolf that lived in the menagerie of the Jardin des Plantes, Paris, which, after being reared by a person who had to leave to proceed abroad, displayed more pas-

sionate affection for its master than the most devoted dog could have shown. And this is not a single isolated example, for they have been trained to hunt like dogs.

THE STRIPED WOLF.

The STRIPED WOLF, *Canis adustus*, is a link between the wolf and the jackal; the body is long, the head is fox-like, the eyes are placed obliquely and have rather elongated pupils; the ears are wide apart; the legs remarkably long and slender; the tail touches the ground. The color is a brownish-gray; a dark stripe runs from the mouth to the ear, a black band crosses the breast, a fawn-colored stripe with a black border traverses the sides longitudinally, the tail is fawn-colored at the root, black in the centre, but pure white at the tip.

The Striped Wolf extends from the Cape of Good Hope to Zanzibar on the East, and the Gaboons on the West Coast of Africa. It is probably the Mboyo of Du Chaillu.

THE KABEROO.

The KABEROO, *Canis simensis*, is a native of Abyssinia, very slender and very like a greyhound. But it is neither a domestic dog gone wild, nor a variety of jackal, but a real species of wolf. The Kaberoo is widely dispersed in the interior of Africa, where it does enormous damage to the shepherds. The natives of Cordofan call it the dog of the wilderness, and regard it as more destructive than the hyæna dog itself.

THE JACKAL WOLF.

The JACKAL WOLF, *Canis lupaster*, is found in the whole North, North-east, and North-west of Africa. It is smaller than the common wolf, which it resembles more closely than it does the jackal. It usually confines itself to a limited range of country, in which it chases hares, mice, wild-fowl and the like, as well as devours fruit of all sorts; during the rainy season it forms considerable packs, and attacks herds of sheep and goats. In the plains of Central Africa it is hunted by greyhounds which, in spite of the wolf's energetic defence, pull it down, or keep it at bay till the huntsman has the courage to come up and give the marauder the finishing stroke with his spear.

THE AMERICAN WOLF.

The GRAY WOLF, *Canis occidentalis* (Plate XVII), is covered with long and fine fur; its form is more robust than the European, its muzzle thicker and more obtuse, its head larger and rounder, its forehead more arched, its ears shorter and wider. In the European Wolf the fur is coarser, with less of soft wool under the long hair, and its tail is more thinly clothed with fur.

The body of the Gray American Wolf is long and gaunt, muzzle elongated, head thick, nose long, ears erect and conical, the eyes oblique, the pupil circular, the tail straight and bushy.

In Gray's classification it represents the genus *Urocyon*.

The LOBO, *Canis occidentalis*, var. *gigas*, is regarded by Audubon as identical with the Common Gray Wolf. He relates that some hunters with a pack of half a dozen fox-hounds struck the trail of a Giant Wolf near Fort Gibson. He dashed boldly into the prairie, making a straight course for the hills on the other side, a distance of three miles. Here he took cover, and when dislodged again took to the plain. In this way he made bold dashes from cover to cover, till at the end of five hours he was brought to bay.

A desperate fight then ensued, dog after dog recoiled more or less injured till, when all the combatants were exhausted, and the hunters could at last distinguish in the crowd which was dog and which was wolf, the latter was knocked on the head with a heavy club.

Col. McCall says the striking marks of distinction in this variety are the size and breadth of the head, and the smallness of the tail; the former forms nearly an equilateral triangle, the latter is short and scant of hair.

The BLACK WOLF, *Canis occidentalis*, var. *ater* (Plate XVII), is found chiefly in Florida at present; but Audubon saw it in considerable numbers during his residence in Kentucky. At one time he was with a planter who had taken three wolves in a pit, and was astonished to see his friend coolly jump down and hamstring the beasts, which were then dragged out and given to the dogs. On another occasion he saw a beautiful black wolf following its owner, who assured the naturalist that no dog could trail deer better. He tells, however, a story of an attack by black wolves on negroes. Both fought bravely, but soon one of the negroes ceased to move, and the other, despairing of aiding his comrade,

took refuge in a tree. In the morning he found the bones of his friend scattered on the snow, which was stained with his blood.

Audubon considers the dusky wolf and the black wolf the same.

The WHITE WOLF, *Canis occidentalis*, var. *albus* (Plate XVII), used to be exceedingly common on the plains, consorting in large bands with the Coyote, and is large, stout, and compactly built.

This variety of wolf is found as far north in the Arctic regions as they have been traversed by man. A white wolf was killed in Erie county, N. Y., at the beginning of this century, but they do not appear on the Atlantic coast. A very considerable degree of cold seems necessary to produce wolves of the white variety.

Audubon remarks that the wolves in the North are mostly white, in the Middle States and on the Atlantic Coast gray, in the South and Florida, black, in Texas and the Southwest, red. "It is difficult," he adds, "on any principle of science to account for this remarkable peculiarity."

The RED WOLF OF TEXAS, *Canis occidentalis*, var. *rufus* (Plate XVII), in shape resembles the common gray wolf, but is more slender and lighter than the white wolf, with a more cunning fox-like look. The hair on the body is not woolly, but lies smooth and flat. The color is reddish-brown mixed with irregular patches of black, there is a brown stripe on the fore-legs extending from the shoulders to the paws; the end of the tail is black for about three inches.

It is by no means the only variety found in Texas, but it does not inhabit the northern prairies, or even the lower Mississippi bottoms. Its habits are nearly similar to those of the black and the white wolf.

It is said that when visiting the battlefields of Mexico, the wolves preferred the Americans to the Mexicans, and only ate the bodies of the latter from dire necessity, as, owing to the quantity of pepper used by the Mexicans in their food, their flesh is impregnated with that powerful stimulant. No corpse of wounded straggler, or of unfortunate traveler butchered by the Comanches is ever neglected by the prowling wolf.

THE PRAIRIE WOLF.

The PRAIRIE WOLF, *Canis latrans* (Plate XVII), has a full, bushy tail like a wolf, and a sharp muzzle like a fox. The neck is short and powerful, the head thin; the eye is light-brown with a round pupil. The color is a dirty-gray, passing into a blacker tint on the back; the tail is

deep black at the tip. Full-grown, it measures about four feet and a half. This wolf is found on the plains of the West, where it is erroneously called the Coyote.

The Prairie Wolf digs its burrow upon the prairies or some slight elevation, to prevent them from being filled with water. These dens have several entrances, like those of the Red Fox. Their howl resembles so closely the bark of a dog, that they deserve their alias of "Barking Wolves." They display considerable intelligence, and no sooner is the report of a gun heard than they all assemble around the hunter in anticipation of a meal. They are always found on the outskirts of the herds of buffaloes, and pick up a subsistence by assailing the weak or wounded members of the herd. In captivity the animal displays all the qualities of the common dog; it knows its master, wags its tail, and leaps up in joy at his approach; like a dog, it shows a quick understanding of different sounds and words—shrinking when spoken roughly to, and being moved to lamentable howls if addressed in a melancholy tone.

THE COYOTE.

The COYOTE, *Canis ochropus* (Plate XVII), is seldom seen except in Texas and Mexico. It is a miserable little cur of an animal, scarcely larger than a fox, and is sometimes called the "Indian Fox." It has a wolfish head, large eyes, small sharp ears, a long, black, slender muzzle, and a very rough, thick tail.

THE SOUTH AMERICAN WOLVES.

The AGUARACHAY, *Canis Azaræ*, is a real link between the jackal and the fox. This species is found from the Equator to Patagonia, from the Atlantic to the Pacific. It is said to follow the jaguar as the jackal follows the lion, and to devour what the more powerful animal has left. When hunting by itself it shows great cunning, making long circuits till it comes near an unsuspecting victim, and prowling around the farmyards even by day; it causes great damage, not only to the poultry but to the sugar-canes, which it bites off close to the root—the place which, its experience tells it, contains most sugar.

It is, when caught young, easily tamed, learning to know its master and answer to its name, and assisting him in the chase, in which it exhibits great keenness of smell and remarkable perseverance.

THE CRAB-EATING WOLF.

The CRAB-EATING WOLF, *Canis cancrivorus*, or MAIKONG, is a slender, long-legged, jackal-like animal, with a short, broad, blunt-nosed head, rounded ears of moderate size, placed wide apart, oblique eyes with oblong pupils, and a tail nearly touching the ground. It attains the length of two feet in the body, with a tail of nearly one foot. The coat consists of moderately long rough hairs, which cover completely the woolly under-coating; the color is a fawn-gray, darkened on the back and shoulders by black-tipped hairs, and becoming nearly pure white below.

The Spaniards are said to have found this creature domesticated among the natives when they landed on the Antilles; it is no longer found in the islands, but is common in the woody plains that border the rivers of Guiana, where it lives and hunts in large bands.

The Maikong, in its habits and behavior, completely corresponds to the jackal of the Old World, and in captivity soon becomes tame.

The epithet "Crab-eating" is as old as Buffon and Linnæus, but is somewhat misleading, as the animal by no means confines itself to a crustacean diet. Schomburgk describes it as preying on the smaller rodents, and as being a terrible plunderer of the hen-roosts of the settlers. It is often crossed with the dog by the Indians, and the breed thus produced is highly prized.

THE RED WOLF.

The RED or MANED WOLF, *Canis jubatus*, is less powerfully built than the common wolf, and has longer legs, a narrower muzzle, and a shorter tail. Its color is a clear reddish-brown. This wolf is found in most parts of South America, and is particularly frequent in Brazil, Paraguay, and the Argentine Republic. It is very timid and avoids settled districts, and hence is little known. Its long legs give to it the power of making very long leaps, by which it overtakes its prey. When walking it has the swinging gait of a Newfoundland dog, and is a good swimmer.

Gray forms the Red Wolf and Coyote into a separate genus which he calls by the name of *Chrysocyon*.

CHAPTER X.

THE JACKALS AND FOXES.

THE JACKAL—THE LANDJAK—THE COMMON FOX—THE RACCOON DOG—THE CORSAC—THE CAAMA
—THE FENNEC—THE AMERICAN FOXES—THE RED FOX—THE SILVER OR BLACK FOX—THE
CROSS FOX—THE KID FOX—THE GRAY FOX—THE ARCTIC FOX—THE BLUE FOX—THE LARGE-
EARED FOX—THE HUNTING DOG.

BETWEEN the Wolves which we have just described, and the Foxes which we shall soon treat of, stands the Jackal; it differs to such an extent from both, that Gray has placed it in a separate genus, *Dieba*, so called from its Arabic name, *Dieb* "the howler."

THE JACKAL.

The JACKAL, *Canis aureus* (Plate XVII), is known everywhere in Asia, where it is regarded very much as the fox in our fairy tales, and is found also in Greece and Dalmatia. It is rather larger than the fox, and its coat is of a grayish-yellow color, the tail being tipped with black.

The jackals resemble the fox more nearly than they do the wolf. They conceal themselves by day, but roam at night, usually in large packs. To keep together they are constantly howling, and their voice is sad, loud, and unmusical. Their voracity and audacity are unparalleled. They enter habitations, when opportunity presents itself, and sweep off everything eatable they can reach; devouring even boots, horse-harness, and other articles made of leather. In the desert they follow the caravans, prowl all night around the encampment, and endeavor to carry off anything chance may throw in their way. Like the hyænas, they disinter the dead, and the natives of the districts in which they are found are obliged to protect the graves from their outrages by covering them with heavy stones and prickly bushes.

The jackals hunt the antelope, gazelle, and other small animals, and in large packs will attack oxen and horses. They fear man, and the

stories of women and children having been devoured by them are mere fables. Equally fabulous is the notion that assigns to the jackal the duties of being the lion's purveyor; it is rather the lion's parasite, and follows the nobler creature in order to get the remains of his meal. The story that the jackal gave the lion notice of prey, was taken by Aristotle from an Indian fable, and was borrowed from him by later writers.

When taken young the jackal is easily tamed, and becomes more domesticated than the fox, exhibiting most of the characteristics of the dog. Like the dog, it is subject to rabies.

The LANDJAK, *Canis pallipes*, is a species found in Nepal and Northern India, resembling in its habits the common jackal.

The BLACK-BANDED JACKAL, *Canis mesomelas*, is by some writers classed with the foxes. It is an inhabitant of Southern Africa, and is sometimes called the CAPE JACKAL. It is distinguished from the common jackal by the black and white mottlings of its fur.

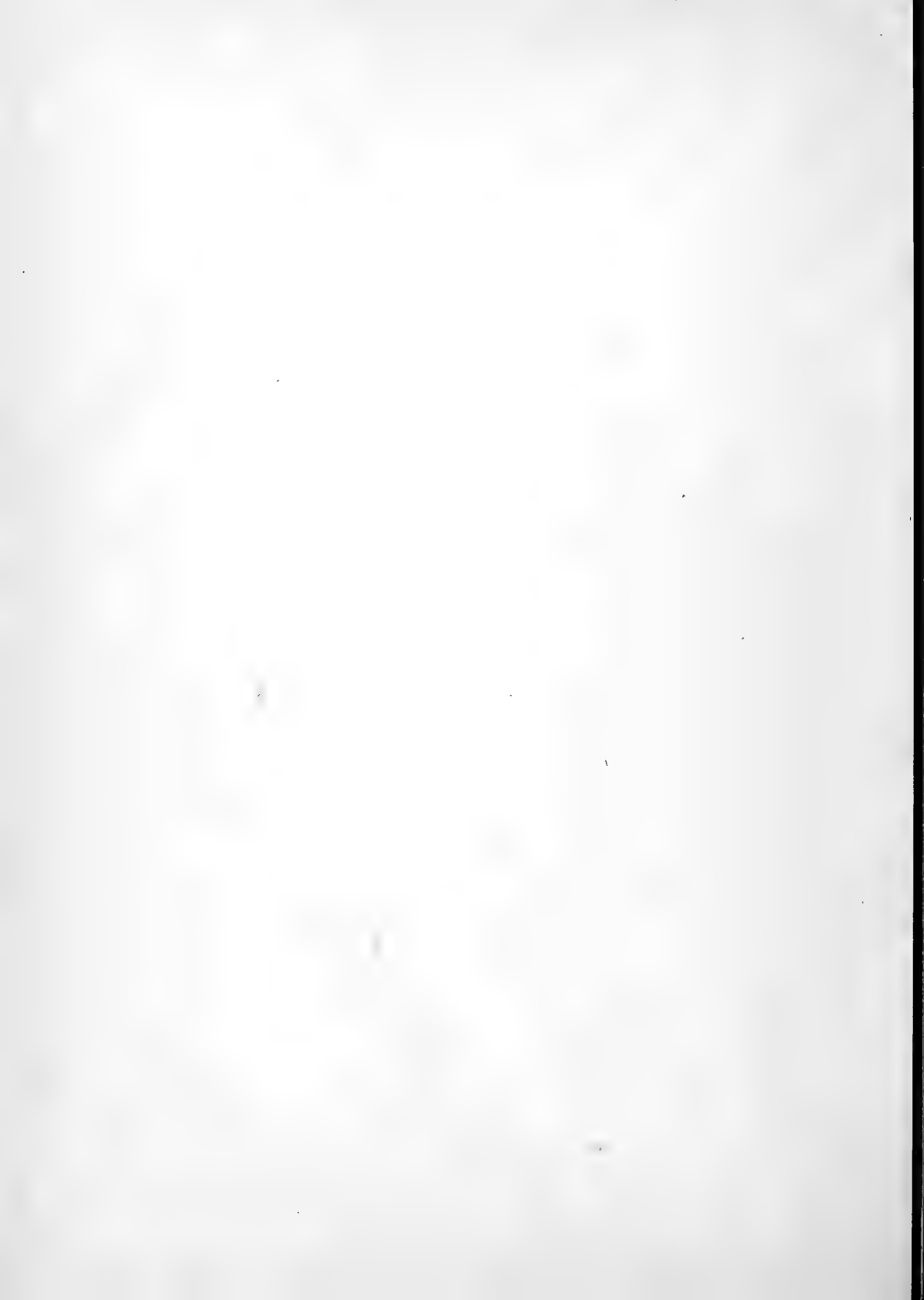
The traveler Burton remarks that among the Somali the morning cry of this jackal is used as an omen of good or evil, according to its direction and its tone. He also mentions that it is in the habit of attacking the peculiar fat-tailed sheep which inhabit that country, and carrying off their lambs. The fat-burdened tail forms an article of diet which seems to be greatly to the jackal's taste, and which he procures by leaping suddenly upon the poor sheep, and then making a fierce bite at its tail. The terrified sheep starts off at best speed, and leaves a large mouthful of its tail between the aggressor's teeth. Kids and other small animals fall victims to this insatiate devourer.

THE FOX.

The foxes are distinguished from the wild dogs, wolves, and jackals by their long bodies, sharp-pointed heads, and by the possession of oblong pupils to their eyes; the tail is very bushy, and most of the species exhale an unpleasant odor.

The COMMON FOX, *Canis vulpes* (Plate XVIII), is found throughout Europe, where it enjoys an immense reputation for cunning, which he displays equally in prosecuting his robberies on the poultry-yard of the farmer and in his endeavors to throw his pursuers on a false track. Like some of the wolves, he will feign death when surprised by the hunters and there is no hope of safety in flight.







GREY WOLF
COYOTE
JACKAL

RED WOLF
PRAIRIE WOLF
BLACK WOLF

PLATE XVII CARNIVORA



The fox is unsocial, and never hunts in packs; he therefore never attacks powerful animals. Birds, hares, or rabbits form his customary diet, but he does not dislike certain fruits; for grapes it exhibits a great fondness.

In the north of the continent of Europe and in England the color of the fox is red; but as we proceed southward we find both gray and black foxes, till in Spain he becomes small and fawn-colored. The fox resides in burrows, which it scoops out of the earth by the aid of its paws, winding its way among the roots of large trees or between heavy stones. Here the vixen, or female fox, produces and nurtures her cubs, which she educates with great care.

In England fox-hunting is the favorite sport of the wealthier classes, and its headquarters are in the county of Leicester. The soil being for the most part good, is highly favorable for scent; there is an immense proportion of grazing land in comparison with arable, and the enclosures are large, the fields running up to one hundred acres each. Large woods are scarce, while natural covers of gorse abound. In addition to these, artificial covers are sometimes made with stakes set a certain height from the ground for the grass to grow over them; but these are far inferior to those of natural brushwood. Usually from twenty to twenty-five couples of hounds are taken out, and it is the custom, quite necessary in these days, for each sportsman to have two horses, the second one being ridden by a groom well acquainted with the country, who rides his horse slowly and carefully, not following the hounds, but seeking to meet his master at some favorable point and give him an opportunity to change horses.

A meet of Fox-hounds is a very pretty sight; the numerous carriages that bring the sportsmen to the field, the magnificent horses that are being walked about till the sport begins, the scarlet coats of the riders, the strong yet graceful forms of the hounds, form a scene almost impossible to describe.

Let us indulge ourselves with a fine morning in the first week of February, and at least two hundred well-mounted men by the cover's side. Time being called—say a quarter past eleven, nearly our great-grandfathers' dinner-hour—the hounds approach the furze-brake, or the gorse, as it is called in that region. A cheer and a wave of the master's cap sends the dogs into the cover. In a very short time the gorse appears shaken in various parts of the cover—apparently from an unknown cause, not a single hound being for some minutes visible. Pres-

ently one or two appear, leaping over some old furze which they cannot push through, and exhibit to the field their glossy skins. Two minutes more elapse; another hound slips out of cover, and takes a short turn outside, with his nose to the ground and his stern lashing his side—thinking, no doubt, he might touch on a drag, should Reynard have been abroad in the night. Hounds have no business to think; a crack of the whipper-in's thong sends the too enthusiastic animal back to its work. Soon the cover shakes more than ever. Every stem appears alive, and it reminds us of a corn-field waving in the wind. In two minutes the sterns of some more hounds are seen "flourishing" above the gorse. In an instant a hound challenges—and another—and another. The fox breaks out; "Tally-ho," cries some countryman, and the chase has commenced. The whole pack, the whole crowd of horsemen is after him. If the hounds are pressed too hard by the riders, they are apt to overrun the scent and come to a fault. It is now the duty of the huntsmen to recall them. At one blast of his horn they are back at the place where the scent failed; it is again taken up, and all that are left of the field are again dashing forward; but the number of men up with the hounds soon diminishes, not only are many of the horses unable to keep up with the speed of the leaders, but many of the riders have not the nerve to face the fences, brooks, or posts and rails which have to be surmounted without a pause.

The pencil of a painter is now wanting; and unless the painter should be a sportsman, even his pencil would be worth little. What a country is before him!—what a panorama does it represent! Not a field of less than forty—some a hundred acres—and no more signs of the plough than in the wilds of Siberia. See the hounds in a body that might be covered by a damask table-cloth—every stern down, and every head up, for there is no need of stooping, the scent lying breast-high. But the crash!—the music!—how to describe these? Reader, there is no crash now, and not much music. It is the tinker that makes great noise over a little work; but at the pace these hounds are going there is no time for babbling. Perchance one hound in five may throw his tongue as he goes, to inform his comrades, as it were, that the villain is before them. The fox shows signs of distress; his coat becomes darker, his pace slower; the dogs run into him, and all is over.

The maintenance of a pack of Fox-hounds is an affair involving considerable expense. The master of one, hunting four days a week, must

spend on his hounds and stable not less than \$20,000 a year. To this must be added the cost of maintaining covers for the foxes, and a stock of game and rabbits for their food, as well as the cost of earth-stopping, an operation which has to be performed on the evening before the chase.

The fox is susceptible of being tamed to a certain extent, but it seems impossible to eradicate entirely its instincts for plunder. Its cunning is no doubt great, but has been very much exaggerated by popular imagination, in which there still linger reminiscences of the astuteness ascribed to him in the great beast-epic of "Reynard the Fox," which had unexampled popularity in the Middle Ages, and which Goethe did not disdain to modernize for our age. The subjoined story evinces the possession of considerable intelligence.

Two foxes, located in a neighborhood where hares abounded, adopted an ingenious stratagem for capturing them. One of them lay in ambush on the side of a road; the other started the quarry and pursued it with ardor, with the object of driving the game into the road guarded by his associate. From time to time, by an occasional bark, the associate in ambush was notified how the chase was succeeding. When a hare was driven into the road, it was immediately pounced on, and both foxes devoured it in thorough good-fellowship. Nevertheless, it sometimes happened that the fox who kept watch miscalculated his spring, and the hare escaped; then, as though puzzled at his want of skill, he resumed his post, jumped on to the road, and several times repeated the movement. His comrade arriving in the middle of this exercise, was not slow to comprehend its meaning, and irritated at being fatigued to no purpose, chastised his clumsy associate; but a tussle of a few minutes sufficed to expend the bad humor, and the *entente cordiale* was quickly re-established.

THE RACoon DOG.

The RACoon DOG, *Canis procyonides*, is very like a weasel in shape, but has no near allies. The long body rests on short, weak legs; the head is short, narrow, and pointed; the tail very short and bushy; the color is dark-brown; the under fur is very thick, but the long hair is as rough as the coat of a badger.

This species is found in Japan and China, and is not rare on the tributaries of the Upper Amoor River. It is shy and timid by day, but by

night will boldly face a dog. It does not run well, nor can it leap like the fox; its voice is a kind of mewing. It is quite omnivorous, eating flesh, fowl, and fish, and vegetables of every kind. Gray places it in a genus *Nyctereutes*.

THE CORSAC.

The CORSAC, *Canis corsac*, is an Asiatic species of fox, considerably less than the ordinary fox, found from Mongolia to the Caspian Sea, exclusively in the steppes, never in woods or hills. It is pursued for the sake of its winter fur, in which a large trade is done with China. The Tartars employ not only dogs to capture the Corsac, but hawks of various kinds, from which winged enemies it has no chance of escaping. The color of the fur in summer is red; in winter more of a fawn-color.

THE CAAMA.

The CAAMA, *Canis caama*, is an inhabitant of Southern Africa, where it is in great request for its fur, which is highly esteemed by the natives for the purpose of making "karosses," or mantles. As the Caama is one of the smallest of the foxes, a great number of skins are needed to form a single mantle, and the manufactured article is therefore held in high value by its possessor. Indeed, so valuable is its fur, that it tempts many of the Bechuana tribes to make its chase the business of their lives, and to expend their whole energies in capturing the animal from whose body the much-prized fur is taken.

THE FENNEC.

The FENNEC, *Canis zerdo* (Plate XVIII), is the most graceful of the foxes. Its face is refined and sly, and embellished by a pair of unusually large eyes, and by large, wide ears. Its legs are very fine, and support a slender, supple body terminating in a bushy tail; everything about it indicates activity, intelligence, and acuteness of sense. Nothing escapes its notice; grasshoppers, lizards, small birds are betrayed by their slightest motions or softest notes. The Fennec is the smallest of all the foxes. It measures, including the tail, about two feet; the head is very pointed; the large eyes have round pupils; the ears are nearly as long as the head. It inhabits the whole north of Africa.

The Fennec burrows in the earth, forming a den with many passages, in which it sleeps by day, rolled up with its head under its tail. At sunset it leaves its home and seeks some spring, where it drinks eagerly before proceeding on its nocturnal chase. Small birds are its favorite food, but it is also very fond of fruit, especially that of the date-palm, which it is said to possess the capability of climbing.

THE AMERICAN FOXES.

The RED FOX, *Canis fulvus*, is very plentiful in the Northern fur countries; it has long, fine fur, and has a much finer brush than the European animal. The coat is of a bright ferruginous color on the head, back, and sides; the throat and neck a dark-gray; the tail is not tipped with white.

In summer it burrows, in winter it shelters under a fallen tree; it preys on the smaller animals of the rat family and is fond of fish, but rejects no animal food it can find. It runs for about a hundred yards with great swiftness, but is easily overtaken by a wolf or a mounted man.

THE SILVER FOX AND THE CROSS FOX.

The SILVER or BLACK FOX, *Canis fulvus*, var. *argentatus* (Plate XVIII), supplies one of the most valuable furs of the world, surpassing in richness and beauty those of the beaver or sea-otter. The outer hair, which is in some places two inches longer than the under fur, is soft, glossy, and fine; the under fur is unusually long and dense, feeling to the hand as soft as sea-island cotton, and the separate hairs exhibit a crimped or wavy appearance. This under-fur is uniformly blackish-brown; the long hairs are brown at the roots, then silver-gray, and then tipped with black; the tail is brownish-black to near the extremity, where it is broadly tipped with white.

The Silver Fox is by no means abundant, and presents considerable variations in color. Some skins are brilliant black, with the exception of the white tip to the tail; others are bluish-gray. This white tip of the tail is a characteristic of the variety.

The CROSS FOX, *Canis fulvus*, var. *decussatus*, is considered by Richardson a mere variety of the Red Fox. Its fur is nearly six times more valuable than that of the latter; the front of the head is gray, the ears

covered with soft black fur behind; the back ferruginous, with dark stripes, one running from the head longitudinally, the other at right angles over the shoulders; the rest of the back is gray, the sides a pale rusty-red, the legs and belly black. The fur is thick and long.

THE KIT FOX AND THE GRAY FOX.

The KIT FOX, *Canis velox* of Audubon, the *Canis cinereo-argentatus* of Richardson, is very like the Red Fox in shape, but approaches the Gray Fox in color; its form is slight and slender; the tail long, bushy, and tapering. It is the smallest of the American foxes; the back is of a grizzled color, the flanks of a dull reddish-orange, the belly is white. It is found on the plains of the Columbia River valley, and on the plains east of the Rocky Mountains; it does not appear to be an inhabitant of New Mexico, Texas, or California.

The GRAY FOX, *Canis Virginianus* or *griseus*, has a shorter and broader head than the Red Fox. The long hairs which give the general color to the body are white at the roots, then for more than a third of their length black, then white, with a broad black tip. This color varies somewhat, specimens from New York State being more fulvous than those from South Carolina.

The Gray Fox is in the South what the Red Fox is in the North—the detestation of farmers. Audubon asserts that the former is by no means rapacious; that he is shy and cowardly, and only preys on creatures much weaker than himself. He hunts quail or partridges just as a pointer dog will do, and runs down rabbits, and it is very fond of making raids on the nests of the wild turkey.

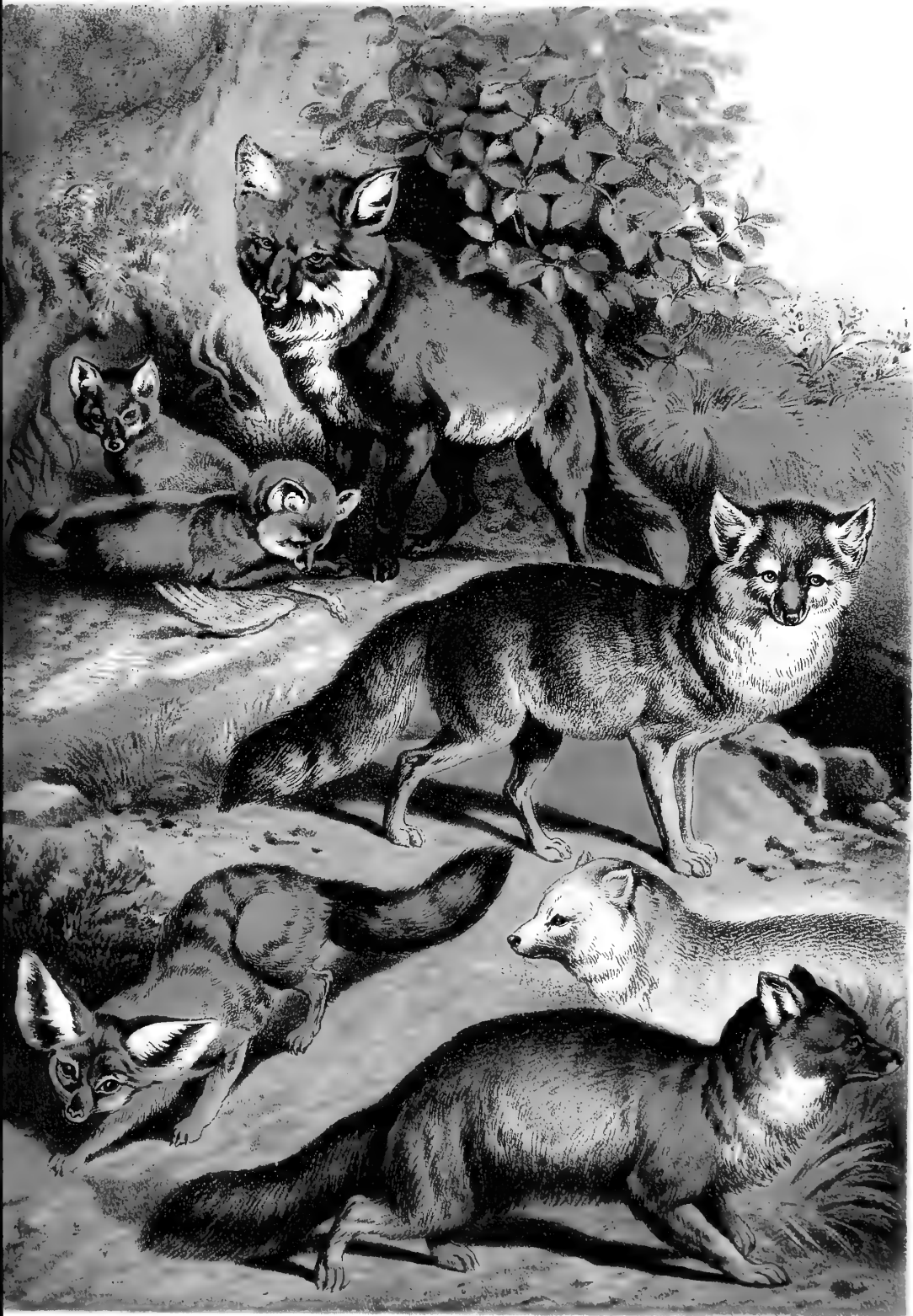
Till within a couple of years fox-hunting in America was exclusively a Southern sport, extending from Maryland to Florida and westward to Louisiana. It is now, however, being taken up in different sections of the Northern States. The hounds are put on the fox's trail near some cover, but it requires good dogs to follow him, as he does not leave so strong a scent as the Red Fox and possesses more cunning.

THE ARCTIC FOX AND THE BLUE FOX.

The ARCTIC FOX, *Canis lagopus* (Plate XVIII), is of a pure white color when in its winter dress, except at the tip of the tail, where a few







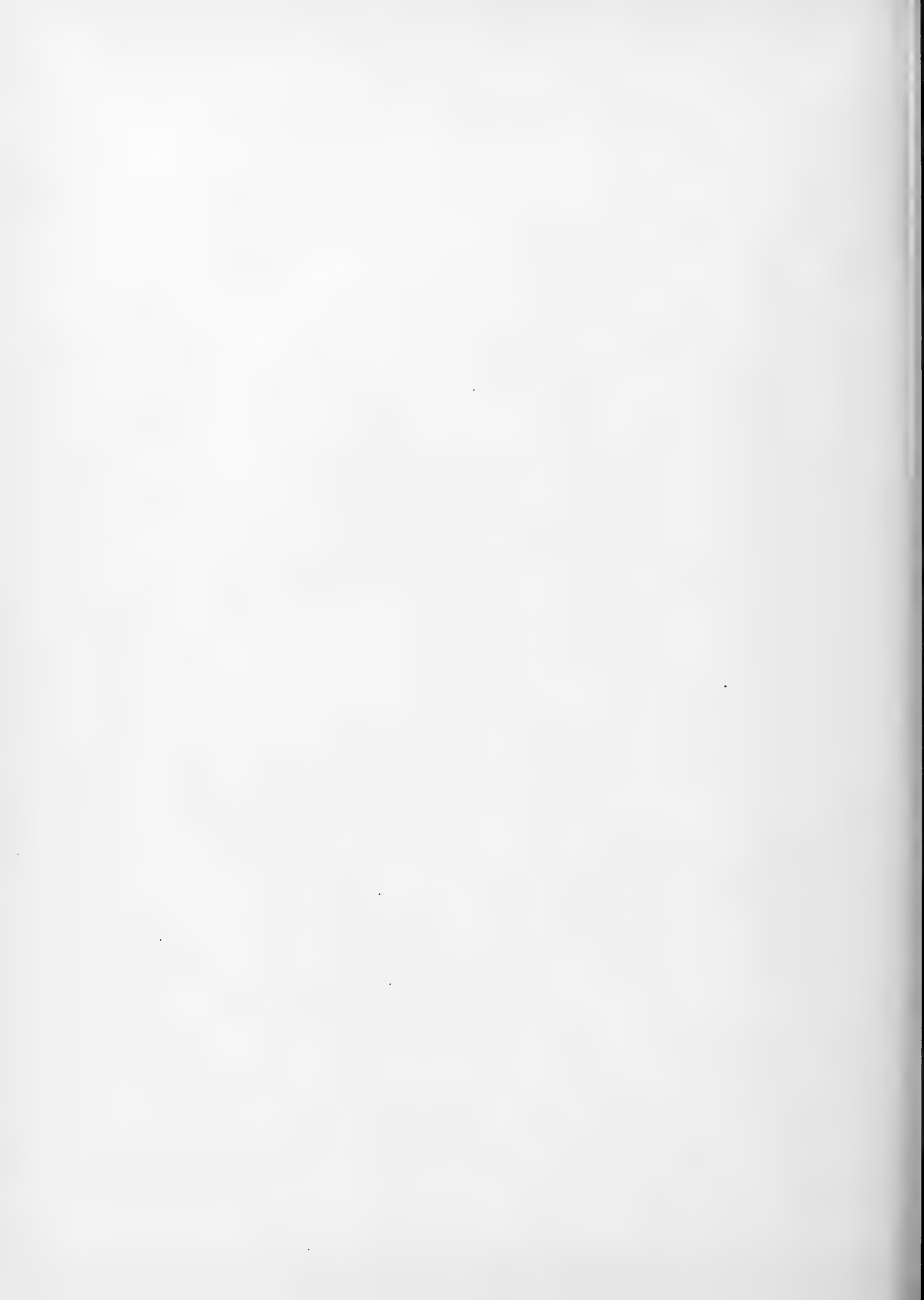
COMMON FOX
TENREC

ARCTIC FOX

BLUE FOX

SILVER FOX

PLATE XVIII CARNIVORA



black hairs are sprinkled. The fur before the eyes is short and sleek; on the neck it is as long as the ears, and is intermixed with soft wool; on the rest of the body it is very long. In most specimens the fur has a bluish-gray color at the roots, the proportion of the length of the fur so colored varying according to the season; at all times the under fur is of a dark brownish-gray color for half its length. In summer the long white fur falls off, and is replaced by shorter hair more or less colored, although individuals may at times be found so eccentric in their tastes as to preserve their winter suit till the dog-days; this is the *kakkortak* of the Greenlanders. In form the Arctic Fox resembles the common fox; the brush is full and large, covering the nose and feet like a muff when the animal sleeps. The eyes are hazel-colored and bright, the legs are long and strong, the feet large and armed with strong claws, and the animal can make powerful leaps.

The Arctic Fox is very cleanly, and does not exude an unpleasant odor; it is very difficult to come upon unawares, as it seems to sleep with both eyes open; its bark is so modulated that the hearer thinks the animal at a distance when it is close before his feet. It is very impatient of confinement. It inhabits North America above latitude 50°, and is numerous on the shores of Hudson Bay. The fur is of small value; the flesh is eatable.

The BLUE FOX, *Canis lagopus*, var. *fuliginosus* (Plate XVIII), is a mere variety of the Arctic Fox, and is to be distinguished from the Black or Silver Fox by its round ears and poor fur, which differs from the ordinary winter or summer states of the Arctic Fox in being entirely of a uniform blackish-brown color. It is called by the Greenlanders *keknektak*, and is very numerous in Iceland. Audubon observed two Blue Foxes which came to the place where he had been cooking; they carried off the scraps of meat and buried each piece in a separate place. The Arctic Fox has the same habit; and the domestic dog, as we all know, still retains these primitive uneducated instincts.

II.—GENUS MEGALOTIS.

The animals hitherto described are so essentially similar that we have followed those authorities who place them all in one genus. We now proceed to consider others which display such marked differences as entitle them to be placed in separate genera.

The LARGE-EARED FOX, *Megalotis Lalandii*, has a slender figure, long legs and tail, large oval ears, and forty-eight teeth; it attains the length of three feet, of which one-third is tail, and externally bears a strong resemblance to the Fennec. The predominant color is a dull-gray, except on the tail, where it has long black hair. It is a native of South and Eastern Africa, hunts in packs, and succeeds in pulling down antelopes or even wild cattle.

III.—GENUS LYCAON.

We now come to a link between the *Canidæ* and the *Hyænidæ*—the remarkable animal which has been, indeed, placed by some naturalists among the hyænas, as, like the latter, it possesses only four toes on its feet. The genus contains only *one* species.

The HYÆNA or HUNTING DOG, *Lycaon pictus*, derives its former title from its hyænine aspect, the latter from the fair and sportsmanlike manner in which it hunts its game. The general color is a reddish or yellowish-brown, marked at wide intervals with large patches of black and white. The nose and muzzle are black, and the central line of the head is marked with a well-defined black stripe, which reaches to the back of the head. The ears are extremely large, and are covered on both their surfaces with rather short black hairs. From their inside edge rises a large tuft of long white hair, which spreads over and nearly fills the cavity of the ear. The tail is covered with long bushy hair.

Although very fond of putrid flesh, these dogs do not make it their exclusive aliment; for they also feed on living prey, such as gazelles and antelopes. To pursue and capture these they collect in troops, which are sometimes very numerous, and under the direction of a chief, when they hunt with a unanimity and cleverness unsurpassed by the best pack of hounds. When the game is taken they divide it equally; but if any of the larger Carnivora approach to take a share in the feast, all unite against the intruder. This often happens with respect to the leopard, and even the lion.



CHAPTER XI.

THE DOG.

THE WILD DOGS—THE DHOLE—THE ALPINE WOLF—THE DOMESTICATED DOG—REGARD IN WHICH THE DOG IS HELD—ABHORRENCE OF THE DOG BY THE ORIENTALS—THE DOGS OF THE EAST—THE DOG IN ANTIQUITY—THE MENTAL QUALITIES OF THE DOG—ITS MORAL SENSE—ITS AFFECTION FOR ITS MASTER—RABIES OR HYDROPHOBIA.

BEFORE we describe the Domesticated Dog, we must say a few words respecting the dogs which still live a free, independent life. In them we see what the dog was before he devoted himself to the human race. They represent the original, the Domestic the modified, or, we may say, the humanized animal.

Gray forms the following species into a genus which he calls CUON, the members of which possess forty teeth. They are dog-like wolves. The head is broad, the muzzle short, the ear erect and high, the eyeball round, the body powerful, the flanks thin, the tail bushy and drooping. They are all animals fond of the chase and skillful in hunting.

THE DHOLE.

The DHOLE, *Canis Dukhunensis* (Plate XIV), sometimes called the KHOLSAM, inhabits the western parts of India; it is a very shy animal, and avoids man and his dwelling-places. The Dhole is remarkable, not merely for hunting in packs—as many of the *Canidæ* do—but for the possession by the pack of such confidence in its own powers that it will give chase to the tiger. The boar falls a victim in spite of its tusks, the antelope in spite of its swiftness, and the panther finds its only safety in taking refuge in a tree.

The color of the Dhole is a rich bay, and it stands as high as a small greyhound. It hunts mute, and has a very intelligent face.





ESQUIMAUX DANISH DOG IRISH GREYHOUND PHOTO. WILD DOG
DINGO, WILD DOG NEWFOUNDLAND THIBET DOG
PLATE XIV. CARNIVORA.



found so entirely adapted to this purpose? where could one be found so bold, so tractable, and so obedient as the dog? Without his assistance how could man have conquered, tamed, and reduced other animals into slavery? how could he have hunted down and destroyed those noxious animals from whose rapacity his life was in continual danger? To confirm the truth of these observations, we need only turn our attention to the present condition of those nations which are not yet emerged from a state of barbarism, where the uses of the dog are but little known or attended to, and we will find that they lead a precarious and wretched life of perpetual warfare with the still more savage inhabitants of the forest, with which they are obliged to dispute the possession of their uncultivated fields and divide with them the fruits of their labors.

“Through the intelligence of the dog the world exists”; so says the *Vendidad*, the oldest portion of one of the oldest books of the world—the *Zend-Avesta*. “The dog,” writes Frédéric Cuvier, “is the most remarkable, complete, and useful conquest which man has ever made. The whole species is become our property; each individual belongs wholly to his master, learns his habits, knows and defends his property, and remains devoted unto death. And all this springs not from necessity or fear, but from pure love and attachment. The speed and the sense of smell possessed by the dog have made it one of man’s most powerful auxiliaries, and perhaps it is necessary for the maintenance of human society. The dog is the only animal which has followed man over all the world.” Toussenel goes further, and, regarding the dog as an integral part of mankind, exclaims: “The best part of man is the dog.”

In marked contrast to these views is the remarkable loathing with which some of the Semitic nations regard the dog. All through the Jewish Scriptures the dog is always mentioned in terms of abhorrence and contempt, although we know that dogs were domesticated among the Jews, and used to guard the sheep-folds (*Job*, ch. xxx, v. 1) and to watch the house (*Isaiah*, ch. lvi, v. 10). This feeling is still felt by most of those who profess the religion of Mohammed. As, however, the Moslem of Persia on the one side, and of North Africa on the other, are as fond and proud of their dogs as we are, the dislike seems to have its foundation in race rather than in religious feeling. As a consequence of this abhorrence the dog is, in most parts of the East, in a very miserable condition; he is left, uncared for, to wander gaunt, hungry, and savage—to wander through the streets without a master

and without a home, cut off from all companionship with man. But even in this neglected state they exhibit a great capacity for organization; they divide the town into districts, and no dog can be tempted to trespass on a district to which he does not belong; each troop seems to be under the command of a leader, whose position is recognized by all the rest. Pierotti describes the dogs in Palestine to-day as ill-favored, ill-scented, ill-conditioned beasts, but ready to respond to the slightest advance and grateful for any kindness, exhibiting, under circumstances of great social degradation, the true canine yearning after human society. These outcast dogs, of course, have to get their living by devouring the offal of the street.

The question has been raised, "Is the dog a separate, independent species, like the wolf, the jackal, or the fox?" Darwin discusses the matter at considerable length, and comes to the conclusion that the origin of the dog is to be looked for in the taming and crossing of various species of *Canidæ* in various regions. Each race of mankind would train and preserve the animals most suited to his wants, and this process of selection continued for ages would account for all the varieties we know.

The oldest traditions, the most ancient monuments, show us the dog already tamed. The records of the twelfth Egyptian dynasty, B. C. 3400, exhibit several kinds of dogs, several of them resembling greyhounds, or the Arabian boar-hound. The Assyrian monuments, B. C. 640, represent huge mastiffs. Homer describes Odysseus weeping over his old dog Argus, that recognized him after twenty years of absence, when wife and child and friend knew him not; and in all European literature, from that day to this, the dog holds an honored place. Socrates used to swear "By the dog!" Alexander the Great built a temple over the remains of his favorite; at Corinth a dog, Soter by name, was presented by the city with a silver collar inscribed with the words, "Corinth's defender and deliverer." A dog is one of the *dramatis personæ* in a play of Aristophanes; and who does not remember Launce and his dog Crab in Shakespeare's "Two Gentlemen of Verona"? A still more important role is played by the dog in the melodrama "The Dog of Montargis," where he appears as a party in a Wager of Battle, and procures the punishment of his master's murderer.

Volumes have been written respecting the mental and moral qualities of the dog. All dogs have good memories for time and place; they

remember the dinner-hour, and distinguish Sunday from week-days; and in places where they are in the habit of going to church with their masters, they soon learn to behave themselves and sleep like good Christians. They vary, like the rest of us, in their capacities for acquiring knowledge, and each variety has its special gift. It is still an open question as to how far the dog possesses the faculty of reasoning. It is said that a dog tracking his master has been seen, when he came to where three roads met, to examine two of them carefully, and then at once run along the third; that is, the dog reasoned, "He must have gone by A, B or C; but he has not gone by A or B, therefore he has gone by C." A dog, however, if offered a large and a small piece of meat, does not as a matter of course choose the large piece; from which fact it is assumed that he does not know the axiom "that the whole is greater than its part." It is more probable that he takes the small piece first, as easiest to dispose of, reserving the large piece to occupy his leisure time.

That the dog has a moral sense we all see; but his moral sense is one suitable to his condition and to promote the chief end of dog, which, to borrow the words of Professor Wilson, is to love man and keep his commandments. A dog taught to steal will become as mean and slouching as his master, and will hate to be detected; but his wicked conscience does not smite him. A dog virtuously brought up feels keen remorse when he has transgressed the moral code. Dr. Calderwood, in his work "The Relations of Mind and Brain," relates the following story: "A dog belonging to a United Presbyterian minister killed the fowls while the family were at church and buried them in the garden. The bodies were found. The dog was taken to the garden and immediately confessed his guilt. His master took him to his library, and having shut the door, began a reprimand after this fashion: 'What a wicked thing you have done in murdering the hens! You are a minister's dog, and should have been an example to other dogs instead of doing such a thing as this. Then, this is the Sabbath day, and the deed is all the worse on account of the day on which it has been done.' Thus admonished, the dog was put out of the room and the door shut. Next morning he was found dead. A veterinary surgeon was consulted, and declared that the dog had died of a broken heart."

Of course, duty ignorantly performed sometimes perpetrates injustice. A dog in Haverhill, Massachusetts, met the newsboy every morning at the gate and took his master's paper. When the subscription was

stopped and the boy attempted to pass the house, the dog threw the boy down, and seizing a copy took it to his home.

The affection and devotion of the dog is proverbial, but the extent to which these qualities are developed depends as much on the master as on the dog. They are seen most plainly in those animals which have been not the mere toys or playthings, but the fellow-workers and constant companions of their "guide, philosopher, and friend." There is more than one well authenticated instance of a shepherd's dog accompanying the coffin of its departed friend to the grave and remaining there till its death, either dying of hunger or leaving the spot only long enough to get some food.

Suicides by dogs are not unknown. An old collie in Caithness, troubled with the infirmities of age, including deafness and the loss of teeth, committed suicide by drowning. A Newfoundland dog had his feelings wounded by being scolded. Soon after he was found alive, but with his head partly submerged in a ditch. He was dragged out; but he refused to eat or drink, and before long he was found in the same ditch dead.

Numerous instances are known of dogs calling on their friends to assist them or avenge them. "Liege" was the favorite of his owner, Dr. Van Tuyl, of Dayton, Ohio. One day he tackled a large yellow dog. With ears torn and bleeding, and smarting from defeat, he ran through the house and jumped a fence into an adjoining yard where another dog was quartered. They held some sort of a council, and half a minute later they both cleared the fence and ran into the street, and there, while Liege looked on, his friend gave the yellow dog a wholesome defeat.

We conclude this chapter with a few remarks on that most terrible of all diseases, rabies or hydrophobia. The first symptom of this complaint is an entire change of manner in the animal. The affectionate, caressing dog becomes suddenly cross, shy, and snappish; retreating from the touch of the friendly hand as if it were the hand of a stranger. His appetite becomes depraved, and forsaking his ordinary food, he eagerly swallows pieces of stick, straws, or any other innutritious substances that may lie in his way. He is restless, unable to remain in the same position for two seconds together, and snaps at imaginary objects; and he ever and anon starts up and listens eagerly to imaginary sounds. Generally he utters at intervals a wild howl, but in some cases the dog remains perfectly silent during the whole of his illness, and is then said

to be afflicted with the dumb madness. In most instances the dog is silent during the later stages of the illness.

Before the disease has developed itself to any extent the poor creature becomes thoughtful and anxious, and looks with wistful eyes upon his friends, as if beseeching them to aid him in the unknown evil that hangs so heavily upon him. He then retires to his usual resting-place, and sluggishly lies upon his bed, strangely uneasy, and continually shifting his posture. Fortunately the disposition to bite does not make its appearance until the disease has made considerable progress.

In these stages of the malady the dog is often seen to fight with his paws at the corner of his mouth, as if endeavoring to rid himself of a bone that had become fixed among his teeth. This symptom may, however, be readily distinguished by the fact that the dog is able to close his mouth between the paroxysms of his ailment, which he is unable to do when he is affected by the presence of a bone or other extraneous substance in his throat.

An unquenchable thirst soon fastens upon the afflicted dog, and drives him to the nearest spot where he can obtain any liquid that may cool his burning throat.

In the earlier stages of the complaint he laps without ceasing, but when the disease has destroyed the powers of his tongue and throat, he plunges his head into the water as far as the depth of the vessel will permit, in hope of bringing his throat in contact with the cooling fluid. It is generally supposed that a mad dog will not touch water, and for this reason the malady was termed hydrophobia, or "dread of water"; but it is now ascertained that the animal is so anxious to drink that he often spills the fluid in his eagerness, and so defeats his own object.

In the last stage of this terrible disease the dog is seized with an uncontrollable propensity to *run*. He seems not to care where he goes, but runs for the most part in a straight line, seldom turning out of his way, and rarely attempting to bite unless he be obstructed in his course; and then he turns savagely upon his real or fancied assailant, and furiously snaps and bites without fear or reason.

The average time of the appearance of this disease after the bite is from three weeks to six months, its duration is four or five days, and no remedy has been as yet discovered.

With regard to people bitten by rabid animals, the wound ought to be immediately cauterized, either with lunar caustic or by a red-hot iron,

such as a steel fork or knitting-needle. Many persons assert that hydrophobia in man is purely a disease of the imagination; this is not the case, as Hertwig has produced the genuine canine rabies in dogs by inoculating them with the virus from a man suffering from hydrophobia. But it is beyond doubt that very many people fall victims to their own terrors; and therefore everything which tends to excite alarm ought to be carefully avoided when the sufferer is nervous or excitable. *Do NOT kill the dog on suspicion; keep it carefully till its condition is clearly ascertained; by destroying it at once we are left in a state of uncertainty as to whether it is mad or no, and the nervous sufferer will always adopt the worst alternative; by preserving it we shall be able to give the most positive assurances in most cases that the animal is not mad.*

The number of puppies which the dog produces at a single litter is very large, varying from three or four to fifteen, or even a still greater number. They are born, as is the case with kittens and several other young animals, with closed eyes, and do not open their eyelids for the space of several days. As it is manifestly impossible for the mother to rear the whole of a very large family their number must be reduced, either by destroying several of the little ones, which of course ought to be the weakest and smallest specimens, or by removing the supernumerary offspring and placing them under the care of another dog which has lately taken upon herself the maternal duties. In this case it needs not that the wet-nurse should be of the same kind with her charge, as it is found that health of constitution and a liberal supply of milk are the only necessary qualifications for that responsible office.



CHAPTER XII.

THE SPORTING DOGS.

MODES OF CLASSIFICATION—SPORTING DOGS—THE SCOTCH GREYHOUND—THE IRISH GREYHOUND
—THE AFRICAN GREYHOUND—THE COMMON GREYHOUND—THE HARE INDIAN DOG—THE
ITALIAN GREYHOUND—THE STAG HOUND—FOX HOUND—HARRIER—BEAGLE—THE OTTER
HOUND—THE DACHSART AND TURNSPIT—THE BLOODHOUND—THE POINTERS AND SETTERS
—THE SPANIELS—SPRINGERS—COCKERS—WATER SPANIEL—CHESAPEAKE BAY DOG—RETRIEVER.

VARIOUS classifications of the numerous varieties of the dog have been proposed. Some have grouped them into "dogs that hunt by sight," of which the Greyhound is the type; "dogs that hunt by scent," of which the Fox-hound or Bloodhound is the type; "Shepherd Dogs," "House Dogs," and "Toy Dogs"—a division based on habits impressed on the animal by education or the use to which man has put them, and not on any natural characteristic. Cuvier groups them according to the shape of the head, and forms them into three large classes: the *Matins*, including the Great Danish Dog, the different varieties of Greyhound, the Shepherd's Dog, and the St. Bernard; the *Spaniels*, comprising the Esquimaux Dog, the Common Spaniels, Hounds, Pointers and Setters, with the Turnspit and the Newfoundland Dog; and thirdly, the *Mastiffs*, including the English Mastiff, the Thibet Dog, the Pug, the Bulldog, the Terrier, and Bull Terrier. This arrangement, however, is somewhat confusing. We shall therefore make no pretence to a scientific classification, but describe the most noteworthy varieties in the order which seems to be most simple for the ordinary reader.

THE GREYHOUNDS.

The ROUGH SCOTCH GREYHOUND. There is but one breed of the Scotch Greyhound, although some families are termed Deerhounds, and others are only called Greyhounds. Each, however, from being constantly employed in the chase of either deer or hare, becomes gradually

fitted for the pursuit of its special quarry, and contracts certain habits which render it comparatively useless when set to chase the wrong animal. The Scotch Deerhound is possessed of better powers of scent than the Greyhound, and in chasing its game depends as much on its nose as on its eyes. Although it makes use of its olfactory powers when running, it holds its head higher from the ground than the Greyhound, which only uses its eyes, because this attitude is the best in waiting to pull down his game. It is very difficult, if not impossible, to procure this Deerhound thoroughbred; even the celebrated one, "Maida," possessed by Sir Walter Scott, was a cross with the Bloodhound.

The IRISH GREYHOUND (Plate XIV) is a magnificent animal, much larger than the Scotch Deerhound, many of them being nearly four feet high, but it resembles that variety in shape; it is usually of a fawn-color, with a rough coat and pendant ears. "Stonehenge" writes that the genuine breed is extinct. They were formerly used for hunting the wolf, which animal was exterminated in Ireland during the last century.

The RUSSIAN GREYHOUND is also gifted with the power of running by scent, and is employed at the present day for the same purposes which Irish Greyhounds subserved in former times.

Many Russian forests are infested with wild boars, wolves, and bears, and this powerful and swift dog is found of great use in the destruction of these quadrupedal pests. In size it is about equal to the Scotch Greyhound. It is not exclusively used for the chase of the large and savage beasts, but is also employed in catching deer, hares, and other animals which come under the ordinary category of "game." The fur of this dog is thick, but does not run to any length.

The PERSIAN GREYHOUND is slender in make; its ears are pendulous and feathered like a Setter's, the body is smooth, the tail is like that of a silky-coated Setter. It is used for coursing the hare and antelope in the plains, and hunting the wild ass in the rocky hill country.

For the antelope the Greyhound would be no match, and is therefore assisted by the falcon, which is trained to settle on the head of the flying animal, and, by flapping its wings in the poor creature's eyes, to prevent it from following a direct course, and thus to make it an easier prey to the Greyhound which is following in the track. Of this curious mixture of falconry and hunting the Persian nobles are passionately fond.

The AFRICAN GREYHOUND has a silky coat of a cream color, and is highly valued by the Arabs. In the Sahara rich and poor regard him as







FOX HOUND POINTER BLOOD HOUND
ST. BERNARD. KING CHARLES SPANIEL COCKER SPANIEL

PLATE XV. CARNIVORA.



an inseparable companion—the very apple of their eyes; they feed him carefully, and bestow as much care on the purity of his race as on that of their horses. An Arab will go any distance to get a good mate for his dog, and the whelps are attended to affectionately; in fact, General Daumas says the women sometimes suckle them. When he is broken in, he passes the day by his master's side and the night in his bed; he is clothed to protect him from the cold, and is adorned with rich collars hung with amulets to keep off the "evil eye." When the dog dies the women and children lament him like a member of the family; often, indeed, he has been the main support of the family. A dog that can run down a gazelle is valued at the price of a camel; one that can capture a larger antelope is as valuable as a good horse.

THE COMMON GREYHOUND.

It is hardly possible to conceive an animal which is more entirely formed for speed and endurance than a well-bred Greyhound. Its long slender legs, with their whipcord-like muscles, denote extreme length of stride and rapidity of movement; its deep, broad chest, affording plenty of space for the play of large lungs, shows that it is capable of long-continued exertion; while its sharply-pointed nose, snake-like neck, and slender, tapering tail are so formed as to afford the least possible resistance to the air, through which the creature passes with such exceeding speed.

In England great attention has for years been paid to the breeding and training of the Greyhound, where it is used for coursing the hare, chiefly in matches.

In actual speed the Greyhound far surpasses the hare, so that, if the frightened chase were to run in a straight line, she would be soon snapped up by the swifter hounds. But the hare is a much smaller and lighter animal than her pursuer, and, being furnished with very short forelegs, is enabled to turn at an angle to her course without a check, while the heavier and longer-limbed Greyhounds are carried far beyond their prey by their own impetus, before they can alter their course and again make after the hare. On this principle the whole of coursing depends; the hare making short, quick turns, and the Greyhounds making a large circuit every time that the hare changes her line. The sport is conducted in this wise: A couple of dogs are held in what is called a pair

of slips by a functionary called the slipper, whose duty it is to let them go at the same moment when a hare is started. The judge, who is the only person allowed to be mounted, rides after the dogs and awards the victory to the one that performs the best, which is by no means the one that kills the hare, but the one which gains most points, such as "first turn," and the like.

The Common Greyhound has varied little in the course of centuries. An old rhyme, which can be traced back to 1496, says this hound should have

The head of a snake,
The neck of a drake,
A back like a beam,
A side like a bream.
The tail of a rat,
And the foot of a cat.

And these are still excellent points. The coat is smooth, firm, and glossy ; the favorite colors black, red, or fawn, with black muzzles.

The HARE INDIAN DOG is used by sportsmen on the Mackenzie River to hunt reindeer and moose. Its hair is long and straight, the tail bushy and slightly curved, the color grayish-black. It is remarkable for possessing feet that spread out on the snow, thus preventing the animal from sinking into it. Its height is about two feet.

The ITALIAN GREYHOUND is prized in inverse proportion to its size. Many specimens only weigh six or seven pounds. One of the most perfect dogs of the present day weighs eight and three-quarter pounds, and is fourteen and a quarter inches in height. His color is uniformly black.

Attempts have been made to employ the Italian Greyhound in the chase of rabbits, but its power of jaw and endurance of character are so disproportioned to its speed that all such endeavors have failed. A mixed breed between the Italian Greyhound and the Terrier is useful enough, combining endurance with speed, and perfectly capable of chasing and holding a rabbit.

In this country it is only used as a petted companion, and takes rank among the "toy-dogs," being subject to certain arbitrary rules of color and form, which may render a dog worthless for one year through the very same qualities which would make it a paragon of perfection in another. If of a uniform color, it must be free from the least spot of

white; the favorite color is a golden fawn. It is a pretty little creature, very active and graceful, and by no means devoid of affection. It is chiefly bred in Spain and Italy.

THE HOUNDS.

The ENGLISH STAG HOUND is extremely rare. It was a cross between the Bloodhound and the Greyhound with a dash of the Fox-hound, but the dog now used in England is simply a large breed of Fox-hound.

The FOX HOUND (Plate XV) is the result of two centuries of careful breeding, conducted regardless of expense and under the guidance of great judgment. Beckford describes the perfect Hound thus: "Let his legs be straight, his feet round and not too large, his breast wide, his chest deep, his back broad, his head small, neck thin, tail thick and bushy"; to which ought to be added, "the thigh long, the back ribs deep." His height varies from twenty to twenty-five inches, and a larger or smaller breed is chosen according to the quality of the country in which it is employed. The Fox-hound has excellent scent, is swift of foot, and persevering in character. In a trial at New Market, a Fox-hound ran four miles, one furlong, and one hundred and thirty-two yards in eight minutes and a few seconds.

The HARRIER, so called because it is employed in hunting the hare, is nothing else than a small Fox-hound, standing about eighteen inches high. He requires a more delicate scent than the Fox-hound in order to follow the doubles of the hare, and is possessed of a more musical note. Both the Fox-hound and the Harrier must be looked on not as individuals, but as component parts of a pack; and hence an animal invaluable in one, will be inadmissible in another pack.

The BEAGLE is smaller than the Harrier, standing about fourteen inches high, with a body comparatively stouter. The Beagle has no great speed, and is followed on foot; hence his chief point is his highly developed powers of scent and sagacity in tracking the hare. A dwarf variety is used for hunting rabbits; these Beagles are sometimes so small that a whole pack can be carried in hampers on a horse. The ROUGH BEAGLE is a cross with the Terrier, and has lost the Beagle's tongue.

The OTTER HOUND or WELSH HARRIER is a Harrier which, by careful selection, has been adapted to hunt the hard-biting otter. He is hardy, courageous, and unusually savage. When he bites he does not retain

his hold, but tears his teeth away with great force. His coat is rough and long, with a short, woolly undercoat, which keeps it warm even when immersed for a long time.

The DACHSHUND is one of the most ancient forms of the dog. The well-bred specimens weigh about sixteen pounds, have a long body with a curved back, short crooked forelegs, large head with hanging ears; the tail is thick at the root, but tapers off and is carried to one side; the hair is short, smooth, and stiff; the usual color is black or black-and-tan; the bark is very loud and deep. As their German name implies, they are chiefly used for attacking badgers in their hole.

The TURNSPIT seems a variety of the Dachs which has been condemned to menial labor. At one extremity of the spit was fastened a large circular box, or hollow wheel, something like the wire wheels which are so often appended to squirrel-cages; and in this wheel the dog was accustomed to perform its daily task, by keeping it continually working. As the labor would be too great for a single dog, it was usual to keep at least two animals for the purpose, and to make them relieve each other at regular intervals. The dogs were quite able to appreciate the lapse of time, and if not relieved from their toils at the proper hour, would leap out of the wheel without orders, and force their companions to take their place and complete their portion of the daily toil. The thoroughbred Turnspit is very rare, although spits are said by travelers to be still turned by canine labor in some parts of France.

The BLOODHOUND (Plate XV) derives his name from his power of scenting blood, and his proper use is to single out a wounded deer from the herd, and to keep steadily on the trail; when thus engaged he utters a long, loud, and deep bay. His talents were very soon employed to trace human beings, but at present he is used in England only for hunting fallow-deer. A pretty pure breed of Bloodhounds can still be found in some of the Southern States. He is extremely irascible, and therefore not fitted to be a companion. He stands about two feet high; the ears measure eight to ten inches; the forehead is long and narrow; the lips loose and hanging; color black-tan or a reddish-fawn; the tail long and sweeping.

The Bloodhound, when once laid on the scent, will follow the trail through a hundred crossing footsteps, and can be baffled only by water or blood. The latter, if spilt on the track, kills the weaker scent of the fugitive's footsteps, and the former holds no scent.

THE POINTERS AND SETTERS.

The POINTER (Plate XV) has a moderately large head, a high forehead, broad square muzzle, a long neck, strong loins, and wide hips; the tail is strong at the root, then suddenly diminishes, and within two inches of the tip goes off into a point. The shape of the tail is an index of pure breeding.

The Pointer possesses considerable speed, and this quality is specially useful because it permits the sportsman to walk forward at a moderate pace, while his dogs are beating over the field to his right and left. The sagacious animals are so obedient to the voice and gesture of their master, and are so well trained to act with each other, that at a wave of the hand they will separate, one going to the right and the other to the left, and so traverse the entire field in a series of "tacks," to speak nautically, crossing each other regularly in front of the sportsman as he walks forward. When either of them scents a bird he stops suddenly, arresting even his foot as it is raised in the air, his head thrust forward, his body and limbs fixed, and his tail stretched straight out behind him. This attitude is termed a "point," and on account of this peculiar mode of indicating game the animal is termed the "Pointer."

The SETTER (Plate XVI). As the Pointers derive their name from their habits of standing still and pointing at any game which they may discover, so the Setters have earned their title from their custom of "setting" or crouching when they perceive their game. In the olden days of sporting the Setter used always to drop as soon as it found the game, but at the present day the animal is in so far the imitator of the Pointer that it remains erect while marking down its game.

The ENGLISH SETTER is thus described: "A moderately heavy head, but not so much so as in the Pointer; the muzzle not so broad nor so square in profile, the lower angle being rounded off, but the upper being still nearly a right angle. The eye is similar to that of the Pointer, but not so soft, being more sparkling and full of spirit. The ear long, but thin, and covered with soft, silky hair, slightly waved. The neck is long, but straighter than that of the Pointer, being also lighter and very flexible. The back and loins are hardly so strong as those of the Pointer, the latter also being rather longer; the hips also are more ragged, and the ribs not so round and barrel-like. The tail or 'flag' is usually set on a little lower,

is furnished with a fan-like brush of long hair, and is slightly curled upward toward the tip; but it should never be carried over the back or raised above the level of its root, excepting while standing, and then a slight elevation is admired, every hair standing down with a stiff and regular appearance. The elbow, when in perfection, is placed so low as to be fully an inch below the brisket, making the fore-arm appear very short. The hind-feet and legs are clothed with hair, or 'feathered,' as it is called, in the same way as the fore-legs, and the amount of this beautiful provision is taken into consideration in selecting the dog for his points."

The IRISH SETTER has lately come into deserved favor. There are two strains—the Red, and the White and Red—the former being the more fashionable. This dog stands higher than the English Setter, and his head is longer and narrower. He is fast and enduring, and works beautifully, but is unreliable.

THE SPANIELS.

The SPANIELS are divided into two classes—the Field and the Water Spaniels; and the Field Spaniels are again divided, according to their work, into Springers and Cockers.

The SPRINGERS are heavy and slow dogs, and the favorite breed at present is the Clumber. This animal weighs about thirty pounds, and stands twenty inches high, with a heavy head and broad, square muzzle, long ears, very long body, with a good barrel; the tail is bushy, the legs well feathered. The Clumber hunts mute, while the Sussex Spaniels give tongue when questing.

The COCKER SPANIEL (Plate XV). This class includes all the other Field Spaniels, and is the original of the Toy Spaniels. The name is given to it because this breed is used for woodcock shooting. The varieties are very numerous; generally speaking, the Cocker is a light dog, of about fourteen pounds in weight. Like the Springer, he keeps his tail down when questing, but moves it to and fro more rapidly. The coat is thick and wavy; the color is plain liver or black, white and black, liver and white, and lemon and white, or nearly all red.

The WATER SPANIEL has great powers of swimming and diving, and is very docile, and is one of the best of outdoor companions.

Much of its endurance in the water is owing to the abundance of natural oil with which its coat is supplied, and which prevents it from

becoming really wet. A real Water Spaniel gives himself a good shake as soon as he leaves the river, and is dry in a very short time. This oil, although useful to the dog, gives forth an odor very unpleasant to human nostrils, and therefore debars the Water Spaniel from enjoying the fire-side society of its human friends.

Some people fancy that the Water Spaniel possesses webbed feet, and that its aquatic prowess is due to this formation. Such, however, is not the case. All dogs have their toes connected with each other by a strong membrane, and when the foot is wide and the membrane rather loosely hung, as is the case with the Water Spaniel, a large surface is presented to the water.

The Water Spaniel is of moderate size, measuring about twenty-two inches in height at the shoulders, and proportionately stout in make. The ears are long, measuring from point to point rather more than the animal's height.

The CHESAPEAKE BAY DOG is very much prized by the duck-shooters of Maryland. There are three breeds—the Otter, with very short hair of a tawny color; the Red, with long hair; the Curly, with curly hair of a reddish-brown hue. The average height is about twenty-five inches.

The RETRIEVER (Plate XVI). In America all shooting-dogs are broken to retrieve; in England this duty is assigned on land to a cross between the Newfoundland and the Setter, or between the Water Spaniel and the Terrier.



CHAPTER XIII.

SHEPHERD'S DOGS AND HOUSE DOGS.

THE SHEPHERD'S DOG—THE COLLEY—THE SPITZ—THE ESQUIMAUX DOG—THE ST. BERNARD—THE MASTIFF—THE THIBET DOG—THE BULLDOG—THE NEWFOUNDLAND DOG—THE BLACK AND TAN TERRIER—THE SCOTCH TERRIER—THE SKYE TERRIER—THE YORKSHIRE TERRIER—THE BULL-TERRIER—THE FOX TERRIER—THE COACH-DOGS—THE PUG—THE POODLE—KING CHARLES—BLENHEIM—THE MEXICAN MOPSEY—THE DINGO, OR THE DOG RELAPSED INTO BARBARISM.

WE now come to the classes of dogs not used for sporting, and commence with the most useful of them.

THE SHEPHERD'S DOGS.

The SHEPHERD'S DOG (Plate XVI) is divided into numerous breeds, all possessing the same general characteristics. It is rather large and powerful, with a thick closely set fur; the muzzle is sharp, the head of moderate size, the eyes intelligent; the shape that of a short, strong greyhound, and there are usually two dew claws on each hind leg.

The SCOTCH SHEEPDOG or COLLEY has a sharp nose, a bright and mild eye, and most sagacious aspect. The body is heavily covered with long and woolly hair, which stands boldly out from its sides. The tail is exceedingly bushy, and curves upwards towards the end, so as to carry the long hairs free from the ground. The color of the fur is always dark, and is sometimes variegated with a very little white. The most approved tint is black and tan; but it sometimes happens that the entire coat is of one of these colors, and in that case the dog is not so highly valued.

It is hardly possible to overrate the marvellous intelligence of a well-taught sheep-dog; for if the shepherd were deprived of the help of his dog his office would be almost impracticable. It has been forcibly said by a competent authority that, if the work of the dog were to be performed by men, their maintenance would more than swallow up the

entire profits of the flock. The Colley is untiring in the discharge of any useful task, but will not display his talents for the idle gratification of spectators.

The SPITZ DOG is one of the commonest house-dogs we see. In its native country Pomerania it discharges the duty of a sheep-dog, and it is fit for nothing else. Its intelligence is of a low order, and its courage is conspicuous by its absence. It has a pointed fox-like head, short legs, and a long tail tightly curled up, and is clad in a thick woolly coat usually of a white color. It has the merit of being a good watch-dog, and with this ends all its good qualities. It is irritable and snappish and therefore unfit to be a playmate for children. Most cases of hydrophobia can be traced to the bite of a Spitz; not that he is more subject to the disease, but that he is more addicted to biting than other dogs.

THE ESQUIMAUX DOG.

The ESQUIMAUX DOG (Plate XIV) is a wolfish-looking creature with oblique eyes, bushy tail and elongated muzzle; its color is a deep dun with obscure bars and patches; its height about twenty-two inches. In winter it is used entirely for drawing sleds and sleighs, but is usually turned loose in the summer. The team of dogs is harnessed to the sleigh by leathern straps, and directed by the voice or the crack of the whip of the driver. The old and experienced animal which leads the team will dash forward, slacken speed, halt, or turn to right and left at the word of command, and the actual stroke of the whip is used as little as possible, for when a dog feels the sting of the biting lash, he turns round and attacks the dog nearest to him. The others immediately join in the fight, and the whole team is thrown into confusion, the traces being entangled with each other, and the sledge in all likelihood upset. When such a rupture occurs, the driver is generally forced to dismount, and to harness the dogs afresh. Usually, the leading dog is permitted to run his own course, for he is able to follow the right path with marvellous accuracy, and to scent it out, even when the thickly-falling snowflakes have covered the surface of the ground with an uniform white carpet.

These dogs are able to travel for very great distances over the snow-clad regions of the north, and have been known to make daily journeys of sixty miles for several days in succession.

THE SAINT BERNARD AND MASTIFF.

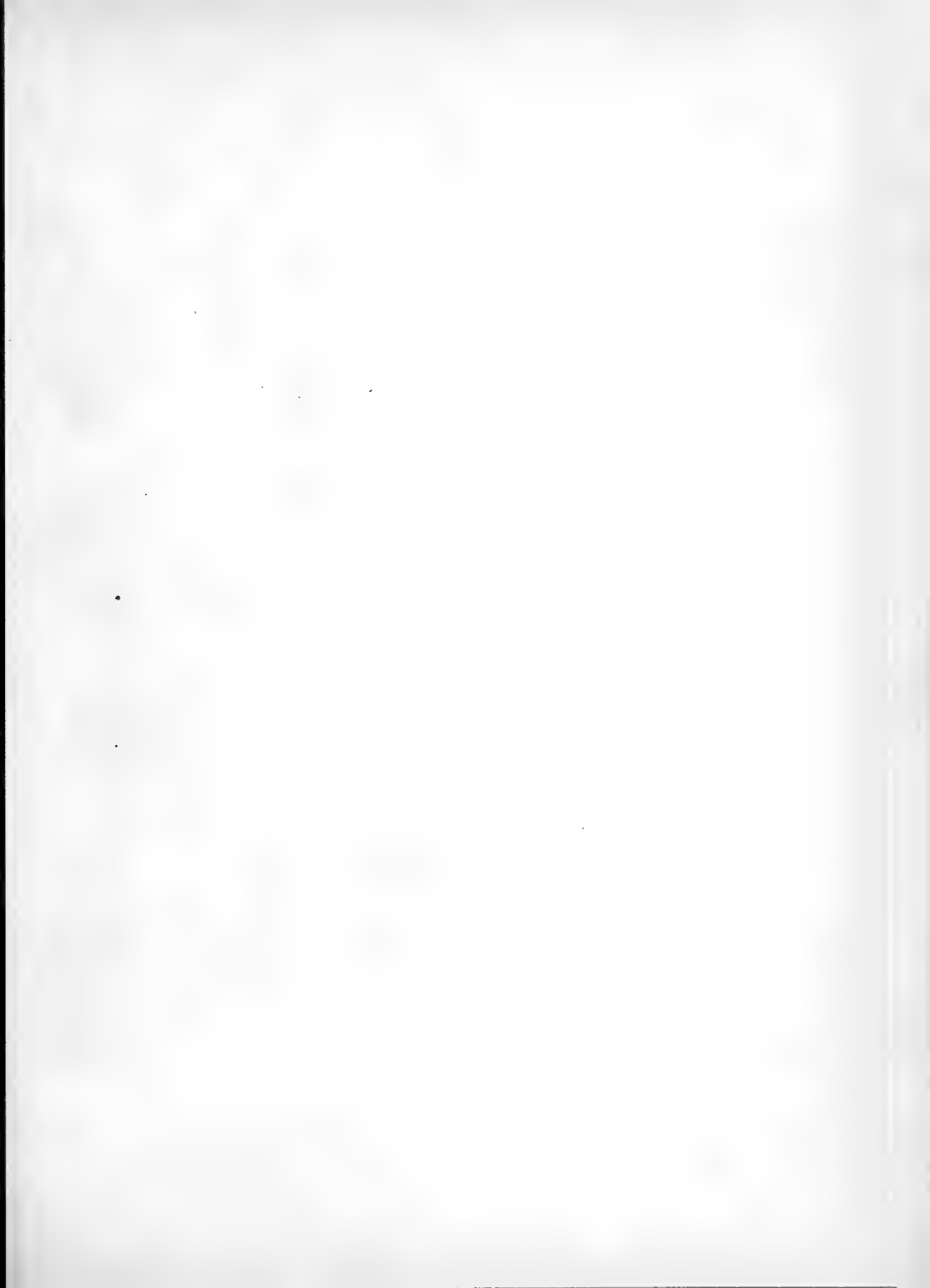
The SAINT BERNARD DOG (Plate XV). These splendid dogs, which belong to the group of Spaniels, are among the largest of the canine race, being equal in size to a large mastiff. The good work which is done by them is so well known that it is only necessary to give a passing reference. Bred among the coldest regions of the Alps, and accustomed from its birth to the deep snows which everlastingly cover the mountain-top, the St. Bernard Dog is a most useful animal in discovering any unfortunate traveler who has been overtaken by a sudden storm and lost the path, or who has fallen upon the cold ground, worn out by fatigue and hardship, and sunk into the death-sleep which is the result of severe cold. Whenever a snow-storm occurs, the monks belonging to the monastery of St. Bernard send forth their dogs on their errand of mercy. Taught by the wonderful instinct with which they are endowed, they traverse the dangerous paths, and seldom fail to discover the frozen sufferer, even though he be buried under a deep snow-drift. When the dog has made such a discovery, it gives notice by its deep and powerful bay of the perilous state of the sufferer, and endeavors to clear away the snow that covers the lifeless form.

The monks, hearing the voice of the dog, immediately set off to the aid of the perishing traveler, and in many cases have thus preserved lives that must have perished without their timely assistance. In order to afford every possible help to the sufferer, a small flask of spirits is generally tied to the dog's neck.

There are two varieties, the rough and smooth haired, the former of a tawny brindle color, the latter red and white with a broad white collar.

The MASTIFF (Plate XVI) is a noble-looking dog, and when pure bred is remarkably good-natured, and seems to delight in affording protection to the weak, either of men or dogs.

The head of the Mastiff bears a certain similitude to that of the blood-hound and the bulldog, possessing the pendent lips and squared muzzle of the former, with the heavy muscular development of the latter. The under-jaw sometimes protrudes a little, but the teeth are not left uncovered by the upper lip, as is the case with the latter animal. The fur of the Mastiff is always smooth, and its color varies between a uni-







RETRIEVER
BULL DOG
BLACK AND TAN TERRIER
CHINESE DOG
PUG
SKYE TERRIER
SETTER
MASTIFF
SHEPHERD DOG
COACH DOG
PLATE XVI CARNIVORA



form reddish-fawn and different brindlings and patches of dark and white. The voice is peculiarly deep and mellow. The height of this animal is generally from twenty-five to twenty-eight inches, but sometimes exceeds these dimensions. One of these dogs was no less than thirty-three inches in height at the shoulder, measured fifty inches round his body, and weighed a hundred and seventy-five pounds.

The THIBET DOG (Plate XIV) is an enormous animal employed by the inhabitants of Thibet to guard their houses and flocks. The men journey as far as Calcutta, for the purpose of selling their merchandise, and while thus engaged; they leave their dogs at home, as guardians to the women and children. The courage of these huge dogs is not so great as their size and strength would seem to indicate, for, excepting on their own special territories, they are little to be feared, and even then can be held at bay by a quiet, determined demeanor. Their color is generally a deep black, with a slight clouding on the sides, and a patch of tawny over each eye. The hanging lips of the Thibet dog give it a very curious aspect, which is heightened by the generally loose mode in which the skin seems to hang on the body.

The BULLDOG (Plate XVI) shares with the gamecock the reputation of being the most courageous animal in the world. His original vocation was bull-baiting, but at present he is kept either for fighting or breeding. Nearly all sporting dogs owe a good deal of their courage to some Bulldog ancestor. "Stonehenge" thinks the Bulldog is naturally sagacious and intelligent, and derives his evil habits from his human companions. He bites before he barks, and will attack anything; when he has once got hold he cannot be dislodged unless by choking. His repulsive appearance is chiefly due to his underhung jaw; in other respects he is a remarkably neat and compact animal.

THE NEWFOUNDLAND.

The NEWFOUNDLAND DOG (Plate XIV) is so called from its native country. It belongs to the group of Spaniels and is remarkably intelligent. It loves to be in water, and is famous for the numerous instances in which it has rescued drowning persons; it swims with great speed, owing to its large feet and legs. There are three kinds of this dog—the TRUE NEWFOUNDLAND, the LABRADOR DOG, and the ST. JOHN'S DOG.

The true Newfoundland is a magnificent and benevolent-looking animal, and an admirable companion; it stands twenty-five to thirty inches high, and has a long, shaggy coat; the favorite color is black, or black and white. Anecdotes of him are innumerable.

The story of the big dog that dropped the little dog into the water and then rescued it from drowning, is well known. But another dog behaved in a less generous manner. Being provoked beyond all endurance by the continued annoyance of a small dog, it took the little tormentor in its mouth, swam well out to sea, dropped it in the water, and swam back again. Another of these animals, belonging to a workman, was attacked by a small and pugnacious bulldog, which sprang upon the unoffending canine giant, and, after the manner of bulldogs, "pinned" him by the nose, and there hung, in spite of all endeavors to shake it off. However, the big dog happened to be a clever one, and spying a pailful of boiling tar, he bolted toward it, and deliberately lowered his foe into the hot and viscous material. The bulldog had not calculated on such a reception, and made its escape as fast as it could run, bearing with it a scalding memento of the occasion.

The attachment which these magnificent dogs feel toward mankind is almost unaccountable, for they have been often known to undergo the greatest hardships in order to bring succor to a person whom they had never seen before. A Newfoundland dog has been known to discover a poor man perishing in the snow from cold and inanition, to dash off, procure assistance, telling by certain doggish language of its own of the need for help, and then to gallop back again to the sufferer, lying upon him as if to afford vital heat from his own body, and there to wait until the desired assistance arrived.

One day a Newfoundland dog and a mastiff had a sharp quarrel over a bone. They were fighting on a bridge, and over they went into the water. The banks were so high that they were forced to swim some distance before they came to a landing-place. It was very easy for the Newfoundland; he was as much at home in the water as a seal. But not so poor Bruce the mastiff; he struggled and tried his best to swim, but made little headway. The Newfoundland dog quickly reached the land, and then turned to look at his old enemy. He saw plainly that his strength was fast failing, and that he was likely to drown. So what did the noble fellow do but plunge in, seize him gently by the collar, and keeping his nose above water, tow him safely into port! It was funny to

see these dogs look at each other as they shook their coats. Their glance said as plainly as words, "We'll never quarrel any more."

Another incident exhibits the intelligence of the Newfoundland. A large, heavy wagon, which was, notwithstanding its enormous weight, dragged along at a smart trot by a vigorous horse, was passing lately through the Rue de la Chapelle, at Paris. An infant of three years of age having ventured on the public road, unconscious of the danger it was running, was just about to be crushed beneath the wheels of the huge vehicle. Quicker than thought, a magnificent Newfoundland dog, which was sitting on the pavement, darted forth with one immense bound, snapped up the little being, passed like an arrow beneath the wagon between the four wheels, and deposited the poor child safe and sound upon the opposite pavement.

The second variety is the LARGE LABRADOR DOG, which is never entirely black, and has a longer and more curly coat than the true Newfoundland. The third breed is the ST. JOHN'S DOG, which seldom exceeds twenty-five inches.

It is a popular mistake to suppose that, to secure a good specimen of these noble animals, it is necessary to send to the country from which they are named. In point of fact, the pure breed is almost extinct in Newfoundland, and there are to be found there now in their stead a race of mean-looking, shabby, cowardly, thievish mongrels, the degenerate descendants of a once noble race, and as different from them as the modern Greeks from the heroic Greeks of Homer. Neglect, ill-usage, starvation, and hard work have wrought the change. Rather more than two years ago an effort was made to introduce another breed, the celebrated Leonberg dog, the finest in the world—a development of, and a decided improvement on, the original Newfoundland. The breeder of this race is Count Esseg of Leonberg, Wurtemberg, and hitherto his endeavors have been crowned with success.

THE TERRIER.

The TERRIER, so named from the Latin *terra* "the earth," was originally used to drive foxes or vermin from drains or burrows in the ground. He is a small, strong, and courageous dog, with a very good scent. As a rule, all terriers have a strain of bulldog in them, to which they owe their determination and endurance. In England, before the present style

of fox-hunting arose, Terriers were attached to every pack of fox-hounds; but the old fox-terrier has now become the assistant of the rat-catcher and game-keeper, or the faithful house-dog.

The **BLACK-AND-TAN TERRIER** (Plate XVI) is the old English Terrier. It is a smooth-haired dog, with a long, tapering nose, high forehead, and overhung jaw; the tail ought to be fine and rather drooping. The colors ought to be well contrasted without any speck of white. The mouth is always black. It is a lively, affectionate dog, a good ratter, but unequal to attack larger vermin.

The **SCOTCH TERRIER** resembles the English dog except in his coat, which is rougher and more mixed with gray. A cross between this dog and the otter-hound has produced the **DANDIE DINMONTS**, of which there are two varieties—the “Mustard,” of a reddish-brown color, and the “Pepper,” of a gray or blue-gray color. The legs are short, the body long, the ears large, the tail erect with a curve over the back, and the hair on the forehead is silky.

The **SKYE TERRIER** (Plate XVI) has a long body and short legs, and ought to measure from nose to tail three times its height. The tail is long and straight; the fore-legs are slightly bandy, and dew-claws are entirely absent. The hair is long, straight, and parted along the back; it hangs straight down nearly to the ground, and falls well over the eyes. The Skye is a good dog for vermin, but is now chiefly prized as a companion.

There are two kinds of pure Skyes—one small with soft hair, another larger with wiry hair. The Toy Skyes, with a black, silky coat, are produced by crossing with the Spaniel.

The **YORKSHIRE TERRIER** is a cross between a mongrel Skye and a Black-and-Tan Terrier. The coat is very long and silky, and abundant over the whole body, head, legs, and tail; its color is a silvery blue, the ears and legs are of a dark tan shade, and the long beard is of a golden tan, the top of the head almost fawn-colored. This dog is a modern invention and is only fit for a toy.

The **BULL-TERRIER** is a cross between the bulldog and the terrier; generally, however, the terrier cross is continued till the bulldog head disappears; the dog retains the courage of its ancestor and acquires more docility, and is the best of ratters; the first generation is an admirable fighting dog and will face anything. Mr. Andersson relates that, during his travels in Africa, his bull-terrier caught a rhinoceros by

the lower lip, and did not relinquish its hold till the beast was shot. The same dog attacked and killed jackals. A bull-terrier, which was celebrated in the sporting world under the title of "Tiny," weighed only five pounds and a half, and yet was known to destroy fifty rats in twenty-eight minutes and five seconds. It is estimated that this dog must have killed more than five thousand rats, the aggregate weight of which nearly equals a ton and a half. He could not be daunted by size or numbers, and was repeatedly matched against the largest rats that could be procured.

The FOX TERRIER is well represented at most dog-shows. The head is flat, jaw powerful, eyes small, ears set rather back; neck light, chest full, thighs well bent, legs strong. The color is white, with black or black-and-tan markings; coat fine, but hard. At present they are the favorite dog in England, and about the most numerous. These dogs are gay and lively in appearance. The best are white, and weigh about sixteen pounds.

THE COACH DOGS.

The GREAT DANISH DOG (Plate XIV) is a large, noble animal, with slender limbs and a smooth tail, short ears and large eyes, and is a cross between the mastiff and greyhound. His color is white, with brown, mouse-colored, or black patches. He used to be employed to hunt red deer; at present the name Danish Dog is given to a variety which is usually seen running with carriages.

The COACH DOG or DALMATIAN DOG (Plate XVI) is a handsome variety of pointer; his color is white, thickly spotted with black spots of a uniform size, about an inch in diameter. In England he runs with his master's carriage, his proper place being just in front of the horses. In his native country he works as a pointer.

TOY DOGS.

The PUG DOG (Plate XVI) is low and thick-set, of a fawn-color, with a black mask extending to the eyes and clearly defined. The coat is short, thick and silky, the head round, the nose short, tail short and curling closely to the side.

The POODLE is a very obedient, intelligent dog, and soon learns all kinds of tricks. He is a favorite in France and Germany, where he is

generally seen shaven, all but a ruff round the neck and legs and a tuft at the end of the tail. He is good-natured, playful and sociable, and makes a good watch-dog. He fetches and carries readily, and swims well ; but, although possessed of keen scent, he has no sporting tastes.

The KING CHARLES SPANIEL (Plate XV) is a very small animal, as a really fine specimen ought not to exceed six or seven pounds in weight. Some of the most valuable King Charles Spaniels weigh as little as five pounds, or even less. These little creatures have been trained to search for and put up game after the manner of the springers and cockers ; but they cannot endure severe exercise or long continued exertion, and ought only to be employed on very limited territory.

When rightly managed the King Charles is a most amusing companion, and picks up accomplishments with great readiness. It can be trained to perform many pretty tricks, and sometimes is so appreciative of its human playfellows that it will join their games.

The BLENHEIM SPANIEL is even smaller than the King Charles, and resembles it closely in its general characteristics. Both these animals have very short muzzles, long silky hair without any curl, extremely long and silky ears, falling close to the head and sweeping the ground. The legs are covered with long silky hair to the very toes, and the tail is well "feathered." The eyes of these little dogs are extremely moist, having always a slight lachrymal rivulet trickling from the corner of each eye.

A very celebrated but extremely rare "toy" dog is the MALTESE DOG, the prettiest and most lovable of all the little pet dogs.

The hair of this tiny creature is very long, extremely silky, and almost unique in its glossy sheen, so beautifully fine as to resemble spun glass. In proportion to the size of the animal, the fur is so long that, when it is in rapid movement, the real shape is altogether lost in the streaming mass of flossy hair. One of these animals, which barely exceeds three pounds in weight, measures no less than fifteen inches in length of hair across the shoulders. The tail of the Maltese dog curls strongly over the back, and adds its wealth of silken fur to the already superfluous torrent of glistening tresses. It is a lively and very good-tempered little creature, endearing itself by sundry curious little ways to those with whom it is brought in contact.

The Indians possessed two kinds of dogs before the Spanish discovery, both called by the generic name *Alco*. Buffon gives as the native names of the two species, *Ytzcuinte potzotli*, a short-necked, silky-haired dog ;

and *Techichi*, a melancholy dog; the former is the Peruvian or Mexican lapdog, the latter the forest dog of Guiana. The best known variety is the much-prized MEXICAN MOPSEY, which has fine woolly—not silky—hair. This is the tiniest of the dog family, and is precisely like the woollen dogs of the toy-shops.

The CHINESE DOG is remarkable only for the entire absence of hair on all parts of its body. In form it seems a modification of the greyhound, the body being long and narrow, the neck moderately long but thin, the head and muzzle pretty long, the legs thin without dew-claws on the hinder pair.

It is called Chinese because it does not come from China, but is probably a native of Africa, where it is said to be used to hunt the antelope. It is very light, swift, and persevering, and is reported to be indefatigable in tracking its game. These exploits of the hairless dog, however, require confirmation, and dates and places. With us the unfortunate creature is a mere monster, kept as a curiosity to gratify a perverted taste, and it must suffer severely from the changes of our climate. One possessed by the writer was good-natured and playful, and was a good watch-dog, but was excessively afraid of other dogs.

THE DINGO.

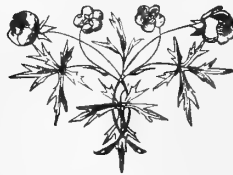
The DINGO, *Canis dingo* (Plate XIV), is not a noble savage who has never known civilization, but a civilized dog run wild. It is the only carnivorous animal found in Australia, consequently is not a marsupial, and therefore is not indigenous to the island. It has all the look of a domestic dog. It is about as large as a sheep-dog, and is of a reddish-brown color, sprinkled with black. It crosses freely with the tame dog.

Large packs of these wild dogs ravage the localities in which they have taken up their residence, and have attained to so high a degree of organization that each pack will only hunt over its own district, and will neither intrude upon the territory which has been allotted to a neighboring pack of Dingoes, nor permit any intrusion upon its own soil. For this reason their raids upon the flocks and herds are so dangerous that the colonists have been obliged to call meetings in order to arrange proceedings against the common foe. Before the sheep-owners had learned to take effectual measures to check the inroads of these marauders, they lost their flocks in such numbers that they counted their missing sheep

by the hundred. From one colony no less than twelve hundred sheep and lambs were stolen in three months.

The Dingo is cowardly, and will rather run away than fight; but when hard pressed, and it finds that its legs are of no use, it turns to bay with savage ferocity, and dashes at its opponents with the furious energy of despair. It carries these uncivilized customs into domesticated life; and even when its restless limbs are subjected to the torpifying thralldom of chain and collar, and its wild, wolfish nature allayed by regular meals and restricted exercise, it is ever ready to make a sudden and unprovoked attack upon man or beast, provided always that its treacherous onset can be made unseen. After the attack it always retreats into the farthest recesses of its habitation, and there crouches in fear and silence, whether it has failed or succeeded in its cowardly malice.

Thus we see that if the dog is necessary for man, man is no less necessary for the dog. Without human society, human guidance, and human rule, the dog, in a few generations, displays all the vices of his wolfish progenitors.



CHAPTER XIV.

THE WEASELS, OTTERS AND SKUNKS.

THE MARTENS—THE SABLE—THE AMERICAN SABLE—THE BLACK CAT—THE POLECAT—THE ERMINE—THE NEW YORK ERMINE—THE FERRETS—THE MINK—THE WEASELS—THE WOLVERENE—THE OTTERS—THE CANADA OTTER—THE CALIFORNIA OTTER—THE SEA OTTER—THE BRAZILIAN OTTER—THE CHINESE OTTER—THE BADGERS—THE AMERICAN BADGER—THE TELEDU—THE RATEL—THE SKUNKS—THE ZORILLA—THE SURILHO—THE COMMON SKUNK—THE NYENTEK.

THE family of the MUSTELIDÆ may be divided conveniently into three sub-families, the MUSTELINÆ, containing the Weasels and Gluttons, the LUTRINÆ, containing the Otters, and the MELININÆ, containing the Badgers and Skunks. The family comprises *twenty-eight* genera and *ninety-two* species, of which we shall mention the most interesting.

THE MARTENS.

The highest position in this sub-family is held by the Martens, slender, short-legged animals with a pointed head, round ears, and moderate size. By many writers the genera *Martes* and *Mustela* are united into one.

GENUS MARTES.

This genus, comprising the Martens proper, is distinguished by possessing thirty-eight teeth. The two species found in the United States are placed by Baird in the Mustelæ.

The PINE MARTEN, *Martes abietum* (Plate XIX), is a very pretty active creature, with a body measuring eighteen inches to two feet, and a tail about one foot in length. In Europe it is found in Scandinavia, Russia, England, Germany, France, Italy, and Spain; and in Asia, as far as the Altai Mountains. The largest specimens dwell in Sweden, and

their fur is of extraordinary thickness. The color does not vary essentially, being generally brown, with a yellowish tinge in Spain and Italy, and a gray hue in Sweden.

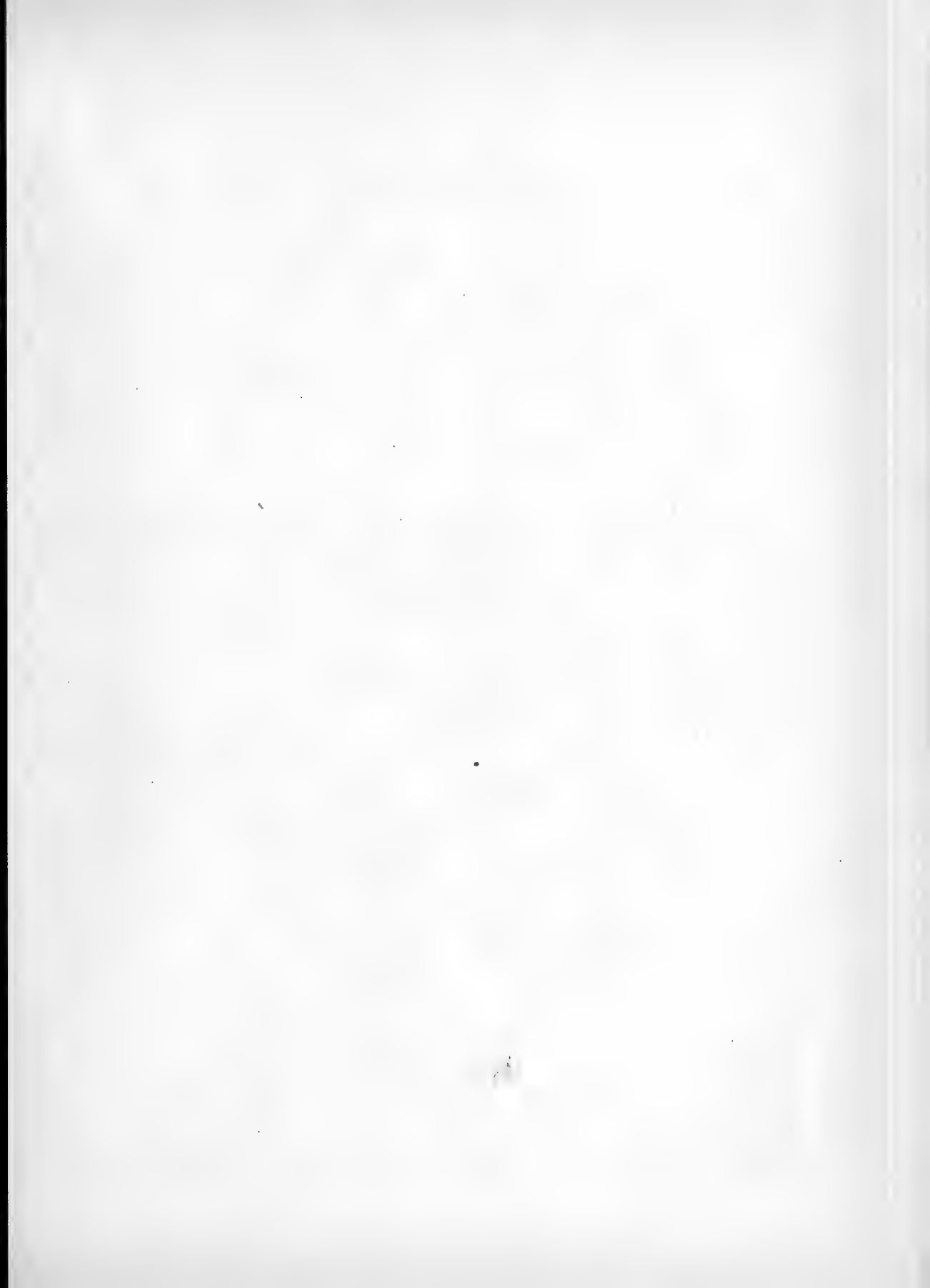
The Pine Marten is so called because it is generally found in those localities where the pine-trees abound. It is a shy and wary animal, and although fierce when brought to bay, naturally shuns collision with an enemy. It traverses the trunks and branches with wonderful address and activity, being enabled by its rapid and silent movements to steal unnoticed on many an unfortunate bird, and to seize it in its deadly gripe before the victim can take flight. It is very fond of appropriating to its own use the nests of crows and other birds, and sometimes occupies the habitation of a squirrel which it has previously killed. Its fur is valuable, and little inferior to that of the Sable.

The BEECH MARTEN, *Martes foina*, is distinguished by the white tint of the fur on the throat and breast, and by its habit of prowling about human habitations. It is more easily domesticated than the Pine Marten, which in other respects it closely resembles.

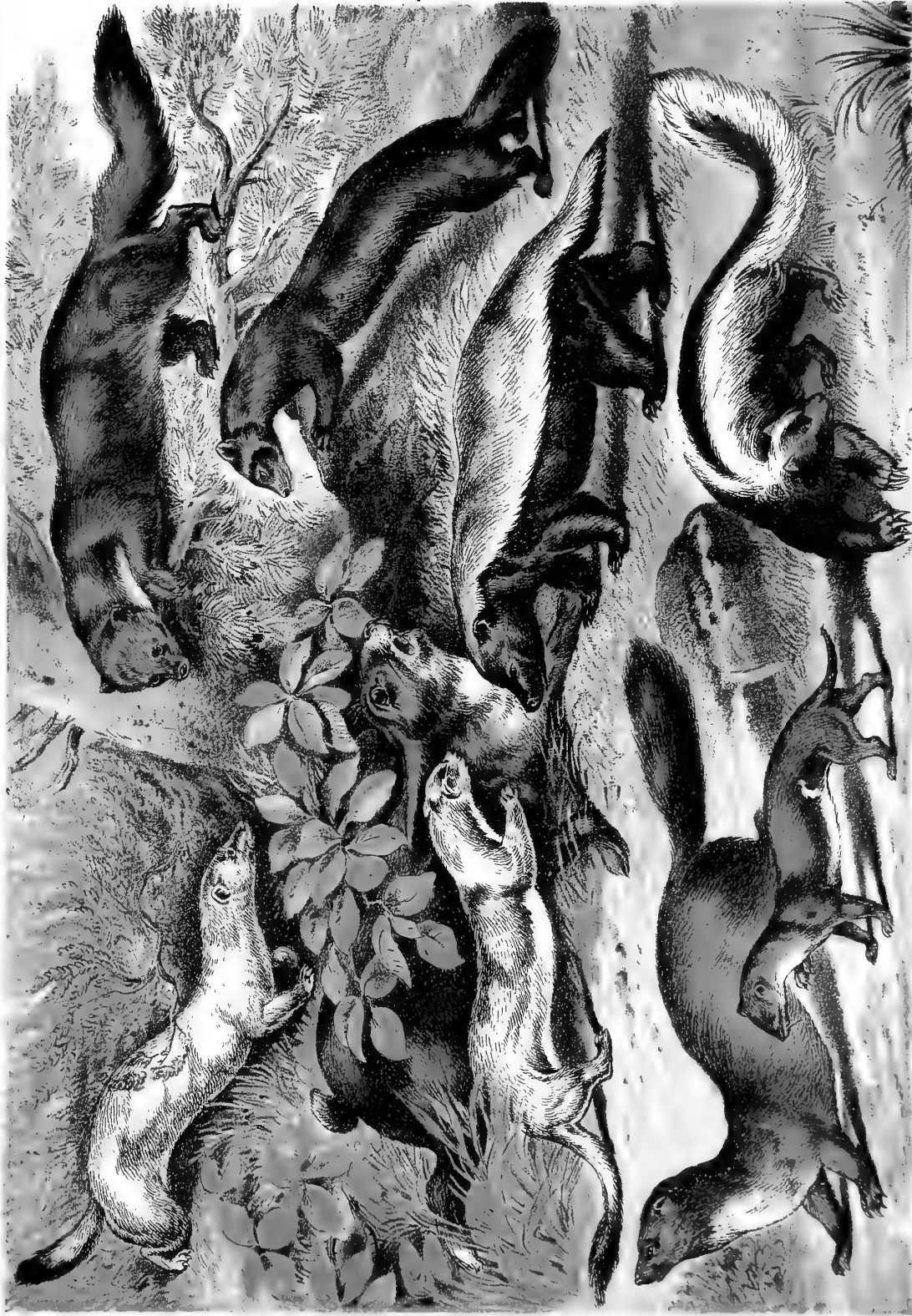
The odor secreted by the inguinal glands of these two species is of a musky, not offensive, odor, and hence they are called in England Sweet-martens, to distinguish them from the Foul-martens or Polecats.

The SABLE, *Martes zibellina* (Plate XIX), has large ears, long legs, and a brilliant, silky fur, and is found from the Ural Mountains to Behring Straits. It lives near the banks of rivers in burrows among the roots of trees, or in hollow trees; its food in summer consists of hares and small animals, in winter it is said to feed on wild berries.

The value of its fur has induced a constant pursuit of the Sable, and as it is most valuable when the animal is captured in winter, the hardships to be undergone by the hunter are very great. The Sables are taken in various modes. Sometimes they are captured in traps, which are formed in order to secure the animal without damaging its fur. Sometimes they are fairly hunted down by means of the tracks which their little feet leave in the white snow, and are traced to their domicile. A net is then placed over the orifice, and by means of a certain pungent smoke which is thrown into the cavity, the inhabitant is forced to rush into the open air, and is entangled in the net. The hunters are forced to support themselves on the soft yielding surface of the snow by wearing "snow-shoes," or they would be lost in the deep drifts which are perfectly capable of supporting so light and active an animal as that they







SKUNK

POLE CAT

PINE MARTIN
RATEL

SABLE

WEASEL

ERMINE

FERRET

PLATE XIX CARNIVORA



are following. The Sable measures about eighteen inches in length, and an ordinary skin is worth thirty to thirty-five dollars; one of the very best quality, however, will bring sixty to seventy-five dollars.

The AMERICAN SABLE, *Martes Americana*, varies a good deal in color, but is usually of a dull grayish-brown, which becomes darker in winter. It is shy, cruel, cunning and active, but does not approach the habitations of man. It is found in the wooded districts of the northern parts of America, from the Atlantic to the Pacific, from the 68th to the 40th degree of latitude. It is considered by Audubon identical with the European Pine Marten.

The BLACK CAT or FISHER, *Martes Pennantii*, has long canine teeth, and indeed its head resembles that of a dog more than that of a cat; the fur is chestnut-brown, with whitish hairs interspersed, which mixture of tints produces a hoary appearance. It is rare in the Northern and Eastern States, but is still met in the thinly settled portions. It obtains its name of "Fisher" from its singular fondness for the fish used to bait traps; it is a formidable enemy to the raccoon and the squirrel, and often pursues the American Sable. When attacked by dogs it makes a more desperate resistance than either the gray or the red fox. It is the largest of the Martens.

The WOODCHUCK, *Martes Canadensis*, is of some value on account of its fur, which is of a grayish-brown color. It lives in burrows on the banks of streams, its food consisting of fish and animals which live near water.

GENUS PUTORIUS.

This genus comprises the Fomarts or Polecats, and they differ from the Martens not only by giving out an offensive odor, but by possessing only thirty-four teeth.

The POLECAT, *Putorius fætidus* (Plate XIX), is bold and blood-thirsty, destroying remorselessly everything it can; it sucks the blood of its victims and eats their brains, leaving the body untouched. Its fur is often fraudulently sold for sable, but is most valued for the manufacture of artists' brushes which are made from the long, sharp, brown hairs which protrude through the creature's woolly coat.

It is a determined foe to game, ravages poultry-yards, and attacks even frogs, newts, and fish; large stores of eels have been found in the

larder of the Polecat, and the nests of the wild bees are not safe from the intrusions of this daring plunderer.

The FERRET, *Putorius furo* (Plate XIX), is an African polecat, and requires, in England, where it is used in rabbit-hunting, to be preserved carefully from cold or frost. One variety is of a creamy white color, with bright pink eyes, another, produced by crossing with the Polecat, is darker and fiercer.

When used for hunting rabbits, it is usually muzzled before it is sent into the burrow, for if its teeth were at liberty, it would kill the first rabbit it met, and remain sucking its blood. It is a very fierce animal, and apt to turn on its owner. A tame one has been known to attack a child in the cradle, mangling it terribly.

The ERMINE or STOAT, *Putorius ermineus* (Plate XIX), is larger than the Weasel. It is a determined hunter, and tolerably swift, possessing good powers of scent, and singular endurance. It has, however, obtained its fame from the beauty of its fur. In summer its coat is of a reddish-brown, not quite so ruddy as that of the weasel, but in winter it becomes entirely white, with the exception of the tail, two-thirds of which remain black. Two explanations of this change of color have been given. One is that new and white hairs are produced in autumn to supply the place of the falling brown ones. The other, which is now generally accepted, is that the summer hairs become blanched.

The hairs are not entirely white, even in their most completely blanched state, but partake of a very delicate cream-yellow, especially upon the under portions, while the slightly bushy tip of the tail remains in its original black tinting, and presents a singular contrast to the remainder of the fur. In temperate latitudes, the Stoat is never sufficiently blanched to render its fur of any commercial value, and the hair appears to be longer, thicker, and whiter in proportion to the degree of latitude in which the animal has been taken. As may be supposed, from the extreme delicacy of the skin in its wintry whiteness, the capture of the Stoat for the purpose of obtaining its fur is a matter of no small difficulty. The traps which are used for the purpose of destroying the Stoat are formed so as to kill the animal by a sudden blow, without wounding the skin; and many of the beautiful little creatures are taken in ordinary snares.

The Ermine is extensively diffused over the northern regions of the Old World; the colder the climate is, the more valuable the fur becomes,

and hence the most valuable specimens come from Siberia, whence about 400,000 pelts are annually sent to market.

The NEW YORK ERMINE, *Putorius Noveboracensis*, is called also the White, and the Common Weasel. It is found as far south as Pennsylvania. It differs from the European Ermine, the tail not being so long, but the hair very long and bushy. It does not change the color of its coat in winter.

KANE'S ERMINE, *Putorius Kaneii*, was so named by Baird in honor of the Arctic explorer, Dr. Kane. Its length to the tail is about eight inches, the tail vertebræ about one-sixth of this length. In summer it is brown, in winter, white. It is smaller than the European Ermine, but has a longer tail, and the black color in place of occupying two-thirds, takes up only one-half of that appendage.

The LITTLE NIMBLE WEASEL, *Putorius agilis*, is light, slender, and graceful; it is smaller than the Ermine, but stands higher in proportion, and has more prominent ears. In summer the color of the fur on the upper portion is light-brown, on the belly and throat white; in winter, the whole body is pure white, except an inch and three-quarters of black at the tip of the tail. The specimen described by Audubon was obtained in the northern part of New York; its burrow was situated on a high ridge of pine-land, and had a very narrow entrance. It feeds upon the meadow mouse, the little chipping squirrel, and other small animals.

The TAWNY WEASEL, *Putorius fuscus*, is more robust than the European Weasel, and is of a uniform tawny brown color. It does not change color in winter. It is found in the States of New York, Ohio, and Michigan.

The MINK, *Putorius vison*, is of a brown color, with some white about the jaws; but both the color and the size vary considerably. It lives by the banks of ponds or marshes, and its food is chiefly aquatic. In shape it assumes something of the Otter aspect. Its fur is excellent in quality, and as it bears a great resemblance to the sable, it is often substituted for that article.

The SMALL WEASEL, *Putorius pusillus*, is the smallest of our native species; it has a very short tail, without the black tip common to other species. It is very like the common weasel, but smaller.

The YELLOW-CHEEKED WEASEL, *Putorius xanthogenys*, is found only in California; it derives its specific name from three yellow patches on

the cheeks. The back and sides are brown, the abdomen slightly duller in tint.

The SMALL BROWN WEASEL, *Putorius cicognanii*, is common in New England. It is brown above, and white beneath, the tail has a black tip, and is one-fifth the length of the body.

RICHARDSON'S WEASEL, *Putorius richardsonii*, has smaller feet, higher ears, and a longer tail than the preceding species. Its summer coat is dark-brown; its winter raiment white. The hair on the tail does not form a brush.

The BRIDLED WEASEL, *Putorius frenatus*, is found in Texas, and perhaps extends into Mexico. It has a yellowish patch on its forehead, and another just in front of each ear.

The BLACK-FOOTED FERRET, *Putorius nigripes*, is, according to Audubon, the size of the Marten; the tail is one-third of the length of the body; the feet, tip of tail, and forehead are black.

GENUS MUSTELA.

The WEASEL, *Mustela vulgaris* (Plate XIX), does not exceed ten inches in length over all; the color is a reddish-brown on the upper part of the body, but the under portions are pure white. It is one of the most audacious of animals, and will attack anything, however superior in size; it is a terrible foe to rats and mice, and in this respect makes some atonement for the chickens it occasionally kills. It hunts by scent and will even cross water in the chase. When it reaches its prey, it fixes its teeth in the back of the neck and drives them into the brain.

Weasels will unite their forces, and act in concert to repel a foe. It is reported that a powerful man was so worn out with his exertions in keeping off his assailants, that he would soon have sunk under their united attacks had he not been rescued by the timely assistance of a horseman who happened to pass near the spot, and who came to the rescue with his whip. Urged by their bloodthirsty instinct, the Weasels all directed their efforts to the throat, and made their attacks in such rapid succession that their opponent was solely occupied in tearing away the active little creatures and flinging them on the ground, without being permitted the necessary leisure for killing or maiming his pertinacious and undaunted antagonists.

GENUS GULO.

This genus is represented by *one* species, which keeps to the cold regions of Europe and Asia, and on this continent comes as far south as the Great Lakes.

The WOLVERENE, *Gulo luscus* (Plate XX), has a strong compact body, a short tail, which is very bushy, a thick short neck, large head and short legs. Sometimes it attains the length of three feet. Old naturalists gave this animal the name of GLUTTON, and told marvellous stories respecting its voracity; in fact it has been known in captivity to eat thirteen pounds of meat in a day.

The general aspect of this animal is not unlike that of a young bear, and probably on that account it was placed by Linnæus among the bears under the title of *Ursus Luscus*. The general color of the Wolverine is a brownish-black; the muzzle is black as far as the eyebrows, the space between the eyes of a brownish hue. In some specimens, a few white spots are scattered upon the under jaw. The sides of the body are washed with a tint of a warmer color. The paws are quite black, and the contrast between the jetty fur of the feet and the almost ivory whiteness of the claws is extremely curious. These white claws are much esteemed among the natives of Siberia for use in manufacturing certain feminine adornments.

The Wolverine is specially obnoxious to hunters, as it takes the bait from their traps, and discovers the stores of provisions that they have *cached* or hidden as they advanced, and on which they depend for sustenance on their return.

GENUS GALICTIS.

The *two* species of this genus are confined to tropical America, and differ very little in their habits or modes of life.

The GRISON or HURON, *Galictis vittata*, is found in Brazil and Paraguay. Its color is peculiar, being lighter on the back than on the belly, the latter being of a dullish black color, the former covered with a gray fur. The ears of this species are very small, and the tongue is rough. The hairs which give the distinctive coloring to the upper parts of the Grison are longer than those which cover the remaining portions of the

body and the limbs. In total length it measures about two feet, the tail being rather more than six inches in length; the neck is very long and snake-like. All its movements are brisk and cheerful.

The odor which proceeds from the scent-glands of the Grison is peculiarly disgusting, and offends human nostrils even more than that of the stoat and polecat.

The TAYRA, *Galictis barbara*, is of a uniform black color, with the exception of a large white patch on the throat and chest. It is often called the Great Weasel, and is nearly the size of the Common Marten.

THE OTTERS.

The next sub-family, the *Lutrinæ*, is divided by some authorities into *ten* genera, by others only into *three*. All are characterized by a long body, small prominent eyes, short round ears, and webbed feet, and all inhabit rivers and lakes, or seas. They are all excellent swimmers, and can remain a long time under water.

GENUS LUTRA.

The COMMON OTTER, *Lutra vulgaris*, is found in all parts of Europe and Northern Asia. In India and China it is represented by allied genera.

This aquatic weasel is a terrible foe to fish, being quite as destructive in the water as any polecat or stoat is on the land.

For the pursuit of its finny prey the Otter is admirably adapted by nature. The body is lithe and serpentine; the feet are furnished with a broad web that connects the toes and is of infinite service in propelling the animal through the water; the tail is long, broad, and flat, proving a powerful and effectual rudder by which its movements are directed; and the short, powerful legs are so loosely jointed that the animal can turn them in almost any direction. The hair which covers the body and limbs is of two kinds, the one a close, fine, and soft fur, which lies next the skin and serves to protect the animal from the extremes of heat and cold, and the other composed of long, shining, and coarser hairs, which permit the animal to glide easily through the water. The teeth are sharp and strong, and are admirably adapted for preventing the slippery prey from escaping.

The color of the Otter varies slightly according to the light in which

it is viewed, but is generally of a rich brown tint, intermixed with whitish-gray. This color is lighter along the back and the outside of the legs than on the other parts of the body, which are of a paler grayish hue. Its habitation is made in the bank of the river which it frequents, and is rather artificial in its character, as the creature is fonder of occupying some natural crevice or deserted excavation than of digging a burrow for itself. The nest of the Otter is composed of dry rushes, flags, or other aquatic plants, and is purposely placed as near the water as possible, without danger of being inundated.

The Otter can be easily trained to hunt for its master. In the East Indies tame otters are nearly as common as tame dogs with us; and in Germany and England many tame otters have been described.

The mode of instruction which is followed in the education of the Otter is sufficiently simple. The creature is by degrees weaned from its usual fish diet, and taught to live almost wholly on bread and milk; the only fish-like article which it is permitted to see being a leathern caricature of the finny race, with which the young Otter is habituated to play, as a kitten plays with a crumpled paper or a cork, which does temporary duty for a mouse. When the animal has accustomed itself to chase and catch the artificial fish, and to give it into the hand of its master, the teacher extends his instructions by drawing the leathern image smartly into the water by means of a string, and encouraging his pupil to plunge into the stream after the lure and bring it ashore. As soon as the young Otter yields the leathern prey, it is rewarded by some dainty morsel which its teacher is careful to keep at hand, and soon learns to connect the two circumstances together.

The NORTH AMERICAN OTTER, *Lutra Canadensis* (Plate XX), differs from the European Otter by the large size of the naked muzzle and by the skull. It is now exceedingly scarce, and is hunted for its highly prized fur. There are two kinds of this fur, an under coat, very fine and soft, and an outer one, long, coarse, and shining. Audubon tamed several Otters that had the run of his library, and used to climb into his lap.

It is very shy, building its dwelling close to the banks of a running stream. It has a most remarkable habit of "coasting." In winter it selects a high bank of snow, and slides down it head-foremost; in summer it indulges in the same game on a steep river bank ending in deep water. Audubon saw two Otters make twenty-two descents in succession on one of these slides without intermission.

The CALIFORNIA OTTER, *Lutra Californica*, differs from the Canadian, by possessing a shorter muzzle. It is about four and a half feet long; the color above is liver-brown, the under surface of the throat a dirty-white. The ears are small, pointed and high, and the hind feet rather larger than the fore feet. Its habits are the same as those of other otters.

GENUS ENHYDRIS.

The SEA OTTER, or KALAN, *Enhydris marina* (Plate XX), the *only* species of the genus, prefers sea-water to fresh for the greater part of the year. It is very much larger than its fresh-water relations, being rather more than twice the size of the common Otter, and weighing as much as seventy or eighty pounds. During the colder months of the year, the Kalan dwells by the sea-shores, and is found upon the coasts of the Northern Pacific, where it is active in the capture of marine fish. When the warmer months begin, the Sea Otter leaves the coasts, and in company with its mate proceeds up the rivers until it reaches the fresh-water lakes. There it remains until the lessening warmth gives warning for it to make its retreat seawards before the frosts seal up the waters.

It is a scarce animal, and is not prolific. The fur of the Kalan is extremely beautiful, shining with a glossy velvet-like sheen, and very warm in character. It is, in consequence, valued at a very high price. The color of the fur is rather variable, but its general hue is a rich black, slightly tinged with brown on the upper portions of the body, while the under portions of the body and the limbs are of a lighter hue. In some specimens the head is nearly white, and in one or two instances the white tinge extends as far as the neck. Indeed, the proportions of dark and white fur differ in almost every individual.

All the Otters are long-bodied and short-limbed, but in the Kalan this peculiarity is very conspicuous on account of the comparative shortness of the tail, which is barely seven inches in length while the body measures three feet on the average.

GENUS LONTRA.

This genus contains *three* species, of which we mention the most characteristic.







WOLVERINE
SEA OTTER

BADGER
OTTER

PLATE XX CARNIVORA



The ARRIANHA, *Lontra Brasiliensis*, differs from the Common Otter very slightly, but is considerably larger; the head is rounder and the tail is sharply flattened vertically. It fishes in bands of considerable numbers. Although it prefers a fish diet, yet it has been known to kill geese when swimming in a pond. It betrays a determined hostility to dogs, and attacks any that straggle from the hunter's camp.

According to Azara, "this species lives in troops, which rising to the surface of the water, bark like dogs. Each family possesses a separate domain, and spends as much time on the water as it does on land. Its motions are slow, and it drags its belly along the ground." It is found in the Amazon and other rivers of Brazil.

GENUS AONYX.

The *five* species of the genus are from Africa and Eastern Asia.

The CHINESE or JAVANESE OTTER, *Aonyx leptonyx*, is somewhat small, measuring only about three feet. Its color is tawny rather than brown, and the whiskers are strongly developed. When wild it is very ferocious, but when taken young is gentle and tractable, and in China and Java is kept in many houses. Its voice is said to resemble that of a person crying in pain or grief.

THE BADGERS.

Our third sub-family, the *Meliniæ*, comprises the Badgers, Ratels, and the unsavory and dreaded Skunks.

GENUS ARCTONYX.

The SAND BEAR, *Arctonyx collaris*, the *only* species, has longer legs, and a more hog-like snout than the common Badger. Its color is of a yellowish-white, marked with two black bands that run on each side of the head, uniting at the muzzle; the toes are united for their entire length, and are armed with powerful claws. It is a fierce animal, and when attacked stands up like a bear, and fights with its fore limbs. It is found in the East Indies, and is sometimes called the Indian Badger. The native name is Balisaur, or "Sand Hog."

GENUS MELES.

The *four* species of this genus are found from the Atlantic Ocean to Japan, and as far south as Hong Kong in China.

The BADGER, *Meles taxus* (Plate XX), is a quiet inoffensive creature, slow and clumsy in its movements, and awkward in its gait. Its colors are gray, black and white; the head is white with a broad black line on each side, the body is gray, the chest and abdomen, legs and feet are of a deep blackish-brown. Its average length is two feet six.

It lives in a long and tortuous burrow, which it digs with great rapidity, using its nose to push aside the earth, which is then flung backward by its paws. It has long and sharp teeth, and a peculiar arrangement of the jaws by which they lock and remain closed without farther effort; its bite is therefore very severe. The word "Badger" is old English for a corn-dealer, and the animal has got this title because it is accused by ignorant persons of injuring the crops of wheat and oats; but far from causing injury, it is benefiting the farmer by its pursuit of mice and the larvæ of insects. It is said to be bolder and fiercer in the steppes of Asia, where it ventures to attack calves and sheep. At the end of autumn the Badger retires to his burrow, makes a thick, warm bed, and rolls himself up for his winter sleep. This is not continuous; he awakens at any spell of fine weather, and leaves his den to get a drink. In Germany the Dachshund is used to drive him from his hole, in which operation the dog often suffers severely, owing to the fierce bite of the inhabitant. A Badger will receive without injury the most violent blows on the body, but one stroke on the nose kills him.

GENUS TAXIDEA.

The *two* species of this genus are both North American. They have short, low bodies, short tails, large claws, and pointed skulls.

The MEXICAN BADGER, *Taxidea Berlandieri*, differs slightly from the following species, the most noticeable variation being in the continuation of the white line on the head to the root of the tail.

The AMERICAN BADGER, *Taxidea Labradoria*, has one tooth less on each side in the lower jaw than the European Badger. The body is

thick, heavy, flat and broad, and is covered in winter with a dense fur three inches long, of a hoary-gray appearance; in summer the hairs become shorter and approach to yellowish-brown; the coat in summer may be best described as hairy, but in winter, as woolly.

This Badger may be distinguished from that of Europe by its hairy muzzle, stout fore-limbs, strong claws, and conical head. It attains a length of about two feet and a half.

GENUS MYDAUS.

This Asiatic genus is represented by *one* species, which is nearly as offensive as our native Skunk.

The TELEDU, *Mydaus meliceps*, is a native of Java, and is confined to the mountainous districts where the earth is light, and hunting for underground insects proportionately easy. Horsfield writes:

“The Mydaus forms its dwelling at a slight depth beneath the surface, in the black mould, with considerable ingenuity. Having selected a spot defended above by the roots of a large tree, it constructs a cell or chamber of a globular form, having a diameter of several feet, the sides of which it makes perfectly smooth and regular; this it provides with a subterraneous conduit or avenue, about six feet in length, the external entrance to which it conceals with twigs and dry leaves. During the day it remains concealed, like a badger in its hole; at night it proceeds in search of its food, which consists of insects and other larvæ, and of worms of every kind. It is particularly fond of the common lumbrici, or earthworms, which abound in the fertile mould. These animals, agreeably to the information of the natives, live in pairs, and the female produces two or three young at a birth.

“The motions of the Mydaus are slow, and it is easily taken by the natives, who by no means fear it. During my abode on the Mountain Prahū, I engaged them to procure me individuals for preparation; and as they received a desirable reward, they brought them to me daily in greater numbers than I could employ. Whenever the natives surprise them suddenly, they prepare them for food; the flesh is then scarcely impregnated with the offensive odor, and is described as very delicious. The animals are generally in excellent condition, as their food is found in abundance in the fertile mould of the country.

Like the skunk, it can eject a most offensive fluid. "On the Mountain Prahú, the natives, who were most active in supplying me with specimens of the *Mydaus*, assured me that it could only propel it to the distance of about two feet. The fetid matter itself is of a viscid nature: its effects depend on its great volatility, and they spread through a great extent. The entire neighborhood is infected by the odor of an irritated Teledu, and in the immediate vicinity of the discharge it will produce syncope.

"The color of the Teledu is a blackish-brown, with the exception of the fur upon the top of the head, a stripe along the back, and the tip of the short tail, which is a yellowish-white. The under surface of the body is of a lighter hue. The fur is long and of a silken texture at the base, and closely set together, so as to afford to the animal the warm covering which is needed in the elevated spots where it dwells. The hair is especially long on the sides of the neck, and curls slightly upwards and backwards, and on the top of the head there is a small transverse crest. The feet are large, and the claws of the fore limbs are nearly twice as long as those of the hinder paws. In the whole aspect of the Teledu there is a great resemblance to the badger, and, indeed, the animal looks very like a miniature badger, of rather eccentric colors."

GENUS MELLIVORA.

The *three* species of this genus inhabit tropical and South Africa and India to the foot of the Himalayas. The animals contained in them have short noses, short tails, and broad backs, and only thirty-two teeth.

The RATEL, *Mellivora capensis* (Plate XIX), loves to feed on the combs and young of the honey-bee. As it is exposed to the attacks of these infuriated insects, it has received from nature a thick, coarse, and rough fur, which is impenetrable to their stings. It digs with great skill and sinks into the ground in a few minutes.

The color of the Ratel is black upon the muzzle, the limbs, and the whole of the under portions of the body; but upon the upper part of the head, neck, back, ribs, and tail, the animal is furnished with a thick covering of long hairs, which are of an ashy-gray color. A bright gray stripe, about an inch in width, runs along each side, and serves as a line of demarcation between the light and the dark portions of the fur. The

ears of the Ratel are extremely short. The lighter fur of the back is variously tinted in different individuals, some being of the whitish-gray which has been already mentioned, and others remarkable for a decided tinge of red. The length of the Cape Ratel is rather more than three feet, inclusive of the tail, which is about eight inches in length.

In captivity the Ratel is very lively and amusing. The writer has often watched one in the Zoological Gardens in London, and can confirm the account given by Wood in his Natural History.

“In the enclosure that has been allotted to this animal, the Ratel has, by dint of constantly running in the same direction, made for itself an oval path among the straw that is laid upon the ground. It proceeds over the course which it has worked out, in a quick active trot, and every time that it reaches either end of the course, it puts its head on the ground, turns a complete summersault, and resumes its course. At intervals, it walks into its bath, rolls about in the water for a second or two, and then addresses itself with renewed vigor to its curious antics.”

GENUS ICTONYX.

The *two* species which have been formed into this genus are natives of Africa, and have a remarkable dentition, while in skeleton they seem to be midway between the Martens and the Skunks proper.

The ZORILLA, *Ictonyx capensis*, or *Zorilla striata*, is found throughout Africa, and even in Asia Minor. The Dutch of the Cape style it the *muishund* or “mousedog,” an honorable title given it, because it destroys so many of those little rodents. It is somewhat inactive, and avoids water whenever it can, although it is an excellent swimmer when forced to take to the water.

The color of specimens of this animal vary considerably, but they all have the same marks. In some, a broad white transverse band crosses the back of the head, from it four longitudinal bands run down the back, separated by three black stripes; the two outer white stripes are prolonged on the tail. In others, the whole back is white, with the three black longitudinal stripes.

The Zorilla emits an obnoxious odor which it uses like the skunk, and drives dogs and hunters to ignominious flight. The very touch of a dead Zorilla leaves a permanent odor on whatever has been in contact with it.

GENUS MEPHITIS.

We cannot affirm that any member of the Mustelidæ is truly sweet-smelling; we have described the Fomart and Polecat, the Teledu and the Zorilla, but what are they beside our native Skunk? The animals forming the *twelve* species of this genus are exclusively American, and are found from Canada to the Straits of Magellan. They are distinguished from their nearest relations, the Badgers, by a slenderer body, a long bushy tail, a black ground color, with white marks. The head is small, the nose hairless and thick, the eyes small and sharp, the ears short and round, the legs are short, the feet large, with five toes provided with long weak claws. The number of teeth is thirty-two. Each of the mephitic glands contains a space the size of a nut, and is provided with a strong muscle. This space is filled with an oil-like fluid, which by contracting the muscle can be ejected in a narrow stream which is gradually resolved into spray. The odor is stronger when the animals are old, especially with the male sex.

The SURILHO, *Mephitis suffocans*, inhabits Brazil, and attains a length of sixteen inches in the body. The hair is thick, long, and abundant; it is short on the snout, but gradually grows longer till it attains a length of nearly three inches on the tail. Two white stripes run from a point on the forehead to the root of the tail, at times widening so that the space between them is reduced to a mere line; the tail has a white tip.

The Surilho lives in the plains, and avoids the thick primeval forest, haunting the clumps of trees that are found in the campos. Its presence can be discovered by a small funnel-shaped hole which it makes in the ground. It is a nocturnal animal, and lives on insects.

THE SKUNK.

The COMMON SKUNK, *Mephitis mephitis* (Plate XIX), has a broad fleshy body, with a small head and short legs. This species varies so much in color, that there is some difficulty in finding two specimens alike, but, speaking generally, we may say that there is a narrow white stripe commencing on the nose and running to a point on the top of the head; a patch of white, two inches in length, covers the upper part of

the neck; on each side of the vertebræ of the tail there is a white longitudinal stripe, and the tail is broadly tipped with white; on every other part of the body the color is blackish-brown.

The Skunk is neither shy nor timid, and walks slowly as if conscious that nothing dare molest it. When surprised, it quickly makes use of its natural weapon of defence, and generally to the discomfiture of its enemy.

"It happened in our early school-boy days," writes Audubon, "that we observed in our path a pretty little animal, playful as a kitten, throwing up its bushy tail, and seemingly desirous to keep company with us. It makes no effort to escape, we run towards it, it waits for us, and raises its tail as if inviting us to take hold of its brush. We seize it instantly, and grasp it with the energy of a miser clutching a box of diamonds, a short struggle ensues, when—faugh! we are suffocated, our eyes, nose, and face are suddenly bespattered with the most horribly fetid fluid!" The offensive odor often produces sickness and vomiting, and is of an acrid character. Dr. Richardson states that he knew several Indians who lost their eyesight in consequence of the inflammation produced by it. A dog, when he has received the discharge, seems half distracted, plunging his nose into the earth and rolling in every direction, and the eyes have been swollen and inflamed for a week afterward. The Skunk can eject this nauseous fluid with unerring aim to a distance of upwards of fourteen feet; it is a thin transparent fluid scarcely visible by day, but at night resembles an attenuated stream of phosphoric light. Everything on which it falls is tainted for a considerable time, if not forever; clothes that have once been infected will, after every effort has been made to purify them, give out the sickening effluvium if the wearer incautiously comes near the fire. It has been sometimes used as a medicine in cases of asthma, but the verdict of the patient generally is, that the remedy is worse than the disease.

The Skunk has a bad character among the farmers, and destroys large numbers of eggs, but he is too clumsy to do much damage.

The burrows of the Skunk are found on a flat surface, and seldom possess more than one entrance; the gallery runs about seven or eight feet in a straight line, about two feet beneath the surface, and ends in a large excavation containing an immense nest of leaves. During winter, five to fifteen individuals may be found in these burrows ready to defend themselves by the means with which Nature has provided them.

The Skunk in the Northern States retires to its burrow about December, and remains there till February; during this period of inaction he is dull and sluggish, but certainly not asleep. In the South he prowls actively about, "stealing, and giving odor."

When taken young, and the glands removed early, the Skunk is easily tamed, and becomes an interesting pet, keeping its fur exceedingly clean and smooth.

The LARGE-TAILED SKUNK, *Mephitis macroura* differs from the common Skunk in the length of its tail, and in its markings. It is the size of the common cat, of a brownish-black color, with a white stripe on each side of the back, and on the forehead; and the tail is longer than the body. This species is very common in Texas, where its tail is used by the country-folk as a plume or feather in their hats.

This species exists on the western ranges of the mountains in Mexico, in New Mexico, and the western parts of Texas.

The CALIFORNIA SKUNK, *Mephitis occidentalis*, has an oval spot of white on the forehead, and a large spot on each temple, with four interrupted white stripes on the sides and back, the tail being tipped with white.

The TEXAN SKUNK, *Mephitis mesoleuca*, is distinguished from the Common Skunk by having the nose naked for about three-fourths of an inch above the snout. The whole back from the forehead to the tail, and the tail, is white, the whole of the under surface of the body is black.

This species is not met in any portion of the United States north of Texas, but seems to represent in that State the common Skunk.

GENUS HELICTIS.

The *four* species of this genus are found in Eastern Asia, from Nepal to Java, Formosa and Shanghai.

The NYENTEK, *Helictis Nepaulensis*, has been described by Horsfield. The body is about sixteen inches in length, the tail about six; the color is a grayish-brown, with white markings, the ears are large, and the eyes prominent. Little is known of the habits of this creature, but Horsfield supposes they resemble those of the Ratel.

CHAPTER XV.

THE RACOONS AND PANDAS.

THE COMMON RACCOON—THE CRAB-EATING RACCOON—THE CALIFORNIA COON—THE COATI—THE RED COATI—THE WHITE COATI—THE KINKAJOU—THE AMERICAN CIVET OR MOUNTAIN CAT—THE PANDA OR WAH.

THE family PROCYONIDÆ are a small but interesting family of bear-like quadrupeds, ranging from British Columbia to Paraguay and the tropical forests to the south thereof. It embraces *four* genera, all peculiar to the New World.

I.—GENUS PROCYON.

This genus is usually considered to be represented by only *one* species, but at least the varieties inhabiting South America are so well defined as to deserve the dignity of species. The animals in this genus are characterized by the following marks. The body is compact, the head very broad posteriorly, the muzzle short, the eyes large and close together, the ears large and on the side of the head, the legs high and thin, the soles of the feet naked with moderately long toes and strong claws; the tail is long, the fur rich, long and smooth.

The RACCOON, *Procyon lotor* (Plate XXI), derives its specific title of "*Lotor*" or "Washer" from its habit of immersing its food before eating; it grasps the morsel in both fore-paws, and shakes it violently backward and forward in the water.

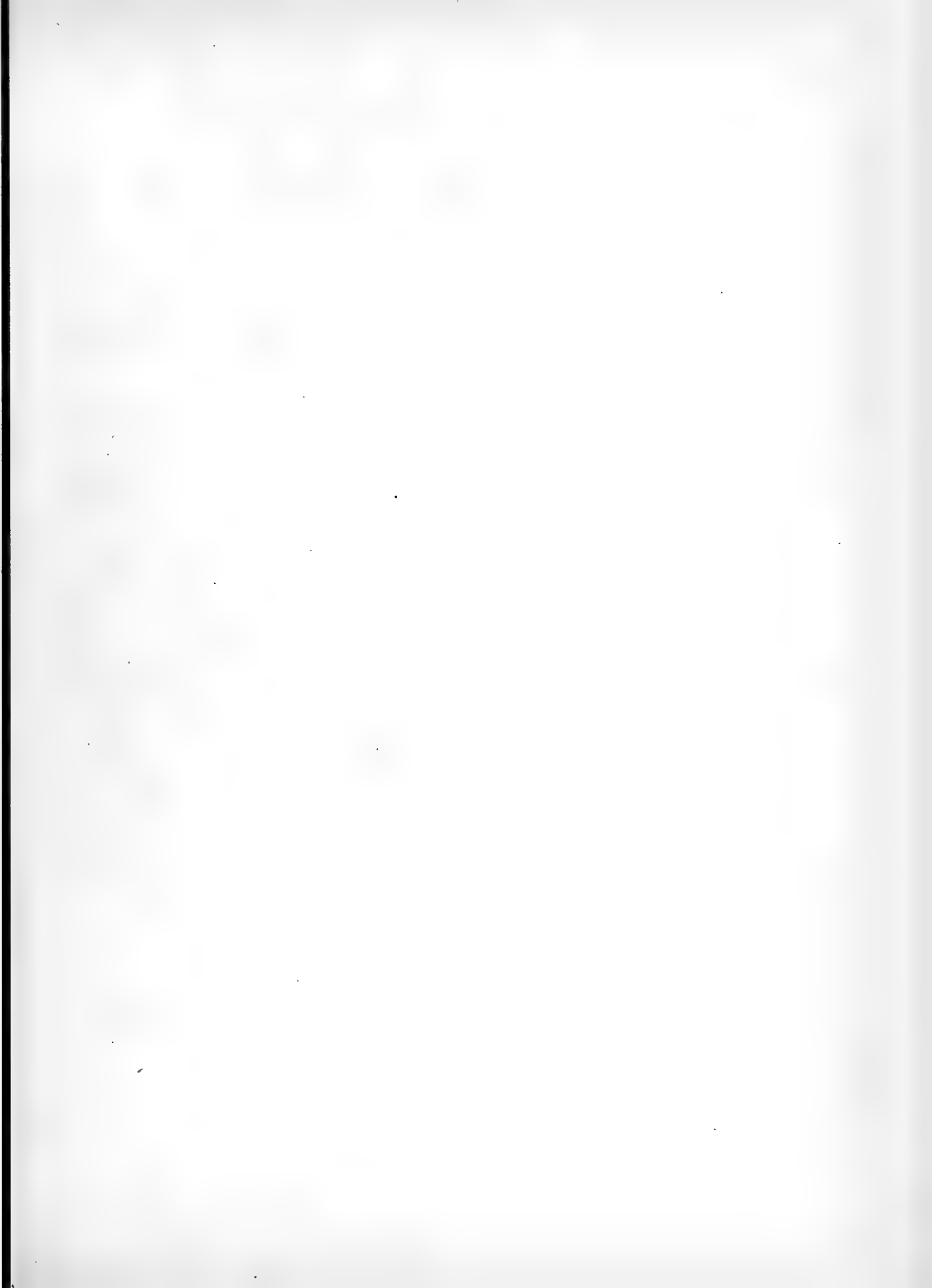
The general tint of the body and limbs is an undecided blackish-gray, the gray or black predominating according to the position of the observer and the arrangement of the fur. The hairs that form the coat of the Raccoon are of two kinds, the one of a soft and woolly character, lying next to the skin, and the other composed of long and rather stiff

hairs that project through the wool for some distance. The woolly fur is of a uniform gray, while the longer hairs are alternately marked with black and grayish-white. Upon the top of the head and across the eyes the fur is of a very dark blackish-brown; and upon the knee-joint of each leg the fur is of a darker tint than on the rest of the body. The tail is rather short and bushy in character, and is marked with five or six blackish rings on a dark gray ground. It is nocturnal in its habits, and when standing is plantigrade, that is, it stands on the soles of its feet, but it runs on the tips of its toes. It hibernates in winter.

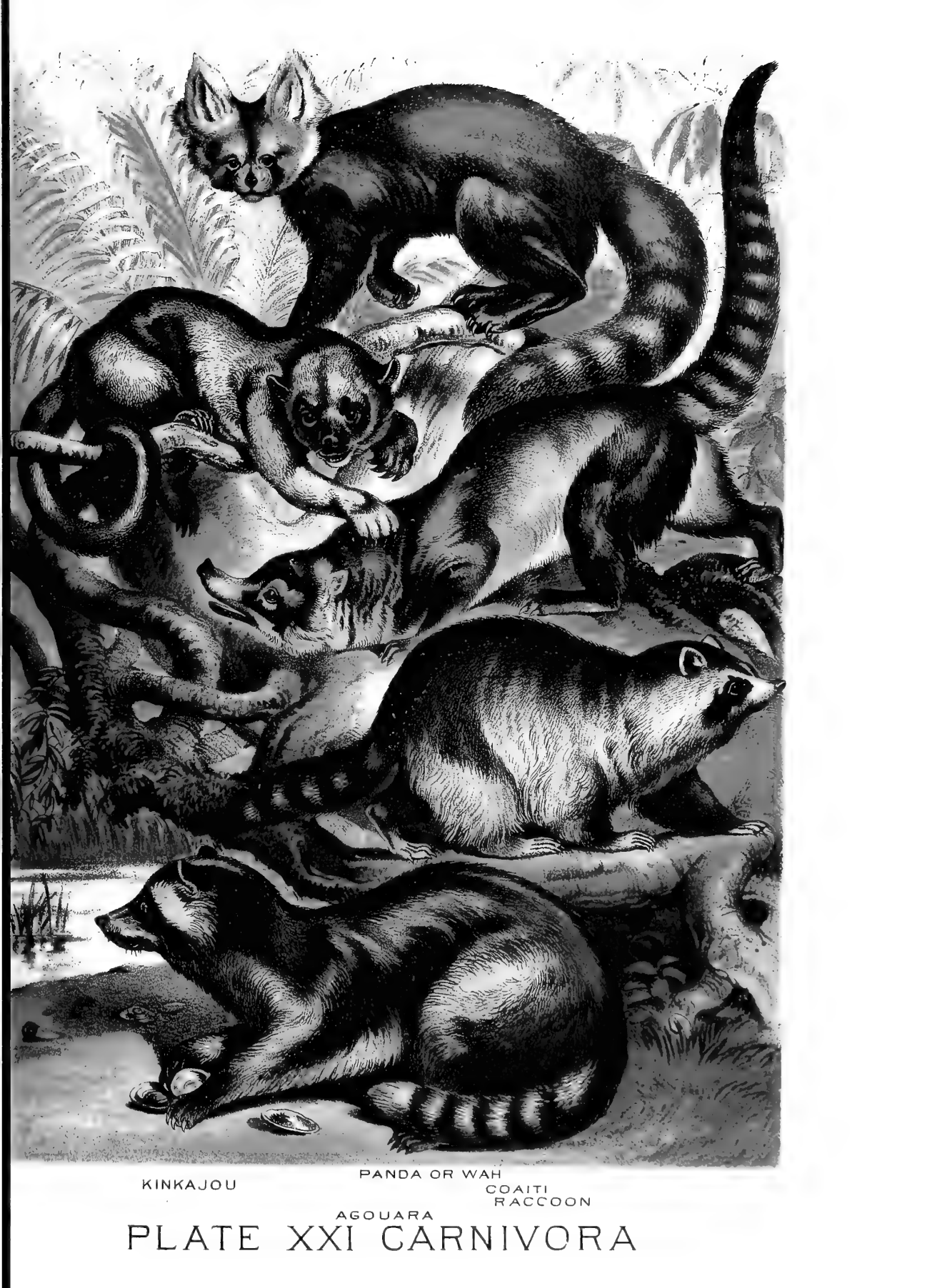
It eats anything, fruit, chestnuts, grapes, corn, and birds, and is very skilful in sucking eggs; it devours fish, crabs, and oysters, as well as insects. In captivity it shows a propensity for intoxicating liquors. Lawson, the surveyor-general of Carolina, in 1784, says, "It is the drunkenest creature living, if he can get any liquor that is sweet and strong."

In size the Racoon equals a small fox, and it is usually hunted by the aid of dogs till it takes refuge in a tree, from which it is dislodged either by an expert climber, or by felling the tree. Audubon gives the following account of a Coon hunt. "The boys had got up with the dogs, which were baying at a Racoon in a small puddle. We soon joined them with a light. 'Now, stranger, watch and see!' The Racoon was all but swimming, and yet had hold of the bottom of the pool with his feet. The glare of the lighted torch was doubtless distressing to him; his coat was ruffled, and his rounded tail seemed thrice its ordinary size, his eyes shone like emeralds; with foaming jaws he watched the dogs, ready to seize each by the snout if it came within reach. They kept him busy for several minutes; the water became thick with mud; his coat now hung dripping and his draggled tail lay floating on the surface. His guttural growlings, in place of intimidating his assailants, excited them the more, and they closed upon him. One seized him by the rump, but was soon forced to let go; another stuck to his side, but Coon made him yelp pitifully. The Racoon would not let go, but in the meantime the other dogs seized him and worried him to death. To the last he held on to his antagonist's snout. Knocked on the head by an axe, he lay gasping, the heaving of his chest being painful to see. The hunters stood gazing at him in the pool, while all around was, by the flare of the torch, rendered doubly dark and dismal. It was a scene for a painter."

The Coon is easily tamed, but can never be trusted near poultry.







KINKAJOU

PANDA OR WAH

COAITI
RACCOON

AGOUARA

PLATE XXI CARNIVORA



The AGOUARA *Procyon cancrivorus* (Plate XXI), as the South American variety is called, is styled "*Cancrivorus*" or "Crab-eater," as he is even fonder than his Northern kindred of all kinds of crustacea and mollusca. It is larger than our racoon, and its fur has a tinge of yellow, darker or lighter on different parts of the body. The tail is short, and has six black rings on a blackish-yellow ground.

The BLACK-FOOTED RACCOON, *Procyon Hernandezii*, is larger than the common coon, the tail is longer and thinner, and the black rings narrower and better defined. It is found on the Pacific coast and in Mexico.

The CALIFORNIA COON; *Procyon psora*, is, according to Prof. Baird, a mere variety of the above. It was found in the same neighborhood, and Gray, who described and named it as a separate species, never saw anything but a most imperfect specimen.

II.—GENUS NASUA.

The number of species comprised in this genus is still far from settled. Wallace expresses doubt as to the *five* species which he gives in his "Distribution of Animals." The Prince of Wied describes two Brazilian species, but Hensel conclusively shows that they are identical. Tschudi seems to have established *two* species for the Southwest of America.

The animals of this genus have a slender, marten-like body, short neck, and long pointed head; a bushy tail as long as the body, and short, powerful, bare-soled legs. Their conspicuous feature is their nose, which is prolonged over the mouth so as to form a miniature proboscis, which they are in the habit of turning up when they drink to keep it from being wetted more than necessary.

The COATI, *Nasua nasica* (Plate XXI), comes from East Brazil, and is about forty inches in length, of which eighteen belong to the tail. Its thick and pretty long fur consists of stiff bright bristles protruding from a soft, short, woolly coat. The color on the back varies from red to grayish-brown; on the belly it passes into a yellowish shade. The tail has seven rings of dark-brown, and seven of brownish-yellow. The forehead is yellowish-gray, the lips white, the ears yellowish in front, black behind; a round white mark stands over each eye, and a white stripe runs from below the eye down the nose. A curious set of tubercles is found on their feet. The narrow head terminates in a salient, mobile muzzle, and the tongue is soft and extensible.

When wild it resembles the racoon in its habits, and climbs trees with great agility, descending head foremost. It is a nocturnal animal, and a merciless robber of birds' nests. In captivity it is a very amusing and lively creature, very inquisitive and distrustful. One which was in confinement for some time was very tame to its friends, but any stranger who ventured to approach the animal was repelled with open mouth and threatening cries, unless he propitiated the creature by offering it some delicacy of which it was fond. It would then lay aside its suspicious demeanor, and become suddenly confidential, returning the caresses of its newly-found friend, and searching eagerly for a further supply of food. It proved to be quite a useful inhabitant of the house when it was domesticated, for it was accustomed to roam over the premises in chase of mice and rats, which it pursued unrelentingly through house, hay-loft, and stables. It was also accustomed to pay visits into the garden, where it spent much of its time in catching snails and slugs, and in digging after worms—a task for which its powerful claws are eminently calculated to adapt it. When it was supplied with meat, it was accustomed to tear its food to pieces with its claws before carrying it to the mouth; and in the act of feeding, it always supplied itself by hitching one of its claws in the morsel which it was about to carry to its mouth. It struck up a friendship with a little dog, and would permit its four-footed friend to occupy the same bed, but would never endure the society of any other animal. When attacked by men or dogs, the Coaiti fights desperately, inflicting dangerous wounds with its double-edged teeth.

The RED COATI, *Nasua rufa*, differs from the preceding species in its color, which is of a reddish-chestnut tinge, interrupted only by black ears and feet, and maroon-colored bands on the tail.

The WHITE COATI, *Nasua leucorhyncha*, is somewhat lighter colored, having a good deal of fawn color; the snout is yellowish-white.

We need not mention other species; the "Social" and "Solitary" *Nasua* of the Prince of Wied, are identical, the latter being old males which have been expelled from the troop.

III.—GENUS CERCOLEPTES.

This genus contains *one* species of small animals with a long prehensile tail, short toes, and claws more or less retractile. It has caused systematic naturalists great perplexity. At first it was put down as a

Lemur, and called *Lemur flavus*; then it was placed among the Civets, as *Viverra caudivolvula*; at present it possesses a genus to itself, and seems to be intermediate between the Martens and the Bears.

The KINKAJOU, *Cercoptes caudivolvulus* (Plate XXI), comes from Northern Brazil, and when full grown, attains the size of a cat; but it is much more powerful. Its soft, silky coat is yellowish-gray with a red shade running through it, and marked with indistinct dark bands which can only be seen in certain lights.

The prehensile tail which the Kinkajou possesses renders it a fearless climber; it swings itself from bough to bough with such agility that even a naturalist like Bates mistook it at first sight for a *Mirikina* (*Nyctipithecus trivirgatus*). It is endowed with a very long, flexible tongue, which it can protrude to a marvellous extent and insinuate into the smallest crevices or the cells of the honeycomb, or can use like an elephant's trunk to seize and draw things towards its mouth. Being a nocturnal animal, its eyes are contractile, and sunlight seems to annoy it very much. During the day it lies buried in deep slumber; at night it becomes extremely lively, and exhibits considerable activity of limb and playfulness of character, running up and down the branches with great skill, uttering at intervals a low, bleating kind of sound, and descending every now and then to drink. In descending it makes use of its hinder claws, turning the feet outward and backward so as to clasp the branch or trunk of the tree, and proceeding head-downward. In its native state its food is of a mixed nature, consisting of fruits, insects, honey, small birds, eggs, and other similar substances. It is easily tamed, and when domesticated is of a sportful nature, delighting to play with those persons whom it knows and trusts, and making pretence to bite, after the manner of puppies and kittens. It is very susceptible to kindness, and is fond of the caresses which are offered by its friends. In its wild state, however, it is a rather fierce animal, and when assaulted, offers such a spirited resistance even to human foes, that it will beat off any but a determined man, supposing him to be unarmed and unassisted.

GENUS BASSARIS.

The animals constituting the *two* species of this genus have been often placed among either the *Viverridæ* or the *Mustelidæ*, but they are now

found to agree in all important respects with the family we are now describing. They are both confined to America.

The AMERICAN CIVET, *Bassaris astuta*, is thus described in the U. S. Pacific R. R. Report: "This beautiful animal, which was formerly supposed to be peculiar to Mexico and Texas, has since been found abundantly in California. The miner calls it the Mountain Cat. It frequently enters his tent and plunders his bag of provisions. When caught, as it often is, it becomes so familiar and amusing, and does so much to relieve the monotony of the miner's life, that it is highly valued, and commands a high price. It is equally efficient as a mouser with the common cat, is much more playful, and to a large number of the members of every community who are cat-haters, might be a desirable substitute." It is abundant in the city of Mexico, frequenting barns and out-buildings, and, like the cat, ravaging pigeon-houses. The Mexican name is Cacamixtli. Prof. Baird says it looks like a mixture of the Raccoon and the Fox, having the tail of the former, the head of the latter; its fur is soft, and as long as a fox's, the head pointed, the eyes large, the muzzle long and hairless. The color is a dark brownish-gray, with indistinct marks on the neck and leg; the tail is white, with eight black rings. It is shy and retiring, and seldom goes far from the tree which holds its nest.

A second species has recently been described by Professor Peters from Coban in Guatemala, where it had also been observed by Salvin.

THE PANDAS.

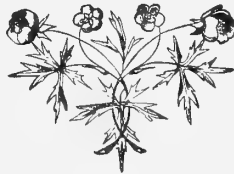
The family of the *ÆLURIDÆ* contains *two* genera, of *one* species each, and the animals comprised in it seem to have their nearest allies in the Coatis and the Bears.

The PANDA, *Ælurus fulgens* (Plate XXI), appears stouter than it really is, from its thick and soft fur; the head is short and cat-like, the long tail is very bushy, the ears small; the short legs have hairy soles, and short toes with semi-retractile claws. The fur is thick, soft, smooth, and very long; on the upper surface of the body it is of a vivid and brilliant chestnut-brown, deepening into a brilliant black on the belly and legs; on the cheeks, muzzle, and chin the hair is white, on the forehead ruddy yellow, the head fawn color, and a chestnut-brown mark runs from the eye to the corner of the mouth, separating the white

muzzle and cheeks; the ears are externally black-red, internally provided with long white hair. The fur is not only handsome in appearance, but is very thick, fine, and warm in texture, being composed of a double set of hairs, the one forming a thick, woolly covering to the skin, and the other composed of long glistening hairs that pierce through the wool, and give an exquisitely rich coloring to the surface of the coat. The hair on the soles of the feet is often snowy-white, contrasting strangely with the black paws.

The Panda or Wah, so named from its cry, is a native of Nepal, where it lives in the mountains on trees near the Alpine streams, two to three thousand feet above the sea level. The Panda resembles in its habits the common racoon; when angry, it sits up like a bear, and utters a very peculiar snorting noise, although its ordinary voice is like the twittering of a bird. Its food is chiefly vegetable. Simpson, who brought one to London, never saw it eat animal food, and Bartlett says it refused raw and cooked chicken and rabbit, but loved to eat young rose-leaves and buds. The latter took great care of the Panda, and restored it to health, but it never betrayed any gratitude for his exertions. It continued as irritable as ever, assumed a hostile attitude at his approach, and struck about with its fore-paws like a cat. As compared with the other members of the family, the Panda is most like the Kinkajou, in its movements and manner of eating, but the Kinkajou far surpasses it in activity and, to all appearance, in intelligence.

An allied genus, *ÆLUROPUS*, has been recently described by Milne-Edwards, from the mountains of Thibet; it is larger than the Panda, and its color is nearly all white.



CHAPTER XVI.

THE BEARS.

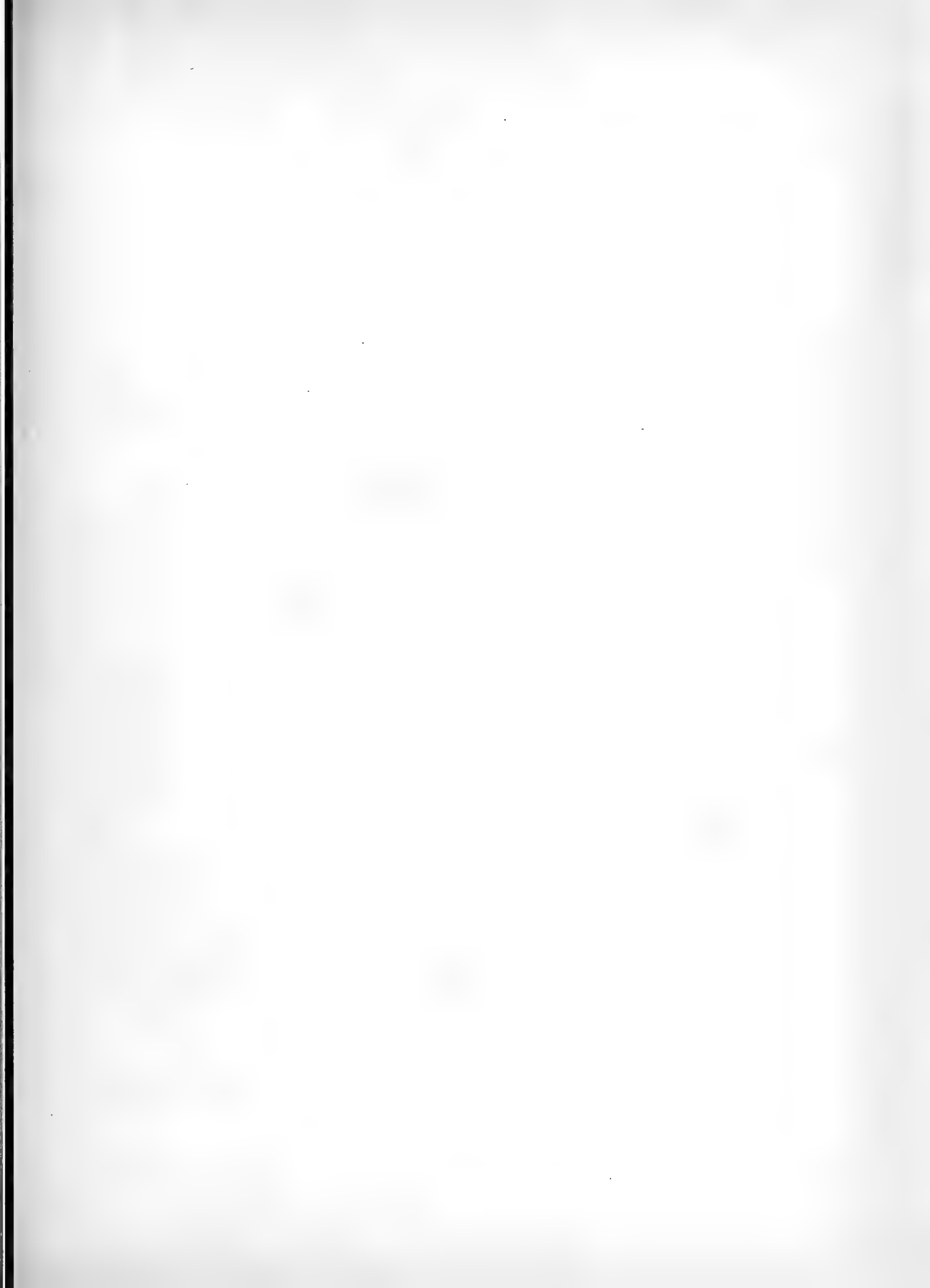
THE BEARS—THE POLAR BEAR—THE BROWN BEAR—THE SYRIAN BEAR—THE AMERICAN BEARS—
THE BLACK BEAR—THE GRIZZLY BEAR—THE BORNEAN SUN BEAR—THE SLOTH OR LIPPED BEAR—
THE SOUTH AMERICAN OR SPECTACLED BEAR.

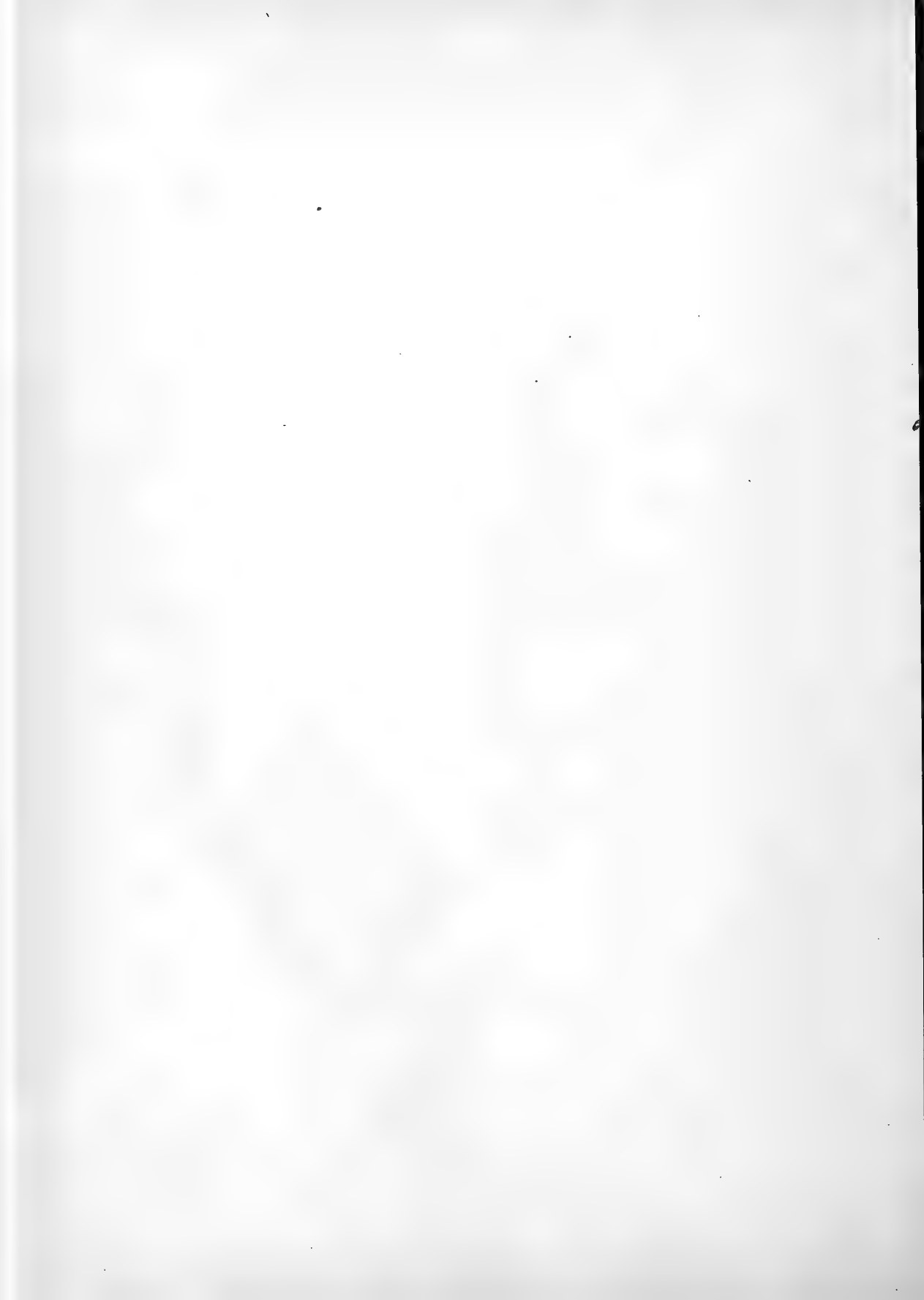
THE family URSIDÆ, comprising the Bears, has a tolerably wide distribution; they are absent from Australia and Southern and Tropical Africa, and only one species is found in South America. They are the largest and most powerful of American and European Carnivora. Considerable uncertainty still prevails respecting the generic classification of the bears; we shall follow Wallace, who divides them into *five* genera or sub-genera, and fifteen species.

A glance at the teeth of the members of this family shows that they are omnivorous, and more inclined to a vegetable than to an animal diet; hence it is probable that their ferocity is exaggerated, for although they exhibit desperate courage in defending themselves, they seldom seem aggressive. The brain of the bear is highly developed, and they are consequently possessed of considerable intelligence, and soon learn all kinds of accomplishments. Their walk is plantigrade, that is, they place the whole sole of the foot on the ground; they progress at a rapid rate, and soon overtake a man; they can climb and swim excellently; their sense of smell is very acute. When attacked they stand upright, and strike with their forepaws, which carry long and sharp claws, they parry neatly, and are remarkably dangerous from the fearful energy they display in the very last moments of life.

I.—GENUS THALASSARCTOS.

The POLAR BEAR, *Thalassarctos maritimus* (Plate XXII), is the *only* representative of the genus. It is almost entirely carnivorous, its food







POLAR BEARS

PLATE XXII CARNIVORA



consisting of fishes and seals, which it captures skilfully. It can swim long distances, and has been seen swimming steadily across a strait forty miles wide. Its fur is of a silvery white, tinged with a yellow hue rather variable in different specimens; the claws are black, the neck is very long in proportion to the body, and the head is small, sharp, and almost snake-like. The foot is equivalent in length to one-sixth of the entire length of the body, and the sole is covered with thick fur.

The Polar Bear has a most acute sense of smell, which enables it to detect the breathing holes which the seals make through the ice, even when the snow is lying thickly over them. After its repast it lies down to sleep, and is often carried off to sea on the moving ice-fields; one was observed two hundred miles from land, and as fish are not easily caught at sea, it doubtless had a hard time. Sometimes whole herds of Polar Bears have been carried by drift-ice to civilized shores, where they prey on sheep and cattle, to the dismay of their unwilling hosts, and are said not to hesitate to attack man. Instances have been known where they have pursued hunters back to their ships, and tried to make their way into the cabins through the port-holes.

The Polar Bear dreads heat, and in a climate like ours requires to have daily poured over it, winter and summer, sixty to eighty pails of water. It always remains wild and savage, and even when caught young, can be only very slightly tamed.

Its flesh is very good, and the animal is hunted for it by the natives as well as by all whale-fishers and Arctic explorers; but the liver must be avoided; Kane, for an experiment, tasted the liver of a newly killed animal, and became seriously sick in consequence.

It is said that the female of this genus hibernates, but that the male continues in the active exercise of all his faculties. The Polar Bear sometimes attains the length of nine feet, and the average is over eight feet. Ross weighed one which had lost thirty pounds of blood, and it tipped the scale at 1131 lbs., while Lyon saw one that weighed sixteen hundred pounds.

II.—GENUS URSUS.

The *twelve* species which constitute this genus are found in all the northern regions of the globe from the arctic circle to Mount Atlas and the Gulf of Mexico, and present a striking similarity over this extensive region.

The BROWN BEAR, *Ursus Arctos* (Plate XXIII), is found in the old world from Spain to Kamtschatka, and from Lapland to Mount Atlas, and is only absent from Belgium, Denmark, England, Germany, and Holland. It requires for its dwelling large unfrequented forest lands rich in fruits and berries, for it seldom attacks cattle. Ants are a favorite food; it scrapes their nests up with its powerful claws, and devours them and their eggs, and, as is well known, it is especially fond of honey: these, however, are but luxuries, its staple food consists of cranberries, blueberries, strawberries, and the like. But when it is unable to find vegetable sustenance, it exhibits a taste for flesh, and will attack sheep and goats, or devour carcasses that fall in its way. When rendered desperate by the pangs of hunger, it will assail the benighted traveler; even when he seeks to protect himself by a ring of fire, the bear dips himself in the nearest stream, then returns with his thick fur well saturated with water, and rolls over the burning embers, extinguishing them effectually. This curious fact is well known to the natives of Siberia, so that they have good ground for the respect in which they hold the bear's intelligence.

During the autumn the bear becomes fat, and makes preparations for hibernating. A curious phenomenon now takes place in the animal's digestive organs, which gives it the capability of remaining through the entire winter in a state of lethargy, without food, and yet without losing condition. As the stomach is no longer supplied with nourishment, it soon becomes quite empty, and, together with the intestines, is contracted into a very small space. No food can now pass through the system, for a mechanical obstruction—technically called the "tappen"—blocks up the passage, and remains in its position until the spring. The "tappen" is almost entirely composed of pine-leaves, and the various substances which the bear scratches out of the ants' nests.

It remains in its den till the middle of April, and is said to emerge as fat as when it entered, unless it has lost the "tappen" too soon. During the winter, the bear gains a new skin on the balls of the feet, and Mr. Lloyd, who has studied their habits carefully, suggests that the curious habit of sucking the paws, to which bears are so prone, is in order to facilitate the growth of the new integument.

In old days, bear-baiting was a favorite amusement of royalty. Queen Elizabeth was a constant patron of the sport, and in the last century, Augustus the Strong, the king of Poland, was ardently devoted to

it. But the improvement of manners has abolished this cruel amusement, and the bear is only called upon to display his talents by dancing and going through the platoon exercise.

Bears are seen in all Zoological Gardens, and the Swiss city of Berne keeps several in honor of its name. The bear in captivity is usually gentle, and takes cakes and food from visitors. The bear's name in "Reynard the Fox" is "Bruin," but in Paris all bears at the Jardin des Plantes are called "Martin." They derive this name from a celebrated fellow-captive. He was unrivaled at begging and catching in his mouth the pieces thrown to him. He earned his glorious fame by killing a soldier. This man saw something shining in Martin's den, and mistook it for a piece of gold. He foolishly went down to pick it up, but it only turned out to be a brass button; Martin attacked and killed him, and from that day became a prominent character in the Jardin des Plantes.

The SYRIAN BEAR, *Ursus Isabellinus* (Plate XXIV), is possessed of a coat which in youth is a grayish-brown, but in mature years, white. The hair is long and curled, and hides a thick woolly fur, while at the neck and shoulders it projects like a mane.

To this species belonged an animal which enjoyed a high reputation at Oxford and elsewhere, on account of his singularly gentle and amusing manners. The bear, which was generally known by the name of "Tig," being an abbreviation of the somewhat lengthy name of Tiglath-Pileser, was for some time a noted celebrity in Oxford, whither he was brought in his early boyhood. High-spirited and rather tetchy in temper, he was very affectionate to those who treated him with consideration, and was perfectly amenable to proper discipline; he was accustomed to don a regulation cap and gown, and under this learned shade to perambulate the college, and partake of the hospitality of its members.

On one occasion he contrived to escape from bondage, and made at once for a candy-store. The owner took to flight at his entrance, and when his pursuers entered they found Mr. Tig seated upon the counter, helping himself to brown sugar with a liberal paw, and displaying such an appreciation of his good fortune that it was not without much trouble that he was removed from the scene of his repast. He was rather peculiar in his tastes, and had attained to a highly civilized state of epicureanism, for his chief delicacies were not, as might be supposed, the produce of the garden or the field, but the more sophisticated dainties of hot muffins and cold ices. He was a most social animal, and if left

alone, even for a short time, would cry and lament in the most pitiful of tones.

The fur of this animal is valuable for its warmth and beauty, and the Syrians still believe in the medicinal virtues of its fat. Even in Europe "Bear's Grease" was for a long time considered a specific for various injuries; but at present it is only heard of in hair-dressers' shops.

THE AMERICAN BEAR.

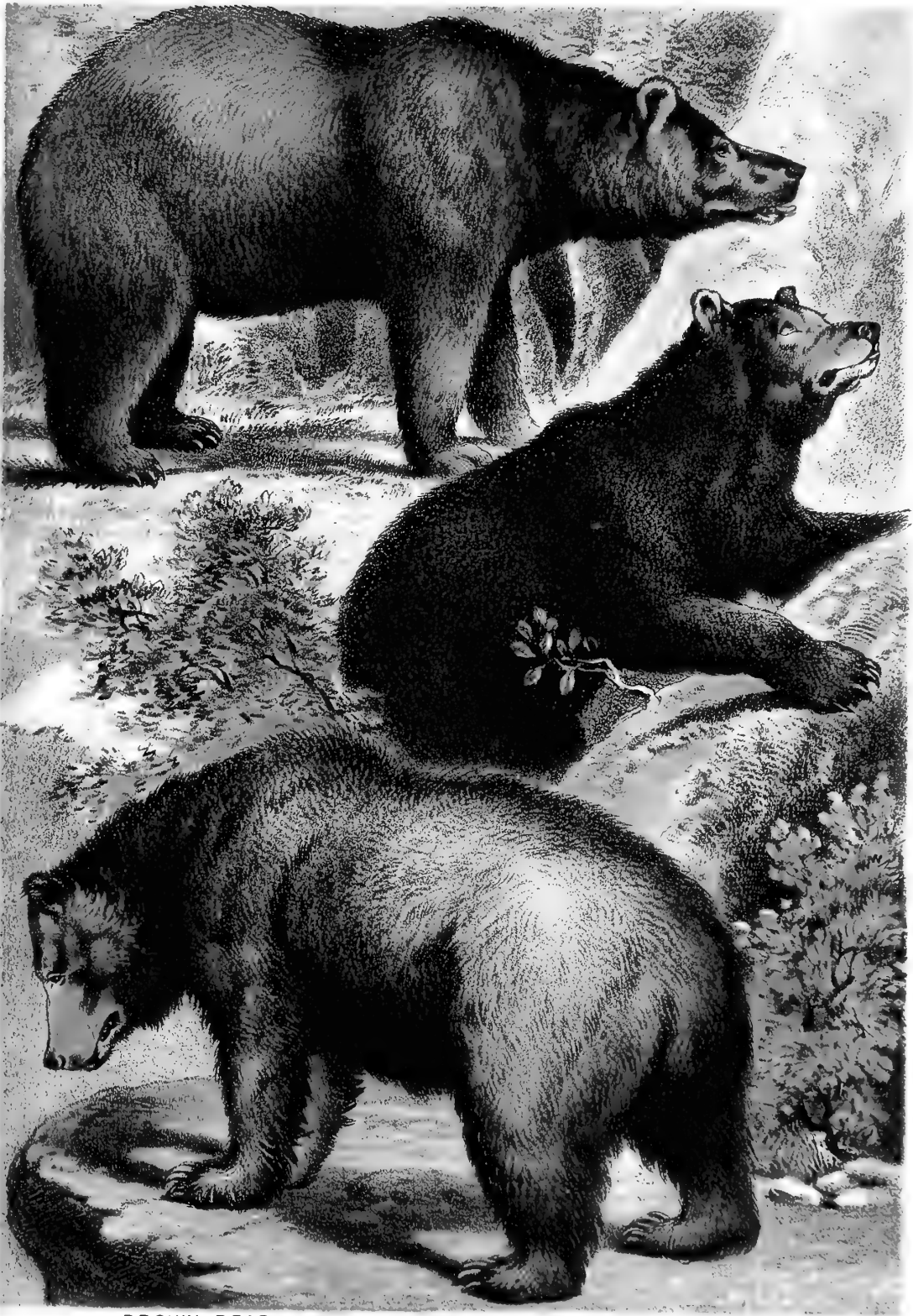
The BLACK BEAR, *Ursus Americanus* (Plate XXIII), had formerly a great range of country, and was once so common in New York State, that the city had a bear-market. It is a very inoffensive animal, and lives chiefly on fruit, insects, and small animals. Audubon says, contrary to the usual opinion, that it will prefer flesh to fruit any day, and confirms the statement that it is fond of fish. The Black Bear is small and of a uniform black or brown color, and is hunted for its fur and fat, which have a commercial value, as well as for its flesh, which is smoked before it is sent to market. Its weight rarely exceeds three hundred pounds. It is chiefly found in mountains and thickets, or in the cane-brakes of the South, and gives good sport when hunted with dogs, as it runs pretty quick, and then takes to a tree. It is really no more dangerous to the hunter than a hog of the same size would be.

As a general rule, they will never fight a man unless forced into it. When they have cubs, and are followed closely, they will keep them ahead and follow close in the rear to protect them. If pushed closely, they will make a great show of fight, growl, and tear the bark from the trees with much fuss and noise, and do their utmost to frighten off the enemy; and, if there is no help for it, they will fight fiercely when brought to bay. Bears when known to be with young are left alone, unless the hunters are well armed for a fight. Experienced dogs greatly assist the hunter, and do much toward checking the speed of the bear. Now and then they nab Bruin by a hind-leg, which worries him greatly. After a dog has tackled a bear once, however, he knows enough to keep out of the reach of his paws, and, being nimbler than Bruin, he has little trouble in avoiding his grasp.

It is said that instead of becoming extinct among the Catskills, bears are more numerous now than ever before. A well-known trapper gives as his reason for this that a number of years ago, when the mountains







BROWN BEAR

GRIZZLY BEAR

BLACK BEAR

PLATE XXIII. CARNIVORA



were well timbered, the bears could scarcely find anything to eat, and had to live on roots, bark, and whatever game they could lay their paws on. Since the wood has been cleared off, shrubs and bushes have grown thickly, intermingled with briars and trailing vines, which furnish berries and other food, capable of sustaining considerable numbers.

Although the white hunters chase and kill the bear without any remorse of conscience, the copper-colored races are so impressed with the intellectual powers of this cunning and dangerous animal, that they endeavor to appease the manes of a slaughtered bear, or Musquaw, as they call it, with various singular and time-honored ceremonies. The head of the slain animal is decorated with every procurable trinket, and is deposited ceremoniously upon a new blanket. Tobacco-smoke is then solemnly blown into the nostrils of the severed head by the successful hunter, and a deprecatory speech is made, in which the orator extols the courage of the defeated animal, pays a few supplementary compliments to its still living relations, regrets the necessity for its destruction, and expresses his hopes that his conduct has been, on the whole, satisfactory to the dead Musquaw and its relations.

This curious custom is the more remarkable, as it bears a close analogy to the belief of the Scandinavians, who are little less fastidious in their conduct towards the bear. No true Norwegian will ever speak of a bear as a bear, but prefers to mention it as "the old man with the fur cloak;" or, more tersely and poetically, the "Disturber."

The CINNAMON BEAR, *Ursus cinnamoneus*, is a variety of the Black Bear; its hair is rather longer and softer, and its color a dark chestnut with purple shades.

THE GRIZZLY BEAR.

The GRIZZLY BEAR, *Ursus ferox* (Plate XXIII), is the most terrible animal on this continent, the largest of American Carnivora. It is found over all North-western America, most abundantly on the slopes of the Rocky Mountains. In the fall it comes down from its usual dwelling in the mountains, and hunts for berries, grapes, and wild fruit in the plains. General Dodge says the Grizzly is very shy, and takes to cover at the slightest suspicious circumstance, always running away if it can, and never attacking except when cornered or wounded. In that case its assault is furious, and quite regardless of the number of its foes, and

then its size and strength, its immense teeth and claws, its tenacity of life and ferocious determination render it a terrible antagonist to the bravest and coolest sportsmen.

The Grizzly Bear varies in color; some specimens are of a dull brown, flecked with gray, while others are of a steely-gray; but the grizzled hairs are always conspicuous. The length of a full-grown male is about eight feet and a half, and the girth the same, while the weight is about eight hundred pounds. The fore-limbs are very powerful, the feet measuring eighteen inches, and the claws five inches; these claws are very sharp, and cut like chisels; the head is large, the tail very short and quite hidden in the fur. The gait of the Grizzly is awkward and rolling; when young it can climb trees; fortunately, however, as it increases in size and weight, it loses this power, its claws being unable to sustain its unwieldy bulk.

The Grizzly is the king of all our animals, and can destroy by blows from his armed paws even the powerful bison of the plains; wolves will not even touch the carcass of this dreaded monster, and, it is said, stand in such awe, that they refrain from molesting deer that he has slain. Horses also require careful training before they can be taught to allow its hide to be placed on their backs.

Terrible stories are told of encounters with Grizzlies. General Dodge says one of the most complete wrecks of humanity he ever witnessed was a huntsman for a party of California miners. He suddenly, one day, came face to face with a Grizzly; the bear stood up on its hind-legs, the man presented his rifle, and stood waiting the attack. The bear advanced, and took the muzzle of the rifle in its mouth, the man fired, and before he had time to think was in the bear's clutches. "It was all over in a second," the narrator stated; "*I didn't feel any pain*, and I didn't know nothing more till I come to next day." His companions found the man and the bear together, the latter dead with a bullet in the brain; the man had received only one stroke from each paw. One fore-paw had passed over the shoulder, and a claw had hooked under the shoulder-blade and torn it out entirely; the other fore-paw tore all the flesh from the left-side; a hind-claw had torn open the abdomen, letting out the bowels, while the remaining hind-paw had torn away the muscle of the right-leg from groin to knee. The man recovered, and when he described the fight to the General, added, "Anybody can fight bear that wants to; I've had enough grizzly."

The same officer tells of a remarkable escape. A she-grizzly overtook a sportsman and knocked him senseless with one blow; she then smelt him carefully, and being satisfied that he was dead, retired. His friends, who had remained at some distance, were just about to proceed to recover his remains, when the body sprang to its feet and made the best possible time to the top of the hill where they were standing. This man was not injured, his clothes only having been torn off; he reported that he came to his senses while the bear was smelling him.

Dr. Parker Gillmore had a regular duel with a Grizzly. The bear was standing up behind a tree; as it peeped round the trunk the sportsman fired, but the bullet only smashed a paw. The bear fell, but rose again in an instant, and went for the aggressor; he fired again, but the result was only a momentary recoil, the gun was sent flying, and he was prostrated. Two or three stabs from his sheath-knife settled the monster. Fortunately, before Gillmore came to close quarters, the bear had one fore-paw smashed, and his lower jaw splintered.

III.—GENUS HELARCTOS.

This genus comprises only *one* species, which is called the "Sun-bear," because it has the very unbearable habit of basking in the sun. The generic name, *Helarctos*, is compounded of the Greek words *Helios* "the sun" and *arctos* "bear." The Sun-bears are found in the mountains of Nepaul, and in the Malay archipelago.

The BORNEAN SUN-BEAR, *Helarctos Malayanus* (Plate XXIV), is not a large animal, measuring when full grown about four feet and a half; but it is powerful for its size, and is armed with very long claws. The head is thick, and the neck remarkably developed in comparison with the head: the eyes are small and lively, but the ears are large. The fur is very fine and glossy, of a deep black color, with the exception of a crescent-shaped patch of white on the breast, which, in some varieties, is of a fulvous yellow hue. It feeds chiefly on vegetables and honey, and is very destructive to the young cocoa-trees. It is called in Java the "Bruang."

It is easily tamed. Sir Stamford Raffles, who possessed one of these bears, permitted it to live in the nursery, and never was obliged to chain, chastise, or otherwise punish the good-tempered animal. Being some-

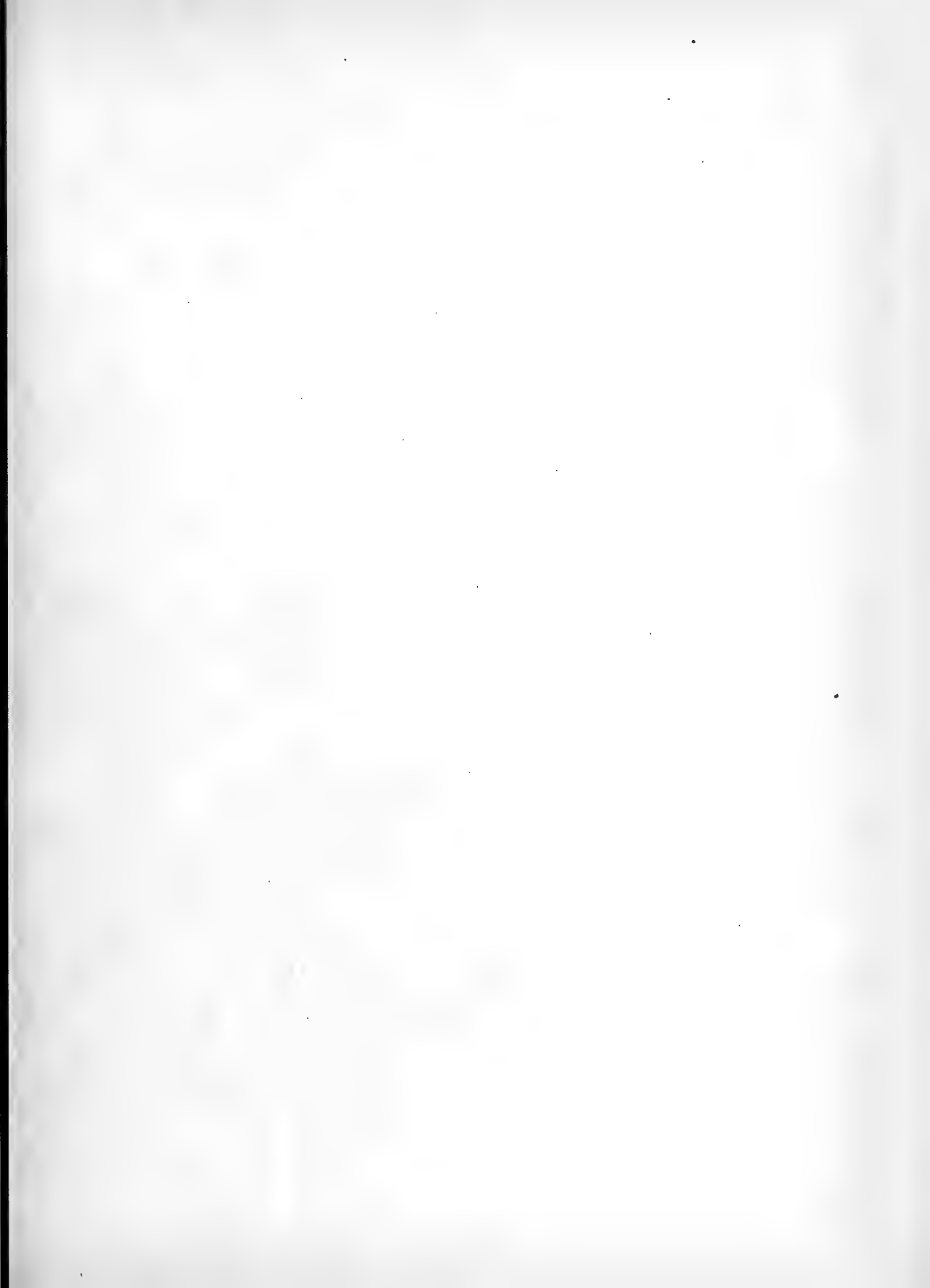
thing of an epicure, and often admitted to his master's table, the Bruang would refuse to eat any fruit except mangosteens, or to drink any wine except champagne. It may seem remarkable that a bear should display any predilection for fermented liquids, and more so that it should be so fastidious as to select champagne as the wine which it honored with its preference. Such, however, was the case, and the animal was so fondly attached to the champagne-bottle, that the absence of his favorite liquid was the only circumstance that would make him lose his temper. His affectionate disposition led him to extend his friendship to various of his acquaintances, and he was on such excellent terms with the entire household, that he would meet on equal footing the cat, the dog, and a small Lory, or Blue-mountain bird, and amicably feed with these domestic favorites from the same dish.

One of these bears that was successfully domesticated was able to eat animal as well as vegetable food, but was fed exclusively on bread and milk, of which it consumed rather more than ten pounds per diem. It is possessed of much flexibility of body, and is very fond of sitting on its hind legs, thrusting out its long tongue to an extraordinary distance, and ever and anon withdrawing it into the mouth with a peculiar snapping sound. While thus engaged, it makes the most grotesque and singular gestures with the fore-limbs, and rolls its body from side to side with unceasing assiduity.

IV.—GENUS PROCHILUS.

The *one* species of this genus is found from the Ganges to Ceylon, and is characterized by a short thick body, short limbs, and large feet armed with enormous sickle-shaped claws. It is usually found in the mountains, and is equally dreaded and admired by the natives.

The SLOTH BEAR, *Prochilus* (or *Melursus*) *labiatus* (Plate XXIV), is nearly five feet long. Its flat, low-browed head is prolonged into a narrow-pointed proboscis-like snout of very peculiar construction, and the nostrils and lips are very mobile; the latter can be so protruded and contracted that they form a kind of pipe nearly as useful as a trunk. Through this lip-pipe the long, thin, flat tongue is constantly shot out, so that the animal can draw things near it, and then suck them up. The hair is very long, of a deep black color with some brownish hairs, and a







SYRIAN BEAR

SLOTH BEAR

BORNEAN SUN BEAR

PLATE XXIV CARNIVORA



forked patch of white on the breast. When it walks, its fore-legs cross each other; its feet are remarkably sensitive, and soon blister.

This bear is liable to lose its incisor teeth, a peculiarity which led earlier writers to class it among the *Edentata*, and style it a Sloth. It is called indifferently the Sloth Bear, the Jungle Bear, the Lipped Bear, or the Honey Bear. The Hindoo name is Aswail. It is very sensitive to heat, and remains in its den during the noontide glow; its diet is chiefly vegetable, the exceptions being honey and oats. Its flesh is in much favor, and is said to be very good.

When captured young, it is easily tamed, and can be taught to perform many curious antics at the bid of its master. For this purpose it is often caught by the native mountebanks, who earn an easy subsistence by leading their shaggy pupil through the country, and demanding small sums of money for the exhibition of its qualities. On account of its association with these wandering exhibitors, it has been called by the French naturalists "Ours Jongleur." Whether owing to the natural docility of the animal, or to the superior powers of its instructor, it performs feats which are more curious and remarkable than the ordinary run of performances that are achieved by the Learned Bears of our streets.

V.—GENUS TREMARCTOS.

The solitary species of this genus is isolated in the Andes of Chili and Peru, and is commonly known as the *Ursus ornatus*.

The SPECTACLED BEAR, *Tremarctos ornatus*, is black, with the exception of two yellow marks above the eyes; as these are of a semicircular shape, they suggest the common name. Little is known of its habits in its wild state, and it has not been domesticated.

One curious detail in the physiology of all the bears is the extraordinary smallness of the young at birth, compared with the bulk of the parents, for they are not larger than cats. The mother has, like the cat, the habit of licking her cubs with her tongue to clean them, and she performs this highly necessary operation so assiduously that a legend has arisen that "she licks them into shape."



CHAPTER XVII.

THE EARED SEALS AND WALRUSES.

THE EARED-SEALS—THE FUR SEALS AND HAIR SEALS—THE SEA-LION—THE SEA-BEAR—VALUE OF ITS FUR—THE FUR SEALS—THE CALIFORNIA HAIR SEAL—THE CALIFORNIA OR NORTHERN SEA LION—MANNER OF CAPTURING IT ALIVE—THE WALRUS.

THE family OTARIADÆ comprises the sea-bears, sea-lions, and eared-seals. These animals are divided by Wallace into *four* genera, but Mr. Allen, in his paper in the "Bulletin of the Harvard Museum," arranges them into five. They are confined to the cold and temperate shores of the North Pacific and similar regions in the Southern Hemisphere.

The Eared Seals, as the OTARIADÆ are commonly called, form a distinct family from the Earless Seals, or *Phocidæ*; they can walk on their limbs with the body raised from the ground, and they rest with their hind-legs bent forward; they cannot swallow under water, and come to the surface during the process of mastication; the pupil of the eye dilates and contracts to an enormous extent. Mr. Allen divides the Eared Seals into two sub-families, the *Trichophocinæ* or Hair Seals, and *Oulophocinæ* or Fur Seals; but Dr. Gray objects to this classification as overlooking the fact that the abundance of the under-fur depends on the season of the year, and the age of the animal. In ordinary parlance the distinction between Hair and Fur Seals is common; the latter are hunted for fur as well as their oil, as they furnish the seal-skin jackets of fashion. These furs differ much in appearance; in most species the hairs are much longer than the under-fur; in others, they only slightly overtop the soft woolly fur, which is very dense, forming a soft, elastic coat. Their habits resemble those of the Earless Seals. The young are brought forth far inland, and are taught to swim very gradually, their dams devoting much time to this duty. They are naturally quiet and peaceable animals, and have no dread of mankind.

I.—GENUS OTARIA.

This southern representative of the Sea Lions is found on the coasts of South America, and the islands southward as far as Graham's Land. It is very abundant in Tierra del Fuego and the Falkland Islands. It seems to perform annual journeys of considerable length to reach its breeding-places, where the females bring forth and nurse their young for some time before leading them into the water. There is only *one* species of this genus, which is the *Phocarctus* of Gray.

The SEA LION, *Otaria jubata* (Plate XXV), attains the length of about nine feet; its fur generally lies flat, but on the neck and shoulders is developed into a short mane, which gives the creature a leonine aspect. The head is of a yellowish-brown color, the muzzle black, the back yellowish-gray, the hairless paddles look black. The female has a darker color, and is without a mane.

The Otariæ are not pursued so zealously as the rest of the family, their skin being comparatively worthless, and their oil scarcely repaying the cost incurred in taking them.

II.—GENUS CALLORHINUS.

The *only* species of this genus is an animal found on the coasts of Kamtschatka and Behring Straits and California in the North, and of Patagonia in the South, having thus a very wide distribution. It is characterized by an elongate skull, round forehead, and small, narrow fore-flippers. It is a Fur Seal.

The NORTHERN SEA BEAR, *Callorhinus ursinus* (Plate XXV), is the *Otaria ursina* of Peters, and the *Arctocephalus Californianus* of Gray. It attains the size of eight to nine feet, the females, however, being only half that length. The head is long, the neck short but clearly distinguished from the body, the tail short, the mouth small, the eye large, dark and lively. The coat consists of somewhat stiff hairs, with very soft, delicate silky fur thickly covering the skin. The ground color is a dark brown, sprinkled with white-tipped hairs on the head and neck. The fur is of a reddish tint. Old females are of a silver-gray color, and the young of both sexes have a silvery coat.

The Sea Bears, like the Otariæ, are migratory, but it is not known where they pass the winter; they return in spring, each family to the same spot for years in succession; an Indian chief in Alaska observed a male that had lost one of its flippers come back to the identical rock for seventeen years. Steller writes that each male has eight to fifteen females, whom he watches jealously, and, although on the coasts where they were observed these seals were lying in thousands, yet each family kept distinct; such a family, consisting of an old male, his wives, his sons and daughters, and yearlings which had not yet paired, amounts often to one hundred and twenty. The females bring forth usually two cubs, which are covered with very fine brilliant black wool, and which play about like young dogs, while the father looks placidly on, only interfering when a quarrel takes place, in which case he always caresses the conqueror. The males also fight among themselves for the possession of the females, or a resting-place on the shore; old defeated males are often found leading a solitary life, and they are bad-tempered and vicious. Their cries are of three sorts; when unoccupied, and on land, they low like cows that have lost their calves; when fighting, they growl like bears; when victorious, they utter repeatedly a loud scream which Steller compares to the note of a house-cricket; when wounded they spit like cats. The males kiss the females, according to the same observer, and wag their hind-flippers as a dog does his tail. They are very active, and swim ten to twelve knots an hour. They are very tenacious of life, and will stand before dying two hundred knocks on the head.

The Sea Bear is especially hunted for his fur, and, fortunately, any number of these seals can be obtained. On St. Paul's Island there were twelve miles of coast occupied by these creatures with an average width of fifteen rods. Allowing twenty seals to the square rod, we have the number of breeding seals as 1,152,000: deducting one-tenth for males, there remains 1,037,800 females. The Russian Fur Company used to pay to the fishers ten cents a skin, the skin when salted being worth three dollars. This price fluctuates with the fashions of the day. When Alaska was transferred to us the price of seal-skins rose to seven dollars, but in 1871 it fell again to three dollars. In 1873, it is estimated that 145,000 were taken, and the net value of the fishery is put down at \$1,175,000 per annum. Besides the skin, each seal yields a gallon and a half of oil. The chief time for hunting is from June to September. The skins of the young are much prized for clothing.

III.—GENUS ARCTOCEPHALUS.

The seals of this genus are usually divided into *three* species, but there is considerable difference of opinion as to how far subdivision should go. The name *Arctocephalus* is formed from two Greek words, and means "Bear-head." All the species are Fur Seals, and of great commercial value.

The CAPE FUR SEAL, *Arctocephalus Antarcticus*, is found near the Cape of Good Hope. Gray gives the following descriptions in his "British Museum Hand-book": "(1.) Adult male, slight mane, called 'Large wig;' fur whitish, under-fur reddish. (2.) Adult without mane, called 'Middling;' fur reddish-white, under-fur reddish. (3.) Young, called 'Black-pup;' fur black and polished, under-fur brown and very thin."

The SOUTHERN FUR SEAL, *Arctocephalus nigrescens*, is found at the Falkland Islands. It is the *Arctocephalus Falklandicus* of Allen, and is peculiar to America.

The AUSTRALIAN FUR SEAL, *Arctocephalus cinereus*, is black, with an abundant reddish-brown under-fur.

The chief distinction on which classifiers rely for this distribution into species, is the position of the fifth grinder in the upper jaw. The Southern Fur Seal is the only one of importance in a commercial point of view. It is remarkable for the closeness and elasticity of its short and even fur, which can be worn without removing the long hairs. When these, however, have to be removed, it is done by shaving the fleshy side of the skin till the deep roots of the long hairs are severed, when the hairs fall out.

IV.—GENUS ZALOPHUS.

The chief representative of this genus, of which *two* species are known, is

The CALIFORNIA HAIR SEAL, *Zalophus Gillespii*, which is found in the North Pacific and on the coasts of Japan and California. The under-fur is very thin. Gray communicates the interesting fact that a line drawn across the palate at the front edge of the zygomatic arch leaves one-third of the palate behind the line.

The AUSTRALIAN HAIR SEAL, *Zalophus lobatus*, has very little under-fur, and small toe-flaps. Its upper grinders are all single-rooted, and the sixth molar is absent.

We add to these species of Hair Seals one which is still waiting for classification. The specimen on which Gray labored had no head, and therefore he is unable to give us his usual charming details about molars and zygomatic arches.

The CAPE HAIR SEAL, *Arctocephalus? nivosus*, has very black, short fur with small white spots. It differs from *Arctocephalus Antarcticus* in the length of the hair, and by having no under-fur.

V.—GENUS EUMETOPIAS.

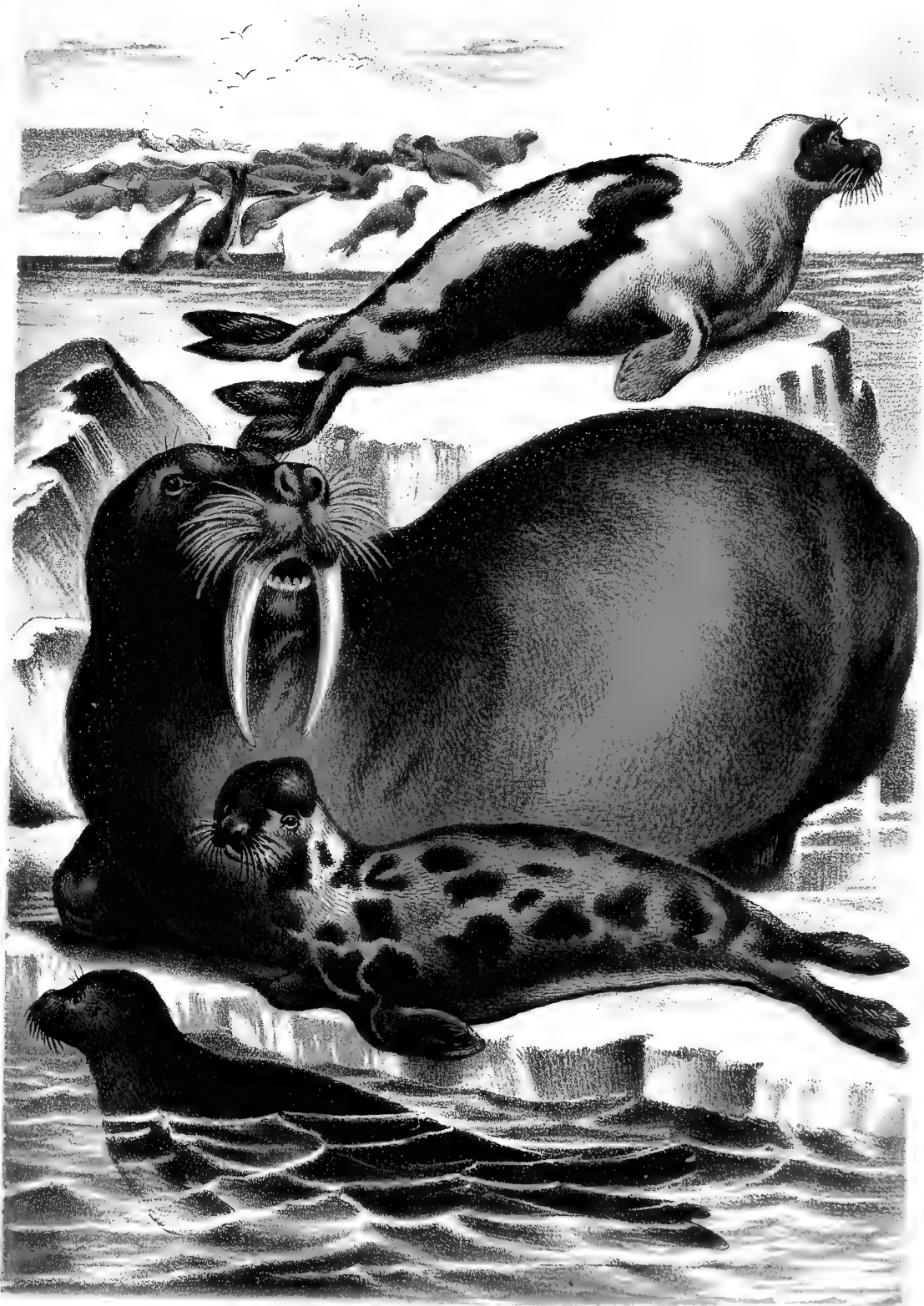
The *one* species is found in Behring Straits and on the coast of California. It has no under-fur, and the flap of the toes is very short.

The NORTHERN SEA LION, *Eumetopias Stelleri*, was called by Steller himself *Lco marinus*. The jaw is much more elongated than in the *Otaria jubata*. This is the SEA LION OF CALIFORNIA. It reaches the enormous size of fifteen feet, and weighs sixteen hundred pounds; the eye is large and expressive; the limbs, which discharge the duties of legs, feet, and fins, are covered with a rough, horny skin, while the rest of the body is hidden in a short, hard, brilliant coat of hair. The males are of different colors, the females are usually light brown, and only half as large as their partners, while the lordly male has around its neck a heavy mass of stiff curly hair, which gives it a lion-like look. During the autumn, great numbers are found at Behring's Island, and in July it comes down the American coast. The male confines himself to three or four females.

They are very ferocious in aspect, but in disposition very peaceable or even sluggish, and fall an easy prey to the hunter, great numbers being slain by the natives by means of harpoons and poisoned arrows, when they come ashore to breed. Their sojourn on shore lasts about four months on the California coast, and a few years ago thousands of barrels were annually filled with their oil. In consequence of the visible diminution of their numbers, at present only males are killed. South of Santa Barbara, there rises a rocky ledge accessible on one side; here, when the sun goes down, fifty to a hundred males will congregate till morning. If a boat approaches, they glide into the water, and wait







TRUE SEAL

WALRUS
CRESTED SEAL

HARP SEAL

PLATE XXV CARNIVORA



there till the human foe has departed. One day, however, a landing was successfully effected by pulling against the wind, and the poor brutes were massacred, for a seal-hunt is a mere butchery of unresisting victims. At present the authorities of California carefully preserve the Seal Rock, which has become one of the natural curiosities of San Francisco.

Sea Lions are in demand for menageries and aquariums all over the world. Captain Mullett, who supplies this demand, gives an interesting account of the method of capture.

“ Our field of operations is on the lower or Mexican coast of California, as we are not allowed to catch the lions in American waters. We are therefore compelled to operate off San Diego, which is the dividing line of California and Mexico. Our method of capturing the lions is this: They go in rookeries of one hundred or more, and we watch the shore to see where they will go into camp. This we can determine from the fact that they carry their young on shore, leave them, and go back to the water, returning at break of day. When we find a camp, we dig trenches in the sand to hide in, or if there are rocks convenient, we hide behind them. The vessels are anchored some distance off the shore, and we bring from them in small boats cages made of six-inch fencing-boards. When the herd comes ashore, the lassoers watch their opportunity, and lasso one of the lions around the neck. Another lasso is then fastened to one of the hind-flippers, and the lion is forced into one of the cages. This must be done within a short time, or the animal will not live. I give orders that if twenty minutes elapse from the time the animal is lassoed until he is in the cage, the men must let him go. This is necessary, from the fact that if kept longer, they struggle and strain themselves so that they die within a few days afterwards. After the lion is captured, a shot, to which a long rope is attached, is fired from a bomb-gun on the shore over the vessel; the other end of the rope is attached to one of the cages, and it is pushed into the breakers and hauled out to the vessel. On board the vessel the lions are not put in water, but are kept wet with a sprinkler. They are then taken to San Francisco, where they are placed in cars built for the purpose, and transported across the continent, each car containing twelve lions.”

THE WALRUS.

The family of the TRICHECHIDÆ comprises only *one* genus and *one* species, the well-known Walrus or Morse. It is a very characteristic

animal of the North Polar Regions, and is seldom found straying south of the Arctic Circle, except on the coasts of North America, where it sometimes reaches latitude 60° . It is most abundant on the shores of Spitzbergen, but it is not found between longitude 80° and 160° east, or between 100° to 15° west of Greenwich.

The WALRUS, *Trichechus Rosmarus* (Plate XXVI), which is also commonly called the Sea Horse, is truly a monster of the deep. When fully grown, it has been known to reach a length of from twenty to twenty-four feet, and weighs two thousand to three thousand pounds, but is usually rather smaller. Its huge body is thickest in the middle, but does not taper down to the tail so finely as in the seals; the powerful limbs project outwards and downwards to such an extent that the elbow and knee-joints are plainly to be seen; the feet have all five fingers, with short blunt claws which do not reach the end of the fingers; the tail is a mere flap of skin. The head is small, the muzzle short, the upper-lip fleshy, the under-lip swollen, on both sides of the muzzle is a considerable number of round, stiff bristles, and in front there protrude two enormous tusks two feet and upwards in length, growing downwards from the upper-jaw. The skin is nearly devoid of hair, and of a liver-brown color.

The Walrus has been long known, and has formed the subject of countless fables. Albertus Magnus says that in the North Sea is a whale-elephant that climbs up rocks with its tusks. The fishermen come up to it when it is asleep, raise the hide near the tail from the blubber, and make it fast with a rope to the rocks. They then pelt the creature with stones; upon which it drops out of its skin and falls into the sea, where it is helpless. Olaus Magnus adds his quota of legend. A few centuries ago, the Walrus was found much farther to the south than it is now; Hector Boece describes it as being a regular visitor of the Scotch coasts, and stray ones have been seen on the shores of the Orkney islands and the Lewis as late as 1857. The swimming powers of the Walrus would enable it easily to accomplish such a journey, but it is, more than all other animals of its kind, restricted by the necessity of procuring food to certain regions. It avoids the deep sea, and sailors know that the sight of one is an indication of land in the neighborhood, for experience has told them that it seldom leaves the pack-ice round the islands. There vast herds are found, as many as seven thousand having been seen in a single herd, clambering in endless succession on to the shore. A single ice-floe often has twenty walruses sleeping on it. When the herd is

reposing, one of them remains on guard, and at the first sign of danger wakens his comrades with his terrible roar, and then the whole party either take to flight or prepare for war; and they are no cowardly foes!

Scoresby writes: "The Walrus is a dauntless creature; he examines an approaching boat with curiosity, not with dread; an attack on one is resented by all the herd; they gather round the boat, dash their tusks through its sides, or suspend themselves by them on the gunwales." "I was once," Brown relates, "in a boat where a walrus was harpooned; it dived at once, but rose again immediately, and in spite of our lances, axes, and muskets, sent its tusks through the sides of our boat, so that we were glad to cut the harpoon-line, and escape to the ice-floe which the walrus had left." Another whale-fisher was pursued by a herd, and when he landed, was regularly besieged. In all cases it is dangerous to meddle with this monster while he is in the water, while its vigilance renders it a difficult task to reach it on land.

A Walrus is a valuable animal, for its skin, teeth, and oil are in much request, while among the Esquimaux its body furnishes them with almost every article in common use. Among civilized men, the skin of the Walrus is employed for harness and other similar purposes where a thick and tough hide is required. The tooth furnishes very good ivory, of a beautiful texture, and possessing the advantage of retaining the white hue longer than ivory which is made from the elephant-tusk. The tusks are sometimes two feet in length, and seven inches in circumference, weighing ten pounds each, but usually attain only half this size. The oil is delicate, but there is very little to be obtained from each Walrus, the layer of fatty matter being scarcely more than a hand's-breadth in thickness. Fish-hooks are made from its tusks, its intestines are twisted into nets, its oil and flesh is eaten, and its bones and skin are also turned to account by the rude but ingenious Esquimaux.

The food of the Walrus consists chiefly of various kinds of mollusca, and it seems probable that the chief use of its formidable tusks is to scrape these shell-fish from the rocks. The Walrus has other than human foes: the Esquimaux speak of its terrible combats with the Polar Bear, and say that when the latter has seized one, the Walrus throws itself and its enemy together into the sea, and drowns him.

The number of young which the Walrus produces at a litter is seldom if ever more than one, and when newly born, the little animal is about the size of a yearling pig. Winter is the usual time of year for the

appearance of the young, and the mother always repairs to the shore or to the ice-fields for the purpose of nourishing her family. The maternal Walrus is very attentive to her charge, and while in the water is very solicitous about its welfare, carrying it about under her fore-limbs, and defending it from any danger that may arise, regardless of her own safety in watching over that of her offspring. When a mother Walrus is surprised upon the shore, she places her young one upon her back, and hurries away to the sea, bearing her precious burden.

The English name of this strange creature, *Walrus*, means "strange horse," the specific title *Rosmarus* is a Latinized form from the Norwegian name *Rosmar* or "Sea-horse"; the appellation "Morse" seems derived from the Lapp name "*Morsk*."

A very full account of the Walrus is given by Dr. Kane in his "Arctic Explorations," to which we refer our readers who desire further information.



CHAPTER XVIII.

THE TRUE SEALS.

THE COMMON SEALS—THEIR WIDE DISTRIBUTION—THEIR HABITS—THEIR LOVE OF MUSIC—ROBBIN'S REEF—THE CASPIAN SEAL—THE HOE-RAT—THE HARP-SEAL—RICHARD'S SEAL—THE BEARDED SEAL—THE GRAY SEAL—THE WHITE-BELLIED SEAL—THE SEA LEOPARD—THE CRAB-EATING SEAL—THE FALSE SEA LEOPARD—THE LARGE-EYED SEAL—THE SEA ELEPHANT—THE CRESTED SEAL—THE WEST INDIAN SEAL.

THE family, PHOCIDÆ, or True Seals, is pretty equally divided between the Northern and Southern Hemispheres, frequenting almost exclusively the cold and temperate regions. The absence of an external ear, the short limbs which seem stuck into the body, the hairy flippers, and the teeth, distinguish the animals of this family from the Eared Seals already described.

They are usually divided into *thirteen* genera, and Gray groups these genera into five sub-families, the first of which (the sub-family of the PHOCINÆ), contains *five* genera.

I.—GENUS CALLOCEPHALUS.

The *three* species of this genus are distributed over the coasts of Greenland, the North Sea, and the Caspian Sea, and also in Lakes Aral and Baikal, and the occurrence of seals in these inland waters is a fact of peculiar interest. In the case of the Caspian and Lake Aral, it is remarked by Wallace, that as they are connected with the Northern Seas by extensive plains of low elevation, a depression of less than five hundred feet would open a communication with the ocean. At a comparatively recent epoch, a gulf of the Arctic Sea must have extended to the Caspian till the elevation of the Kirghiz steppes cut off the passage.

Lake Baikal offers greater difficulties, for it is a fresh-water lake situated in a mountain district two thousand feet above the sea-level,

and separated from the plains by several hundred miles of high land. Mr. Wallace adds: "We are accustomed to look at seals as animals which exclusively inhabit salt water, but there seems no reason why fresh water should not suit them, provided they find in it a sufficiency of food, facilities for rearing their young, and freedom from the attacks of enemies. Mr. Belt's ingenious hypothesis that during the Glacial epoch the northern ice-cap dammed up the waters of the northward flowing Asiatic rivers, and thus formed a vast fresh-water lake which might have risen as high as Lake Baikal, seems to offer the best solution of the curious problem."

The true seals keep closer to the coast than the eared-seals, and are rarely seen over thirty nautical miles from land. On land their movements are awkward—they cannot walk like the eared-seals, but only shuffle along; in the water they are perfectly at home, working their fore-flippers as a means of propulsion, while the hind one seems more used to steer by, and swimming with great speed. They are often seen sporting in the sea, leaping in and out of the water, racing in circles, and so occupied with their pursuits that a fisher can approach them unperceived. When alarmed, they dive, but do not stay very long under water, coming to the surface to breathe once a minute, on the average, and perhaps never remaining more than six minutes under water. Wallace observes that the seal has the curious habit of sleeping for three minutes, and then waking for three minutes.

The voice of the seal is usually like that of a calf, but when angry it utters a growling bark. The eye is very peculiar, the pupil is neither round nor oblong, but four-rayed; the eye is very expressive, and the seal when wounded or alarmed sheds tears. In spite of the absence of an external ear, the sense of hearing is good, and the creature is very susceptible to music, listening with great complacency to the sound of bells. The seals will raise their heads above water and listen to the song of the sailors weighing the anchor; at Iboy in the Orkneys, the church stands on the shore, and when the bell rings for divine service, the seals are observed swimming shoreward straight to the spot whence the sound proceeds, and then listening with rapture as long as the bells are ringing out their summons to all good Christians.

They are easily tamed, learn their names, and come when called for, and it is said that some have been trained to fish. The females are devoted to their young, playing with them and defending them at all

risks; when hard pressed, they take their offspring in their fore-paws, press it to the breast, and fling themselves into the water; if flight is difficult, the mother never deserts her child, but remains to share its fate, whether it be captivity or death.

The food of the seal is almost exclusively fish, and they work sad havoc in salmon fisheries, as they occupy the mouths of the rivers and catch the ascending fish. In some regions, therefore, they are hunted as destroyers; in others, they are hunted as the most valuable of animals. The Greenlanders use every part of the seal, civilized men prize its water-proof skin and its oil. The seal-fishery is a mere slaughter, especially as carried on by the professional seal-fishers. Another enemy is the species of dolphin, *Orcinus orca*, which the Greenlanders call the "Seal's Master"; and the terror of this foe makes the seals lay aside all their fear of man, and they will come up on shore and crowd like dogs around the fishermen, as if hoping to find protection. The Polar Bear, too, is assiduous in capturing them.

The COMMON SEAL, *Callocephalus vitulinus* (Plate XXVI), is found on our northern and eastern shores, and is the common seal of Europe. It is not, however, very numerous south of Hudson's Bay; a small colony is said to have existed at Nahant, but usually only individuals are seen in our waters. It is probable, however, that they were once common in New York harbor, as the reef named Robbin's Reef derives its name from the Dutch word for seal, "Robbe."

This seal attains the length of five or six feet, and the female is larger than the male. The head is round, the eye large and with a sagacious expression, the ear marked only by a slight elevation, the neck short, the body tapering from the shoulders to the tail, the fore-feet short, the hind-feet broad. The hide is covered with stiff shining bristles over a thin undercoat, the color is gray, with brown and black spots.

It is found all through the North Atlantic, on the coasts of Spain, France, England, Scandinavia and Iceland, in the Baltic, in the Sound and Belt, as well as in the Gulf of Bothnia and Finland, in the Mediterranean Sea, in the White Sea, and on all our Northern Coast. It has been seen in the Gulf of Mexico, and even on the north coast of South America.

To the Esquimaux this seal is indispensable; his food consists of its flesh, his hut is lighted with its oil, its blood is formed into soup, its sinews are used for fishing-lines and in countless other ways, its finer

membranes are dried, and, as they are transparent, are used to cover the windows of the hut. Each seal furnishes about half a barrel of oil.

The CASPIAN SEAL, *Callicephalus Caspicus*, seems to be a mere straggler from the great army of Common Seals, and to possess no very characteristic marks, distinguishing it from its fellows.

II.—GENUS PAGOMYS.

This genus embraces *two* species, and is distinguished from the preceding genus by the greater depression of the skull.

The HOE-RAT, *Pagomys fœtidus*, is the smallest of the northern seals, and obtains its specific title *fœtidus* or “stinking” from the vile odor emitted by the old males.

III.—GENUS PAGOPHILUS.

The seals contained in the *two* species of this genus have a longer and narrower head than the common seal, a flatter forehead, a longer muzzle, a shorter hand, the second finger being the longest.

The HARP SEAL, or ATAK, *Pagophilus Greenlandicus* (Plate XXVI), may be taken as the representative of the genus. It is also called the Saddle-back Seal, and derives its name from its remarkable coloring. Its coat is a whitish-gray, on which two broad semicircular bands of deep black are drawn, extending from the shoulders to the tail; the muzzle and forepart of the head are also black. This marking is not conspicuous till the animal attains its fifth year.

The Harp Seal is generally about seven feet in length, and is found in great numbers on the coasts of Greenland, where it congregates in large herds. It prefers to take up its abode upon floating ice-islands. The oil it supplies is said to be purer than that from other seals, and it is furnished with an extraordinary amount of blubber. In its habits it resembles the Common Seal, and like it, it is easily tamed.

Two of these animals which were placed in the zoological collection at the Jardin des Plantes, were at their first arrival extremely shy, and would avoid the person of man with every mark of terror. Yet in a very short time they became quite tame, and would voluntarily seek the caresses of those who had behaved kindly toward them. They also

struck up a great friendship with two little dogs, and would allow their little playfellows to take all kinds of liberties with them, permitting the dogs to sit on their backs and bark, and not even resenting an occasional bite. They would even permit the dogs to take their food from their mouths; but if any of the seal-tribe attempted to act in like manner, a sharp combat immediately took place, the weaker being forced ultimately to succumb to superior might. In cold weather, dogs and seals were accustomed to huddle closely together for the sake of warmth, and when the dogs made their way out of the entrance, the seals did their best to follow their little playfellows, caring nothing for the rough ground over which they were forced to pass. This Seal stands in great dread of other species of Seal, such as the Sea Lion and Sea Bear, and according to many accounts holds the spermaceti whale in awe, being chased by that formidable creature into the shallow waters of the shore. Twice in the year the Harp Seal indulges in a migration similar to that of the Sea Leopard. The young of this species are sometimes two in number, although the maternal Seal is often forced to content herself with a single child.

IV.—GENUS HALICYON.

The *two* species mentioned by Gray are probably identical, and we may regard them as the sole representative of the genus.

RICHARD'S SEAL, *Halicyon Richardsii*, the best known species, is found on the Californian and Oregon coasts.

V.—GENUS PHOCA.

Of the *three* species of this genus we need mention only one.

The BEARDED SEAL, *Phoca barbata*, is so called from its long mustaches; from its size, it has also obtained the name of the Great Seal. It attains a length of about fifteen feet, is of a dark-brown color, with short stiff hair, and frequents lonely and sequestered places. The Esquimaux say its blubber has a very delicate taste, and its skin is used for their harpoon lines.

The other species are found in the North Pacific, and in Japanese waters.

Gray's sub-family HALICHÆRINA contains only *one* genus, of *one* species.

VI.—GENUS HALICHÆRUS.

The GRAY SEAL, *Halichærus gryphus*, is common on the Swedish and Scotch coasts. The muzzle is broad and rounded, the skull high in front, the nostril very large. In many respects it resembles anatomically the walrus, and like the latter, has a small brain, and consequently little intelligence.

The next sub-family is called by Gray MONACHINA, and the genus *Monachus*. We prefer Wallace's nomenclature.

VII.—GENUS PELAGIUS.

The ocean near the island of Madeira, and the Black and Mediterranean seas are the homes of the *two* species of this genus.

The WHITE-BELLIED SEAL, *Pelagius albiventer*, is found in the Mediterranean, especially on the borders of the Adriatic Sea. It varies in size from seven feet to over ten feet. It is one of the most intelligent of the family. M. Boitard says that he saw one which had been in captivity for two years, and which, let loose in ponds and even in large rivers, came to its master when called.

The sub-family STENORHYNCINA contains *four* genera.

VIII.—GENUS STENORHYNCUS.

The *solitary* species of the genus inhabits the Antarctic Ocean, extending northward to the Falkland Islands, New South Wales, and New Zealand. It is named by Gray the SEA LEOPARD, *Stenorhynchus leptonyx*; the hinder feet are nearly clawless, and resemble somewhat the tail-fin of a fish.

IX.—GENUS LOBODON.

This also is represented by *one* species.

The CRAB-EATING SEAL, *Lobodon carcinophoca*, has a pale-olive color on the head and back, and hind-feet; the fore-feet, sides of face, and belly are yellowish-white, and the whiskers white. Like the preceding genus, it is found in the Antarctic Seas.

X.—GENUS LEPTONYX.

The FALSE SEA LEOPARD, or LEOPARD SEAL, *Leptonyx Weddellii*, the only species yet discovered, is distinguishable from the other Seals by means of its slender neck, and the wider gape of its mouth, which opens further backward than is generally the case. The body is rather curiously formed, being largest toward the middle, from whence it tapers rapidly to the short and inconspicuous tail.

The fore-paws are without any projecting membrane, and are largest at the thumb-joint, diminishing gradually to the last joint. The claws are sharp and curved, and rather deeply grooved; their color is black. The hind-feet are devoid of claws and projecting membrane, and bear some resemblance to the tail-fin of a fish. The color of this Seal is generally a pale gray, relieved with a number of pale grayish-white spots, which have earned for the animal the name of Leopard Seal. The external ears are wanting.

Very little is known of the habits of this Seal. Captain Weddell, who first noticed this species, speaks of it casually as a well-known animal, merely mentioning that his men caught so many Leopard Seals, or that they secured so many Seal skins and so many Leopard Seal skins in the course of their hunt.

It is not a very large animal, as the average length of the largest specimens is scarcely ten feet. Around the largest part of the body the circumference measures nearly six feet and a half, round the root of the tail about two feet three inches, and round the neck barely two feet. It was recorded by Captain Weddell to have been seen off the South Orkneys. Some specimens in the British Museum were taken off the eastern coast of Polynesia. As far as is yet known, these animals are only found in the Southern hemisphere.

XI.—GENUS OMMATOPHOCA.

This genus is distinguished by a short, broad muzzle, and very large orbits of the eyes. Its habitation is the Antarctic Ocean. It contains only one species.

ROSS'S LARGE-EYED SEAL, *Ommatophoca Rossii*, has a greenish-yellow fur, with oblique yellow stripes on the side.

Gray's last sub-family is that of the CYSTOPHORINA or Crested Seals, and comprises *two* genera.

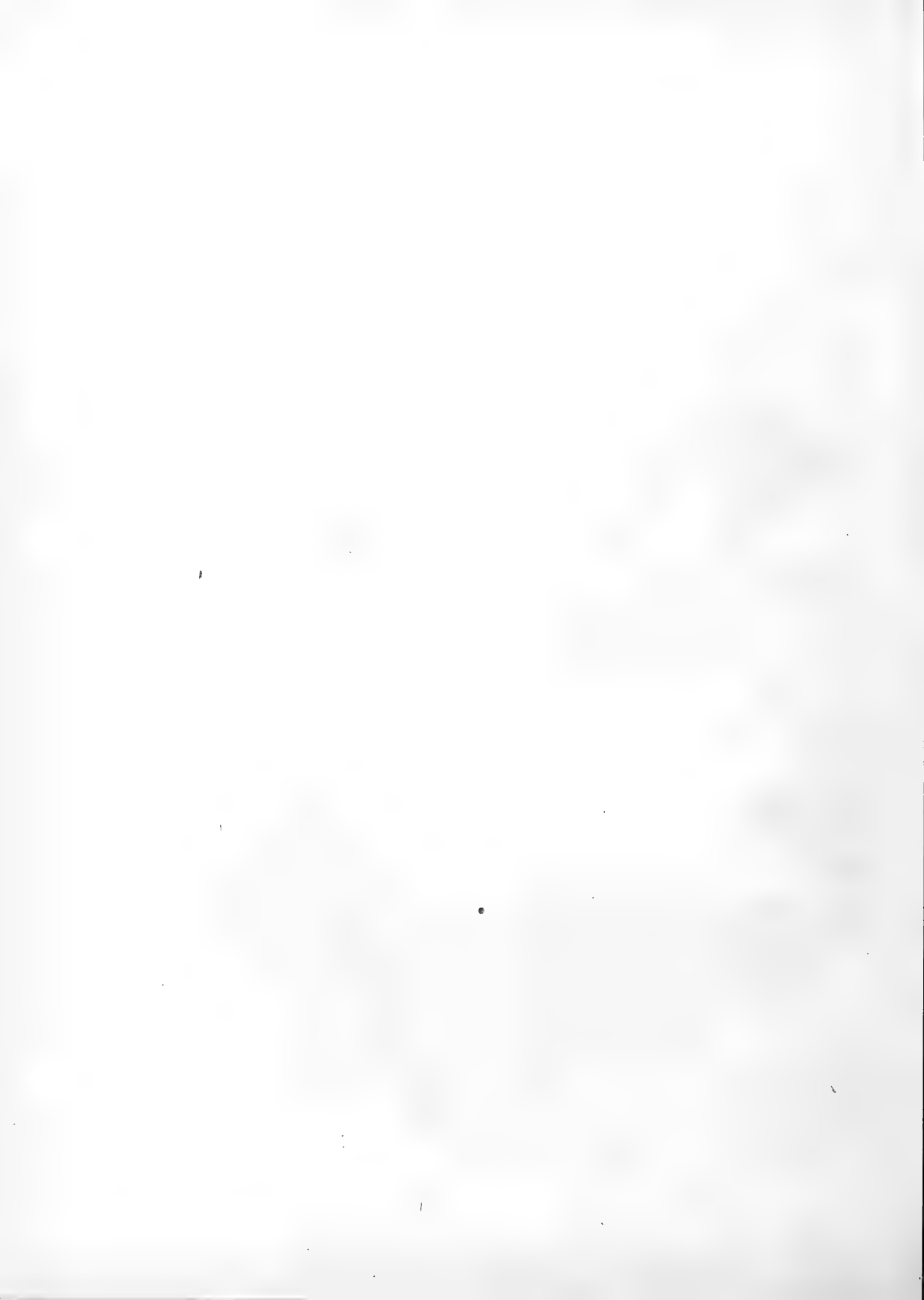
XII.—GENUS MORUNGA.

The *two* species of this genus are found in California, the Falkland Islands, and in general the temperate regions of the Southern Ocean.

The SEA ELEPHANT, *Morunga elephantina* (Plate XXVI). This enormous animal, when fully grown, has a length of twenty-five feet, and a circumference of sixteen feet. It has a prominent proboscis, which, as well as its great size, justifies its name. When fully developed this feature attains in the male a length of about four feet. It has the power of drawing in or extending it at will. The color of the male is a dark grayish-blue or brown, and that of the female a dark olive-brown above, and a yellowish-brown below. It has four fingers and a short thumb on the fore-limbs, with perfect nails, but the hind-toes are nailless. The hair is rather coarse, but the thick skin was formerly in much request for harness. The blubber yields an odorless oil, which burns without smoke. Sea-elephants were formerly found in shoals in the Antarctic seas, but have been almost entirely exterminated. One of the Falkland Islands was called Elephant Island, from the number of these creatures that frequented it; but when Lecomte was there, he found the place deserted. Their food is chiefly cuttle-fish and sea-weed.

It is a migrating animal, moving southward as the summer comes on, and northward when the cold weather of the winter months would make its more southern retreats unendurable. Their first migration is generally made in the middle of June, when the females become mothers, and remain in charge of their nurseries for nearly two months. During this time the males are said to form a *cordon* between their mates and the sea, in order to prevent them from deserting their young charges. At the expiration of this time, the males relax their supervision, and the whole family luxuriates together in the sea, where the mothers soon regain their health and strength. They then seek the shore afresh, and occupy themselves in settling their matrimonial alliances, which are understood on the principle that the strongest shall make his choice among the opposite sex, and that the weakest may take those that are rejected by his conquerors, or none at all, as the case may be. None but the brave obtain the fair.







SEA BEAR

SEA LION
SEA ELEPHANT

PLATE XXVI. CARNIVORA



During the season of courtship the males fight desperately with each other, inflicting fearful wounds with their tusk-like teeth, while the females remain aloof, as quiet spectators of the combat. They are polygamous animals, each male being lord over a considerable number of females, whom he rules with despotic sway. When the victorious combatants have chosen their mates, they are very careful about their safety, and refuse to quit them if they should be in any danger. Knowing this fact, the seal-hunters always direct their attacks upon the females, being sure to capture the male afterward. If they were to kill the male at first, his harem would immediately disperse and fly in terror, but as long as he lives they will continue to crowd round him.

Although these animals are of so great dimensions and bodily strength, and are furnished with a very formidable set of teeth, they are not nearly such dangerous antagonists as the walrus, and are most apathetic in their habits. When roused, they never use their teeth, but waddle away toward the water, their huge bodies shaking like jelly. So plentifully are they supplied with blubber, that one male will furnish seventy gallons of oil.

The extraordinary proboscis is not very conspicuous till the animal is excited; then it protrudes it, blows violently through it, and has a most formidable appearance. The female is entirely destitute of this extraordinary and inexplicable appendage.

At present the Sea Elephant is found chiefly near the Crozet Islands and Kerguelen's Land, but it seems possible that in a few years it will be as extinct as the Mammoth.

XIII.—GENUS CYSTOPHORA.

The preceding genus has the nose developed into a trunk; this one has it provided with a hood. The head is broad, and the muzzle very short, and over the head stands a cartilaginous crest, six or seven inches in height, supporting a hood-like development of the septum of the nares, which is covered with short brown hair, and can be inflated at will. This extraordinary head-gear is peculiar to the adult male. The genus contains *two* species.

The CRESTED SEAL, *Cystophora cristata* (Plate XXVI) is found spread over the coasts of Southern Greenland, and is in the habit of reposing much upon ice-islands, caring comparatively little for ordinary land. It

also frequents the shores of Northern America. From September to March it is found in Davis' Straits, but leaves that locality for the purpose of producing and rearing its young, and returns again in June, together with its offspring, in a very bare and poor condition. About July it takes another excursion, and employs its time in recovering the health and strength which it had lost during the period of its former absence, so that in September it is very fat, and altogether in excellent condition for the fisher who values it for its oil.

The Crested Seal attains the size of ten to twelve feet when fully grown, and then it is of a dark blue-black color on the back, fading away to a yellowish-white below: a number of gray patches, each with a dark spot, are scattered over the body; the head, tail, and feet are black. It is the lion of the Northern Seas, and shares with the walrus the empire of the Pole. The onset of an enraged Crested Seal is much to be dreaded, for the creature is marvellously fierce when its anger is roused, and its strength is very considerable. The teeth, too, are formidably powerful, and can inflict very dangerous wounds. In fighting, they can use their claws as well as their teeth. The males are always pugnacious animals, and during the season when they choose their mates are in the habit of fighting desperately among each other for the possession of some attractive female, and in these combats inflict severe lacerations. During these conflicts the two combatants express their mutual rage by emitting a torrent of loud, passionate, yelling screams, which are audible at a considerable distance. Various speculations have been made regarding the use of the crest, or rather, nasal bladder. It probably is useful by protecting that very vulnerable spot, the nose.

The WEST INDIAN CRESTED SEAL, *Cystophora Antillarum*, has a gray-brown color. In the Report of the U. S. Exploring Expedition to the Antarctic Seas, Dr. Pickering states that he saw one a hundred and thirty-five miles from land, swimming entirely by its pectoral fins.



ORDER V.

CETACEA.

Sub-Order—I. { 36. BALÆNIDÆ.
MYSTACETI. { 37. BALÆNOPTERIDÆ.

Sub-Order—II. { 38. CATODONTIDÆ.
ODONTOCETI. { 39. HYPEROODONTIDÆ.
{ 40. MONODONTIDÆ.
{ 41. DELPHINIDÆ.

CETACEA

CHAPTER I.

THE RIGHT WHALES.

THE CETACEA—THE FAMILY BALÆNIDÆ—THE GREENLAND WHALE—ITS MODE OF RESPIRATION—ITS BLUBBER—WHALEBONE—THE YOUNG WHALE—ENEMIES OF THE WHALE—THE WHALE FISHERY—AMERICAN WHALERS—MODE OF HUNTING THE WHALE—THE HARPOON AND BOMB-LANCE—AUSTRALIAN RIGHT WHALE—SCRAG WHALE—BISCAV WHALE—GENUS EUBALÆNA—GENERA HUNTERIUS, CAPERIA, MACLEAYIUS.

THE order at which we have now arrived contains some of the largest animals of the world. In land animals, whose weight has to be supported by limbs, there is evidently a limit to their size; while aquatic animals, buoyed up by the dense medium of water on every side, and surrounded by an inexhaustible supply of food, attain to enormous dimensions.

The CETACEA are mammals deprived entirely of hinder limbs. The trunk of the body is prolonged into a thick tail terminated by a broad fin which resembles in its general shape that of a fish, but is entirely composed of an expansion of the skin, supported by a tough cartilaginous substance. This tail, instead of being placed vertically, is horizontal, thus enabling the animals to plunge into the depths of the ocean, and rise again to the surface. The head is joined to the body without any apparent neck, and the fore-limbs are so flattened and hidden in the skin that they may easily be mistaken for pectoral fins. Dissection, however, shows that they present, under a modified shape, bones and fingers corresponding to those met with in the lion and the bat. Constructed entirely for swimming, the Cetacea are strictly confined to the waters; nevertheless they breathe air by means of lungs, and are therefore perpetually compelled to come to the surface for the purpose of respiration. Their blood is hot; they bring forth living young which they feed with their own milk, and thus, in all details of their structure, differ from the cold-blooded, gill-breathing, oviparous fishes. As the Cetacea often dive

to considerable depths, where the pressure of water is enormous, they are provided with a covering of great elasticity. Their skin is thickened, and made up of a texture of interwoven fibres enclosing an immense quantity of oil or blubber, which is admirably adapted to resist compression. This thick integument of fat retains the animal heat, and thus enables the Cetaceans to inhabit the coldest regions of the ocean, and as oil is lighter than water, it contributes greatly to the buoyancy of these unwieldy animals. A dead whale floats, but the carcass, when stripped of blubber, sinks immediately.

The order CETACEA is divided into two sub-orders; MYSTACETI, or true whales, which have the mouth provided with baleen or whalebone, and ODONTOCETI, sperm-whales, blackfish, porpoises, and the like, which have teeth in one or both jaws. The first sub-order contains *two* families, the second, *four*.

THE RIGHT WHALES.

The family BALÆNIDÆ is divided into *six* genera and *fourteen* species, but most of the latter are imperfectly known, and their classification is by no means settled; it comprises the "right" whales, of which the Greenland whale is the most important.

GENUS BALÆNA.

Into this genus *three* species are admitted without controversy; but a fourth, the so-called "Scrag Whale of Dudley," has been the subject of great doubt, as it is not known to whalers now-a-days, and is supposed by Cuvier to be a mutilated Rorqual.

The GREENLAND or RIGHT WHALE, *Balæna Mystacetus* (Plate XXVII), inhabits the Northern seas, and when full-grown, attains a length of sixty to seventy feet, with about thirty to forty feet in girth. Its color is velvety black upon the upper part of the body, gray at the junction of the tail and at the base of the fins, and white on the abdomen. The head is remarkably large, being about one-third of the length of the entire bulk. The jaws open very far back, and average sixteen feet in length, seven feet wide, and ten or twelve feet in height, affording space for a jolly-boat and her crew to float in. The tail is enormously powerful, enabling the largest whales, measuring eighty feet in length, to leap

clear out of the water, like a trout after a fly. This movement is technically called "breaching," and the splash of the creature as it falls back into the water may be heard for miles. The length of the tail in the larger whales is about five or six feet, but it is often more than twenty feet in breadth. The skin of the whale is devoid of hair, and is of very peculiar structure. The true skin constitutes the blubber, which is never less than two inches in depth, and in some places is nearly two feet thick; it is as elastic as caoutchouc, and in a large specimen will weigh thirty tons.

The whales are compelled to rise to the surface to breathe; their respirations are technically called "spoutings," because a column of vapor is ejected from the "blow-holes" or nostrils, and spouts up to the height of about twenty feet. These blow-holes are on the upper part of the head, so that very little of the carcass need be exposed during the operation; in fact, only the upper portion of the head and part of the back are visible. The "spoutings" can be heard for a considerable distance, and indicate to the fisher the presence of their victim. These "spoutings" at intervals would not be of any avail to oxygenize the blood unless the organs of respiration had been modified to meet the peculiar circumstances in which the whales are placed: the whales therefore are furnished with a large reservoir of arterial blood, which is contained in a mass of vessels lining the interior of the chest and the adjacent parts, and which are capable of holding a sufficient quantity of fresh blood to support life for a considerable period.

The spout is not formed of any liquid water; it is composed at one and the same time of hot air issuing from the chest, of a certain quantity of vapor of water, mixed with this air, and of greasy particles. So, when the temperature is rather high, the sea calm, and, above all, when the sun is near the zenith, this blowing, or spouting, is invisible. When the vapor from this blow-spout is disseminated into the air, it dissolves—all disappears; there falls nothing but a few little drops of greasy matter. These drops, diffused over the surface of the water, and joined to the exhalations of the skin, leave on the surface of the sea long trails of oily spots, which show the way by which the whale has passed. Of course there is always a certain quantity of water, which has penetrated into the aërial canal terminated by the blow-hole, and this water is mixed in a state of minute subdivision or particles, with the respired air, and disseminates itself in the atmosphere, like the pulmonary moisture.

The whales descend to depths so profound, that if a piece of dry wood be sunk to an equal depth, it will become saturated, and cease to float; their ears and nostrils require special adaptations to prevent the water from penetrating into these cavities; they are consequently provided with an ingenious valvular structure which closes the external orifices in proportion to the depth to which the animal dives.

The substance called "whalebone" is a very remarkable feature in the jaws of the Right Whales. This whalebone, or baleen, is found in a series of plates, thick and solid at the insertion into the jaw, and splitting at the extremity into a multitude of hair-like fringes. On each side of the jaw there are more than three hundred of these plates. The weight of baleen which is furnished by a large whale is about one ton. This substance does not take its origin directly from the gum, but from a peculiar vascular formation which rests upon it. These masses of baleen are placed along the sides of the mouth for the purpose of aiding the whale in procuring its food and separating it from the water.

The mode of feeding which is adopted by the whale is as follows: The animal frequents those parts of the ocean which are the best supplied with the various creatures on which it feeds, and which are all of very small size, as is needful from the size of its gullet, which is not quite two inches in diameter. Small shrimps, crabs, and lobsters, together with various molluscs and medusæ, form the diet on which the vast bulk of the Greenland Whale is sustained. Driving with open mouth through the congregated shoals of these little creatures, the whale engulphs them by millions in its enormous jaws, and continues its destructive course until it has sufficiently charged its mouth with prey. Closing its jaws and driving out through the interstices of the whalebone the water which it has taken together with its prey, it retains the captured animals which are entangled in the whalebone, and swallows them at its ease. The multitude of these little creatures that must hourly perish is so enormous, that the prolific powers of nature would seem inadequate to keep up a supply of food for the herds of whales that inhabit the Northern seas. Yet the supply is more than equal to the demand, for the sea is absolutely reddened for miles by the countless millions of medusæ that swarm in its waters.

The enormous mouth contains an immense tongue, which sometimes measures as much as twenty-five feet in length and twelve feet in breadth. This organ is very soft, and produces five to six barrels of oil.

The eye is placed immediately above the junction of the lips, very near the shoulder, and thus either eye can see only the objects on its own side; it is very small, and often difficult to discover; the eyelids are destitute of lashes, and so swollen by the grease which occupies their interior, that they are almost incapable of being moved. The structure of the eye is admirably adapted for aquatic media.

The Greenland Whale, as its name indicates, inhabits the Arctic seas without having, however, any fixed dwelling-place. Its coming and going depends on the state of the ice, and it immediately leaves a neighborhood when the ice is melted. According to some observers, the old whales never come south of 65° north latitude, nor the younger ones south of 64° . Between the 66° and 69° both young and old are seen regularly in December and January. In March, numbers are seen in the bays and near the islands of the coast of Greenland, but after that month they retire to the north, and in summer may be found in the latitude of 71° to 75° north, resuming their journey to the south in the end of September.

According to the observations of Scoresby and Brown, the whales pair about June or July, and bring forth their young (never more than one at a birth) in ten months. No one has yet seen how the little one is taught to suck. Other marine mammals are either born on land, or if born in the water, as is the case with the Sirenia, are clasped by the mother to her breast and raised above the surface. The whales, from their bodily structure, must, from the first moment of their lives, perform the same motions as the parent. Scammon states that the mother reclines on one side on the surface of the water in order to give suck. The young whale sucks for nearly a year, during which time the mother displays the utmost affection and solicitude, exposing herself to all dangers, and never leaving it as long as she is alive.

The movements of the whale are by no means so slow as we might imagine, if we regarded only the unwieldy shape of the carcass. A whale wounded at Scoresby Sound on the east coast of Greenland, was found dead next day on the west coast at Omenak; it must therefore have swum round Cape Farewell, and traversed a distance of nearly three hundred miles. Considerable difference of opinion exists as to the length of time the whale can remain under water. Under ordinary circumstances it seldom exceeds half an hour, although one instance is

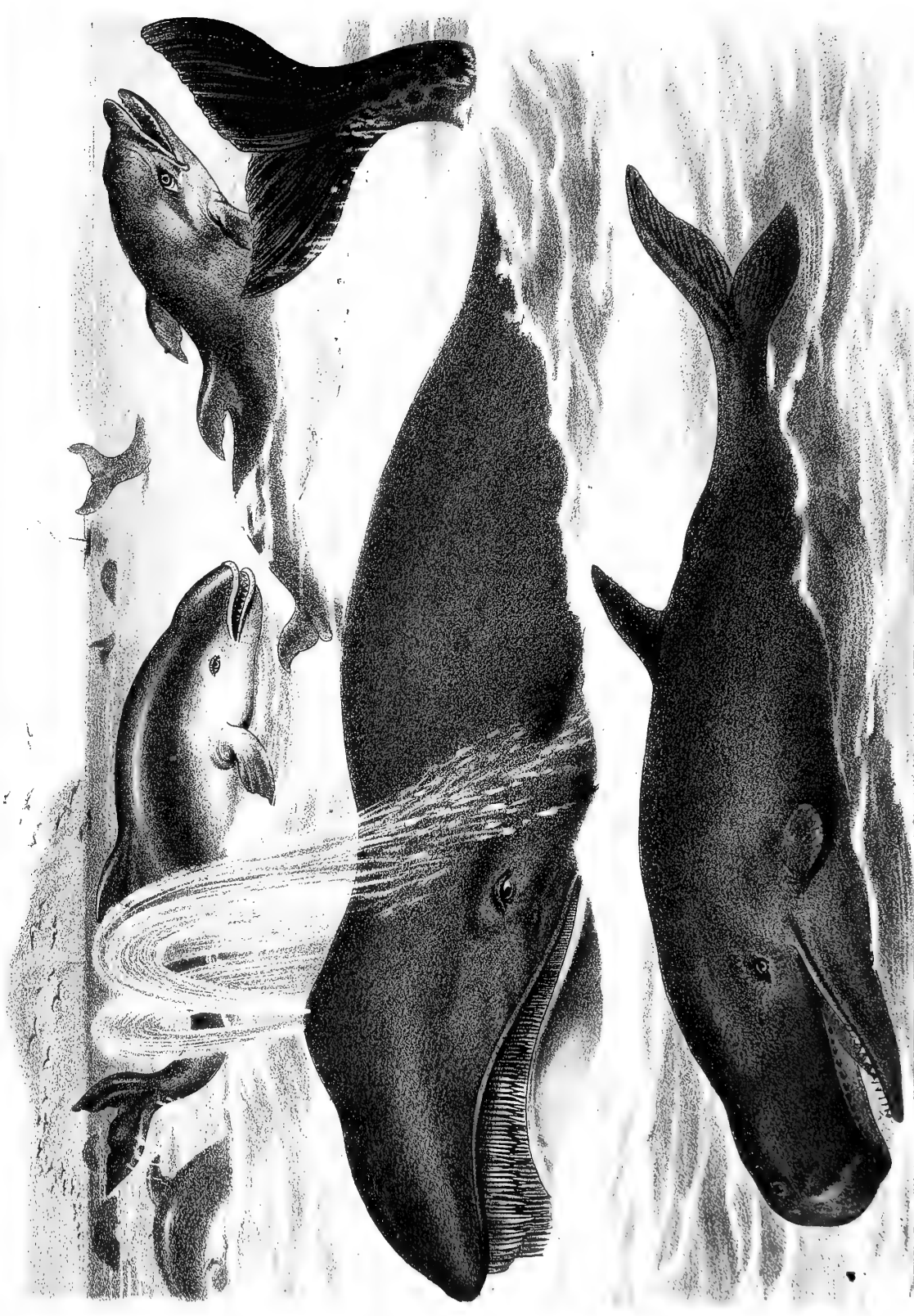
recorded where a wounded old whale remained an hour and twenty minutes without rising. When it did appear, it was terribly exhausted.

The whale possesses numerous enemies, the chief being the Gladiator Dolphin, the most savage of all Cetacea. The Thresher and Greenland Shark do not attack it while alive. A very circumstantial account, given by many writers, of a combat between the sword-fish and the whale, originated in a misconception, the name sword-fish being applied by many sailors to the above-mentioned Gladiator Dolphin. Each kind of whale has its own peculiar kind of parasite, one has the *Coronula*, another the *Diadema*, a third the *Tubicinilla*. They are all sunk beneath the surface of the skin, with the aperture for the free valve exposed, and as they grow in size, they sink deeper into the skin. Birds have often been observed alighting on the backs of whales for the purpose of picking up these cirripeds, but the operation does not seem to be acceptable to the marine monster, which usually dives with the utmost speed when it feels the first dig of the bird's beak.

The whale is an animal of great importance to civilized and to savage men. The oil which is procured in great quantities from its blubber and other portions of its structure is almost invaluable to us, while the bones and baleen find their use in every civilized land. To the natives of the polar regions, however, the whale is of still greater value, as they procure many necessaries of life from various parts of its body, eat the flesh, and drink the oil. Repulsive as such a diet may appear to us who live in a warm region, it is an absolute necessity in these ice-bound lands, such oleaginous diet being needful in order to keep up the heat of the body by a bountiful supply of carbon. But the best part of the whale is one that would hardly be expected to form an article of diet, namely the portion of the gums in which the roots of the baleen are still imbedded. The Tuskis call this substance their sugar, though its flavor is very like that of cream-cheese. One traveler who had been obliged, through motives of politeness, to take part in a native banquet, and who had been more than disgusted by the very remarkable dishes which were brought to table, became quite enthusiastic on the merits of whale's skin and gum, acknowledging himself to be agreeably surprised by the former, and calling the latter article of diet "perfectly delicious." On the shores of the Polar Sea whalebone is used for building purposes, and the dwellings thus constructed are described as better and more solid than most of the Siberian huts on that bleak coast.

[: [: : : : : < < : : :]





DOLPHIN

PORPOISE

RIGHT WHALE
BLACK FISH

PI A T F XXVII C F T A C F A



THE WHALE FISHERY.

The chase of the whale has been long practised, and has furnished material for countless stories of adventures. The figure copied from "Scoresby's Account of the Arctic Regions" of a whale tossing a boat and its crew far into the air is an artistic exaggeration; at the utmost, a whale has been known to toss a boat nearly three feet into the air. The occupation has enough of excitement and danger to dispense with any imaginary feats. The Basques are the people to whom belongs the honor of first fitting vessels for hunting the whale. Like other nations, these bold sailors at first contented themselves with attacking the rorquals that visited their native coasts, but as early as 1372 they ventured into the Northern seas. But the civil war of 1633 which ended in a success for the Spaniards, destroyed the whale-fishing enterprise of the Basques, many of whom left their country, and took with them a knowledge of the art. Hull, in England, sent out a whaling-ship in 1598, and the merchants of Amsterdam formed a company in 1611 to prosecute the fishing near Spitzbergen. The business speedily developed. Between 1676 and 1722 the Dutch had sent out 5,886 ships from their harbors, and captured 32,907 whales. In 1732 England offered a bounty to whalers, and even doubled the amount in 1749: the result was that soon afterward she had over two hundred ships engaged in the pursuit. At present the Americans are the most active. Scammon states that between 1835 and 1872 nearly 20,000 vessels had been occupied in the trade, and brought back a little over three and a half million barrels of spermaceti, and six and a half million barrels of train oil; worth, altogether, two hundred and seventy-two millions of dollars. This statement leads to the conclusion that 3,865 sperm whales, and 2,875 right whales were killed annually. The year 1854 shows the largest figures, 668 ships, 73,696 barrels sperm, and 319,837 barrels train oil: while, in 1872, the numbers had fallen to 218 ships, 44,880 barrels sperm, and 31,395 barrels train oil, and in 1876, to 169 ships of all sizes.

Whale-fishing is not only a very dangerous and laborious pursuit, but it is also exceedingly precarious. Sometimes a complete cargo of oil and whalebone is taken in a short time, but it also happens that after a long cruise not a single whale is caught.

The Greenland whale-fishery was at first confined to the seas between Spitzbergen and Greenland, but at present the whalers seek the higher

latitudes of Baffin's Bay, sometimes entering Lancaster Sound and Barrow's Straits.

The ships leave their harbors for the Arctic fishing-grounds in spring, and when they reach the fishing-grounds, either cruise to and fro, or lie at anchor in a favorable spot. Men are placed at the mast-head to look out. The cry, "There she blows," brings all the crew on deck, the boats are at once manned with six or eight rowers, a helmsman and a harpooner, and row with all speed toward the unsuspecting whale. The harpoon is a long, lance-like weapon, provided with a strong barb, and made fast to a very long, very flexible rope which is rolled on a reel with the utmost care, as any kink in it as it runs out would imperil the boat. The boat approaches as near the whale as possible, the harpooner rises and poises his weapon. He flings it with all his strength, and the rowers immediately back-water to get away from the wounded animal. Usually it dives at once, and with such speed that the line runs from the reel with such violence that it has to be kept cool by pouring water over it. It often, indeed, happens that the boat is dragged for hours by the wounded creature in its headlong flight. The whale appears at the surface in about a quarter of an hour, in order to breathe; the boat from which it has been struck and other boats from the ship approach; a second weapon is plunged into the body. The fish rolls from side to side, leaps out of the water, dives furiously, leaving a whirlpool behind it; rises once more, only to meet a new lance. Blood is driven out from the blow-holes, and the sea is dyed red; a vain expenditure of strength makes the ocean boil, then comes a final quiver, and the whale sinks on one side, a plaything for the waves; while, in the Southern seas, thousands of birds, chiefly petrels and albatrosses, are flying around waiting to make a meal of the dead monster.

When the whale is dead, it is made fast alongside of the ship, belly upward, its tail forward, and its nose level with the stern of the vessel. It is not without great difficulty that this enormous mass, which just now traversed the sea with such facility, can be towed so as to be landed on the shore.

In olden times the fishermen of the north of Europe used to cut up the whale by going upon its carcass, provided with boots furnished with cramp-irons. They thus stripped off bands of blubber along the whole length of the animal, from head to tail. But this way of cutting up the whale was long, difficult, and even dangerous.

The whalers in the Southern Ocean have a better way of proceeding: this consists in cutting out, along the whole length of the animal's body, a broad continuous band shaped like a screw, beginning at the head and only finishing at the tail, very nearly in the same way in which children proceed when they are taking off the peel of an orange.

The head is drawn up by pullies, and they then detach, by means of sharp spades, one side of the under-lip, and take it away; they then detach the tongue, which weighs many thousands of pounds; then the other half of the lip; next the upper jaw, with its whalebone-plates, which are becoming more and more sought after in commerce every day. Then they begin to cut a thick band of grease and skin, which they keep on detaching, hauling up on board, and stowing away. It is thus that they unwind, as we may say, the whale, making its body turn round on itself. The blubber is then melted; a single Right Whale will yield twenty tons of oil.

The harpoon, however, has been superseded by the *bomb-lance*. This weapon contains about one hundred grains of powder, and can be thrown by a heavy gun a distance of over twenty fathoms. When the gun is fired, the projectile penetrates into the fleshy parts of the animal, the fuse which had been kindled by the explosion of the gun, sets fire to the powder in the bomb, the bomb explodes and throws out barbs. If the explosion of the charge takes place in the lung, death is nearly always instantaneous.

The Greenland fishers estimate the size of the fish by the size of the whalebone, and when this is six feet long, the whale is called a size-fish. The flakes of whalebone are from ten to fourteen feet in length in full-grown specimens, the breadth of the largest at the thick end is about a foot. As regards the color of the whalebone, it is variable. In the young, the laminæ are frequently striped green and black, but on the old animal they are occasionally altogether black; often some of the laminæ are striped with alternate streaks of black and white, whilst others want this variegation. Whalebone is said to be occasionally found white, without the animal differing in the slightest degree; and, accordingly, this character loses its supposed importance as being a peculiarity of the exceedingly dubious Scrag Whale indicated by Dudley. With regard to the nature of whalebone Dr. Gray writes: "The baleen has generally been considered as the teeth of the whale, but this is a mistake. The teeth in the *balæna* never cut the gum, but are reabsorbed, while the

integumentary system furnishes the baleen, which is evidently a modified form of hair and cuticle."

We need not do more than mention the other species of the genus, as they do not differ in any important particular from the Greenland Whale, which we have just described.

The WESTERN AUSTRALIAN RIGHT WHALE, *Balæna marginata*, is remarkable for the length and slenderness of its whalebone, and is undoubtedly a very distinct species.

The SCRAG WHALE, *Balæna gibbosa*, we have already mentioned. Its describer Dudley writes in the year 1725, "Nearly akin to the Fin-back, but instead of a fin upon its back, the ridge of the after-part of its back is scragged with half-a-dozen knobs or knuckles. He is nearest the Right Whale (*B. mysticetus*) in figure and quantity of oil. His bone (whalebone) is white, but will not split." Mr. Brown says, "What whale this is, I cannot imagine."

The BISCAY WHALE, *Balæna Biscayensis*, is the name given by Dr. Eschricht to a second species of Right Whale found in the Greenland seas, which is much smaller and more active than the *Balæna mysticetus*, and which belongs to the temperate North Atlantic.

GENUS EUBALÆNA.

The CAPE WHALE, *Eubalæna Australis*, is the only species that can be certainly referred to this genus; a female measuring sixty-eight feet in length has been caught, and we may remark that in the Greenland Right Whale, and probably in all other *Balænidæ*, the female is the larger. The Japanese Whale (*E. Siebaldii* of Gray), according to that naturalist, "is only described and figured from a model made in porcelain clay by a Japanese under the inspection of a Japanese whaler and of Dr. Siebold; but no remains of the animal were brought to Europe; so that we do not know whether it is a *Eubalæna* or a *Hunterius*, or if it may not be an entirely new form." Mr. Bennett observes that "the Right Whale, so abundant and so little molested in the northernmost waters of the Pacific, especially off the north-west coast of America, is probably identical with the Greenland species;" but Dr. Gray remarks that its baleen, which is very inferior in quality to that of *B. mysticetus*, "shows that it is more allied to the Cape species, but apparently distinct from it."

GENERA HUNTERIUS, CAPERIA, MACLEAYIUS.

These three Southern genera are only beginning to be understood. In one or more of them a curious horny substance is commonly observed upon the fore-part of the head, which the whalers denominate the creature's "bonnet." One in the British Museum, obtained at the Sandwich Islands, is oblong in shape, eleven inches long and eight inches wide, with a very rough, pitted surface. The whole substance seems to be formed of irregular horny layers placed one over the other, the lowest layer being the last one formed; and each of these layers is more or less crumpled and plicated on the surface, giving the irregular appearance to the mass. "I do not recollect observing any account of this 'bonnet,'" writes Dr. Gray, "or giant corn, or rudimentary frontal horn, as it may be regarded, in any account of the Right Whale, nor in that of the Cachalot. I have especially searched for it in works by persons who have seen these whales alive, but without success. It has been suggested by Mr. Holdsworth, that the 'bonnet' may be a natural development, and possibly characteristic of the species bearing it."

Our knowledge of the Cetaceans is still very incomplete; they dwell in the most inaccessible parts of the ocean, and the swiftness of their movements rarely allows more than a transient view of their external form. Doubtless many species are still unknown, and doubtless, too, one and the same species has often been described under different names.



CHAPTER II.

THE FINNER WHALES AND RORQUALS.

THE HUMPBACK OR BUNCHED WHALES—THE RORQUALS OR BIG FINNERS—DIFFICULTY OF TAKING THEM—THE NORTHERN FINNER—THE SULPHUR-BOTTOM—ADVENTURE OF THE SHIP "PLYMOUTH"—THE GREAT INDIAN RORQUAL—ANCIENT ACCOUNTS OF IT—THE PIKE WHALE—THE SOUTHERN RORQUAL—THE CALIFORNIA GRAY WHALE.

THE second family, BALÆNOPTERIDÆ, comprises the Finner Whales and Rorquals, which are characterized by possessing a dorsal fin, and by having the baleen, or whalebone, less developed. The head is moderate in size, the body elongate, the belly usually marked with longitudinal plaits. They are abundant in all the Northern seas, occasionally found in the Tropical seas, and reappear in the Southern hemisphere in less numbers than in the Northern. The family is divided into *nine* genera, containing *twenty-two* species. We describe the most typical.

GENUS MEGAPTERA.

The animals of this genus are distinguished by having the flippers elongated, and the dorsal fin placed very low, the flippers attaining to one-fifth, or even one-fourth of the total length of the animal. From this extraordinary development the genus derives its name MEGAPTERA, from the Greek words *megas* "great" and *pteron* a "wing or fin." When the integument is removed these flippers are seen to be provided with only four fingers. The whalebone is of little value, being short, not splitting kindly, and becoming twisted when dry.

THE HUMPBACK WHALE.

The HUMPBACK OR BUNCHED WHALE, *Megaptera longimana*, may be taken as the representative of the genus. It is found in all parts of

the ocean, and attains a length of sixty to eighty feet, with fins measuring from twelve to twenty feet. The body is thick and clumsy, the front part, especially on the lower surface—for the peculiarity is not so noticeable on the back—being extraordinarily protuberant, the hinder part at the tail being remarkably contracted. The under jaw is longer and broader than the upper. On the last quarter of the body is found, with various modifications and developments, a mass of blubber forming a hump, a foot or so in height, and about the size of a man's head. From the under-jaw there run along the throat and breast as far as the pectoral fin, broad folds varying in number from eighteen to twenty-six, which are supposed to enable the creature to dilate its maw at pleasure. The skin is smooth, and is usually of a more or less uniform black on the back, while the under surface of the body and the pectoral fins are of a whitish color: some specimens are simply black above and white below, others all black, others black above, white below, with the pectoral and tail fins of a dark ash-gray hue.

The Humpback or Bunched Whale is very common, and seems to migrate annually from the Poles to the South, coming southward about September, and returning to the Arctic seas in spring. Off the coast of Upper California they are seen rarely between April and December, but on the coast of Greenland they are found only in summer. On the west coast of America they are seen all the year, but not every month at the same places. The movements of this whale are very irregular; it seldom swims any great distance in one direction; it stops here and there for longer or shorter intervals, and changes its course. At times the Humpbacks appear in numerous companies which cover the sea as far as the eye can reach, at other times they appear solitary, yet in this latter case they indulge in all the play, and all the attitudes of the tribe, as if they were surrounded by hundreds of their fellows. Even when swimming under water, they rock themselves from side to side. When they breathe, they blow in quick succession six to twenty times, sending up spouts of various degrees of strength from six to eighteen feet in height. Their food consists exclusively of small fishes and molluscs.

The Humpwhales are almost entirely neglected by the fishers, as their blubber furnishes much less oil than the Greenland or Sperm Whales. Of like quantities of blubber taken from Humpback and Greenland Whales respectively, the former will give eighteen, the latter sixty barrels of oil. Hence they are never chased when anything better can

be procured. Since our acquisition of Alaska, the capture of this species of whale has been carried on, while the older hunting-grounds, the Bays of Monterey, Magdalena, and Balenas are neglected.

The AMERICAN HUMPBAC, *Megaptera Americana*, is found in the neighborhood of Bermuda, and attains a length of fifty to sixty feet.

GENUS PHYSALUS.

The general characteristics of this genus—which contains *four* species—are as follows; the head forms one-fourth of the total length, the dorsal fin rises in the last quarter of the body, the pectoral fins close behind the head; the tail is deeply cut in the middle, forming two more or less clearly divided flaps.

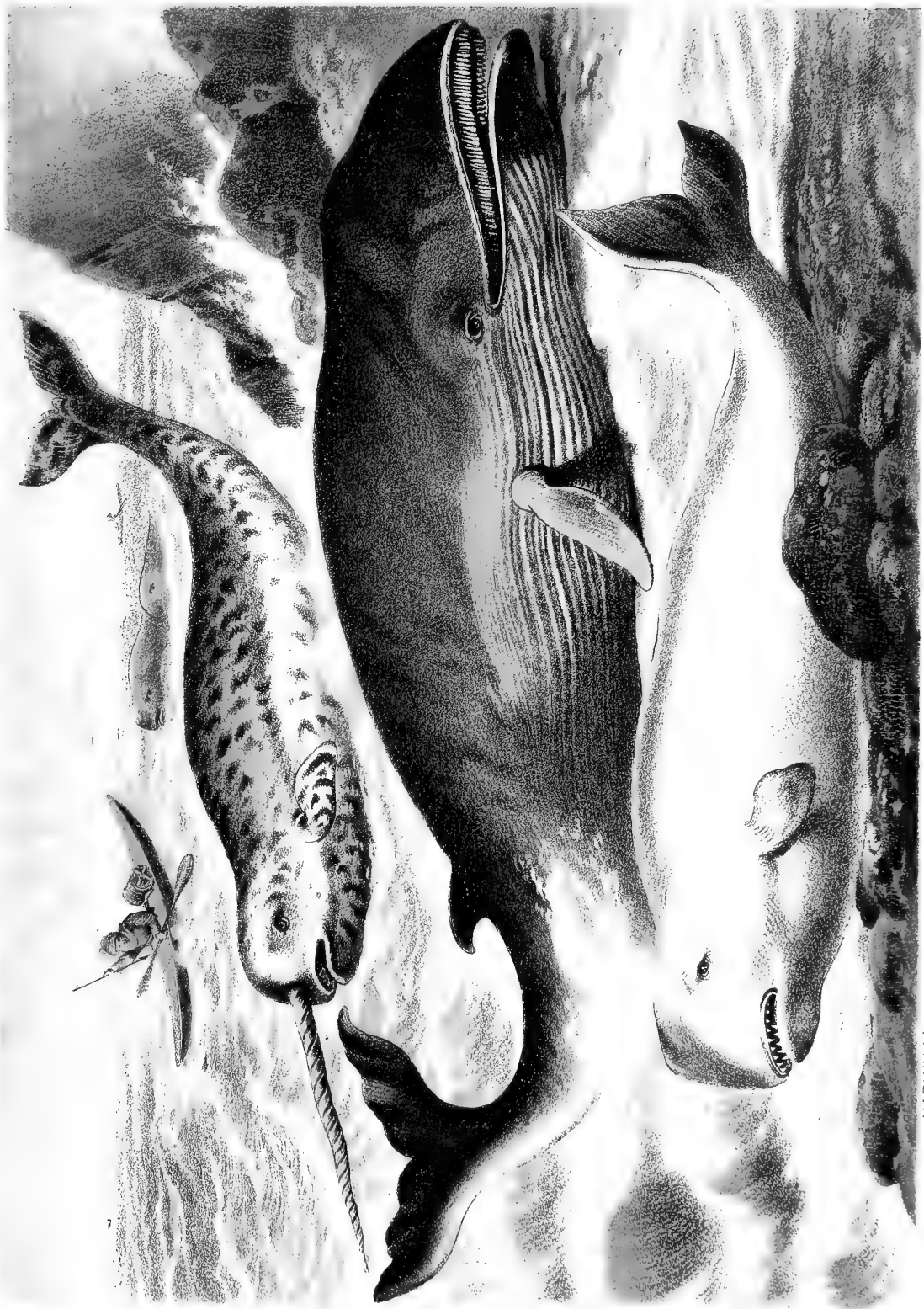
THE RORQUAL.

The RORQUAL, *Physalus antiquorum* (Plate XXVIII), is called also the "Gibbar," the "Razorback," or the "Big Finner." It is the most slender of all cetaceans, and the longest of all known animals, measuring in some cases upwards of one hundred feet. The pectoral fins possess a length of one-tenth of the creature's length, and a breadth of one-fifteenth. The body attains its greatest thickness just behind the pectoral fins, but towards the tail becomes so compressed that its vertical section is considerably greater than its horizontal diameter. With the exception of a few hairs, or rather of some horny filaments split at the extremity into very fine threads, which are found on the upper jaw, the body is perfectly smooth, of a black color above, and pure white below. The deep furrows which run from the lower jaw down to the navel, are of a bluish-black. These furrows resemble cuts made with a knife. The toothless jaws bear three hundred to three hundred and fifty plates of baleen on each side, but this substance is short, coarse, and valueless for ordinary manufacturing purposes.

The Rorqual frequents the northern portions of the Atlantic Ocean and the Arctic seas, and is especially abundant near Barendt's Island, Nova Zembla, and Spitzbergen. When autumn begins, the Rorquals migrate to southern waters, and are found during the winter in the seas of the Temperate and Torrid Zones.







NARWHAL

WHITE WHALE

RORQUAL

PLATE XXVIII CETACEA



As befits its slender figure, the Rorqual is a swift and active animal, and when going at full speed, can pass a steamship. Its course is right ahead, and it rises on an average every ninety seconds to breathe. Less timid than other members of the family, it often appears near sailing ships, swimming round them or following them for hours; it displays extraordinary courage, and when provoked is the most mischievous of all whales: it possesses social instincts, and in case of danger seeks with all its power to defend its fellows.

It requires more nourishing food than the Right Whale, and has a much larger gullet. In the stomach of a single Rorqual six hundred codfish have been found, as well as a quantity of pilchards. It is in pursuit of the shoals of these fishes that the Rorqual proceeds southward, hovering around the fishing-ground and swallowing whole boat-loads of herrings and pilchards. It eats also immense quantities of sea-weed, and is said by observant fishermen to leave a neighborhood when the sea-weed is all consumed.

The Rorqual being almost valueless for commercial purposes, is seldom attacked by whale-fishers, and it is so active and fearless that the aggressors have often to repent their temerity. On one such occasion the Rorqual when harpooned started off in a direct line, and at such a rate that the men in the boat lost their presence of mind, and forgot to cut the rope. The whale made straight for a neighboring ice-field, shot beneath it, and dragged the boat and its crew beneath the ice. Scoresby endeavored to secure some Rorquals by using short lines with a buoy at the end, hoping the resistance offered by the buoy would tire out the whale. Two Rorquals were struck; the first dived with such speed and force that the line snapped away from the buoy; the second got loose by the rope being cut by the dorsal fin. A third that was harpooned by mistake, carried out three thousand feet of line in about a minute, and escaped by snapping the rope.

While neglected by the regular whalers, the Rorqual is eagerly chased by the inhabitants of the coasts which it visits. The chase is dangerous, not merely from the strength of the animal attacked, but from the fact that the other whales in the vicinity come to assist their comrade in his hour of need.

The Laplanders, who find the bones and other portions of this animal to be of great service to them, unite in its chase, and employ a very simple mode of action. To harpoon such a being would be useless, so

they content themselves with inflicting as many wounds as possible, and leaving it to die. After the lapse of a few days the huge carcass is generally found dead upon the strand, and becomes the property of all those who have wounded it and can prove their claims by the weapons which are found in its body. The person who finds the stranded carcass is by law entitled to one-third of the value.

The NORTHERN FINNER WHALE, *Physalus Gibbaldii*, has been taken by Gray as the representative of a separate genus which he calls *Gibbaldius*. It attains a length of one hundred feet, and has pectoral fins twelve feet in length. Little is known about this species, as it is usually confounded with the Rorqual.

THE SULPHUR-BOTTOM FINNER.

The SULPHUR-BOTTOM WHALE, *Physalus sulphureus*, is found on our North-west Coast. It is, perhaps, the largest of the whales frequenting the Pacific Ocean. It is found on the coast of California at all times of the year, but appears from May to September in numerous bands which approach the coast fearlessly, and swim round ships at anchor, or accompany them on their voyage. In the year 1850 the ship "Plymouth" passed through a school of these whales. One of them left its companions and followed the ship for twenty-four days. The crew, not admiring this dangerous companion, tried all means to get rid of it. As whales have a great horror of bilge-water, they set their pumps to work, but in vain. They pelted the whale with bottles, pieces of spars, and other missiles, and fired ball after ball into it. But the Sulphur-bottom paid no heed to their attentions, and kept close to the ship, occupying exactly the same position with regard to the vessel, whether she was sailing free before the wind, tossing about in a gale, or lying becalmed. At the end of November, the "Plymouth" met the bark "Kirkwood;" as the ships approached to each other within speaking distance, the whale left the "Plymouth" and took its station at the "Kirkwood," but when they parted, it returned to its old ship. The sailors gradually grew accustomed to the creature's presence, and called it "Blowhard," affirming that it knew its name, and would come nearer when summoned by this appellation. The Sulphur-bottom seemed to be anxious when the "Plymouth" drew near the coast, and finally left the ship when she came into soundings.

THE INDIAN RORQUAL.

The GREAT INDIAN RORQUAL, *Physalus Indicus*, was seen by Nearchus, who commanded the Indian fleet of Alexander the Great, B. C. 327.

Arrian informs us that when, in the morning, Nearchus was off Kyiza or Guttar, his people were surprised by observing the sea thrown up to a great height in the air, as if it were carried up by a whirlwind. The people were alarmed, and inquired of their pilot what might be the cause of the phenomenon; he informed them that it proceeded from the blowing of the whale, and that it was the practice of the creature as he sported in the sea. His report by no means quieted their alarm; they stopped rowing from astonishment, and the oars fell from their hands. Nearchus encouraged them, and recalled them to their duty, ordering the heads of the vessels to be pointed at the several creatures as they approached, and to attack them as they would the vessels of an enemy in battle: the fleet immediately formed as if going to engage, and advanced by a signal given; when, shouting altogether, and dashing the water with their oars, with the trumpets sounding at the same time, they had the satisfaction to see the enemy give way; for upon the approach of the vessels, the monsters ahead sunk before them, and rose again astern, where they continued their blowing without exciting any further alarm. All the credit of the victory fell to the share of Nearchus, and the acclamations of the people expressed their acknowledgment, both to his judgment and fortitude, employed in their unexpected delivery.

The great Indian Rorqual is, indeed, very common still in the seas where it was observed by Nearchus and his companions, off the coasts of Arabia and of Mekran, Sindh, the peninsula of Cutch, and again further southward, off the Malabar coast. One cast up dead upon Amherst Islet, near Ramri Island, on the Arakan coast, in the Bay of Bengal, during the rainy season of 1851, measured eighty-four feet in length, of which the rami of the lower jaw were twenty-one feet, or exactly one quarter of the total length. Another, stated to be ninety feet long, and about forty-two feet in circumference, was cast upon the Chittagong coast in 1842, in about lat. 21° N. It appears that early on the 15th August, the attention of the inhabitants of that coast were attracted by something in appearance like the capsized hull of a large vessel, floating on the surface of the sea, and coming towards the mouth of the Muskal

River. When it approached near the land, they perceived that it was a living creature, by its continually spouting up water into the air, and by the middle of the day it cast itself on the shore of Muskal Island. By the assistance of the flood and the surf of the sea, it was brought completely on shore, where, as soon as it was landed, it appeared to be in great distress, for it roared very loudly, like an elephant.

GENUS BALÆNOPTERA.

This genus, to which Gray allows only *two* species, comprises the smallest and most gracefully built creatures of the whole family. They possess moderately long pectoral fins, and a sickle-shaped dorsal fin on the latter third of the body.

THE PIKE WHALES.

The PIKE WHALE, *Balænoptera rostrata*, is the best known species of this genus. It seldom exceeds thirty feet in length, and is more commonly about twenty-five. It is furnished with baleen, but the plates are comparatively short, and of a slight pinkish hue. The mouth is developed into a kind of huge pouch, which is capable of containing a very large volume of water and marine animals. The tongue is not tied down as in the Greenland Whale, but is free toward the apex, and almost as capable of movement as that of man. The Pike Whale is a native of the seas that wash the coasts of Greenland, and is sometimes seen near Iceland and Norway, descending but rarely into warmer latitudes. The flesh of this animal is in some repute for its delicacy, and is therefore much coveted by the natives of these northern regions. They do not, however, attempt to harpoon the creature, on account of its great activity, but content themselves with inflicting severe wounds with their darts and spears, in the hope that the wounded animal may die, and may in time be stranded on their coasts. The oil which it furnishes is said to be particularly delicate.

The Pike Whale feeds not only on the little creatures that form the food of the Greenland Whale, but chases and kills the active salmon and other fish. In the stomach of one of these animals have been found the remains of various fish, those of the dog-fish being the most prevalent.

The head of this species is elongated and rather flattened, and the throat and chest are furnished with very deep longitudinal folds, which are capable of dilatation to a great extent.

At the extremity of the snout there are eight distinct bristles, arranged in perpendicular rows on the top of each jaw. It has been called by a great number of names by different writers, and is mentioned by various authors under no less than seventeen distinct titles. The color of this animal is black upon the upper parts of the body, and white on the abdomen, tinged with a reddish hue. The pectoral fin is almost entirely dark, but changes into white on its upper surface, near its base.

On the American coasts the Pike Whale is never made a regular object of pursuit. It is often, however, attacked when it comes near the coast; all the fishing-boats of the neighborhood put out to sea, surround the bewildered animal and drive it into shallow water, where it can be dispatched at leisure.

The SOUTHERN RORQUAL, *Balænoptera Australis*, has a long dorsal fin placed not far backward as usual, but just over the flippers. It is sometimes seen at the Cape of Good Hope, but is never pursued.

THE CALIFORNIA GRAY WHALE.

The classification of all these cetaceans is still very unsettled. Captain Scammon remarks: "We have experienced the greatest difficulty in finding any two of these strange animals alike, or possessing any marked generic or specific differences. If the differences pointed out as constituting different species are maintained, we conclude there must be a great number." One of the sufferers by modern systems of classification is the CALIFORNIA GRAY WHALE, for which Professor Cope has formed a separate genus, *Rhachianectes*. This species differs from the Southern Rorqual by the color of its baleen, and the number of its vertebræ, and from the Right Whale by its short head. It has no dorsal fin.



CHAPTER III.

THE SPERM WHALES AND BLACK FISH.

THE FAMILY CATODONTIDÆ—THE SPERM WHALES—SPERMACETI—THEIR SPEED—THEIR FURY WHEN PROVOKED—THE STORY OF THE SHIP "ESSEX"—OTHER SHIPS DESTROYED BY THIS WHALE—AMBERGRIS—SPECULATIONS AS TO ITS ORIGIN—FOOD OF THE SPERM WHALE—BLACK FISH—THE GENUS COGIA.

THE family CATODONTIDÆ, comprising the Cachalots or Sperm whales and the Black-fish, are distinguished from the true whales by having teeth in the lower jaw, and by being destitute of whalebone. While the two preceding families are dwellers in the Arctic and Antarctic regions, the toothed whales prefer the Tropical seas. The general characteristics of the family are as follows: The head is very large, and truncated in front; the blow-holes are separate, and situated in the front of the head; the pectoral fins are short and broad; in the upper jaw the teeth are only rudimentary. The numerous teeth in the lower jaw fit into holes in the gums of the upper. The family comprises *four* genera.

GENUS CATODON.

The skull of the animals of this genus occupies nearly one-third of the entire length of the body. Gray assigns to it *two* species, but experienced fishermen affirm that there is only *one* species, which is profoundly modified in form and size by location and abundance of food.

THE SPERM WHALES.

The SPERM WHALE, *Catodon macrocephalus* (Plate XXIX) is called "Cachalot" by the French, and "Pottfish" by the Dutch, and attains a considerable size. An adult male measures from sixty to seventy feet in length, a female about thirty to forty feet. The long, abruptly trun-

cated nead is as thick as the body, and passes into it without any external marks of separation. The pectoral fins are close behind the eye, and are marked on the upper surface by folds which indicate the five fingers; the tail is deeply indented. The blow-hole, an aperture almost in the shape of a capital S, is placed at the extremity of the snout, and occupies, therefore, the position of the nostrils in terrestrial animals. The mouth is huge, the jaw opening back almost to the eye. The under-jaw is narrow, and shorter than the upper, and possesses heavy and strong teeth which vary considerably in number in the specimens that have been examined; the average in the adults is about fifty-two. In the upper-jaw we find a series of conical cavities in which the teeth of the lower-jaw fit, and near them, or sometimes even in these depressions, a series of rudimentary teeth is detected. The teeth of the Sperm Whale are, for us, merely curiosities, but in the South Sea Islands they are articles of the highest value, being thought worthy of dedication to the idol deities, or at least placed as rare ornaments in the king's house. So great is the conventional value of these teeth, that several wars have arisen from the possession of a whale's tooth by an inferior and unfortunate chief who had discovered the rarity and meant to keep it.

The partly-hidden teeth of the upper-jaw are about three inches in length, but they hardly project more than half an inch through the soft parts in which they are imbedded. In preparing the skull of the Spermaceti Whale these teeth are apt to fall out together with the softer parts, as their attachment to the jawbone is very slight. Eight of these teeth have been found on each side of the jaw.

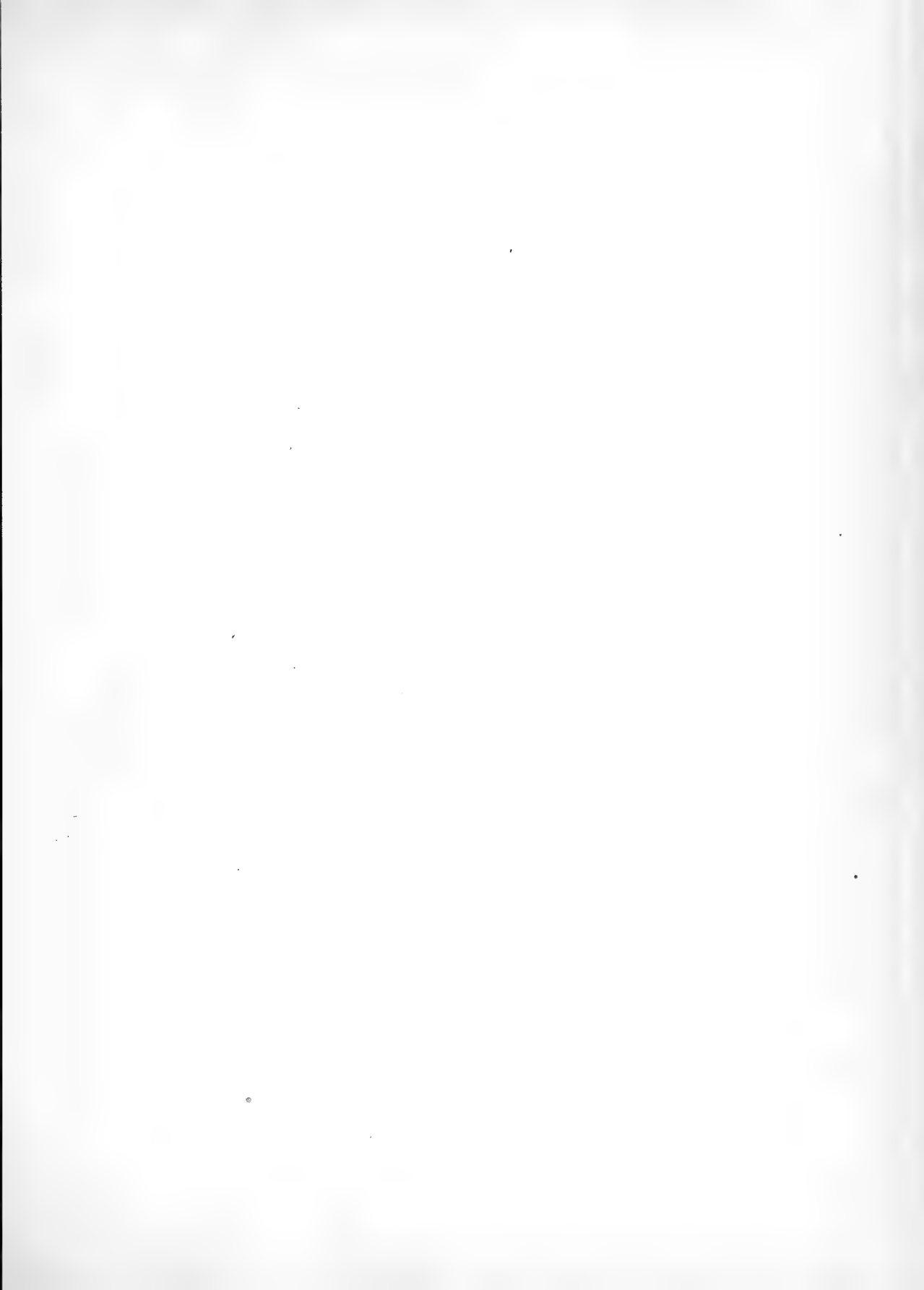
The enormous head is divided by a perpendicular wall into two chambers, which connect by several openings. The whole space is full of a liquid, oily substance, the so-called "spermaceti," which is also found in a canal running from the head to the tail, and in many small cavities scattered in the blubber, the bulk, however, being in the head. When the whale is killed, the head is cut off, a large hole cut in the top of it, and the liquid is baled out in buckets. It is then clear and oily, but after a few hours exposure to the air the spermaceti begins to separate, and is soon firm enough to be removed, and put in a different vessel. To prepare it for commercial purposes, a long process is required; it is melted several times, treated with a solution of potassa, and boiled in alcohol. It is then deposited in laminated crystals of a pearly-white hue. The amount of this substance obtained from a single

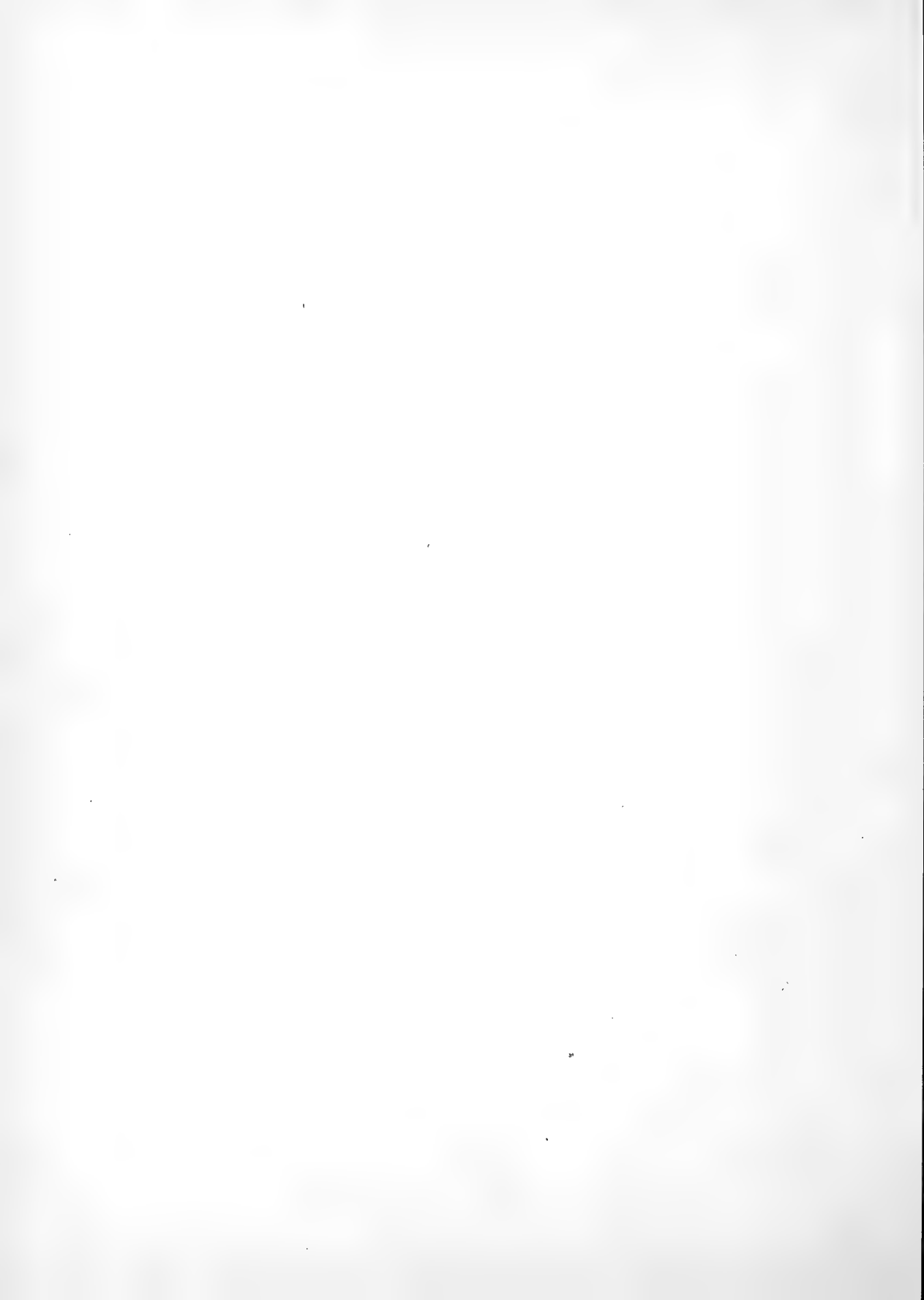
whale is sometimes very large: from a moderate-sized one twenty-four barrels of spermaceti and one hundred barrels of oil were procured. It is used in medicine, and in the preparation of candles.

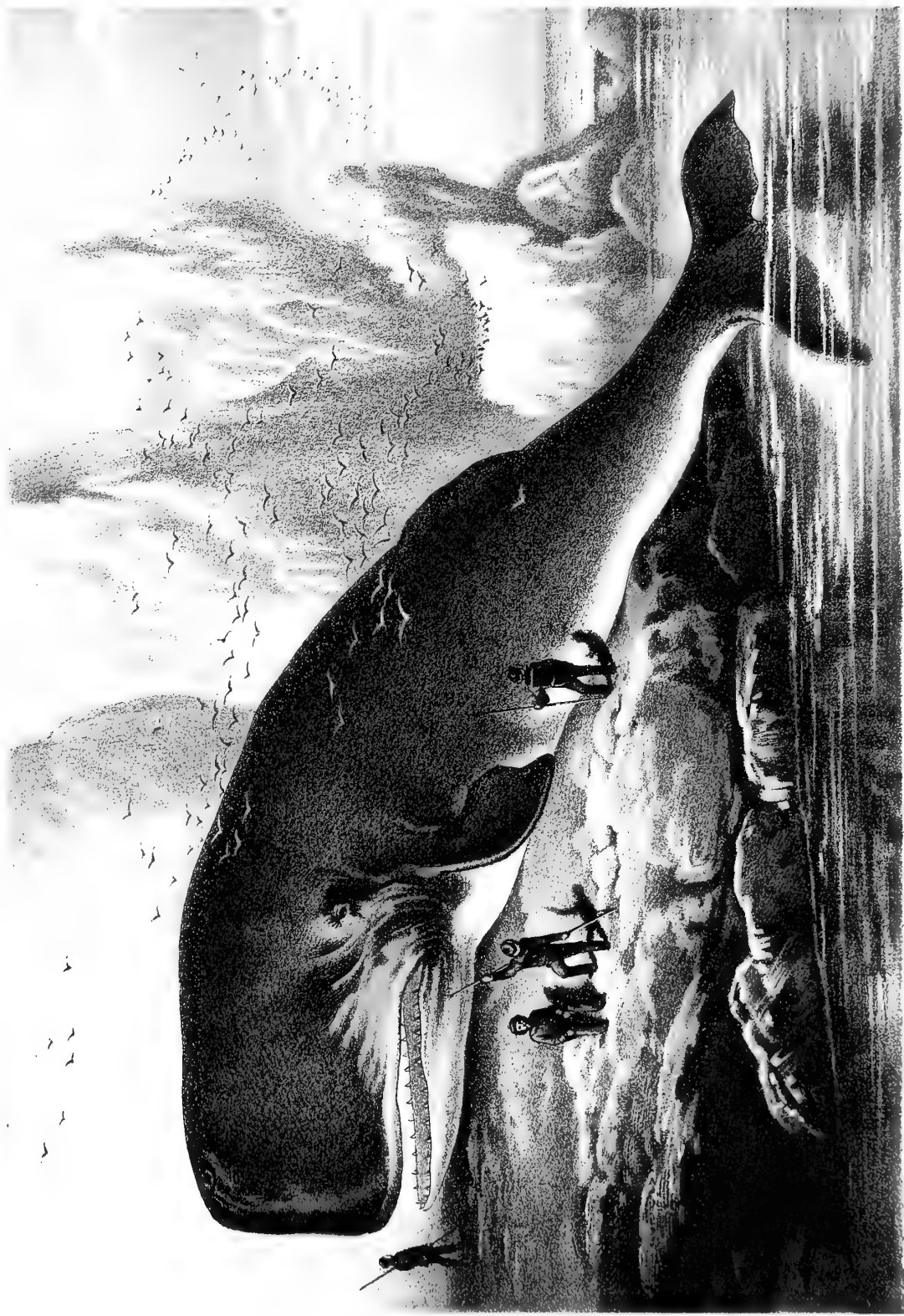
The Sperm Whale in its movements resembles the Dolphins more than the Right Whales, and in speed nearly equals the Rorquals. When swimming quietly, it glides at the rate of three or four miles an hour under the surface of the water, but when excited, it rushes through the sea with violence, the strokes of its powerful tail sending the water in waves on every side. It is remarkable for assuming at times a perpendicular position, the head or tail just projecting above the water. When alarmed, it sinks straight to the bottom; when sporting, it raises first one, then the other pectoral fin above the surface, and leaps clear out of the sea, falling again with a splash that sends the foam mast-high, and can be seen for ten miles. These movements are usually attributed to the attacks of parasites; but this seems an erroneous supposition, as the Sperm Whale suffers less than others from such enemies. The members of a troop of Sperm Whales usually arrange themselves in a long line, dive and rise simultaneously, spout at the same moment, and at the same instant disappear beneath the water. When they are sleeping, they lie motionless, rocked by the swell, or keep the head out of water, so that to the spectator it seems the end of a huge timber, or the neck of an enormous bottle bobbing up and down. They breathe at very regular intervals, the spouting is directed forward, and is on an average only three feet high. Scammon pursued a sperm whale for five hours, and noticed that it regularly blew fifty-five times at intervals of ten seconds at each appearance, and then remained fifty-five minutes under water, going at the rate of three miles an hour. The sense of hearing of the sperm whales is dull, that of sight pretty good, that of touch or feeling excellent, as the skin seems provided with nerves which convey the slightest impression.

The sperm whales, very unlike the dolphins, avoid the neighborhood of vessels, and it often happens that when surprised, they are almost paralyzed with terror, and remain motionless. This is especially the case when a female is the first to be wounded, whereas if an old male is struck, the whole herd at once take flight.

Sometimes, however, a "large whale" will become belligerent, and is then a most fearful antagonist, using its tail and its huge jaws with equal effect. One of these animals has been known to drive its lower jaw







S PERM - WHALE

PLATE XXIX. CETACEA.



entirely through the plankings of a stout whaling-boat, and another well-known individual destroyed nine boats in rapid succession. This formidable animal was at last killed, and in its carcass were found a whole armory of harpoons and spears belonging to different ships. Not only boats, but even ships have been sunk by the attacks of an infuriated "old bull," as the adult male is styled.

An American ship, the "Essex," was thus destroyed by the vengeful fury of a sperm whale. The story of the disaster is as follows: "The 'Essex,' Captain Pollard, sailed from Nantucket in August, 1819. Late in the fall, in latitude 40° of the South Pacific, a school of sperm whales was discovered, and three boats were manned and sent in pursuit. The mate's boat was struck by one of them, and he was obliged to return to the ship to repair damages. While he was thus engaged, a sperm whale, judged to be eighty-five feet long, broke water about twenty rods from the ship on her weather-bow. He was going at the rate of about three knots an hour, and the ship at nearly the same rate, when he struck the bows, just forward of the chains. The ship shook like a leaf; the whale dived and passed under the ship, grazing her keel, and then appeared at about the distance of a ship's length, lashing the sea with fins and tail as if suffering the most horrible agony. He was evidently hurt by the collision, and frantic with rage. In a few minutes he seemed to recover himself, and started with great speed directly across the vessel's course to windward. Meanwhile the hands on board discovered the ship to be gradually settling at the bows, and the pumps were rigged. While working at them, one of the men cried out, 'God have mercy! here he comes again!' The whale had turned at about one hundred rods from the ship, and was making for her with double his former speed, his pathway white with foam. Rushing head on, he struck her again at the bow, and the tremendous blow stove her in. The whale dived again and disappeared, the ship filled and fell over on her broadside in ten minutes from the first collision. After incredible sufferings, the survivors reached Ducie's Island, where three of the crew resolved to remain. The remainder, in three boats, made for Juan Fernandez; the mate's boat was taken up by the 'Indian' of London, ninety-three days after the catastrophe, with only three survivors. The captain's boat was fallen in with five days afterward by the 'Dauphin' of Nantucket, with only two survivors. Thus, out of a crew of twenty, only five survived to tell the sad tale."

Another American ship, the "Ann Alexander," was similarly destroyed, and two months after the sinking of the unfortunate vessel, the "Rebecca" captured a huge sperm whale which surprised the fishermen by offering no resistance. They found embedded in its carcass two harpoons marked "Ann Alexander," and discovered severe injuries in its head from a terrible wound in which fragments of ship's planking were projecting. A British ship, "Waterloo," was another victim to the fury of the sperm whale, and Scammon expresses his belief that many a ship which goes to the fishing and never returns, has been sunk by the animal it was engaged in pursuing to the death.

We have not yet mentioned one of the most curious products of the sperm whale, the strange substance called Ambergris. It is a light wax-like material of various colors, and greasy to the touch; it possesses a very agreeable smell, and becomes soft when heat is applied, boiling water reducing it to an oily fluid. It is used by perfumers for mixing with sundry oils and soaps. In ancient times, and down to the last century, it was employed in medicine as an anodyne and antispasmodic, but modern science rejects it from our pharmacopœia.

The origin of this substance for a long time baffled all inquirers; some imagined it to be the excrement of a bird, which, being melted by the heat of the sun and washed off by the waves, was then swallowed by whales, who returned it in the condition we find it. Others took it for a kind of wax or gum which distils from trees, and congeals in the sea. Many of the Orientals say it springs out of the sea; others, that it is a vegetable production issuing from the roots of trees; others, that it is made from honeycombs which had fallen from the rocks into the sea, and witnesses were brought forward to depose that they had found pieces half-ambergris, half-honeycomb, and even had taken honey from a piece, when it had been broken. As it was usually found on the shore, it obtained the name of amber, and to distinguish it from the genuine amber of the Baltic coast, it received the epithet of *gris* or "gray." Ambergris, therefore, means "gray amber." Amber, however, is a resinous substance, and we now know that ambergris is a morbid secretion found in the intestines of the sperm whale, a mass weighing fifty pounds having been discovered in a single whale. The value of this article is very variable, but is always costly, averaging five dollars the ounce.

The food of the sperm whale is mostly furnished by squids or cuttle-

fish, but when it approaches land it devours any small fish. The manner in which it feeds is, however, not ascertained. It is supposed that it drops its lower-jaw till it makes nearly a right-angle with the upper one, and then swims slowly along, its sharp teeth transfixing whatever comes in its way. The stories that it can devour seals or dolphins are unworthy of credence. It will take vegetable diet, and has been seen to swallow fruit drifting on the waves.

The Sperm Whale never passes the Cape of Good Hope, but does pass round Cape Horn.

THE BLACK-FISH.

The Black-Fish has been separated from the genus *Catodon* because, although it possesses the huge head and heavily-toothed jaw of the sperm whales, the spout-holes are removed from the extremity of the snout, and placed upon the middle of the top of the head. These spout-holes are separate, and covered with a common flap. The pectoral fins are moderate in size and triangular in form; the dorsal fin is long and sickle-shaped; the head exceeds one-fourth of the entire bulk.

GENUS PHYSETER.

The BLACK-FISH, *Physeter tursio* (Plate XXVII) the only species of the genus, is, when fully grown, of considerable dimensions, often measuring fifty to sixty feet in length.

The dimensions of one of these animals have been very accurately given by Sibbald.

In total length it measured between fifty-two and fifty-three feet, its girth at the largest part of the body was rather more than thirty-two feet, and as it lay on the ground the height of its back was twelve feet. The lower jaw was ten feet in length, and was furnished with forty-two teeth, twenty-one on each side. Each tooth was slightly sickle-shaped, and curved towards the throat. An equal number of cartilaginous sockets are placed in the upper jaw into which the conical teeth are received when the mouth is closed. The teeth in the middle of the jaw are larger and heavier than those of the front or base; some of them exceed nine inches in length, and weigh more than eighteen ounces when perfectly dried. The root of each tooth is hollow in the centre to

the depth of several inches, and is so deeply buried in the jaw, that the projecting portion of the largest tooth rarely exceeds three inches. The teeth range from seven to nine inches in length. These teeth are very white and polished, are conical in their shape, tolerably sharp while the animal is young, but become blunt as the creature increases in years and dimensions.

In Sibbald's specimen, from the tip of the snout to the eyes was a distance of twelve feet, and the upper part of the snout projected nearly five feet beyond the tip of the lower jaw. The eyes were remarkably small, about the size of those of the common haddock. As may be supposed from the popular name of this animal, the color of its skin is almost uniformly black. The throat is larger, in proportion, than that of other whales. One of these animals is said to have been thrown ashore at Nice, in the month of November, 1736; when the head was opened, it was found to contain spermaceti, which lay in a mass two feet in thickness in the usual locality.

This species is frequently seen on the coast of the Shetland Islands in summer.

GENUS COGIA.

The *two* species of this genus are both inhabitants of the Southern seas. They are considerably smaller than the rest of the family, and as in the dimensions of the head they resemble the dolphins, they are commonly known as the "Short-headed" Whales.

The methods of taking the Sperm Whales are identical with those already described as employed in the capture of the other whales, and the ships engaged are principally from the United States and Australia.



CHAPTER IV.

THE BEAKED WHALES AND THE NARWHALS.

THE FAMILY HYPEROODONTIDÆ—THE BEAKED WHALES—THE BOTTLE-NOSED WHALE—THE XIPHIUS—THE FAMILY MONODONTIDÆ—THE NARWHAL—ITS EXTRAORDINARY HORN—CONJECTURES AS TO ITS USE—FABLES RESPECTING IT—MEDICINAL PROPERTIES ATTRIBUTED TO IT—VALUE OF THE NARWHAL TO THE GREENLANDERS—SHIPS STRUCK BY IT.

THE family HYPEROODONTIDÆ consists of the Beaked Whales, which have no permanent teeth in the upper jaw. It is divided into *nine* genera or sub-genera, containing *twelve* species, nearly equally distributed between the Northern and Southern Hemispheres. Most of the genera consist of only one species.

GENUS HYPEROODON.

The *two* species embraced under this genus both inhabit the North Seas. The best known representative is

The BOTTLE-NOSED WHALE, *Hyperoodon bidens*, a powerfully-built creature of twenty to twenty-six feet in length. The head is like that of the dolphin, but the animal is longer, the body being thicker for the first half of its length, narrow towards the tail. The eye is small, and just behind the corner of the mouth; the ear is scarcely noticeable behind the eye; the spout-hole lies between the eyes, and is crescent-shaped; the fore-part of the muzzle is prolonged so as to form a beak, the pectoral fins, springing from the anterior third of the body, are narrow and abruptly rounded, the dorsal fin is small, low, and sickle-shaped, the tail is divided into two pointed flaps. From the centre of the under-jaw runs a short, deep fold of skin, the rest of the hide is smooth and shining, and of a dark color, becoming black on the back.

The Bottle-nosed Whales are confined to the Northern Arctic and

Northern Atlantic Oceans, but they occasionally migrate into more southern regions, and are, every year, found in the neighborhood of the Faroe Islands, and sometimes on the Scotch coasts, even entering the mouths of rivers. They are rare in the Greenland waters, but frequent at the entrance of Davis Straits. Their habits are little known, owing to their being so often confounded with the dolphins. When they blow, they send out a thin low spout four or five times in succession. Cuttle-fish and squids form their chief food.

The Bottle-nosed Whale is often stranded on the coasts of Europe. The earliest account of it we have is a description of one taken near Harwich in England, in 1717, and measuring fourteen feet. Hunter describes one caught above London Bridge in 1783, which was twenty-one feet in length, and he mentions the skull of one which must have been thirty feet in length.

GENUS XIPHIUS.

The *solitary* species of this genus is found in the Northern Atlantic.

The XIPHIUS, *Xiphius Sowerbiensis*, is so named after the well-known naturalist Sowerby, who figured and described the animal in the British Miscellany. His description was founded upon a specimen that was cast ashore upon the estate of Mr. J. Brodie, in Elginshire. The skull of this individual was preserved by Mr. Sowerby in his museum, and after his death it was placed by Dr. Buckland in the Anatomical Museum at Oxford. As it is so valuable a specimen, it has been industriously multiplied by means of plaster-casts, which have been distributed to various scientific institutions.

The length of the creature was sixteen feet, and its girth at the largest part of the body was eleven feet. The head is small, narrow, and pointed, and the lower-jaw is longer, blunter, and wider than the upper-jaw, so that when the mouth is closed, the lower-jaw receives the upper. In the upper-jaw there are two depressions corresponding with the teeth, and permitting the perfect closing of the mouth. The color of the animal is black on the upper surface and gray below, and is remarkable for the pellucid and satin-like character of the skin, which reflects the rays of the sun to a considerable distance. The body is marked like watered silk; this effect is produced by a vast number of

white streaks immediately below the skin, which are drawn irregularly over the whole body, and at a little distance appear as if they were made by means of some sharp instrument. Nothing is known of the habits of this curious animal, which is unknown to science, except by means of the specimen above-mentioned.

We may dismiss the remaining genera of the family with the remark that PETRORHYNCUS and NEOXIPHIUS are found in the Mediterranean Sea, that BERARDIUS has been seen near New Zealand, and DOLICHODON at the Cape of Good Hope. The genus DIOPLOODON in the Indian Ocean is a very remarkable creature, judging from its solitary species, *Dioploodon Schellensis*. The skull has two horn-like processes projecting from the snout; the vertebræ are enormous in comparison with the ribs, which are slender and short. The genus LAGONOCETUS inhabits the North Seas, and EPIODON the South American waters.

THE NARWHAL.

The family MONODONTIDÆ comprises *one* genus of only *one* species, but this is so remarkable and so peculiar as to fully justify the creation of a family for it.

GENUS MONODON.

The NARWHAL or SEA UNICORN, *Monodon monoceros* (Plate XXVIII), is distinguished from all other whales by the possession in the upper-jaw of two powerful teeth. As a rule, the tooth on the right-hand side is rudimentary, while the other attains a length of seven to nine feet. This curious weapon is placed perpendicularly in the jaw, is hollow within, and twisted spirally from right to left. In the females it is only slightly developed. The skull, too, is likewise unsymmetrical. The upper-arm and fore-arm are joined so as to preclude motion, the flipper consists of five fingers of four or three joints. The round head occupies one-seventh of the total length of the creature, the eyes are deep set, a little higher than the point of the snout, the ear is very small, the crescent-shaped blow-hole is between the eyes, in the centre of the forehead. From the blow-holes a tube leads to two large air-chambers. The dorsal fin is wanting, and only indicated by a fold of skin, the pectoral fins are short and oval, the tail forms two distinct flaps. The skin is soft, brilliant, and

like satin, and in the male it is marked in numerous irregularly shaped but usually long spots of a dark brown color, the rest of the skin being white or yellowish. These dark spots are densest on the back. Specimens, however, have been seen of a uniform white or gray color. The length of the Narwhal is on an average twelve to sixteen feet, but some have been found which measured nearly twenty feet.

The extraordinary weapon with which the Narwhal is armed, soon attracted attention, and provoked numerous speculations as to its use. The celebrated Albertus Magnus describes this animal as a fish which has a horn on its forehead by which it can pierce fishes, or even ships, but that the mercy of the Creator has made it so sluggish that escape from it is easy. Rochefort relates that the horn is used for attacks on other whales, and for boring through the ice. Fabricius conjectures that the Narwhal spits fish on this weapon, which it then holds up till the prey slips down within reach of its tongue. Scoresby agrees with those who regard the horn as an instrument for making breathing-holes in the ice. It is evident, however, that an apparatus necessary to enable the animal either to procure food or get fresh air would not be restricted to one sex. There can be no doubt that this horn, which is a distinguishing mark of sex, is, like the tusk of the boar, a weapon of offence.

In some rare instances the right tusk has been developed instead of the left, and it is supposed that if the developed tooth should be broken, the right tusk becomes vivified, and supplies the place of the damaged weapon. One remarkable case is known where both tusks were almost equally developed, being rather more than ten inches in length; and another example is recorded of a Narwhal which possessed two long tusks, the one being seven feet five inches in length, and the other seven feet. These tusks diverge slightly from each other, as their tips are thirteen inches asunder, though there is only an interval of two inches between their bases. Both these specimens were females. Sometimes the female Narwhal possesses a spear like her mate, but this is probably the effect of age, which in so many creatures, such as the domestic fowl, gives to the aged female the characteristics of the male. As both these double-tusked Narwhals were females, it may be probable that they owed their unusual weapons to some peculiarity in their structure, which prevented them from becoming mothers, and forced the innate energies to expend themselves in the development of tusks instead of the formation of offspring. The tusks of male swine and other animals,

the horns of male deer, the mane of male lions, and other similar structures, appear to be safety-valves to the vital energies, which in the one sex are occupied in the continual formation of successive offspring, and in the other find an outlet in the development of tooth, horn, and hair, according to the character of the animal. In all probability, the health of the animal would greatly suffer if the calcareous and other particles which are deposited in the tusk were forced to remain in the system instead of being harmlessly removed from it and placed upon its exterior.

The ivory of the Narwhal's tusk is remarkably good in quality, being hard and solid, capable of receiving a high polish, and possessing the property of retaining its whiteness for a very long period, so that a large Narwhal horn is of no inconsiderable commercial value. The throne of the kings of Denmark was made of this ivory; kings and emperors had their sceptres, and bishops their croziers fashioned from it. But the Narwhal's tusk in older days had a still greater renown for its medicinal virtues; it was regarded as the horn of the unicorn, capable of disarming all poisons. This antidotal potency was thought to be of vital service to the unicorn, which resides in the wilderness, among all kinds of loathsome beasts and poisonous reptiles, whose touch was death, and whose look was contamination. The springs and pools at which such monsters quenched their thirst were saturated with poison by their contact, and would pour a fiery death through the veins of any animal that partook of the same water. But the unicorn, by dipping the tip of his horn into the pool, neutralized the venom, and rendered the deadly waters harmless. This admirable quality of the unicorn-horn was a great recommendation in days when the poisoned chalice crept too frequently upon the festive board; and a king could receive no worthier present than a goblet formed from such valuable material. Charles the IX of France was very careful to put into his cup a piece of the Sea Unicorn's tooth. The Margraves of Baireuth kept one in their treasury, but reserved its benefits for members of their princely house alone. Under the influence of such a belief the most exaggerated price was set on a Narwhal's horn. One in the Elector of Saxony's possession in Dresden was valued in the sixteenth century at 100,000 dollars. As navigation became more general, the horn lost its value, and when in the beginning of the eighteenth century the "Greenland Company" sent several Narwhal horns to Moscow with a view to selling them to the Czar, the emperor's physician refused to buy them, as they were merely

fishes' teeth, not the horns of the unicorn. At present the only believers in the medicinal properties of the horn are the Chinese and Japanese.

The native Greenlanders hold the Narwhal in high estimation; for, independently of its value, it is welcomed on each succeeding year as the harbinger of the Greenland whale. It is, moreover, of the greatest service to the Greenlanders, for its long ivory tusk is admirably adapted for the manufacture of various household implements and of spear-heads, so that it is the sad fate of many a Narwhal to perish by means of the tooth that has been extracted from its near kinsman. It is easily killed, as it possesses no very great power of diving, and is soon tired out by means of inflated buoys which are attached to the harpoon, and offer a great resistance to the water. It seldom descends above two hundred fathoms below the surface, and when it again rises, is so fatigued that it is readily killed by a sharp spear. The oil which is extracted from the blubber is very delicate, but is not present in very great amount, as the coating of fatty substance is seldom more than three inches in depth. About half a ton of oil is obtained from a large specimen. The flesh is much prized by the natives, and is not only eaten in its fresh state, but is carefully dried and prepared over the fire.

The stories of the Narwhal destroying ships have some foundation in the experience of later navigators. The force of the tusk is terrific when urged with the impetus of the creature driving through the water at full speed, for the whole combined power of the weight and velocity of the animal is directed along the line of the tusk. A Narwhal has been known to strike a ship on the quarter, and to drive its tusk through the sheathing, and deeply into the timbers. The shock was probably fatal to the assailant, for the tooth was snapped by the sudden blow, remaining in the hole which it had made, and acting as a plug that effectually prevented the water from gaining admission into the vessel. This the author can verify from personal observation.



CHAPTER V.

THE DOLPHINS.

THE DELPHINIDÆ—THE SOOSOOK OR DOLPHIN OF THE GANGES—THE INIA OF THE AMAZON RIVER—THE TUCUXI—THE DOLPHINS PROPER—LEGENDS—SYMBOLS—THE COMMON DOLPHIN—THE WHITE-BEAKED DOLPHIN—THE BOTTLE-NOSED DOLPHIN.

THE family DELPHINIDÆ comprehends the Porpoises, Dolphins, and White Whales, all of which may be described as small fish-shaped whales with teeth in both jaws. The two breathing-holes are, as a rule, united together so as to form a single crescent-shaped aperture set transversely on the crown of the head: the body is usually elongated, the head small, the snout prominent and often pointed; a dorsal fin is usually present.

Members of the Dolphin family are found in all seas, and are the only Cetaceans which ascend high into rivers, or pass the greater part of their lives in them and the lakes which are connected with them. They are all social in a very high degree; many species indeed form very large bands, which traverse the seas in company for days and weeks together. The smaller species often form troops in alliance with some one or more of their kindred species, and pursue their quest for food in common. The liveliness of all members of the family, their sportiveness, and the absence of all dread of mankind have rendered them in all ages favorites of sailors and poets.

Nearly all the Delphinidæ swim with extraordinary skill and rapidity, and are thus well qualified to catch fish. They are the most terrible of sea-robbers, attacking even the huge whale and mastering it by their persevering courage. Their food usually consists of cephalopods, mollusca, crustacea, or radiata, but some feed on sea-weed, and will even eat fruit, which they pluck from the boughs which overhang rivers. They are all rapacious, greedy, and cruel. They consume whatever can be eaten; even the young of their own or allied species fall victims to their

gluttony; when one of a band is slain, the others at once fall on the body and tear it to pieces. During the pairing season the males fight desperately, and the slain rival is at once devoured. The females, after a pregnancy of ten months, bring forth one or two young ones, which they suckle for a long time, cherish with the utmost care, and defend against all dangers. It is conjectured that they grow slowly, and live long.

The Delphinidæ are less pursued by man than other Cetacea; their chief enemies are those of their own kindred. Their own impulsiveness leads to their destruction very frequently; they follow their prey with such fury, that they rush blindfold into shallow water, or on to the treacherous strand, where the fishers sometimes find them by dozens. When wounded to death they utter lamentable groans and sighs, which are usually accompanied by floods of tears.

As all members of the family exhibit the greatest uniformity in their habits and modes of life, we confine ourselves to a description of the most important genera. The family is divided by Carus into four sub-families and eight genera, but Dr. Gray distributes it into *twenty-four* genera and *one hundred* species.

GENUS PLATANISTA.

The name PLATANISTA is given by Pliny to a dolphin which he describes as living in the Ganges, and measuring twenty-three feet in length. The actual animal is much smaller, being only six feet long.

The SOOSOOK, *Platanista Gangetica*, has a slender body, remarkable for the curious shape of its beak, which is long, slender, compressed at the sides, and larger at the extremity than at the middle. It possesses one hundred and twenty teeth. It is a swift and powerful but sluggish animal, never caring to exert itself except in pursuit of its prey. Its color is grayish-black upon the back, white on the abdomen; the eye is extraordinarily small, being about one-eighth of an inch in diameter. The dorsal fin is indicated by a projection of the skin.

As far as is known, this remarkable dolphin is found only in the Ganges and its various arms. It often goes far up the country, but is usually found near the mouth. It is as social as the other dolphins, lives on fishes and aquatic animals, and is said to pluck the ears of rice or the fruits which bend over the stream. The natives pursue it for the sake of

its fat, which they regard as a sovereign cure for rheumatism and other diseases of like nature. Its flesh is used only as bait for other fishes.

GENUS INIA.

In 1819, Humboldt published his observations on a dolphin which frequents the fresh-water streams of South America, but we owe to the French naturalist, D'Orbigny, the first accurate description. This traveler was astonished to hear that there existed five hundred miles from the Atlantic Ocean a "fish" which he was compelled to recognize as a dolphin; he had considerable difficulty in procuring a specimen, but finally obtained one at Principe Dobeira, the frontier port of Brazil.

The INIA, *Inia Amazonica*, is called "Bufes" by the Spaniards, "Bonto" by the Brazilians, and "Inia" by the Indians. The breathing apparatus is placed far back on a line with the pectoral fin, the dorsal fin is very small, the mouth is cleft far back, the snout is prolonged into a narrow, round beak covered with stiff bristles, each jaw possesses about sixty-six teeth. The length of the body is from six to nine feet, the female being only half as large. The color of the back is a dull blue, passing into a rosy red beneath. There are considerable variations in color, and specimens have been seen entirely red, and entirely black.

As far as is known, the Inia is found in all the streams of South America between 10° and 17° south. It is common in the Orinoco and the Amazon and its tributaries. It differs from the Sea-Dolphins in its movements, which are slower and less lively; it comes more often to the surface to breathe, and usually forms only small societies. Schomburgk observed dolphins which he considered identical with the Inia in the rivers of Guiana; they were especially numerous during and just after the rainy season. "Very often six or eight of them appeared, keeping together in pairs, or swimming swift as an arrow just under the surface, or at other times diving up and down incessantly, thus displaying not only their pointed snout, but the greatest part of their body above the water. As soon as the head was above the surface, they snorted like horses, the water ejected from the blow-holes looked like fine rain, and gave a remarkable charm to the quiet landscape."

Bates, the explorer of the Amazons, asserts that there are three species of this genus. "From its mouth, for fifteen hundred miles upward, we heard continually, especially by night, one or other of these

varieties blowing or snorting, and the sounds contributed in no small degree to creating a feeling of sea-like extent."

The *Inia* always keeps near the surface, often projecting its beak-like snout for the purpose of swallowing its food. This food consists chiefly of small fishes, and of fruits that drop into the stream. The *Inias* are to be found most abundantly in the clear deep bays of the river, or where streams flow into it, these spots being the best for catching fish. They often annoy travelers on the banks by approaching when a fire is kindled; the crowds of dolphins blowing and snorting is often so great, that the stranger, if he desires to sleep, must put his light out.

The native Indians do not chase the *Inia*, less because they can make little or no use of it, than from peculiar views respecting its nature and being. Mysterious tales respecting the *Inia* pass from mouth to mouth. It is a seductive nymph who has the power of appearing in the form of a maiden of wondrous beauty and flowing locks to beguile young men from the paths of virtue. She walks by night through the streets of the village, and many a youth follows the siren to the banks of the stream. Enraptured he sinks into her arms, when with a yell of triumph she plunges with the lover whom she is clasping to her bosom into the fatal waters. The *Inia* is the Lorelei of the Amazons—no Indian kills it, no one uses its oil for his lamp, for the light cast by such oil causes blindness. Bates had great difficulty in overcoming the scruples of an Indian fisherman who procured a specimen for him. The poor man declared afterward that from the moment he killed the *Inia*, all good fortune had deserted him, and that his peace of mind had been destroyed forever by his yielding to the importunities of the naturalist.

GENUS STENO.

The TUCUXI, *Steno Tucuxi*, shares with the *Inia* the lower waters of the Amazon River. It can be distinguished from the latter by its method of rising and sinking in the water. It ascends to the surface in a horizontal position, so that its dorsal fin is the part first seen; it then breathes and sinks back, head foremost, into the water very gently, while the *Inia* rolls like a porpoise, displaying first its head, then respiring, and immediately plunging its head down so that by degrees the whole external line of its curved back and its dorsal fin become visible. Apart from its peculiar mode of respiring, the Tucuxi differs from the *Inia* by not keeping in pairs.

THE DOLPHINS.

No whale occupied the attention of ancient naturalists more than the Dolphin, no marine animal inspired the poets with brighter descriptions or more marvellous fables. According to them, it was a mild, familiar animal, sensible to music. Philautes, after being shipwrecked on the coast of Italy, had been saved by a dolphin. Arion, threatened with death by the sailors of the ship of which he was on board, having thrown himself into the sea, was picked up by a dolphin attracted by the sweet notes of his lyre, and conveyed safely into harbor on the animal's back. Apollo took the form of a dolphin when he conducted his colony to the Delphian shores. Neptune changed himself into a dolphin when he carried off Melanthus. And so this marvellous creature was, among the ancients, the object of religious worship. Neptune was adored at Sunium, under the form of the Cetacean dear to his friend; and the Delphian Apollo, honored at Delphi, had dolphins as his symbol. Pliny tells a pretty story of a boy who gained the affection of a dolphin by feeding it with bread: the grateful creature used to save the lad a long walk every day, by carrying him on his back to and from school, across the Lucrine Lake. When the boy died, the dolphin appeared at the accustomed spot, and when the lad never came, pined away and died. Pliny also affirms that a young dolphin never goes abroad without an older companion, and that dolphins have been seen carrying off a dead dolphin to save it from other fishes. The old German writer, Gessner, calls the dolphin "the king and regent of the seas and waters," adding that for this reason the heir to the throne of France is called the Dauphin, an erroneous but favorite explanation of the origin of the title.

The fables inherited from antiquity still exist near the borders of the Mediterranean Sea, and from these fables are derived many of our current symbols. Twisted round a trident the dolphin represents the liberty of commerce; placed round a tripod, it signified the college of fifteen priests who performed service at Rome in the Temple of Apollo; caressed by Neptune, it was the sign of a calm sea and the safety of sailors; arranged round an anchor, or placed above an ox with a human face, it indicated that mixture of quickness and slowness which is expressed by prudence. Modern artists still represent the dolphin in the manner adopted by the earliest Greek sculptors, the tail elevated, the head large, the mouth enormous.

The species of dolphins are very numerous. Gray enumerates *ten* species in the genus: they inhabit all the oceans, and possess the same general traits.

We must remember that in common language the name "dolphin" is applied to the Scomberoid fish *Coryphæna*, and this must not be confounded with any species of the *Delphinus* of the naturalists.

GENUS DELPHINUS.

The general characteristics of the genus may be summed up as follows: the head is small in proportion, and is prolonged into a beak-like snout equal in length to the rest of the head, the jaws are armed with an extraordinary number of teeth, the pectoral fins are lateral, the dorsal fin rises from the centre of the back, the tail is very large, and forms almost a complete crescent.

The DOLPHIN, *Delphinus Delphis* (Plate XXVII), attains on the average a length of six feet. The number of its teeth vary considerably; specimens have been found with the astonishing number of two hundred and twelve; these teeth are so arranged that those of the lower-jaw fit into the interstices of those in the upper-jaw; and are all sharply pointed and curved backward, thus enabling the dolphin to hold securely its slippery prey. All the seas of the Northern Hemisphere are inhabited by this Cetacean, and it is everywhere a favorite of the sailors. It loves to follow vessels, and however swift their speed is, it gambols around their bows as if they were stationary. Dolphins are seen in troops numbering from ten up to many hundred members, their companionship arising chiefly from community of interest in obtaining food. This consists of small fishes, such as herrings or sardines, and they chase with great eagerness the flying-fish. In fact, it is the attack of the dolphin that makes the bonito leap from its native element.

In old days, the flesh of the Dolphin was considered a luxury; and as the creature, in common with all the Cetaceans, was considered as belonging to the fishes, its flesh was a permitted diet upon fast-days, and was served at table with a sauce composed of bread-crumbs, vinegar, and sugar; now-a-days, however, the flesh of the dolphin has fallen entirely into disrepute as an article of diet. The formation of the Dolphin's brain is of such a nature that it indicates great intelligence on

the part of its possessor, and goes far toward confirming some of the current reports on this subject. It is said that dolphins have been tamed and taught to feed from the hand of their instructor, besides performing sundry feats at his bidding. Sailors still believe in its possessing a taste for music, and when they desire to harpoon one, are reported to whistle in concert, with a view of keeping the dolphin still till the iron can be thrown.

The Dolphin produces only one young one at a birth, and is a very tender and careful parent.

GENUS DELPHINAPTERUS.

The WHITE-BEAKED DOLPHIN, *Delphinapterus Peronii*, bears also the names of the RIGHT-WHALE PORPOISE and PERON'S DOLPHIN. It is the *only* species known, and can be distinguished by the white beak, abdomen, and pectoral fins, the rest of the body being black. It is a Southern variety, and confined to the Atlantic Ocean, between the opposite coasts of Africa and Brazil.

GENUS TURSIO.

This genus contains *seven* species, one of which has been found in Philadelphia harbor. They are all rarer than the ordinary dolphin.

The BOTTLE-NOSED DOLPHIN, *Tursio erebennus*, usually measures seven or eight feet in length; its back is deeply tinged with purple, but the abdomen is grayish-white. It is distinguished from the common dolphin by the projection of the lower jaw beyond the upper; the teeth never exceed one hundred in number. This species is sometimes called the "Blunt-toothed Dolphin," but the shape of the teeth which led to this appellation has been proved to be not the normal one; as skulls exist in which the teeth are as sharp as in the ordinary dolphin.



CHAPTER VI.

THE PORPOISES AND WHITE WHALES.

THE COMMON PORPOISE—THE GRAMPUS, OR GLADIATOR DOLPHIN—ITS DESTRUCTIVENESS—ITS NAME “THE THRESHER”—THE PILOT WHALE, OR CAAING WHALE, OR GRIND—MODE OF CAPTURING—THE WHITE WHALE—SPECIMENS EXHIBITED IN SHOWS.

SOME of the Cetacea which form the subject of this chapter are better and more widely known than any other, as many specimens are seen in every inlet or bay of our sea coast.

GENUS PHOCÆNA.

The members of this genus, which comprises *two* species, are distinguished from the dolphins by having the muzzle short and uniformly rounded, instead of ending like a beak. Their size varies from six to eight feet, the head is small, the body round and full anteriorly, but compressed toward the tail; the color is a black-brown, or black with a greenish or violet reflection, with pure white on the abdomen. The jaws are armed with about one hundred teeth.

The PORPOISE, *Phocæna communis* (Plate XXVII), is the most familiar of all the Dolphin fraternity. The name is a corruption from the French *Porcpoisson*, or “Swine-fish,” and it is curious to observe that while we borrow a name from the French language, the French fishermen adopt a name of German or Scandinavian origin, and style the animal *Marsouin*, or “Sea-swine.”

The true home of the Porpoise is the northern portion of the Atlantic Ocean, from Greenland to North Africa, the Baltic and the Mediterranean Seas included. In the Pacific it extends down to the latitude of the Japan Islands. It seems to undertake regular migrations, proceeding northward when summer comes, and seeking the south on the

approach of winter. The porpoises live in numerous troops, and attract attention by their merry gambols among the waves. The mackerel, the herring, and the salmon flee before these turbulent troops, which are sometimes so numerous that, at the moment when the individual creatures composing them come to the surface to breathe, they darken the surface of the ocean. One then sees their oily, blackish bodies shining on all sides. They may often be seen shooting over the surface of the sea in Indian file.

As might be presumed from the formidable array of sharp teeth with which the jaws are studded, and which are so arranged that the upper and lower sets interlock when the animal closes its mouth, the food of the Porpoise consists entirely of animal substances; its voracity is proverbial; and it is a declared enemy to the fisherman, as it seems to prefer to devour the most marketable kinds of fish. Alone of the Cetacea it prefers the waters near the coast to the high seas, and pursues its prey into shallow water, and up rivers. Even the salmon, with its enormous power of leaping, cannot escape. The Porpoise prefers places where the water is discolored. It swims not far below the surface, comes up for an instant to breathe, and then dives again, curving its body so sharply, that it seems to form a ball. It is very active before a storm, and gambols about as if it were delighted at the coming tempest. It was much easier to watch these creatures before our rivers and coasts were so frequented by steam vessels, for the porpoises will not approach them so nearly as they approach sailing vessels.

The female produces one or two young ones at a birth, and the newborn offspring are remarkable for their very great size, measuring nearly one-half the length of the parent. The mother has large quantities of milk of a saltish, fishy taste.

The skin of the Porpoise is well suited for tanning, and makes valuable leather. Beneath the skin is a layer of fat about an inch deep, which can be melted into a very fine and delicate oil. Its flesh was formerly highly valued, and was cooked with bread-crumbs and vinegar; but it is unpleasing to the eye, and is said to be coarse to the taste, although it graced the royal banquets of Queen Elizabeth. The Porpoise has often been caught and kept for some time in captivity. When alarmed, it utters continuous cries of a very distressing and plaintive kind, and sheds tears in profusion. It is not known how long it would live in a state of nature if unmolested.

GENUS GRAMPUS.

The characteristics of this genus are a rounded head, a convex forehead, conical teeth, and ovate pectoral fins. It contains *three* species, of which none are found in our American waters.

CUVIER'S GRAMPUS, *Grampus Cuvierii*, is of a bluish-black color above, dirty white below. It loses its upper teeth at an early period, and preserves only a few of its lower ones. It is distinguished from the *Orca gladiator*—the Grampus of English sailors—by the lower position of the dorsal fin.

GENUS ORCA.

Of the *four* species assigned to this genus, we need only mention two, both of which are commonly called Grampus, a word corrupted from the French *grand poisson*, "great fish."

The KILLER or GRAMPUS, *Orca gladiator*, is also called the "Gladiator Dolphin," and has obtained in the Northern seas the somewhat misleading name of "Sword-fish" from its large sabre-like dorsal fin, which it is erroneously supposed to use as a weapon. It attains a length of eighteen to twenty feet. It possesses forty-four teeth, strongly made and slightly curved. It is black on the upper part of the body, white on the abdomen and sides, with a white patch above and behind the eye.

Although it sometimes wanders into more southern regions, its favored home is near the coasts of Greenland and Spitzbergen, where it congregates in small herds. It is a very wolf in its constant hunger, and commits great havoc among the larger fish, such as the cod, the skate, and the halibut: at times it is said to make systematic attacks on seals, by startling them from their slumber as they lie sunning themselves on the rocks or ice, and seizing them as they plunge half-asleep into the sea. Even the smaller porpoises and dolphins fall victims to the Grampus, as has been proved by the discovery of their remains in the dissected stomach of one of these animals.

In ancient times the Grampus seems to have been seen in the Mediterranean Sea, as Pliny mentions a whale which had white streaks on the head; but at present it does not seem to penetrate the Straits of Gibraltar, although very common on the English and French coasts. A

Grampus was captured nearly opposite Greenwich Hospital in 1772, and was so swift and powerful, that after it had been struck with three harpoons, and covered with lance wounds, it twice dragged the boat from Blackwall to Greenwich, and once ran as far as Deptford, going at a rate of eight miles per hour against the tide. The struggles of the wounded animal were so formidable, that none of the boats could approach it. Several other specimens of this animal have been caught in the same river at different times, one being twenty-four feet in length, and another measuring more than thirty feet.

The Killer is not only the largest, but the boldest, most rapacious and voracious, most blood-thirsty and dreaded of all the Delphinidæ. It deserves the title bestowed on it by Linnæus of "The Tyrant of the Whales," and exceeds even the shark in the devastation it creates wherever it appears. Its extraordinary voracity compels it to approach the coasts, but its favorite hunting-grounds are where the white whale is found. These robbers of the seas are also fond of amusing themselves by mobbing the Greenland whale, just as the little birds mob owls when they venture forth in the daytime, and they persecute it by leaping out of the water and striking it sharply with their tails as they descend. The Americans, in consequence, have called it by the name of Thresher, or Killer. Captain Scott relates that he has often seen the Thresher engaged in this strange combat. Scammon writes: "The attack of these wolves of the ocean on their gigantic prey was like that of a pack of dogs on a deer. Some hung on to the head of the whale, others attacked it from below, others seized it by the lips, and if it opened its mouth, tore its tongue. In 1858 I was eye-witness of a combat between three grampuses and a whale and her calf; the calf was three times the size of the largest grampus. The latter charged the whales alternately, and slew the young whale after a combat of an hour's duration. During the course of the struggle the strength of the mother was nearly exhausted, and she had received several severe wounds in the breast and on the lips." Even harpooned whales are attacked by this sea-murderer and dragged under water, in spite of all the fishermen can do to prevent it.

The CAPE KILLER, *Orca Capensis*, called also the "South Sea Grampus," is frequently noticed in the Pacific Ocean. They occur in herds, and their appearance is supposed to indicate the resorts of the sperm whales. They are less in size, but similar in other respects to the common grampus.

GENUS GLOBIOCEPHALUS.

The *fourteen* species comprehended under this genus are all distinguished by the globular aspect of the head, the sickle-formed pectoral fins, and the dorsal fin rising from the centre of the body. To the inhabitants of the Faroe and Orkney Islands, and to the dwellers in remote Iceland, the sea yields no more precious product than the animals we are about to describe.

The PILOT WHALE, *Globiocephalus deductor*, is known by many names. The one we have used is that of the British Museum Catalogue; but the names ROUND-HEADED PORPOISE, BOTTLE-HEAD, SOCIAL WHALE, HOWLING WHALE, and BLACK WHALE are given to it by English writers. The Scotch call it the CAAING WHALE. In Iceland and the Faroe Islands it is called GRIND. This species has long pectoral flippers and a black skin, the belly and throat being white; the teeth seldom exceed fifty in number. The males attain the size of eighteen to twenty feet, the former being perhaps more common.

More social than others of its kindred, the Pilot Whale is always found in troops varying in number from ten up to thousands, and led by some old experienced male whom the rest follow with the same docility or senselessness with which sheep follow their leader. On the appearance of a shoal, the sailors endeavor to get to seaward of their victims, and gradually closing upon them, drive them onwards by shouts and missiles to the shore. When one of them—the leader—is forced upon the beach, a curious scene of self-immolation is acted by the whole herd. They are then attacked by the whole assembled population of the neighborhood, who dispatch them by various means; the cries and struggles of the poor animals—some in, some out of the water—the shouts of the men, the bloody sea, combine to form a scene of no trifling interest. By such methods an entire shoal of seven hundred and eighty were captured at once at Sumburgh in Shetland; while there came ashore at Hvalfjord in Iceland no less than one thousand one hundred and ten, all of which were taken. Cuvier relates that some fishermen drove a cub-whale ashore on the coast of Brittany; its cries attracted the rest of the herd, all of which, seventy in number, were soon lying on the strand. The herd consisted of seven males and twelve young ones, all the others being adult females, many of which had their udders full of milk. They lived for some time; one old male did not die till the fifth day.

To the inhabitants of all the Northern islands this dolphin is invaluable; on the average, each one yields a barrel of oil; the flesh is eaten both salted and fresh; it is said to resemble coarse corned-beef; the fat has no taste; the skin is used for straps and rudder-lines, the ribs to fence in the fields, and the bladder as a receptacle for oil.

GENUS BELUGA.

The most remarkable characteristic of this genus, which contains *six* species, is the entire absence of a dorsal fin. The pectoral fins are oval, and placed in the first quarter of the total length of the body; the round head falls perpendicularly to the broad, short truncated muzzle; the jaws are provided with a few teeth, which fall out in age.

The WHITE WHALE, *Beluga Catodon* (Plate XXVIII), is an animal nearly akin to the Narwhal, but it is not provided with a tusk, and it has situated in the front-half only of the jaws some teeth which are conical, oblique, often truncated from attrition, and in the upper jaw not unfrequently disappearing. These teeth vary in number, but there is usually a row of nine above and eight below, occasionally one more or less. The color of the Beluga is wholly white, but the young are black. In length it rarely exceeds fifteen feet. According to Mr. R. Brown, this animal is, beyond all comparison, so far as its importance to the Greenlander and Eskimo are concerned, *the* Whale of Greenland. Like the Narwhal, it is indigenous; but it is only seen on the coast of Danish Greenland during the winter months, leaving the coast south of 72° north latitude in June, and roaming about at the head of Baffin Bay and the western shore of Davis Strait during the summer. In October it is seen to go west, not south; but in winter it can be observed, in company with the Narwhal, at the broken places in the ice. Its range may be said to be the same as that of the Narwhals; and during the summer months corresponds with that of the Right Whale, of which it is considered the precursor. It, however, wanders farther south than the Narwhal, being found as a regular denizen as far south as 63° north latitude, on the European coast, though on the opposite or American side of the Atlantic it reaches much farther south, being quite common in the St. Lawrence River. The Greenlanders, during the summer, kill great numbers of them, and preserve their oil and dry their flesh for winter use. Of this animal and the Narwhal, about five hundred are

yearly caught by the Greenlanders; but the majority of this number are Belugas. It feeds on crustaceans, fishes, and cuttles, and in the stomach is generally found sand. The Greenlanders often jocularly remark, in reference to this, that the *Kelelluak* takes in ballast. Great numbers are captured by means of nets at the entrance of fiords and inlets, or in the sounds between islands. The young are darker colored than the adult, and can at once be distinguished among the herds of the adults, which are of a pinky-white color. They are rarely seen far from land. The males and females go together in the herd, and do not separate. Their blast is not unmusical; and, when under the water, they emit a peculiar whistling sound, which might be mistaken for the call of a bird; on this account the seamen often term them "Sea-canaries." It is rarely that the regular whalers kill a Beluga, their swiftness and activity giving the fishers more trouble than the oil is worth.

A White Whale was exhibited for some time at Barnum's Museum, New York. It was sufficiently well-trained to recognize its keeper, and would put its head out of the water to take its food. Since then numerous specimens have been seen in captivity both in New York and Boston. There was one at Coney Island in 1877, where it had the benefit of having a tank supplied with fresh sea-water.

The name *Beluga Canadensis* has been given to the White Whales which are taken at the mouth of the St. Lawrence River, but Gray considers them identical with *Beluga catodon*.

Most of the species of whales are as yet imperfectly known. Some idea of the number of the species may be formed from part of the evidence of Professor Owen given before a Parliamentary Commission. He said that in order to display his specimens of whales properly, the British Museum ought to have *fourteen* galleries, each *one mile* in length.



ORDER VI.

SIRENIA.

42. MANATIDÆ - - - - - MANATEES, SEA COWS.

SIRENIA

THE SEA COWS.

THE ORDER SIRENIA—MERMAIDS—THE FAMILY MANATIDÆ—THE MANATES OF AMERICA—THEIR VORACITY AND LAZINESS—MODES OF CAPTURE—TAME SPECIMENS—THE FLORIDA MANATEA—THE AFRICAN LAMANTIN—THE EASTERN DUGONG—THE AUSTRALIAN DUGONG—THE NORTHERN SEA COWS—STELLER'S DESCRIPTION—EXTINCT SINCE 1768.

THE SIRENIA, or Sea Cows, as they are commonly called, are regarded by some authorities as intermediate between the Eared Seals and the Whales, while others consider them as constituting a sub-family of Cetacea. But many parts of their structure exhibit so close an alliance with the thick-skinned, or pachydermatous mammalia, that modern investigators place them in a separate order, preceding immediately the orders which are sometimes united under the common appellation Pachydermata.

The name of Sirenia, which is given to this group of animals, is chiefly owing to the peculiar form and habits of the Dugong, which has a curious custom of swimming with its head and neck above the surface of the water, so that it bears some grotesque resemblance to the human form, and might have given rise to the poetical tales of mermaids and sirens which have prevailed in the literature of all Eastern countries. When the female Dugong is nursing her child, she carries it in one arm, and takes care to keep the head of her offspring, as well as her own, above the surface of the water, and thus presents a strangely human aspect. If alarmed, she immediately dives below the waves, and flinging her fish-like tail into the air, corresponds in no inadequate degree with the popular notions of mermaid form.

The Sea Cows are herbivorous animals, living on the coasts or in the great rivers of several parts of the globe. The nostrils are placed at the extremity of the muzzle, and are never used as blow-holes. They possess

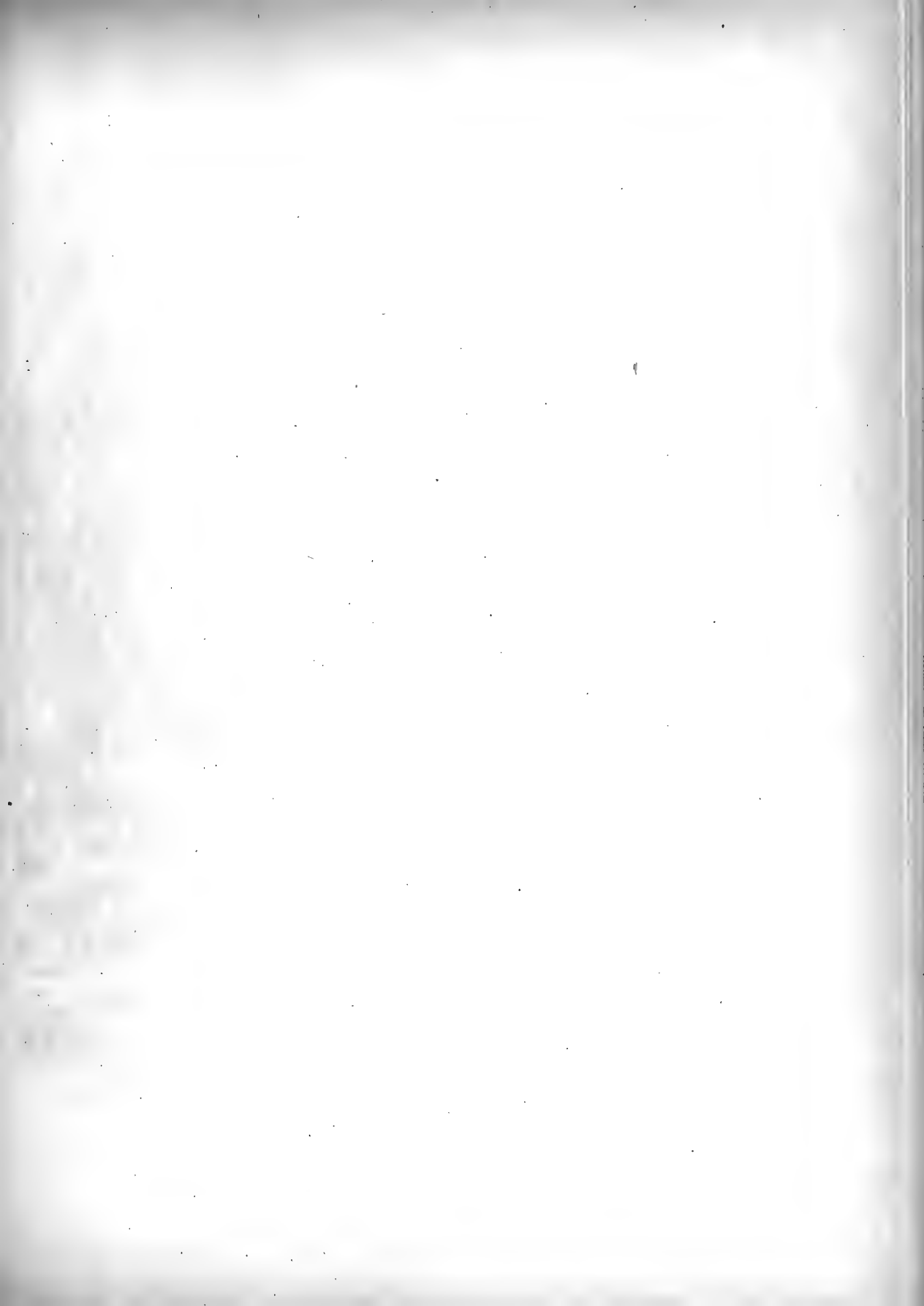
only the two fore-limbs, which are developed into fin-like flippers; but the skin so completely covers the fingers, that all separate movement of the joints is impossible, traces of nails being the only external indication of the internal division of the hand. The tail, representing the hinder-limbs, ends in a fin. One striking peculiarity exists in the form of the female Sirenia; this peculiarity is the position of the mammæ, which are placed on the breast and between the fore-limbs, and which are more prominent than in the other marine mammals. It requires, however, very great powers of imagination to see in these clumsy and awkward creatures any resemblance to the human form divine; and perhaps it is the same power of imagination which has led to the assertion that these creatures live in strict monogamy.

The Sirenia are much more sea-animals than the seals are; they very seldom protrude their unwieldy bodies above the surface of the water, while their movement on dry land—on to which they never emerge voluntarily—is slow, and requires great exertion, as the fore-limbs are too weak to bear the weight of the body, which is much less flexible than that of the seals. They swim and dive excellently, but avoid deep water, preferring places where the marine plants, weeds and grasses, on which they feed, can be found. They are very voracious, and like all voracious animals, heavy, lazy, and dull. They do nothing but eat and sleep, and may therefore be described as peaceful and harmless. Both sexes display great mutual affection, and the female is a devoted mother, clasping the little one to her bosom with one of her fore-flippers. In danger or in pain, tears roll from their eyes, and they utter a weak, dull moan, which somewhat resembles that of a human being in pain.

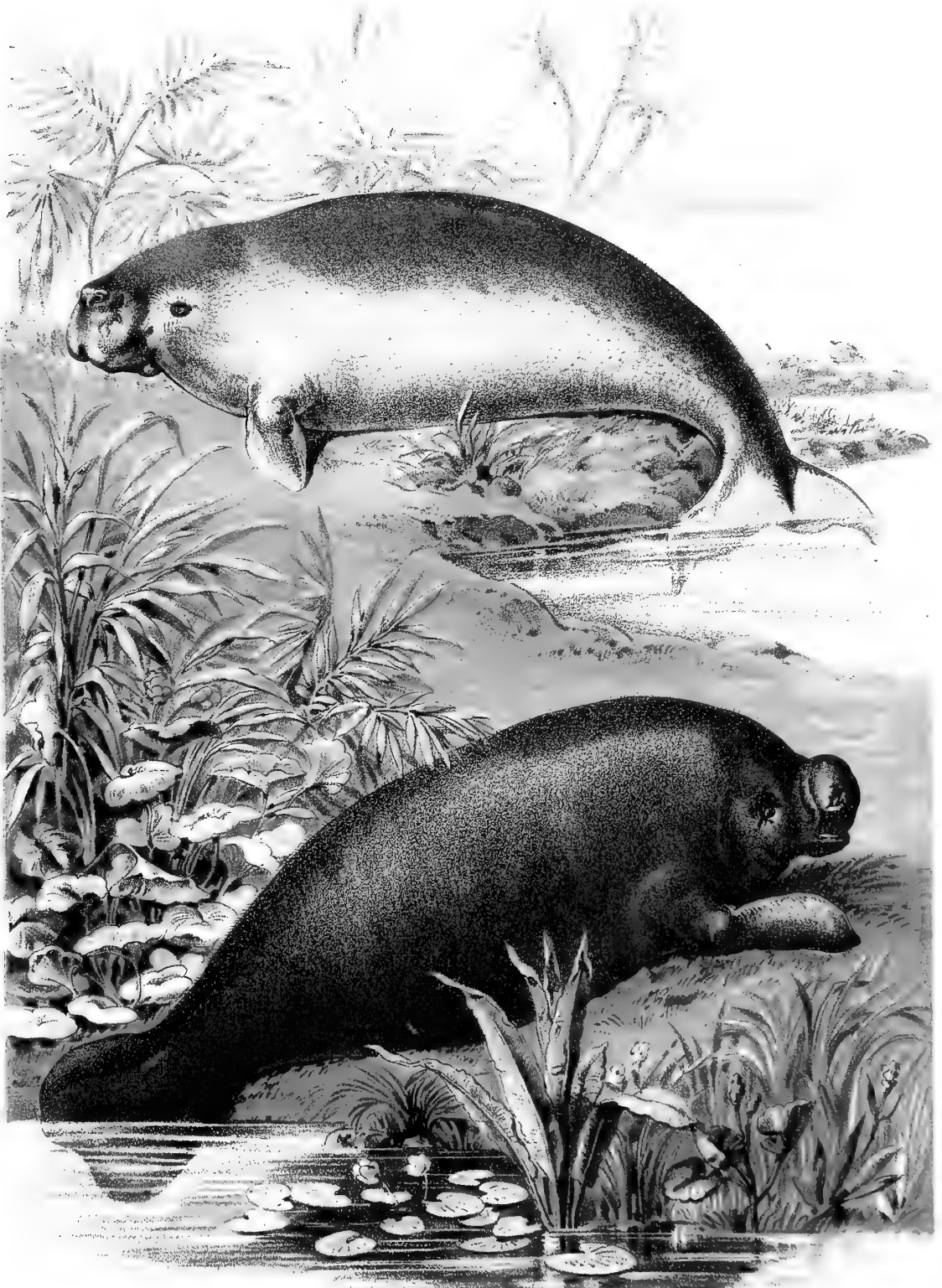
The Sirenia constitute only one family, MANATIDÆ, which is divided into *three* genera.

I.—GENUS MANATUS.

The *two* species of this genus inhabit both shores of the Atlantic; one ranging from the gulf of Mexico to North Brazil, and ascending the Amazon River; while the other is found on the West Coast of Africa. The genus is distinguished from the following one by the shape of the tail-fin, which is round, and by the thick fleshy dirk which terminates the muzzle. The body is covered with short, thin hairs which become







DUGONG
MANATEE

PLATE XXX SIRENIA



bristles on the muzzle; traces of four small nails can be detected on the flippers.

The MANATEE, *Manatus Australis* (Plate XXX), attains the length of nine feet, on the coast of Brazil. Our first accurate knowledge of the animal is due to the great traveler, Humboldt, who dissected one captured in the lower Orinoco. He observed that the Manatees prefer to linger in parts of the sea where fresh water springs arise, as in the Bay of Jagua in Cuba, and are very common in the Amazon, the Orinoco, and its tributaries. As all these southern rivers are rich in quiet nooks where water-plants of all kinds grow, they have no need to swim to any great distances; they eat ravenously, and when their hunger is satisfied, they lie in shallow places with the snout out of the water; they are thus saved the trouble of diving and rising, and sleep tranquilly for hours. During their waking time, they only come to the surface to breathe, but this emergence from the water occurs very often.

In all places where the Manatee is found, it is eagerly pursued. Its flesh is compared by Humboldt to pork, but is said to be unwholesome, and to produce fever. Salted and dried, it can be kept for a whole year, and like the flesh of the Cetacea, it is allowed as an article of food in Lent. The mode of taking the animal is very simple. A canoe approaches the feeding-grounds, and waits till one rises to take breath. As it appears, arrows with light wooden buoys fastened to them by cords are discharged at it, or it is harpooned. In the latter case an ingenious method of getting the body on board is adopted. The boat is filled two-thirds with water, and pushed under the dead Manatee, after which the water is baled out again by a calabash. The end of the inundations is a favorable season for its capture, and the Jesuits used to organize hunts on a large scale. The oil obtained from the carcass has not the offensive odor of train oil; the hide is manufactured into whips, from which the luckless Indians of the Missions used to suffer.

The Manatee is susceptible of domestication. The old traveler of the sixteenth century, Peter Martyr, writes: "A cacique in San Domingo has a little fish named Manato, which is quite tame, comes when called, eats bread out of the hand, allows itself to be stroked, and will carry people on its back across the pond in which it is kept." Gomara adds that it lived twenty-six years, crawled on dry land up to the house for food, and then back to the lake accompanied by boys, whose singing pleased it. It once carried ten people on its back across the water.

After a Spaniard had pricked it with his spear to see if its hide was as thick as people said, it would never come near any one in the Spanish dress. A planter in Surinam a few years ago trained a Manatee: he fed it on milk and bananas; it became quite tame, but displayed little intelligence, and its powers of sight and hearing were weak. If its owner stepped into the water, it would come and snuffle at his legs as a dog does, or if he sat down would climb on to his lap. It died after seventeen months of captivity. Dr. Cunningham has had, since 1867, two Manatees in the Public Gardens at Rio de Janeiro, where they were kept in company of some alligators and a number of waterfowl. One of them became very fond of a swan, which reciprocated the attachment, and they were always in company. This Manatee would eat grass out of the hand, and come halfway out of the water to reach the herbage which grew on the bank of the pool in which it was confined.

Some writers raise the Florida Manatee to the dignity of a species, *Manatus latirostis*; it seems to be, however, only a large variety, sometimes measuring fifteen feet or upwards. They used to abound in Tampa Bay, but are now rare. The one that was kept for some time in the Central Park, New York, was of this variety.

Columbus states that he saw three sirens dancing on the waters at Saint Domingo. Their lack of beauty, however, made him think that "they regretted their absence from Greece."

The LAMANTIN, *Manatus Senegalensis*, found on the African coast, is about eight feet long, having a conical head, round and very small eyes, with the iris of a very deep blue; a cylindrical muzzle, fleshy and thick lips, horizontal tail, and thick skin of an ashy-lilac color.

II.—GENUS HALICORE.

The Chinese and Arabians have for centuries been acquainted with this branch of the family. The old Greek writer Megasthenes speaks of creatures in the Indian seas which resemble women; an early Portuguese surgeon professes to have dissected a "mermaid"; and the Dutch traveler Valentyn describes "sea-wives"; in all of which cases one of the *two* species of *Halicore* is doubtless meant.

The DUGONG, *Halicore Dugong* (Plate XXX), is found in all parts of the Indian Ocean, and of the seas and straits connected with it; it

abounds in the southern parts of the China Seas, in the Straits of Banda and Sunda, and extends northward into the southern half of the Red Sea. It is always found near the coast where marine vegetation abounds: it enters occasionally the mouths of rivers, but does not sojourn in the rivers themselves: it does not come up on the land, and any dugongs that may have been seen lying on the shore, have doubtless been left high and dry by the receding tide. It rises to take breath once a minute, showing its muzzle, or even half his body, and then it sinks slowly and steadily back again into the water.

The Dugongs are said by the Eastern fishers to live in pairs; but this is not generally true, as they have been seen in schools in the Indian Ocean, as well as in the Red Sea. Their form is not well adapted for moving through the water; the snout is of an obtuse truncated character; and the tail is proportionately greater than in the Cetacea, its breadth being rather more than one-third of the length of the body; they do not possess the blood-reservoirs which enable the seals to survive for a long time beneath the water; and they are distinguished from the Manatee by their flippers, which have no nails, while the two external incisor teeth of the upper-jaw are elongated into a sort of tusks.

They are caught either in nets, or by spears. The natives on the Malay coast spear them at night, their presence being known by the snuffing noise they utter. When caught, the tail is raised out of the water, in which position the animal is quite powerless. The flesh is said to be good eating, with a peculiar sweet taste, and its skin is manufactured into various useful articles.

The Dugongs of the Red Sea are regarded by the German naturalist Ruppell as constituting a separate species, which he calls *Halicore tabernaculi*, from a notion that the Jews used its hide for covering the tabernacle. The AUSTRALIAN DUGONG, *Halicore Australis*, is undoubtedly a distinct species, and it is eagerly hunted for the sake of the oil which it yields, to which are attributed the same virtues as to cod-liver oil.

III.—GENUS RHYTINA.

This genus is supposed to be now extinct. The celebrated naturalist Steller was stranded, in November, 1741, on Behring Island, and spent ten weary months there. He writes: "Along the whole coast of the

island, especially where streams enter the sea and sea-weeds grow, there is found at all times of the year the animal called by the Russians *Morskaja Korowa*, or Sea-Cow. As food from other quarters began to be scarce, we resolved to catch some of these animals. I made my first attempt with a great iron hook provided with a strong and long rope. The hook, however, was too blunt, and the creature's hide too tough. I then tried harpooning. We repaired our jolly-boat, and sent it out with a harpooner; the harpoon was connected to a rope which was passed ashore, and held there by forty men of our crew. The boat was rowed quietly up to the animals as they were feeding near the shore. When one of them had been struck, we drew it gradually to land, stabbing it with bayonets and knives till it lost nearly all its blood, and at high water we made it fast on the strand. When the water had receded we cut off the flesh and preserved it in barrels. The largest of these animals measured four to five fathoms, with a girth of three and a half fathoms. The skull, when stripped of the flesh, was, in its general conformation, not unlike that of a horse; but when the hide was on it, resembled more that of a buffalo, especially in the lips. In place of teeth there were on each side two broad, long, smooth, spongy bones provided with protuberances and furrows which formed sharp angles. The lips were furnished with strong bristles, nearly as thick as the quills of chickens' feathers; the eyes were as large as a sheep's; and had no eyelids; the aperture of the ears was very small, and invisible till the skin was removed; there was no external ear. The head is united to the body by a very short neck; the fore-limbs consist of two joints, the extremity somewhat resembling the hoof of a horse; no nails or fingers could be seen. With these fore-limbs it tears up the sea-weed from the rocks. Below them the breasts are situated, the nipples being black, and two inches long, and abundantly supplied with lacteal ducts. When pressed, these teats discharge a great quantity of milk, which surpasses that of terrestrial animals in sweetness and richness. The back is like that of an ox; the tail is horizontal, as in the whale."

"These animals live in herds in the sea; usually a male and female go together, with the young one before them. The back and half of the body is frequently seen above water. They eat like cows as they slowly advance, scratching the weeds up with their fore-feet, and chewing unceasingly, but they do not ruminate. They care for nothing but eating. While eating, they move their heads like oxen, and after every few

minutes, raise their heads from the water, and snort like a horse. When the tide ebbs, they retire into the sea, but return as it rises, approaching the land so closely that they can be struck from the shore. They have no fear of man, and have little trace of intelligence, their most admirable quality being their affection for each other, which is so great, that when one was struck, the others tried to rescue it. Some formed a line, and attempted to keep their wounded comrade from the shore; others tried to upset the jolly-boat, while others exerted themselves to knock the harpoon out, a feat they accomplished successfully in several cases. We observed that a male came for two days in succession to the shore where his dead wife was lying, as if to ascertain her condition. They sometimes rest their heads on the land, leaving the body floating like a log on the water.

“They are found at all times of the year in great abundance around Behring Island, and all the inhabitants of the East Coast of Kamtschatka are thus supplied with plenty of meat and fat. The skin of the Sea-Cow is peculiar; the exterior layer is black or black-brown, an inch thick and firm; it consists of vertical fibres lying close to each other. This exterior layer, which can be easily scaled off, seems to me to be formed of hairs modified in an extraordinary manner. The inner skin is somewhat thicker than a cow's, strong, and white in color. Beneath these two skins the whole body is enveloped with a layer of fat four fingers deep, then comes the flesh. The fat is not oily, but hard; and, after exposure to the sun, becomes as yellow as the best butter; the tail is a mere mass of fat. The flesh of the calves is like veal, that of the old ones like beef; it has the peculiar quality that it can remain, even in summer, exposed to the open air for the space of two weeks without giving forth any bad smell, although it may be covered with flies and maggots; the flesh is very red in color, almost as if it had been rubbed with saltpetre. It was very nutritious, and soon banished the scurvy, from which some of our men were suffering.”

We have given Steller's description at some length, as no other exists or will ever be given, for, since the year 1768, no trace of this animal in a living condition has ever been recorded. There can be no doubt, however, that considerable numbers once existed; and these have all fallen a prey to the rapacity of the Aleutian fishermen, and hunters of the sea-otter.

Attracted by the reports of the Russian exploring expedition in

which Steller was engaged, whalers and adventurers of all kinds flocked to Behring Island, and commenced such a terrible butchery among the defenceless creatures, that not a single specimen of the animal can now be discovered. All attempts have been in vain to recover even a fragment of the Sea-cow of Steller. Every ship which set sail for the Island of Behring was requested to keep a look-out for them, but no news was ever brought back. Steller regarded this Sea-cow as identical with the Lamantin of Hernandez. It is clear, from his description, that the animal seen by him was a creature perfectly different from any of the Sirenia mentioned by earlier writers. It is well for science that Steller was among the unfortunate voyagers who were shipwrecked on Behring Island, and still more fortunate that he left so perfect a description of his discovery. His narrative was first published in 1749, at St. Petersburg, after his death. The animal seems not to have been abundant even at the time of Steller's voyage, and our destructive race, without giving naturalists an opportunity of unraveling its structure, have swept it from its native shores, and well-nigh obliterated all traces of its existence.

This sea-cow deservedly bears the name of the naturalist who discovered it, and is called *RHYTINA STELLERI*; it has, however, been described under the generic appellations of *Manatus* and *Trichechus*, while in the British Museum Catalogue of Cetacea it is alluded to under the name of *Rhytina gigas*. Like the Dodo and the Great Auk, Steller's Sea-cow is one of the animals which civilized man has destroyed in the mere wantonness of power.



ORDER VII.

U N G U L A T A .

- 43. EQUIDÆ - - - - - HORSES.
- 44. TAPIRIDÆ - - - - - TAPIRS.
- 45. RHINOCEROTIDÆ - - - - RHINOCEROS.
- 46. HIPPOPOTAMIDÆ - - - - HIPPOPOTAMUS.
- 47. SUIDÆ - - - - - SWINE.
- 48. CAMELIDÆ - - - - - CAMELS.
- 49. TRAGULIDÆ - - - - - CHEVROTAINS.
- 50. CERVIDÆ - - - - - DEER.
- 51. CAMELOPARDALIDÆ - - GIRAFFES.
- 52. BOVIDÆ - - - - - CATTLE, SHEEP, ANTELOPES.

UNGULATA

CHAPTER I.

HOOFED ANIMALS.

THE ORDER UNGULATA—THE NUMEROUS FAMILIES—THE RUMINANTS—THEIR PECULIAR STOMACH—HORNS—ANTLERS—EXTINCT SPECIES—THE ORIGINAL HORSE PROTOHIPPIUS—GRADUAL DEVELOPMENT—THE FAMILY EQUIDÆ—THE GENUS EQUUS—THE HORSE—THE TARPAN OR WILD HORSE OF TARTARY—THE MUSTANG OR WILD HORSE OF AMERICA.

WITH the exception of the Australian region, in which this order of mammalia is almost entirely wanting, the UNGULATA are well distributed over the world; they are the dominant vegetable feeders of the great continents, and are of larger size and less activity than the CARNIVORA. Among them are the most valuable and most domestic animals which man possesses, as the horse and the camel, the ox and the sheep. Among them are the strongest, as well as the most timid, the rhinoceros and the hippopotamus, the giraffe and the tapir, the antelope and the deer.

The order UNGULATA, from the Latin *unguis*, "a hoof," embraces ten extensive families. Many subdivisions have been proposed; one method is based on the number of toes, and whether they are odd and even; by it the families *Equidæ*, *Tapiridæ*, *Rhinocerotidæ* are classed as *Perissodactyla* or "odd-toed"; the remaining families, as *Artiodactyla*, or "even-toed." By another classification those animals that "divide the hoof and chew the cud" are taken from the UNGULATA and formed into an order RUMINANTIA. Among these latter are those domesticated animals which are especially adapted for human food.

With the exception—in some instances—of the *Suidæ* or Swine, all the families in this order are herbivorous, and the molar teeth have hard crowns adapted for grinding vegetable substances. In the Ruminant animals, the typical dentition consists in the absence of incisor and canine teeth in the upper jaw, while the lower jaw holds six incisors and

two canines, which are all similar in size and form. There are six molars on each side of each jaw. The lower incisors bite against a callous pad of gum. But, more remarkable than the arrangement of the teeth, is the structure of the stomach in the cud-chewing families. They first swallow their food unchewed, and then bring it up again to chew it. This regurgitation is effected as follows: the stomach is divided into compartments, of which the largest, lying to the left, is called the *rumen* or "paunch," and receives the food. Here it remains soaking for some time, and is then passed into the *reticulum* or "honey-comb" bag, where it is made into little balls or pellets which are returned to the mouth by a reverse action of the muscles. In the mouth the food is thoroughly chewed and then swallowed a second time, passing not into the paunch, but into the *psalterium* or "manyplies." From the "manyplies" a wide aperture leads into the *abomasum* or fourth stomach, where the gastric juice is secreted, and digestion completed.

Among the ruminants alone are found animals which possess those appendages that are usually called horns. But these horns are of two distinct kinds. The true Deer bear on their forehead two solid, bony antlers, which, except in the Reindeer, are confined to the males. These antlers are deciduous, and are shed annually; they increase in size every time they are reproduced. Oxen, sheep, goats, and antelopes have true horns, consisting of a horny sheath surrounding a central bony axis: these horns are persistent, that is, they are not shed. In the antelope, the horns are compact, without cells; in the goat, ox, and sheep they have cells which communicate with the nose.

Wallace remarks that the present distribution of the *Ungulata* is utterly unintelligible without reference to the numerous extinct forms of existing and allied families; he adds, that we have good evidence that their wide range over the globe is a comparatively recent phenomenon. Tapirs and Llamas have probably not long inhabited South America, while Rhinoceroses and Antelopes were once perhaps unknown in Africa, although abounding in Asia and Europe. Swine are the most ancient types in both hemispheres, and their great hardiness, omnivorous diet, and powers of swimming, have led to their wide distribution. The sheep and goats, on the other hand, are perhaps the most recent development of the *Ungulata*, and seem to have arisen in the Northern region of the Eastern hemisphere, when the climate approximated to that which now prevails in the same regions.

The animals belonging to this order being usually of larger size, and accustomed to travel in herds, are liable to wholesale destruction by floods, bogs, precipices, drought, or hunger. Hence their remains are exceedingly numerous in the older geological strata. Such fossil remains are especially abundant in America. The horse is peculiarly interesting. When Columbus and the Spaniards landed, it was entirely unknown on this continent; but in the earlier ages of the world's history, horses of all kinds must have roamed over our plains. Among these was the *Protohippus*, only two feet and a half high, with the lateral toes not externally developed, the *Mesohippus* and *Anchitherium*, about the size of a sheep with three toes used for locomotion, but still unmistakably equine; and in the deposits of Utah and Wyoming, species have been discovered about the size of a fox, with four toes in front and three behind. These form the genus *Orohippus*, the oldest ancestral horse known. America thus possesses a perfect series of forms which, beginning with this minute ancient type, is gradually modified by gaining increased size and increased speed, by concentration of the limb-bones, by elongation of the head and neck, by the canine teeth decreasing in size, and by the molars becoming larger and being coated with cement, till we at last come to animals hardly distinguishable, specifically, from the living horse with which we are all acquainted.

The family EQUIDÆ, as befits the beauty and utility of the animals embraced in it, stands at the head of the order. It contains *one* genus, which is divided into *eight* species; among which are *four* species of Asses, and *three* of Zebras.

GENUS EQUUS.

The members of this genus are often styled *Solipedes* or "solid-footed," as they have only one apparent toe on each foot, which is enclosed in a single hoof. They have, however, under the skin, the rudiments of lateral toes. They have six incisor teeth in each jaw, small canines exist in the males, but are wanting in the females. Between the canines and the molars there is a space where the bit is placed, an arrangement by which alone man has been able to subdue these vigorous animals. They all attain a moderate size, and possess a graceful figure with strong limbs; their head is long, the eyes vivacious, the nostrils expanded, the ear small, and the hair is short and thick, forming a mane on the neck.

THE HORSE.

The HORSE, *Equus caballus* (Plate XXXI), the noble companion of man in the battle and the chase, in the labors of agriculture and commerce, is distinguished by the uniformity of his color, and by his tail being ornamented with long hair throughout its entire length. Wild horses exist both in Tartary and America, where they live in troops, conducted and defended by an old male. We know that in the latter, these herds are all descended from imported ancestors, and many authorities consider that those that roam over the steppes of Asia are likewise the offspring of domesticated parents.

THE TARPAN.

The TARPAN, as the wild horse of Tartary is called, is considered by the Cossacks and Tartars to be a wild animal in the proper sense of the word. It is small, with powerful legs, long pasterns, a long thin neck, a thickish head, pointed ears inclined forward, and small, lively, wicked-looking eyes. A light or yellowish brown is the prevailing color of the summer-coat, but in winter the hair becomes lighter, at times even white. The mane is bushy, and, like the tail, is uniformly dark. Dappled or black horses are rare.

The Tarpan live in herds, numbering several hundreds; usually the larger herds are divided into smaller family groups, each under an old stallion; they live in the open steppes, but are not found in the desert of Gobi, or in the highlands north of India. They migrate from place to place, traveling against the wind, are very watchful and shy, and recognize in good time the approach of danger. The leading stallion is the autocrat of the troop; at the sight of anything suspicious he raises his head, advances, and when he thinks it advisable, neighs the signal for flight. These herds of horses have no dread of beasts of prey, they attack wolves without fear, and strike them down with their fore-feet. In the combats between the males, teeth as well as feet are used, and the young ones have to establish their right to found a family by a series of desperate duels with their seniors of the troop.

The appearance of one of these herds as they sweep over the plains, and career around any intruder on their domain, is best described in the well-known lines of the poet Byron :

"A trampling troop: I see them come
 In one vast squadron they advance!
 I strove to cry—my lips were dumb.
 The steeds rush on in plunging pride,
 But where are they the reins who guide?
 A thousand horse and none to ride!
 With flowing tail and flying mane,
 Wide nostrils—never stretch'd by pain—
 Mouths bloodless to the bit or rein,
 And feet that iron never shod,
 And flanks unscarr'd by spur or rod—
 A thousand horse, the wild, the free,
 Like waves that follow o'er the sea.
 On came the troop
 They stop—they start—they snuff the air,
 Gallop a moment here and there,
 Approach, retire, wheel round and round,
 Then plunging back with sudden bound;
 They snort, they foam, neigh, swerve aside,
 And backward to the forest fly."

The inhabitants of the steppes dread the Tarpans, on account of the injury they do to their haystacks, and because the male Tarpans run away with their mares. The Cossacks are accustomed to hunt the wild horses, partly to keep up their own stock, and partly for food. A species of vulture is sometimes made use of in this affair. The bird pounces upon the poor animal, and fastens itself on his head or neck, fluttering his wings, and perplexing and half-blinding him, so that he becomes an easy prey to the Tartar. The young horses are generally tamed without much difficulty; they are, after a little while, coupled with a tame horse, and grow gentle and obedient. The wild horses thus reclaimed are usually found to be stronger and more serviceable than any which can be bred at home, in the Tartar villages.

Pallas, the great Russian traveler, considers these wild horses to be descended from those employed at the siege of Azof in 1657, which were turned loose by the army, owing to want of forage.

THE MUSTANG.

The MUSTANG (Plate XXXI) is the wild horse of the American prairies and pampas. The city of Buenos Ayres was abandoned by the Spanish colonists soon after its settlement in 1535, and about half-a-dozen horses were left behind. The city was again occupied in 1580,

and the new-comers saw, to their astonishment, that the neighborhood was swarming with wild horses. The descendants of these Spanish derelicts are now spread in every part of the pampas, and have been seen in troops of ten thousand. They possess much of the form of the Spanish horse, but are not speedy: they are capable of enduring immense fatigue, and are frequently ridden sixty or seventy miles without drawing bit, while they have been known to be urged on by the cruel spur of the Gauchos more than a hundred miles a day, at the rate of twelve miles an hour. They know no pace between the walk and the gallop, and at the end of the day's journey are turned loose on the plains. The mares are never ridden, and when the Gaucho or native Indian of the South American plains wants a horse, he sets out armed with his lasso, mounted on a horse that has been used to the work. He gallops alongside a troop of the wild horses, and as soon as he comes sufficiently near his prey, the lasso is thrown round the two hind-legs, and as the Gaucho rides a little on one side, the jerk pulls the entangled horse's feet laterally, and throws him on his side, without endangering his knees or his face. Before the horse can recover the shock, the rider dismounts, and snatching his *poncho* or cloak from his shoulders, wraps it round the prostrate animal's head. He then forces into his mouth one of the powerful bridles of the country, straps a saddle on his back, and bestriding him, removes the poncho; upon which the astonished horse springs on his legs, and endeavors by a thousand vain efforts to disencumber himself of his new master, who sits quite composedly on his back, and, by a discipline which never fails, reduces the horse to such complete obedience, that he is soon trained to lend his whole speed and strength to the capture of his companions.

When the Gauchos have a grand breaking-in, a whole herd is driven into the corral. A young horse is lassoed by the neck and dragged out; some men on foot lasso his fore-legs and throw him; in an instant a Gaucho is seated on his head, and, with his long knife, in a few seconds cuts off the whole of the horse's mane, while another cuts the hair from the end of his tail: this is a mark that the horse has been once mounted. They then put a piece of hide into his mouth to serve for a bit, and a strong hide halter on his head. The Gaucho who is to mount arranges his spurs, which are unusually long and sharp, and while two men hold the horse by his ears, he puts on the saddle, which he girths extremely tight. He then catches hold of the horse's ear, and in an instant vaults

into the saddle; upon which the man who holds the horse by the halter throws the end to the rider, and from that moment no one takes any further notice of him.

"The horse instantly began," Sir F. Head writes, "to jump in a manner which made it very difficult for the rider to keep his seat, and quite different from the kick or plunge of an English horse; however, the Gaucho's spurs soon set him going, and off he galloped, doing everything in his power to throw his rider.

"Another horse was immediately brought from the corral; and so quick was the operation, that twelve Gauchos were mounted in a space which I think hardly exceeded an hour. It was wonderful to see the different manner in which different horses behaved. Some would actually scream while the Gauchos were girding the saddle upon their backs; some would instantly lie down and roll upon it; while some would stand without being held, their legs stiff and in unnatural positions, their necks half bent towards their tails, and looking vicious and obstinate; and I could not help thinking that I would not have mounted one of those for any reward that could be offered me, for they were invariably the most difficult to subdue.

"It was now curious to look around and see the Gauchos on the horizon in different directions, trying to bring their horses back to the corral, which is the most difficult part of their work, for the poor creatures had been so scared there that they were unwilling to return to the place. It was amusing to see the antics of the horses; they were jumping and dancing in different ways, while the right arm of the Gauchos was seen flogging them. At last they brought the horses back, apparently subdued and broken in. The saddles and bridles were taken off, and the young horses trotted off towards the corral, neighing to one another."

In the *Estancias*, or establishments dedicated to the breeding of cattle on the pampas, large numbers of these horses are required, and in order to secure a good supply of colts, to make good the wear and tear of the year, herds of brood mares are kept, which yield an annual supply. The small herds are called *manádas*, and consist of from twenty-five to thirty mares, and over them presides the father of the family. They are parted off from larger herds, and are shut up in the corral for the night, where at first they seem to feel their separation from their old friends and companions. At sunrise they are let out, and a peon, or Indian

servant is appointed to assist the horse to keep them together. Presently one jade bolts away at full speed, and tries to regain her old accustomed herd. Away goes the horse in chase, and as he overhauls her, with his ears laid back, and his nose to the ground, he compels her return quicker than she went away. Before he has got well *breathed*, another starts off in the opposite direction. After her goes the horse, and the jilt is brought back at the top of her speed. This continues nearly all the day, and at night they are again locked up. Next day the same game goes on, the horse still assisted by a well-mounted peon, until, at the end of eight or ten days, their acquaintance is made. If any remain refractory, they are thrown down, the axe applied to one of the hoofs of the hind-legs; it is cut to the quick, and, thus punished, she is compelled to *limp it* for fifteen or twenty days, until the hoof grows again. By that time she becomes reconciled, and the *manáda* is established, and keeps together. They are then conducted to a quiet part of the ground, apart from the other herds, in order to prevent collision between the different families.

Apart from these herds of horses already described, there are small troops of horses accustomed to go together in company with a mare selected for that purpose, and called the *madrina*. These are reserved for particular service, and are called *tropillas*. The horses, which generally consist of ten or twelve, are selected of one color, and the mare, to render her more distinguishable, is as different as possible from the horses. For instance, a tropilla of black horses will generally have a white mare; she wears a bell suspended from her neck, so that the horses at night may hear the sound, and prevent them from parting company.

Such is the life of the wild steeds that run over the wide plains of the Argentine Republic, Paraguay, and Central Brazil. The Mustangs north of the Isthmus of Panama are derived from Mexican horses which have escaped into the woods and savannahs, and roamed northward to the Rocky Mountains. The Indians have learned to capture them, and employ them in transporting their families from place to place. The highest ambition of the young Indian is to possess a good horse; and to steal a horse is almost as glorious as to scalp an enemy. The Indian pony, as it is called, is barely fourteen hands high, rather light built, with good legs, straight shoulders, short, strong back, and full barrel. He has no appearance of "blood" except sharp, nervous ears, and intelligent eyes. He is never stabled, washed, rubbed, shod,

nor fed ; in winter he is an animated skeleton, sustaining a bare existence on cottonwood branches ; but when spring brings out the tender grass, he is soon in condition "worthy to be trusted to the death." After endurance, the best quality of the Indian pony is his sureness of foot. He climbs rocks like a mule, he plunges down precipices like a buffalo, and crosses swamps like an elk. The amount of work got out of him by the Indians is considerable, and in Indian hands and with Indian bits he is tractable. But he does not receive civilization any better than his master. According to General Dodge, "he is either a morose, ill-tempered brute, hard to manage, and always dangerous, or he degenerates into a fat, lazy, short-breathed cob, fit only for a baby or an octogenarian. Prosperity spoils him, and his true character and value are best displayed in adversity." Among the Indians a "pony" is the standard of value by which the price of wives and other chattels is fixed.

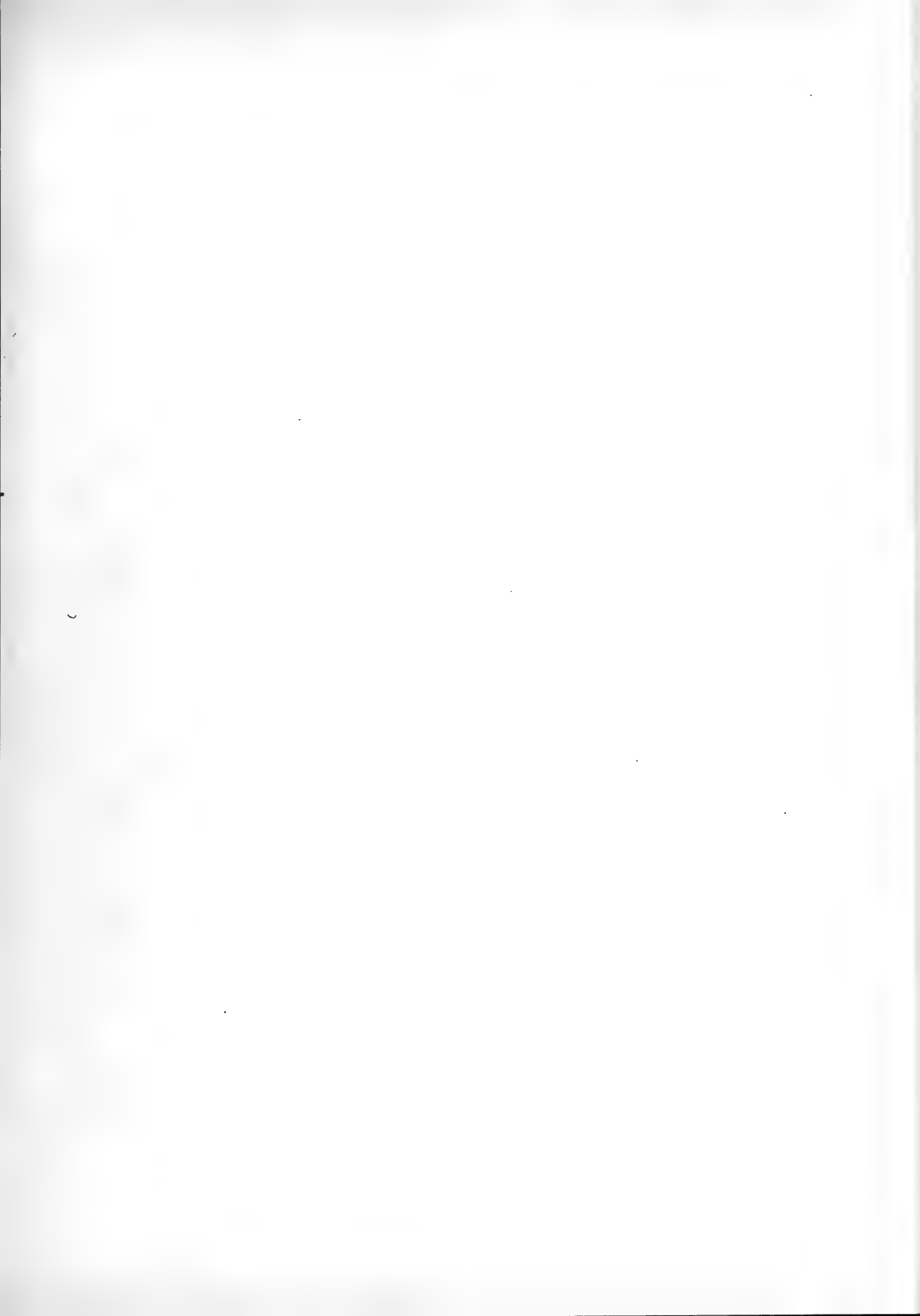


CHAPTER II.

THE ARAB AND THE BARB.

EARLY DOMESTICATION OF THE HORSE—THE HORSE IN EGYPT—ASSYRIA—JUDÆA—GREECE—
PERSIA—BITS AND STIRRUPS—CHARIOT RACES—THE ARAB HORSE—EXAGGERATED PEDIGREES—
—THE BEST ARABS—THEIR TRAINING—ATTACHMENT OF THE ARAB FOR HIS MARE—SPEED
AND ENDURANCE—THE BARB—THE SAME HORSE AS THE ARAB—ABD-EL-KADER ON THE
HORSE.

NO historian tells us what nation first subdued the horse. Pictures of the horse are not found on the monuments of Egypt till the eighteenth century before the Christian era, when the Pharaohs of the "New Kingdom" employed them to draw their war-chariots. As these animals are represented well-trained and harnessed, they must have been domesticated for several generations previously, unless we suppose that they were introduced from Asia by the nomad tribes who visited the delta of the Nile. But from whatever source they derived their horses, the Egyptians were the first to give systematic attention to improving the breed: the symmetry, beauty, and color of the steeds represented on the ornaments show that they were designed from high-bred types. Grooms are represented as rubbing their joints, and sedulously attending to their comfort. If we turn from the sculptures of Egypt to the bas-reliefs of Assyria, we find the horse again serving for warlike purposes, and harnessed to the chariot. The Jews, according to the Book of Deuteronomy, were prohibited from breeding or importing horses. At all events, they seem not to have used them for five hundred years after their migration from Egypt; Solomon, however, possessed fourteen hundred chariots, and stabling for forty thousand horses, most of which were imported from Egypt. In the Homeric poems, the oldest Greek records, we again find the horse, used solely for drawing chariots. Mounted cavalry is not heard of till comparatively a late period. The Persians were the first to become celebrated for their





MUSTANGS

ARABIAN HORSE

SHETLAND PONY

PLATE XXXI UNGULATA



mounted troops, and every Persian boy was taught "to ride, to shoot, and to speak the truth." The provinces of the Persian Empire contained many excellent breeds of horses, Armenia and Cappadocia being the most famous in this respect. Cyrus, the founder of the Persian power, devoted himself to the improvement of native horses, and declared it ignominious for a Persian to be seen in public except on horseback. The Persian horseman mounted on the right side, and his horse was carefully taught to have a high action, and was ridden by a halter. We first see the bit in some of the Grecian sculptures, and this Greek bit is the common snaffle of the present day. To their great credit, the Greeks never rode with a curb. The Romans invented a cruel bit with sharp projections like the teeth of a wolf. No mention is made by ancient writers of saddles such as are used in modern times; the back of the horse was covered with a cloth or a skin, which was kept in its place by a surcingle. Stirrups, too, were unknown; in fact, they are first mentioned in the year 1158 A. D., but are represented in the Bayeux tapestry executed nearly a century earlier, and representing William the Conqueror's invasion of England. The ancient heroes trusted chiefly to their own agility in leaping on their horses' backs; sometimes they climbed up by the aid of the loop of their lance, sometimes the horse was taught to kneel; wealthy men were assisted to mount by their slaves. Shoes of metal were not fixed to the hoof by nails, but both the Greeks and Romans were accustomed to fasten on the foot a sort of shoe of leather, which was sometimes strengthened with a plate of iron, or adorned with silver or gold.

Next to war, the race was the chief field on which the ancients exercised their horses. The favorite race was the chariot race, each chariot having four horses attached to it; the circus was about one-third of a mile in length, and six laps formed the course. In the later Roman Empire and the Empire of Constantinople, the passion for the circus reached such a point that the history of the city became a history of the struggle between the *blue* and *green* parties, as they were called, from the colors of their drivers. This was at a time, too, when the use of chariots in war had fallen into disuse, and when cavalry was the important part of the army.

The Romans were the first to introduce the custom of employing horses in ordinary agricultural or mercantile pursuits, and they have from that time, in every part of Europe and North America, gradually

become one of the most useful of the servants of man. In the East the practice does not prevail, and the Arabs say that a horse is degraded if employed in tillage or carrying burdens. Abd-el-Kader, the great Algerian chief, who for so many years withstood the French and baffled the French generals, has written on the horse, and tells us: "My father—may God receive him in mercy—was accustomed to say, 'No blessing on our country since we have changed our coursers into beasts of burden and tillage. Has not God made the horse for the race, the ox for the plough, and the camel for the transport of merchandise? Nothing is gained by changing the ways of God.'"

M. Toussenel exclaims: "Tell me what sort of horse a people have, and I will tell you the manners and institutions of that people. The history of the horse is the history of the human race, for the horse is the personification of the aristocracy of blood. Every revolution which exalts the people, abases the horse. The horse is one of the first conquests of man, and is one of the pivots on which the very existence of a patriarchal tribe depends. Some day or other the tribe of horsemen conquers its horseless fellows, and organizes itself so as to ensure a firmer settlement on the conquered territory. The first step is to ennoble the horse; in other words, to establish a feudal system. The highest functionary in a feudal kingdom was the Constable, the 'Count of the Stable,' or the Marshal, the 'Horse-servant'; the lesser nobles are *chevaliers*, that is, horsemen (from the French *cheval*, 'a horse'), or *ritters*, the men who ride. But gunpowder has killed both the horse and the feudal system." The remarks of M. Toussenel are decidedly fanciful, but he states the truth when he says, "There is only one horse in the world—that is, one real horse—the Arab."

THE ARAB HORSE.

The ARAB HORSE (Plate XXXI). The horse of the Egyptian monuments closely resembles the Arab, but no ancient writer celebrates any breed of steeds belonging to that peninsula. In the seventh century of our era the Arabs had few horses, and it is said that when the Prophet attacked the Koreish near Mecca he had only two in his whole army, nor does he enumerate a horse among the spoils of his bloody campaign. It is only since the thirteenth century that the Arab horse began to obtain its unrivaled celebrity. There are now three breeds recognized by the Arabs, the *Attechi*, an inferior breed which is found wild in some places,

the *Kadischi*, or mixed breed, and the *Kochlani*, or pure breed. Till the last century, the pedigrees of these horses used to be traced to the five which bore Mohammed and his companions on the flight to Medina; at present, no Arab chief is happy unless he can trace the descent of his favorite steed from one of the stud of King Solomon. The Bedouins themselves, however, never make use of any written pedigree, and, according to Abd-el-Kader, the Arabs of Algiers care nothing for written registers, the genealogy of the blood-horses being as well known as that of their masters. The province of Nedjed adjoining the Syrian desert is said to produce the noblest horses of the present day, the pasture there is rich and succulent, and unrivaled for its nutritious and aromatic properties, and it is a mistake to suppose that the Arabian is reared in an arid desert, and owes his powers of endurance to early hardships. Another error is to suppose that horses are numerous in Arabia; Burckhardt estimates the total number at fifty thousand. Still fewer, comparatively, are those of perfect quality and beauty, probably not two hundred in the whole desert. A true Arab of Arabia never mounts a stallion, and never parts with his mare.

The owner of a mare bestows great pains in seeking out for her a mate of unblemished descent. The mare and foal live in the tent with the Bedouin and his children, who roll about with her and her foal; no accident ever occurs, and the animal becomes a loving friend. At the end of a month the foal is weaned, and is fed for three months on camel's milk; then a little wheat is allowed for another three months; at the expiration of this time, the young animal is allowed to graze near the tent, and some barley is given it. The kindness with which the Arab is treated from her very birth gives her an affection for her master, a wish to please, a pride in exerting every energy, and an apparent sagacity, which is seldom seen in other breeds.

When the rider falls from his mare, and is unable to rise, she will immediately stand still, and neigh until assistance arrives. If he lies down to sleep, as fatigue sometimes compels him, in the midst of the desert, she stands watchful over him, and neighs and rouses him if either man or beast approaches. The Arab horses are taught to rest occasionally in a standing position; and a great many of them never lie down.

The Arab loves his horse as truly and as much as the horse loves him; and no little portion of his leisure time is often spent in talking to and caressing his faithful steed.

An old Arab had a valuable mare that had carried him for fifteen years in many a rapid weary march, and many a hard-fought battle; at length, eighty years old, and unable longer to ride her, he gave her and a scimitar that had been his father's to his eldest son, and told him to appreciate their value, and never lie down to rest until he had rubbed them both as bright as a mirror. In the first skirmish in which the young man was engaged, he was killed, and the mare fell into the hands of the enemy. When the news reached the old man, he exclaimed that "life was no longer worth preserving, for he had lost both his son and his mare, and he grieved for one as much as the other." He immediately sickened, and soon afterward died.

The following anecdote of the attachment of an Arab to his mare has often been told: "The whole stock of an Arab of the desert consisted of a mare. The French consul offered to purchase her, in order to send her to his sovereign, Louis XIV. The Arab would have rejected the proposal, but he was miserably poor; he had scarcely a rag to cover him, and his wife and his children were starving. The sum offered was great—it would provide him and his family with food for life. At length, and reluctantly, he yielded. He brought the mare to the dwelling of the consul, dismounted, and stood leaning upon her; he looked now at the gold, and then at his favorite. 'To whom is it,' said he, 'I am going to yield thee up? To Europeans, who will tie thee close, who will beat thee, who will render thee miserable. Return with me, my beauty, my jewel, and rejoice the hearts of my children.' Thus speaking, he sprang upon her back, and was out of sight in an instant."

The Arab horse would not be acknowledged by every judge to possess a perfect form. The head, however, is inimitable. The broadness and squareness of forehead, the smallness of the ears, the prominence and brilliance of the eye, the shortness and fineness of the muzzle, the width of nostril, the thinness of the lower jaw, and the beautifully developed course of the veins, are always striking characteristics. The body is too light, and the chest too narrow, but the barrel is roomy, the neck is long and arched, and beautifully joined to the chest, the withers are high, the shoulder-blade well sloped, and though covered with plenty of muscle, has no appearance of heaviness.

The fineness of the legs and the oblique position of the pasterns might be supposed by the uninitiated to lessen his apparent strength, but the leg, although small, is deep, and composed of bone of the densest

character. The tendons are sufficiently distinct from the bone, and the starting muscles of the fore-arm and the thigh indicate that it is fully capable of accomplishing many of the feats that are recorded of it.

The young Arab commences its career with a severe trial. Probably the filly has never before been mounted. Her owner springs on her back, and goads her over the sands and rocks of the desert for fifty or sixty miles without one moment's respite. She is then forced, steaming and panting, into water deep enough for her to swim. If, immediately after this, she will eat as if nothing had occurred, her character is established, and she is acknowledged to be a genuine descendant of the *Kochlani* breed. The Arab does not think of the cruelty which he thus inflicts; he only follows an invariable custom.

We may not, perhaps, believe all that is told us of the speed and endurance of the Arabian. It has been remarked that there are on the deserts which this horse traverses no mile-stones to mark the distance, or watches to calculate the time; and that the Bedouin is naturally given to exaggeration, and, most of all, when relating the prowess of the animal that he loves as dearly as his children. But it cannot be denied that, at the introduction of the Arabian into the European stables, there was no horse comparable to him. The mare in her native deserts will travel fifty miles without stopping; she has been urged to the almost incredible distance of one hundred and twenty miles, and occasionally, neither she nor her rider has tasted food for three whole days.

Our horses would fare badly on the scanty nourishment afforded the Arabian. The mare usually has but two meals in twenty-four hours. During the day she is tied to the door of the tent, ready for the Bedouin to spring, at a moment's warning, into the saddle; or she is turned out before the tent ready saddled, the bridle merely being taken off, and she is so trained that she immediately gallops up at her master's call. At night she receives a little water; and with her scanty provender of five or six pounds of barley or beans, and sometimes a little straw, she lies down content, if she is accustomed to lie down at all, in the midst of her master's family.

Burckhardt relates a story of the speed and endurance of one of them, which shows with what feelings an Arab regards his quadruped friend: "A troop of Druses on horseback attacked, in the summer of 1815, a party of Bedouins, and pursued them to their encampment; the Bedouins were then assisted by a superior force, and becoming the

assailants in their turn, killed all the Druses except one, who fled. He was pursued by some of the best mounted Bedouins, but his mare, although fatigued, could not be overtaken. Before his pursuers gave up the chase they called to him, and begged to be permitted to kiss his excellent mare, promising him safe conduct for her sake. He might have taken them at their word, for the pledge of an Arab, in such circumstances, might have been relied on; he, however, refused. They immediately left the pursuit, and, blessing the noble beast, cried out to the fugitive, 'Go and wash the feet of your mare, and drink off the water.' This expression is often used by the Bedouins to show the regard they have for their mares."

A writer of eminence observes: "Taking the comparative excellence of the different races, Nejed, between the desert of Syria and Yemen, and now in the possession of the Wahabis, is generally reckoned to produce the grandest, noblest horses. Hejaz (extending along the Red Sea, from Mount Sinai to Yemen, and including in it Medina and Mecca) the handsomest; Yemen (on the coast of the Red Sea and the Indian Ocean, and the most fertile part of Arabia) the most durable; Syria the richest in color; Mesopotamia the most quiet; Egypt the swiftest; Barbary the most prolific; and Persia and Koordistan the most warlike."

THE BARB.

By the Barb is meant the breed of horse found in the north of Africa, from the coast to the Desert of Sahara. The common horse of the country is a miserable creature, but the tribes of the desert possess some horses of superior breed, form, and power. Their general points are those of the Arab. Abd-el-Kader refutes the notion that there is any difference between the Barb and the Arab. "The people of Barbary," he writes, "are of Arab origin, who entered the country before Islam, and no one doubts that the Arabian horses have spread in the same way as the Arab families." The Arabs of Africa, contrary to the habits of the Arabs of Arabia, always ride stallions. Abd-el-Kader, in his reply to the questions of General Daumas respecting the horse of the Sahara, says that an Arab horse ought to be able to travel sixty miles a day, without fatigue, for three or four months, without resting a single day. A horse, if necessary, ought to accomplish one hundred and eighty-seven miles in a day. "We have seen," he adds, "a great number of horses per-

form this distance. Nevertheless, the horse which has accomplished this distance ought to be spared the next day." He then describes one of his own forays: "We completed our excursion thither and back, in twenty or twenty-five days. During this interval our horses had no barley to eat except what their riders could carry, eight feeds apiece. Our horses went without drinking one day or two, and on one occasion three days. The horses of the desert do much more than this." The Arabs commence to educate their foals early. In the first year, continues the Emir, they teach the horse to be led with the *reseun*, a sort of bridle; they call him *djeda*, and begin to tie him up. When he is two years old he is ridden for a mile, then for two, then for a parasang (nearly four miles). The Arabs have a proverb, "In the first year tie him up, for fear of accident; in the second, ride him till his back bends; in the third, tie him up again." Respecting the feeding of the horse, he writes: "Offer it to the horse saddled and bridled, as the proverb says: 'Water with the bridle, barley with the saddle.' 'To give drink at sunrise makes a horse lean; in the evening, fat; in the middle of the day, it keeps him in condition.' In the great heats they give water only every other day." Abd-el-Kader concludes with a string of proverbs: "Horses are birds without wings." "For horses, nothing is distant." "He who forgets the beauty of horses for the beauty of women will never prosper"; and finally drops into poetry:

"Love horses, care for them,
Spare no trouble for them,
By them comes beauty, by them honor."

He repeatedly insists on the necessity of keeping the horse free from all servile employment, and relates the following story: "A man was riding on a horse of pure race. He was met by his enemy, also mounted on a noble courser. One pursued the other; he who gave chase was distanced by him who fled. The former shouted, 'I ask you, in the name of God, has your horse ever worked on the land?' 'He has worked for four days.' 'Mine has never worked! By the head of the Prophet, I am sure of catching you.' Toward the end of the day the pursuer began to gain. He soon succeeded in fighting with the man whom he had given up all hopes of reaching."

While the horse of Arabia has only become famous recently, the horse of Barbary has been famed since the light Numidian cavalry of

Hannibal swept from end to end of Italy. They were light men on light horses, and rode without rein or bit.

The following are the characteristic points of a true Barb, and especially from Morocco, Fez, and the interior of Tripoli; The forehead is long, slender, and ill-furnished with mane, but rising distinctly and boldly out of their withers; the head is small and lean; the ears well-formed, and well-placed; the shoulders light, sloping backward, and flat; the withers fine and high; the loins straight and short; the flanks and ribs round and full, and with not too much band; the haunches strong; the croup, perhaps, a little too long; the quarters muscular and well-developed; the legs clean, with the tendons boldly detached from the bone; the pastern somewhat too long and oblique; and the foot sound and good. They are rather lower than the Arabian, seldom exceeding fourteen hands and an inch, and have not his spirit, or speed, or continuance, although in general form they are probably his superior.

The training is adapted to the exigencies of desert warfare. All that is required of the best-taught and most valuable Barbary horse is thus to gallop and to stop, and to stand still, all the day if it is necessary, when his rider quits him. As for trotting, cantering, or ambling, it would be an unpardonable fault were he ever to be guilty of it. A Barbary horse is generally broken in in a far severer way, and much earlier than he ought to be, usually in his second year, and therefore he usually becomes unfit for service long before the Arabian. The usual food of the Barb is barley and chopped straw, and grass while it is to be found, but of the provision for winter food in the form of hay they are altogether ignorant.

The Barb has chiefly contributed to the excellence of the Spanish horse: and, when the improvement of the breed of horses began to be systematically pursued in Great Britain, the Barb was very early introduced. The Godolphin Arabian, as he is called, who was the origin of some of our best racing blood, was a Barb; and others of our most celebrated turf-horses trace their descent from African mares.



CHAPTER III.

THE RACE-HORSE AND TROTTING-HORSE.

THE RACE-HORSE—THE ENGLISH TURF—THE AMERICAN TURF—IMPORTED HORSES—THE TROT-
TING-HORSE—FLORA TEMPLE—STEVE MAXWELL—ST. JULIEN AND MAUD S.—THE NARRAGAN-
SETT PACERS—POCAHONTAS.

“AS breeders of horses,” Brehm remarks, “the English of the present day stand on a level with the Arabs.” The horse, indeed, is curiously connected with the history of England, the leaders of the Anglo-Saxon invaders of Britain bearing, according to tradition, the very equine names of Hengest (Stallion), and Horsa (Horse). Lappenberg, the historian, supposes that these names do not indicate individuals, but the fact that the expedition was undertaken in obedience to an oracle derived from the sacred horses which were kept for purposes of divination. Tacitus describes these sacred horses as being white; the White Horse was a favorite symbol of the Saxon, and on the Chiltern Hills in Berkshire, England, by removing the green turf an enormous white horse is still visible, cut on the slopes of the chalky hill. The figure has most probably been unchanged from the time of the Saxon kings, and is periodically renewed and cleaned with great ceremony. The “White Horse” figures conspicuously in the coats of arms of the Princes of the House of Hanover and Brunswick, and the sovereigns have always affected on state occasions the use of cream-colored horses in their royal chariots. The horses used by the Queen of England when she opens Parliament, are descendants of a North German race, and may probably be derived from those mentioned by the Roman historian as dedicated to the gods, and endowed with the powers of prophecy. Most of the superstitions connected with the horse have died away, but that of the horseshoe remains as vigorous as ever, and this mysterious symbol is seen everywhere nailed over doors, and has lately spread into the domain of personal ornament.

THE RACE-HORSE.

The first improvement in the breed of the original English horse was effected by William the Conqueror, who imported some Spanish horses, thus introducing Barb blood; and down to the time of Henry VIII, Spanish and Italian horses were frequently imported. While the use of heavy armor in war prevailed, heavy, stout animals were necessary, and the real amelioration of the English horse commenced when the musket superseded the battle-axe and lance.

Ever since men possessed horses, they have been fond of trying the speed of their favorites; but it was not till the reign of James I, that regular race-courses were laid out, and rules for the sport laid down. James did his best to improve the stock by purchasing an Arab for the enormous sum, in those days, of five hundred pounds. But, strangely, this Arab was disapproved of by the celebrated writer on horsemanship, the Duke of Newcastle, who described it as a little, bony horse, of ordinary shape. James bought another Eastern horse, the White Turk, and the Helmsley Turk, and Fairfax's Morocco Barb were imported about the same time. No attention was paid to the genuine Arabian till Mr. Darley, in Queen Anne's time, purchased the famous "Darley Arabian," whose figure contained every point that could be desired in a turf-horse. This horse was the sire of "Flying Childers" and "Bartlett's Childers," and through them his blood has passed into most of our racers. Twenty years after Darley had established the value of Arabian blood, Lord Godolphin bought, out of the shafts of a cart in Paris, the celebrated "Godolphin Arabian," which in all probability, however, was a Barb. The most illustrious of the English racers of the last century was "Eclipse," a grandson of Bartlett's Childers, which never was beaten, nor ever paid forfeit.

Races originally were merely meetings at which men could test the speed of horses which were on ordinary occasions used for other purposes, such as war, or the chase. But the establishment of regular race-meetings with valuable prizes to be won by the victors, soon introduced great changes. It was at once seen that the ordinary hunter or roadster or charger had no chance in a competition with horses bred for the sole purpose of racing, and therefore men ambitious of distinction or desirous of making money on the turf, turned their attention to producing a breed of animals which were racers and nothing else. The racers,

down to the middle of the last century, were powerful animals; the course was usually four miles, and the race was run in heats. The object of all breeders of race-horses being to win, they did their best to gain speed, and very soon stoutness became a secondary consideration; horses soon showed that they could not run the distances their ancestors performed, heats became unfashionable, the length of the course was diminished, and younger horses entered. At present, the length of the "Derby" course is a mile and a half; that of the "St. Leger" nearly two miles. With young horses and short courses, the result of a race depends in a very great degree on the riders, if the animals are at all fairly matched, and hence has arisen the system of betting on "mounts."

The ENGLISH RACE-HORSE (Plate XXXII) is the result of long-continued efforts to obtain the maximum of speed, and it is to the English Race-horse that other nations turn, when they desire to improve their native stock. By numerous crossings with English thorough-breds, the Prussians have produced the Trakehner, a powerful and useful animal, and the French have employed it with advantage in improving their Norman stock.

English horses of pure blood were introduced into the colonies at a very early date, and race-horses were kept and trained, especially in those States which had not been settled by the Puritans. Virginia and Maryland took a decided lead in this pursuit. Spark, grandson of the Darley Arabian, a stallion presented by Frederick, Prince of Wales, to Lord Baltimore, was one of the earliest importations, and in 1750 he was followed by Selima, a daughter of the Godolphin Arabian. From Virginia the love for racing spread to the Carolinas, and northward to New York, where Colonel Delancey of King's Bridge imported Wildair and Lath. Within thirty years of the close of the Revolutionary War, Bedford, Citizen, Diomed, Messenger, Saltram, Shark, Sir Harry, Spread Eagle, and many other sires of fame were brought over, and the good breed thus introduced was continued by the importation of such horses as Priam, Barefoot, Margrave, Rowton, St. Giles, Squirrel,—six Derby and St. Leger winners—Glencoe, Riddlesworth, Monarch, Sovereign, Leamington, and others. American-bred horses are now entered in the English races. Mr. Ten Brock led the way, and his example has been followed in the last two years by Mr. Sanford, Mr. Lorillard, and Mr. J. Keene. Mr. Lorillard's Parole especially distinguished itself, winning both the Metropolitan and City and Suburban stakes at Epsom, while Keene's Don Fulano gained a brilliant victory at Newmarket.

THE TROTTING-HORSE.

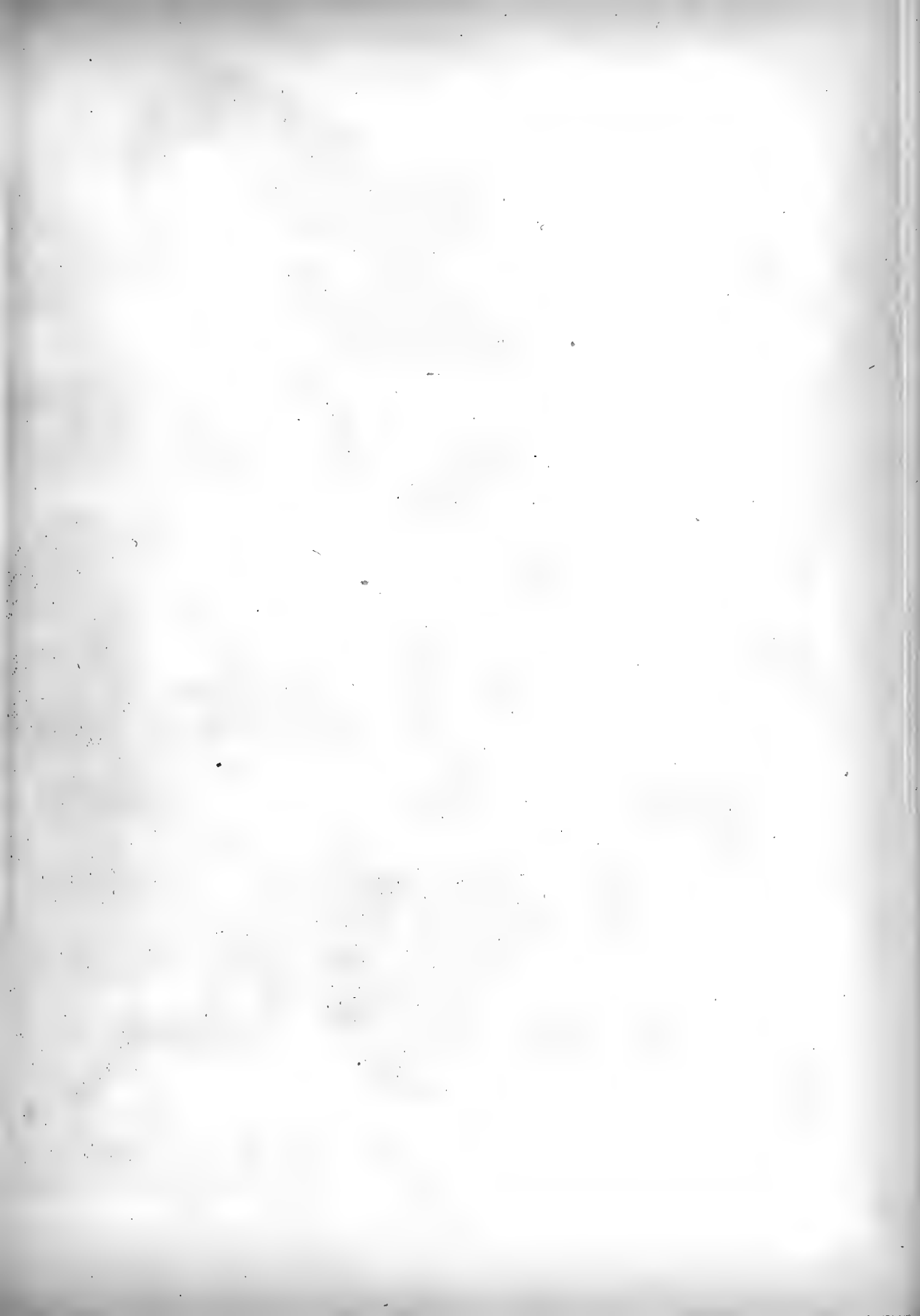
The TROTTING-HORSE (Plate XXXII) is pre-eminently the American horse, and the pace attained during the last few years is almost incredible, but is well authenticated.

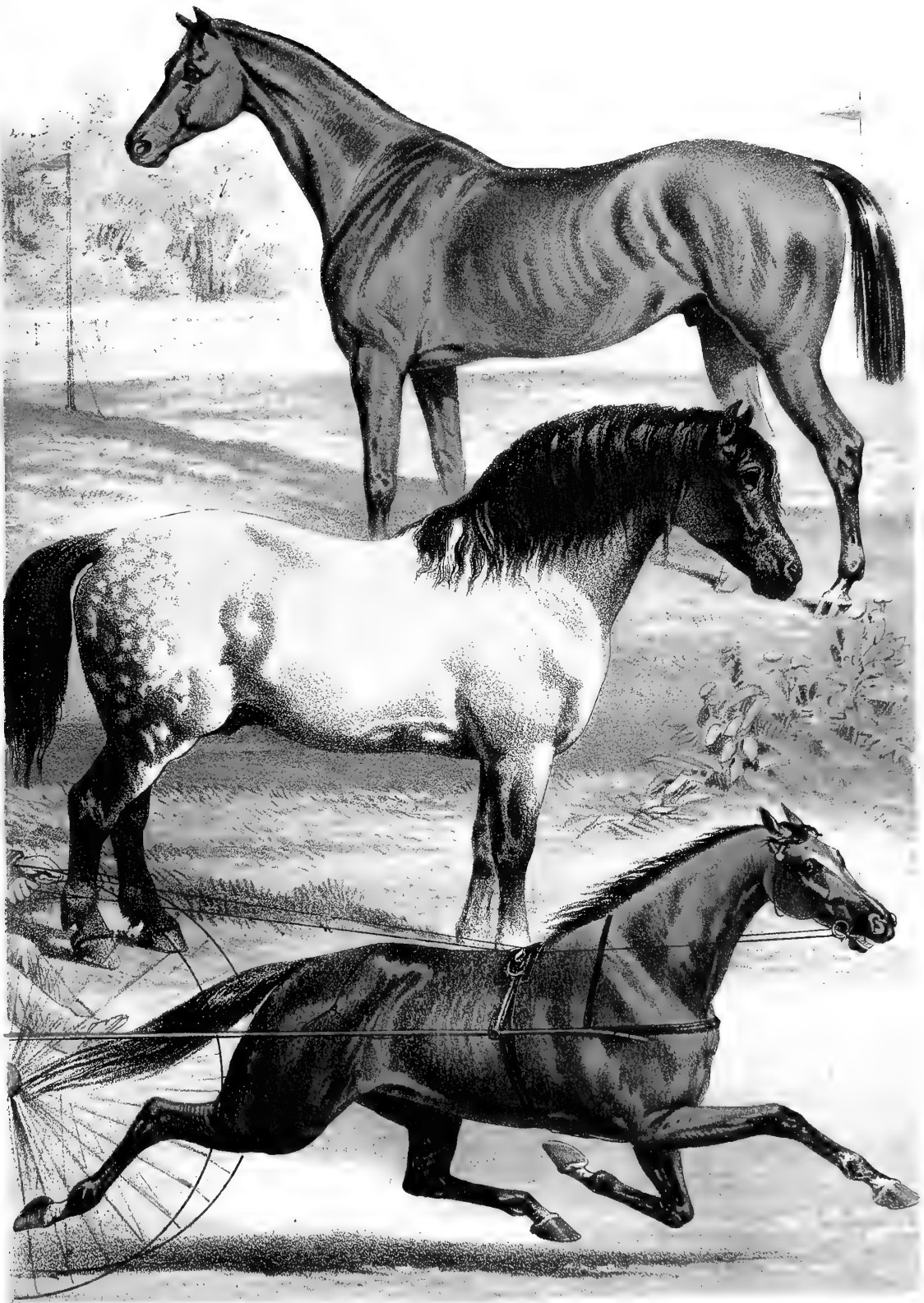
In England, trotting matches have never been fashionable, but some celebrated ones are recorded. In 1822, there was a match of nine miles between Mr. Bernard's mare and Captain Colston's horse, near Gerrard's Cross, for five hundred guineas. It was won easily by the mare, who performed the distance in twenty-seven minutes and forty-six seconds. The horse went the same distance in twenty-seven minutes forty-nine seconds, which is nearly at the rate of nineteen and a half miles an hour. The race was on an ordinary road.

This, however, had been equalled or excelled some years before. Sir Edward Astley's Phenomenon mare, when twelve years old, trotted seventeen miles in fifty-six minutes. There being some difference about the fairness of the trotting, she performed the same distance a month afterward in less than fifty-three minutes, which was rather more than nineteen miles an hour. Her owner then offered to trot her nineteen and a half miles an hour; but, it being proved that in the last match she did one lap of four miles in eleven minutes, or at the rate of more than twenty-one and a half miles an hour, the betting men would have nothing more to do with her.

Mr. Osbaldeston had a celebrated American trotting-horse, called Tom Thumb. He matched him to trot one hundred miles in ten hours and a half. It seemed to be an amazing distance, and impossible to be accomplished; but the horse had done wonders as a trotter; he was in the highest condition; the vehicle did not weigh more than one hundred pounds, nor the driver more than one hundred and forty-three pounds. He accomplished his task in ten hours and seven minutes; his stoppages to bait, etc., occupied thirty-seven minutes—so that, in fact, the hundred miles were done in nine hours and a half. He was not at any time distressed; and was so fresh at the end of the ninetieth mile, that his owner offered to take six to four that he did fourteen miles in the next hour, but no one was bold enough to take the bet.

An English-bred mare was afterward matched to accomplish the same task. She was one of those animals, rare to be met with, that could do almost anything as a hack, a hunter, or in harness, and on one





RUNNING HORSE
CLYDESDALE CART HORSE
TROTTER HORSE

PLATE XXXII. UNGULATA.



occasion, after having, in following the hounds, and traveling to and from cover, gone through at least sixty miles of country, she fairly ran away with her rider over several ploughed fields. She accomplished the match in ten hours and fourteen minutes—or, deducting thirteen minutes for stoppages, in ten hours and a minute's actual work; and thus gained the victory. She was a little tired, and, being turned into a loose box, lost no time in taking her rest. On the following day she was as full of life and spirit as ever. These are matches which it is pleasant to record, particularly the latter one; for the owner had given positive orders to the driver to stop at once, on her showing decided symptoms of distress, as he valued her more than anything he could gain by her enduring actual suffering. These matches, it will be seen, are all for long distances, and are trials of endurance rather than speed: the system of matches against time had not yet been introduced.

In England, as we have observed, the efforts of breeders and trainers were turned to producing a swift gallop; the sportsmen of America, especially in the North and West, directed all their energies to developing the trot. Frank Forester writes in explanation of the difference in the sporting tastes of the two countries: "I do not think I ever knew, or heard tell of such a thing, in my life, in England, as of two gentlemen going out to take a drive in a light carriage. In England, every man who can keep a horse for pleasure, keeps it with a view of occasionally taking a run with hounds. In America, every farmer keeps his wagon and driving-horse, and, as it costs no more to keep a good horse than a bad one, he keeps one that enables him to combine business and pleasure. Trotting in America is the popular pastime, and the trotting-course is open to all."

The trotting-horse is not a distinct breed, and his qualities as a trotter cannot be ascribed to his origin or connection with any one blood. Some trotters of first-rate powers have come from the Canadian or Norman stock, some from the Vermont stock, some from the Indian pony, and some entirely from the thorough-bred. It is, however, beyond doubt that "the best type of American trotter descends from the English thorough-bred horse Messenger, imported into this country toward the end of the last century. Mr. C. J. Foster writes that "when the old gray, Messenger, came charging down the gang-plank of the ship which brought him over, the value of not less than one hundred million dollars struck our soil." The estimate appears at

first sight to be extravagant, but when it is found upon investigation that the Messenger blood crops up in almost all the best American trotters of the present century, the figures are not too high.

The first Kentucky sire which seems to have done great good to the trotting stock of that sporting State was Abdallah, who was a grandson of Messenger. From Abdallah's loins sprang by far the best trotting sire that the United States have hitherto produced, whose name was Rysdyk's Hambletonian; and in the "List of Trotters with Records of 2:25 or Better," in the agricultural paper the *National Live Stock Journal*, published at Chicago, it appears that Hambletonian is to the trotting turf what Touchstone is to the running course. Hiram Woodruff believes that the Messenger blood existed in the most historical horse ever bred in Hindoostan, whose name was Lylee, and who was the favorite of Runjeet Singh, "the Lion of the Punjab." It is known that Runjeet spent enormous sums upon his stud; that his bridles and saddles were inlaid with gold and studded with precious stones; and that the Maharajah himself was a desperately hard rider. In order to get possession of his incomparable gray stallion Lylee, Runjeet Singh used to boast that he had spent six hundred thousand pounds and the lives of twelve thousand men. When the fame of Lylee first reached Runjeet's ears, the horse was the property of Yan Mohammed Khan, one of the Punjabee princes, who had his capital at Peshawur. Runjeet opened negotiations to get hold of Lylee, and having failed, went to war for that purpose. After a long contest the arms of the Maharajah prevailed, and the first condition upon which he offered peace was that Lylee should be ceded to him by his vanquished foe. After an infinite number of evasions and subterfuges resorted to by Mohammed Khan, the horse became the property of Runjeet, but he had to fight another war in order to retain him. Lylee, who was believed to be the son of an English thoroughbred, was seen in 1839 by some English officers, and was "a flea-bitten gray, very old, standing sixteen hands high," and with all the characteristics of the Messenger blood.

From Messenger are descended Abdallah, Hambletonian, Volunteer, Mambrino Chief, Edward Everett, Alexander's Abdallah, Conklin's Abdallah, Dexter, and a host of famous trotting-mares. But, richly though our sportsmen are indebted to the Messenger blood, it would be injustice to deny that they owe still more to the skill, patience, and persistency lavished upon training and bringing the trotter to

perfection by such men as Hiram Woodruff and Dan Mace. The system of training, teaching, driving, and riding the trotting-horse of the United States is an art of itself, peculiar to the country which has bred St. Julien, Maude S., Rarus, and Goldsmith Maid. These horses are superior by at least forty seconds in the mile to any trotters that Europe can boast. "The English had the stock all along," says Hiram Woodruff, "but it is our method of cultivation and perseverance that has made the difference between their fast trotters of a mile in three minutes and ours in two minutes and twenty seconds, or less."

The development of the trotting-pace and the establishment of the trotting-course is comparatively recent. The first American match against time was in 1818; the wager was, that no horse could be produced to trot a mile in three minutes. The horse named at the post was Boston Blue, who won easily. He afterward became the property of Thomas Cooper the tragedian. The same horse afterward trotted eighteen miles within the hour. In 1824, the Tredwell mare trotted a mile in two minutes thirty-four seconds, but for many years afterward a two-forty horse was considered extra fast. In 1826, the first authenticated record of authorized trotting is found. The New York Trotting Club opened its course near the Jamaica Turnpike, about a mile below the Union Course, Long Island, with a series of two-mile and three-mile heats. The first two miles was done in five minutes thirty-six seconds; the second, in five minutes thirty-eight seconds. In 1827, the horse Whalebone trotted fifteen miles in harness within the hour, performing the last mile in three minutes five seconds. In 1828 the best time on record was made by Screwdriver, at Philadelphia, by winning a three-mile heat in eight minutes two seconds, beating the celebrated Topgallant. In 1833, Paul Pry was backed to do seventeen and three-quarter miles within the hour; he won with the greatest ease, going eighteen times round the Long Island Trotting Course, covering eighteen miles thirty-six yards in fifty-eight minutes fifty-two seconds. He was ridden "by a boy named Hiram Woodruff." Topgallant, Columbus, Collector, Lady Jackson, and the best trotters of whom Hiram Woodruff makes mention as having flourished about 1830, could not "knock off" their mile in less than 2:50; but in 1834, Edwin Forrest beat the record by trotting a mile in two minutes thirty-one and a half seconds.

Coming down to more recent times, Flora Temple began her performances in 1850, and in 1853 she accomplished a mile in two minutes

twenty-seven seconds, and in 1856 made the best time on record, two minutes twenty-four and a half seconds, beating Tacony for a stake of one thousand dollars. She won this race in one heat, distancing Tacony, and the time was one second less than ever made before. She was driven by her favorite driver, Hiram Woodruff, who declared after the race that she could beat a locomotive. But the time, both in mile and two-mile races, has gradually been shortening; we pass over the performances of Goldsmith Maid, Rarus, Hopeful, and Lulu, all of whom have accomplished a mile in 2:15 or less, and come at once to the running of this year. At Rochester, Steve Maxwell trotted two miles in four minutes forty-eight and a half seconds, beating by two seconds Flora Temple's best record at that distance; and both St. Julien and Maud S. trotted a mile in the extraordinary time of two minutes eleven and three-quarter seconds. And even this has been surpassed, the former being credited with accomplishing the distance in two minutes eleven and a quarter seconds, the latter with covering the same distance in two minutes ten and three-quarter seconds. Such are the results of careful breeding and skilful training, and there seems to be no reason why a mile may not be done in two minutes ten seconds. We must observe that, respecting these times and distances, there can be no dispute, while, in earlier races, the distance traversed was often inaccurately estimated, and the time never given with anything like precision.

THE NARRAGANSETT PACER.

This beautiful animal, according to Frank Forester, has entirely ceased to exist. The pace, it may be explained, is a gait in which both legs on one side are raised together; while in the trot, one of the fore-legs and the opposite hind-leg are lifted at the same time. In the celebrated Elgin marbles from the Parthenon of Athens, two horses are represented as pacing; and in the famous "Horses of St. Mark" at Venice, the attitude is the same. A writer in the middle of the last century describes Rhode Island as producing fine horses, remarkable for swift pacing, and adds: "I have seen some of them pace a mile in a little more than two minutes, and a great deal less than three." The original genuine Narragansett Pacers are said to pace naturally, but the name soon became applied to all pacers. The most famous of modern pacers was the magnificent mare Pocahontas, an animal described by a

eulogist as "the most sumptuous," as well as the fastest of her day. She was a rich chestnut, sixteen hands in height, good crest, high and thin withers: her pedigree was excellent, and her greatest triumph was her defeat of Hero, whom she distanced in the first heat to wagons in the then unparalleled time of two minutes seventeen seconds.

The original breed is said to have been introduced by Governor Robinson of Rhode Island from Spain in the last century, and large numbers of them were produced in New England for exportation to the West Indies, where they were in great demand for the wives and daughters of the planters. But change in our modes of traveling has extinguished the pacer. While our roads were all bad, and horseback-riding the only method of locomotion, pacers were highly-prized luxuries. Now they are superseded by the trotter, and for riding-horses of mere pleasure, the present day requires speed, style, and action, rather than an easy gait which can be kept up at a slow pace for a considerable time. Any animals possessing this gait at the present time have fallen into it by accident, or been taught to pace. As far as is known, there is no breed of horses in Spain or elsewhere, to which the gait is native, and there has always been considerable doubt as to whether the claim put forward for the Narragansett Pacer could be allowed.



CHAPTER IV.

EUROPEAN HORSES.

THE HUNTER—THE HACKNEY—THE RUSSIAN HORSE—THE AUSTRIAN HORSE—THE HOLSTEIN HORSE—THE FRENCH HORSE—THE ITALIAN HORSE—THE RACES AT ROME—THE SPANISH HORSE—THE S'WETLAND PONY—THE CARRIAGE HORSE—THE CART HORSE—THE PERCHERON HORSE.

THE HUNTER.

THE best of all hunters is a thorough-bred horse with bone, standing about fifteen hands and a half. A lofty forehead, a good oblique shoulder, and a clear high action are indispensable. The body should be compact, the barrel round, the loins broad, the quarters long, the thighs muscular, and, above all, the hunter's temper should be good. In other words, he must have wind and bottom, plenty of jumping power, and be able to go at a good rapid pace.

THE HACKNEY.

The perfect roadster is more difficult to find than even the hunter. He must have good fore-legs, and good hinder ones too; he must be sound in his feet, even-tempered, no starter, quiet in all situations, not heavy in hand, and never disposed to fall on his knees. Safety in this latter respect depends entirely on the foot being placed at once flat on the ground. His height should rarely exceed fifteen hands and an inch. He is more valuable for the pleasantness of his paces and his safety, good temper, and endurance, than for his speed. It is the roadster which furnishes most of the recorded instances of intelligence and fidelity in the horse. Their memory is often remarkable. A horse was ridden thirty miles into a quite new district by a road very difficult to find. After an interval of two years, during which the animal had never been in that direction, the gentleman had occasion to make the same journey.

He was benighted on a common where it was so dark that he could scarcely see his horse's head. He threw the reins on its neck, and in half an hour was safe at his friend's gate. Another gentleman, riding through a wood in a dark night, struck his head against the branch of a tree and fell, stunned, to the ground. The horse returned to the house they had lately left, and paused at the door till some one arose and opened it. He then turned about and led the man to the place where his master was lying senseless.

In 1809, the inhabitants of the Tyrol captured fifteen horses from the Bavarian troops, on which they mounted their own men. An encounter afterward took place between the hostile forces; but at the commencement of it the Bavarian chargers, which had changed their masters, recognized their former trumpet-call and the uniform of their old regiment, and in an instant darted off at full gallop, in spite of all the efforts of their riders, whom they bore in triumph into the midst of the Bavarian ranks, where the Tyrolese were at once made prisoners.

An orchard had been repeatedly stripped of its best and ripest fruit, and the marauders had laid their plans so cunningly that the strictest vigilance could not detect them. At last the depredators were discovered to be a mare and her colt which were turned out to graze among the trees. The mare was seen to go up to one of the apple-trees and to throw herself against the trunk so violently that a shower of ripe apples came tumbling down. She and her offspring then ate the fallen apples, and the same process was repeated at another tree. Another mare had discovered the secret of the water-butt, and whenever she was thirsty, was accustomed to go to the butt, turn the tap with her teeth, drink until her thirst was satisfied, and then to close the tap again. Two animals are said to have performed this feat, but one of them was not clever enough to turn the tap back again, and used to let all the water run to waste.

A careless groom was ordered to prepare a mash for one of the horses placed under his care, and after making a thin, unsatisfactory mixture, he hastily threw a quantity of chaff on the surface, and gave it to the horse. The animal tried to push away the chaff and get his nose into the mash, but was unable to do so, and when he tried to draw the liquid into his mouth, the chaff flew into his throat and nearly choked him. Being baffled, he paused awhile, and then pulled a lock of hay from the rack. Pushing the hay through the chaff, he contrived to suck

the liquid mash through the interstices until the hay was saturated with moisture. He then ate the piece of hay, pulled another lock from the rack, and repeated the process until he had finished his mash.

THE RUSSIAN HORSE.

Russia supplies a magnificent race, which combines elegance of proportion, height, size, vigor, and suppleness. Many of this breed are remarkable for their speed in trotting, and they all much resemble the celebrities of the American trotting turf. They are, in all probability, derived from Cossack blood, but improved by stallions from Poland, Holstein, and England, with some Turkish and Arab blood.

The Cossack horse is remarkable for its combination of speed and endurance, and it was long supposed to be unrivaled in the possession of these qualities. But the Cossack horse was beaten by horses of English blood in a race which fairly tested its powers.

On the 4th of August, 1825, a race of forty-seven miles was run between two Cossack and two English horses. The English horses were Sharper and Mina, well-known, yet not ranking with the first of their class. The Cossacks were selected from the best horses of the Don, the Black Sea, and the Ural.

On starting, the Cossacks took the lead at a moderate pace; but before they had gone half a mile, the stirrup-leather of Sharper broke, and he ran away with his rider, followed by Mina, and they went more than a mile, and up a steep hill, before they could be held in.

Half the distance was run in an hour and fourteen minutes. Both the English horses were then fresh, and one of the Cossacks. On their return, Mina fell lame, and was taken away, and Sharper began to show the effects of the pace at which he had gone when running away, and was much distressed. The Calmuck was completely used up, his rider was dismounted, a mere child was put on his back, and a Cossack on horseback on either side dragged him on by ropes attached to his bridle, while others at the side supported him from falling. Ultimately Sharper performed the whole distance in two hours and forty-eight minutes—sixteen miles an hour for three successive hours and the Cossack was brought in eight minutes after him. The English horse carried fully forty pounds more than the Cossack.

In Southern and Western Russia, and also in Poland, the breeding

of horses and cattle has lately occupied the attention of the great landed proprietors, and has constituted a very considerable part of their annual income. There is scarcely now a seigniorial residence to which there is not attached a vast court, in four large divisions, and surrounded by stables. In each of the angles of this court is a passage leading to beautiful and extensive pasture-grounds, divided into equal compartments, and all of them having convenient sheds, under which the horses may shelter themselves from the rain or the sun. From these studs a larger kind of horse than that of the Cossacks is principally supplied, which are more fit for the regular cavalry troops, and for pleasure and parade, than common use. The remounts of the principal houses in Germany are derived from this source; and from the same source the great fairs in the different states of the German empire are supplied.

THE AUSTRIAN HORSE.

The Austrian cavalry has long been the most famous in the world, and most of the horses are bred in the vast plains of Hungary, where there has always been a strong infusion of Turkish and Arab blood. In 1790, an Arabian named Turkmainath was imported, and in 1819, the Archduke Maximilian purchased several valuable stallions in England. Of late years, some of the best sires and dams that could be procured from the English racing stables have been imported by several of the Hungarian nobles for their breeding establishments.

But the improvement of the breed of horses is not left to private enterprise alone; the imperial government maintains noble studs in many places, on which neither care nor money is spared.

The following account is given by the Duke of Ragusa of the imperial establishment for the breeding of horses at Mesohagyés, near Carlsburg in Austria: "This is the finest establishment in the Austrian monarchy for the breeding and improvement of horses. It stands on forty thousand acres of land of the best quality, and is surrounded in its whole extent, which is fifteen leagues, by a broad and deep ditch, and by a broad plantation sixty feet wide. It was formerly designed to supply horses to recruit the cavalry; at present its object is to obtain stallions of a good breed, which are sent to certain dépôts for the supply of the various provinces. To produce these, one thousand brood mares and forty-eight stallions are kept; two hundred additional

mares and six hundred oxen are employed in cultivating the ground. The plain is divided into four equal parts, and each of these subdivided into portions, resembling so many farms. At the age of four years the young horses are all collected in the centre of the establishment. A selection is first made of the best animals to supply the deficiencies in the establishment, in order always to keep it on the same footing. A second selection is then made for the use of the others: none of these, however, are sent away until they are five years old; but the horses that are not of sufficient value to be selected are sold by auction, or sent to the army to remount the cavalry, as circumstances may require.

“The whole number of horses at present here, including the stallions, brood mares, colts, and fillies, is three thousand. The persons employed in the cultivation of the ground, the care of the animals, and the management of the establishment generally, are a major-director, twelve subaltern officers, and eleven hundred and seventy soldiers.”

THE HOLSTEIN HORSE.

The horses of Holstein and Mecklenburg, and some of the neighboring districts, are on the largest scale. Their usual height is sixteen, or seventeen, or eighteen hands. They are heavily made; the neck is too thick; the shoulders are heavy; the backs are too long, and the croups are narrow compared with their fore-parts; but their appearance is so noble and commanding, their action is so high and brilliant, and their strength and spirit are so evident in every motion that their faults are pardoned and forgotten, and they are selected for every occasion of peculiar state and ceremony.

THE FRENCH HORSE.

In France, as in Hungary, the breeding of horses is an affair of state. Before the creation of the *Administration des Haras*, there existed in Normandy a race of horses which for many years furnished carriage animals to the great lords of olden time. These were of Danish origin; but the present race is the result of a cross between the Norman or Danish mares and the English thorough-bred; the results show the characteristics of both stocks. They are bred in two districts in Nor-

mandy: one, the plain of Caen, comprising the grassy meadows of Calvados and La Manche; the other is situated in that part of the Department of Orne which bears the name of Merlerault.

The French horses, however, are generally of a very miscellaneous character. In addition to the Percheron which we speak of under the head of the "cart-horse," there are the Boulonais and Flemish breeds, both of which are in repute as draught-horses. The most remarkable is the horse of the district named the Camargue. In England he would be denominated a pony, for he is small, his height measuring from thirteen to thirteen hands and a half; it is but seldom that he is tall enough to reach the limit for a light cavalry charger. His coat is always of a grayish-white. Although the head is large, and sometimes "Roman-nosed," it is generally squarely made, and well set on; the ears are short and widely separated, the eyes are lively and well opened, the crest is straight and slender, but sometimes ewe-necked; the shoulder is short and upright, but yet the withers are of a sufficient height; the back is prominent, the reins wide, but long, and badly set on; the croup is short and drooping, the haunches are poor, the hocks narrow and close, but yet strong; the foot is very sure and naturally good, but wide, and sometimes even flat. The Camargue horse is active, abstemious, mettlesome, high-spirited, and capable of enduring both bad weather and fasting. For centuries he has maintained the same type, notwithstanding the state of distress to which he is sometimes reduced by carelessness and neglect.

These small horses are kept in the marshes and wild meadows which stretch away from Arles to the sea. They live in perfect freedom, in small droves, together with semi-wild oxen. In harvest time these horses are used for threshing out the grain; they are led in upon the threshing-floors, and are made to stamp upon the sheaves to beat out the corn from the ears. Their hard, but elastic hoof forms an excellent flail. When they have done their allowance of work they are permitted to return to their independent existence, to roam and feed over the wide expanse of uncultivated districts which surround their homes.

The breed of Camargue horses is, as a rule, but little valued, even in the south of France. The best of them are, however, occasionally sent into the market. It is stated that these horses are the descendants of some of those left by the Moors in one or the other of the frequent descents and incursions made by them on the south coast of France during the early years of history.

THE ITALIAN HORSE.

We need say little respecting the horse in Italy. During long ages of misgovernment and oppression, the Italian horse, once celebrated for the beauty of his form and his paces, sadly deteriorated. The Neapolitan horses were particularly remarkable for their size and majestic action, but, with few exceptions, have degenerated. A rapid improvement has now taken place, and is still in progress.

As a striking contrast between our style of racing, in which the rider or driver is so important, we subjoin an account of the peculiar method in which the races were run during the Roman Carnival.

The horses—termed Barberi, because the race was at first contested by Barbs—are brought to the starting-post, their heads and their necks gayly ornamented; while, to a girth which goes round the body of each, are attached several loose straps, having at their ends small balls of lead thickly set with sharp steel points. At every motion these are brought in contact with the flanks and bellies of the horses, and the more violent the motion, the more dreadful the incessant torture. On their backs are placed sheets of thin tin or stiff paper, which, when agitated, will make a rustling, rattling noise. A rope is placed across the street to prevent them getting away, and a groom holds each horse. When all is ready for starting, a troop of dragoons gallops through the street in order to clear the way. A trumpet sounds, the rope drops, the grooms let go their hold, and the horses start away like arrows from a bow. The harder they run, the more they are pricked; the cause of this they seem scarcely able to comprehend, for they bite and plunge at each other, and a terrible fight is sometimes commenced. Others, from mere fright or sulkiness, stand stock-still, and it is by brute force alone that they can again be induced to move. A strong canvas screen is passed along the bottom of the street. This is the goal. It has the appearance of a wall; but some of the horses, in the excess of their agony and terror, dart full against it, tear through it, or carry it away.

THE SPANISH HORSE.

The common breed of Spanish horses have nothing extraordinary about them. The legs and feet are good, but the head is rather large, the forehead heavy, and yet the posterior part of the chest deficient, the crupper also having too much the appearance of a mule. The horses of

Estremadura and Granada, and particularly of Andalusia, are most valued. Berenger, whose judgment can be fully depended on, thus enumerates their excellences and their defects: "The neck is long and arched, perhaps somewhat thick, but clothed with a full and flowing mane; the head may be a little too coarse; the ears long, but well placed, the eyes large, bold, and full of fire. Their carriage lofty, proud and noble. The breast large; the shoulders sometimes thick; the belly frequently too full, and swelling, and the loin a little too low; but the ribs round, and the croup round and full, and the legs well formed and clear of hair, and the sinews at a distance from the bone—active and ready in their paces—of quick apprehension; a memory singularly faithful; obedient to the utmost proof; docile and affectionate to man, yet full of spirit and courage."

GALLOWAYS AND PONIES.

A horse between thirteen and fourteen hands in height is called a GALLOWAY, from a beautiful breed of little horses once found in the south of Scotland, on the shore of the Solway Firth, but now sadly degenerated, and almost lost, through the attempts of the farmer to obtain a larger kind, and better adapted for the purposes of agriculture. There is a tradition in that country that the breed is of Spanish extraction, some horses having escaped from one of the vessels of the Grand Armada, that was wrecked on the neighboring coast. This district, however, so early as the time of Edward I, supplied that monarch with a great number of horses.

The pure Galloway was said to be nearly fourteen hands high, and sometimes more; of a bright bay or brown, with black legs, small head and neck, and peculiarly deep and clean legs. Its qualities were speed, stoutness, and sure-footedness over the very rugged and mountainous country of which it was the native.

THE SHETLAND PONY.

The SHETLAND PONY, or SHELTYE (Plate XXXI), an inhabitant of the extremest northern Scottish Isles, is a very diminutive animal—sometimes not more than seven hands and a half in height, and rarely exceeding nine and a half. He is often exceedingly beautiful, with a small head, good-tempered countenance, a short neck, fine toward the throttle,

shoulders low and thick—in so little a creature far from being a blemish—back short, quarters expanded and powerful, legs flat and fine, and pretty, round feet. These ponies possess immense strength for their size, will fatten upon almost anything, and are perfectly docile. One of them, nine hands (or three feet) in height, carried a man of twelve stone the distance of forty miles in one day.

A gentleman was, not long ago, presented with one of these elegant little animals. He was several miles from home, and puzzled how to convey his newly-acquired property. The Shetlander was scarcely more than seven hands high, and as docile as he was beautiful. "Can we not carry him in your chaise?" said his friend. The strange experiment was tried. The sheltie was placed in the bottom of the gig, and covered up as well as could be managed with the apron; a few bits of bread kept him quiet; and thus he was safely conveyed away, and exhibited the curious spectacle of a horse riding in a gig.

The WELSH PONY is one of the most beautiful little animals that can be imagined. He has a small head, high withers, deep yet round barrel, short joints, flat legs, and good round feet. He will live on any fare, and will never tire. About a century and a half ago, pony-hunting was a favorite amusement of the Welsh farmer. The sportsmen ran them down with greyhounds, and then caught them with a lasso.

The EXMOOR PONIES, although generally ugly enough, are hardy and useful. A well-known English sportsman said that he rode one of them half-a-dozen miles, and never felt such power and action in so small a compass before. To show his accomplishments, he was turned over a gate at least eight inches higher than his back; and his owner, who rides fourteen stone, traveled on him from Bristol to South Molton, eighty-six miles, beating the coach which runs the same road.

Among the ponies we may class the Iceland, Lapland, and Finland horses, none of which exceed twelve hands in height. In Iceland thousands run wild in the mountains, and never enter a stable; but instinct or habit has taught them to scrape away the snow, or break the ice, in search of their scanty food. A few are usually kept in the stable; but when the peasant wants more he catches as many as he needs, and shoes them himself, and that sometimes with a sheep's horn. The breed of horses found in the Faroe Islands resembles in most of its points the horses of Iceland. It is, however, rather higher, owing to an infusion of Danish blood.

THE CARRIAGE-HORSE.

In the old coaching days in England the favorite carriage-horse was the Cleveland Bay, which was formed by the progressive mixture of the blood of the race-horse with the original breeds of the country. The points of a good carriage-horse are, substance well-placed, a deep and well-proportioned body, bone under the knee, and sound open feet. At present, it is merely a larger saddle-horse, combining size, strength, and elegance—in other words, a tall, strong, oversized hunter.

THE CART-HORSE.

The CLYDESDALE CART-HORSE (Plate XXXII). One of the best horses for ordinary heavy work is the CLYDESDALE; it is docile in temper, and possessed of enormous strength and great endurance. It owes its origin to one of the Dukes of Hamilton, who crossed some of the best Lanark mares with stallions that he had brought from Flanders. The Clydesdale is larger than the Suffolk, and has a better head, a longer neck, a lighter carcass, and deeper legs; he is strong, hardy, pulling true, and rarely restive. The southern parts of Scotland are principally supplied from this district; and many Clydesdales, not only for agricultural purposes, but for the coach and the saddle, find their way to the central and even southern counties of England. Dealers from almost every part of the United Kingdom attend the markets of Glasgow and Rutherglen. Mr. Low says that "the Clydesdale horse as it is now bred is usually sixteen hands high. The prevailing color is black, but the brown or bay is common, and is continually gaining upon the other, and the gray is not unfrequently produced. They are longer in the body than the English black horse, and less weighty, compact, and muscular, but they step out more freely, and have a more useful action for ordinary labor. They draw steadily, and are usually free from vice. The long stride, characteristic of the breed, is partly the result of conformation, and partly of habit and training; but, however produced, it adds greatly to the usefulness of the horse."

The PERCHERON breed, justly celebrated for ages, is the model of a light draught-horse. In the days of mail-coaches and diligences, this race was, *par excellence*, the post-horse of France. At the present time it almost exclusively supplies the horses for the omnibuses of Paris and the

rapid carriage of merchandise. The brow of these animals is slightly bulging between the orbital arches, which are prominent. The face is long, with a narrow forehead, straight at the top, but slightly bulging out towards the tip of the nose; the nostrils are open and mobile; the lips thick and the mouth large; the ear long and erect; the eye lively, and the countenance animated. Their mane is but poorly provided with hair, but the tail is bushy; the legs are strong and firmly jointed, with rather long shanks devoid of hair. Their coat is generally a dappled gray color, but other colors are not uncommon.

The HEAVY BLACK DRAY-HORSE, which is conspicuous in the brewers' carts in London, is more adapted for show than for utility. They are noble-looking animals, very docile, with round fat carcasses and sleek coats, but they eat a deal of hay and corn, and at long-continued work would be beaten by a team of active horses a good deal lower. Many of these dray-horses stood seventeen hands high at two and a half years old, but all have the fault of slowness, their pace being about three miles an hour; their effectiveness lies in their weight alone.

We have made no mention of the horse as an article of food. M. Figuiet writes: "Every one is acquainted with the efforts which, during the last year or two, have been made (and to some extent with success) to introduce horse-flesh for the use of the public. In Paris and some other cities in France, at the present time, it forms no inconsiderable portion of the nutriment of the poor. Prussia and the north of Europe were the first to set the example in this path of economy."



CHAPTER V.

THE WILD AND THE COMMON ASS.

THE WILD ASSES—THE KULAN OR DZIGGETAI—THEIR SPEED—DOMESTICATION—THE WILD ASS OF THE BIBLE—THE AFRICAN WILD ASS—THE COMMON ASS—ITS PATIENCE—ITS INTELLIGENCE—THE EGYPTIAN ASS.

WE follow the usual arrangement, and classify the Ass as a variety of the Horse. Dr. Gray, however, who has been followed by Professor Bell, separates the Ass under the generic name of *Asinus*, leaving the horse alone to fill the genus *Equus*.

THE KULAN.

The KULAN or DZIGGETAI, *Equus hemionus*, is thus described by Pallas: "The Dziggetai cannot be called either Horse or Ass. It is an intermediate form which its first discoverer, Merserschmied, called 'prolific mules.' It is not a mongrel, but a separate species, with a much more beautiful figure than any mule. The body is generally light, the limbs slender, its look wild; the head is rather heavy, but the ears are better proportioned than the mule's are, the hoofs are small, the tail resembles that of a cow. Its color is a light reddish-brown in the summer, but changes in the winter into a grayish-brown. The mane and tail are black, and on the back is a black stripe which becomes broader at the loins." Nothing need be added to this description.

The Kulan is a child of the steppes, and peoples the most dissimilar portions thereof. Although preferring the vicinity of lakes and rivers, it does not avoid the waterless and barren regions, nor even the hills, provided they are steppe-like, that is, without trees. It is found from the eastern slopes of the Ural to the Himalaya, and especially on the Mongolian and Chinese frontier, where it bears the name of "Kiang." It avoids the presence of the pastoral nomads, and only finds itself secure

in tracts where even these precursors of civilized man do not linger. Pallas remarked that after the appointment of guards on the Russian frontier, the herds of Kulans became more rare, and to-day they are driven still further back, but are far from extirpated in the Russian dominions. They may be seen close to the frontier of Europe, and on the east and south of Siberia and Turkestan, but not in such numbers as in the desert steppes of Mongolia and Northwest China, or in the mountains of Thibet. In all this extensive district the vicissitudes of climate compel the Kulan to roam; they form herds at the beginning of winter, and, in bodies of over a thousand, seek in common a neighborhood that can furnish food. In spring, these herds are again dissolved into smaller troops, consisting of a horse and from six to twenty mares, according to the prowess of the leader.

Nothing is more wonderful than the speed and agility of the Kulan; it is as fleet as the antelope, and as sure-footed as the chamois. When pursued, they run in a long and graceful gallop, pausing from time to time to watch the hunters. A herd always puts out one of its number as a sentry; at the sight of any strange object the leading male rushes out to examine it more closely, and will even follow a horseman; but if danger threatens they all turn and fly. The natives of the steppes hunt the Kulan, but unless the hunter is sure of his aim, he does not risk a shot. The sportsman sets out early in the morning, mounted on a light yellowish horse. He stalks his game carefully, always advancing against the wind till he comes to the hill beyond which the Kulans are browsing. He then ties the hairs of his horse's tail closely together, and lets it feed on the summit of the hill. He himself lies on the ground, as much concealed as possible, with his gun ready, at a distance of two hundred yards. The Kulan sees the horse, imagines it to be some strayed mare, and gallops toward her. But as he approaches he stops, and that is the moment to fire. If struck in the breast he falls at the first ball, but sometimes it requires five shots to dispatch him.

The flesh of the Kulan is prized highly by the Kirghises and Tungusians; the hide is used for various purposes.

The Kulan has been brought to Europe, and is as easily trained as a common horse. It will be seen that we regard, with Pryewalski, the Kulan and Kiang as identical with the Dziggetai. This is also the view held by Apollon Rusinsky, who investigated the question, and whose opinion was confirmed by the Kirghis chief whom he consulted.

THE WILD ASS.

The WILD ASS, *Equus onager* (Plate XXXIII), is repeatedly mentioned in the Bible. Xenophon found it near the Euphrates, Pliny in Asia Minor, and it is seen to-day in Palestine. Its home extends from Syria through the Persian dominions to India.

It is considerably smaller than the Kulan, but larger and finer limbed than the common ass. The head is larger than the Kulan's, the lips thick, and closely set with stiff bristles, the ears pretty long, but shorter than in the ass. The prevailing color is of a deep cream tint, which in many specimens varies to a beautiful silver-white, and usually a somewhat lighter stripe runs along the back, in the centre of which is a dark-brown line. The winter coat resembles camel's hair, the summer coat is extremely smooth and soft. The mane stands upright, and is formed of soft woolly hairs; the tuft at the end of the tail is a span long.

In its habits it resembles all other members of the family. An old male conducts the herd of mares and foals, but he is not of so jealous a disposition as the male Kulan, and at times tolerates the presence of a rival. In speed it is not inferior to the Kulan. Porter writes that when he was in the Persian province of Fars, his greyhound gave chase to an animal which his companions affirmed to be an antelope. They followed it at full speed, and, thanks to the hound's skill, got a good sight of it. To his astonishment, it was a wild ass. He resolved to ride it down with an Arab horse of extraordinary speed; but all the efforts of his noble horse were in vain till the wild creature stood still and gave him an opportunity to examine it. But in an instant it was off as quick as thought, curveting, and kicking out in play, as if not in the least wearied by the chase, and was soon beyond the reach of its pursuer.

The senses of the Wild Ass are very acute, and he is thus almost unapproachable: he drinks only every other day, and prefers for food plants like the sow-thistle or dandelion, disliking all fragrant herbs and the true thistle. Like many wild animals, it ascends hills for the purpose of surveying the country, a peculiarity noticed by Jeremiah (ch. xiv. 6): "The wild asses did stand in the high places, they snuffed up the air like dragons." Wood writes: "It is of a very intractable disposition, and even when captured young, can scarcely ever be brought to bear a burden, or draw a vehicle: even foals born in captivity refuse to be

domesticated. Many zoologists suggest that this animal is the progenitor of the domestic ass. They are exactly similar in appearance, and are hardly distinguishable by the eye. But while the one is quiet and docile, the other is savage, intractable, and filled with an invincible repugnance to human beings." Some other authorities, however, assert that the best riding asses in Persia and Arabia are Wild Ass foals that have been caught young, and retain all the excellent qualities of endurance possessed by their progenitors.

THE AFRICAN WILD ASS.

The AFRICAN WILD ASS, *Equus taniopus*, resembles in size and appearance the common Egyptian donkey; but, in his habits, does not differ from the Asiatic species just described. It is found in the regions east of the Nile, being numerous along the course of the Atbara tributary of that river, as far as the Red Sea. It lives in herds exactly like the other wild *Equidæ*. It is very shy and circumspect, and the chase of it is very difficult. Travelers report that herds will often come up to their watch-fires, and remain till some noise or movement sends them bounding back into the night.

All the asses used in Abyssinia seem to be descended from this species. Brehm saw many asses in that country which, he was assured, had been captured when foals and tamed, and he describes them as being docile. A male which he possessed for some time, had a noble carriage and a very affectionate disposition.

In this species the mane is weak and short, the tail-tuft long and strong, the cross on the back very distinct, while the legs have horizontal stripes such as are seen on the legs of the zebra.

THE COMMON ASS.

The COMMON ASS, *Equus Asinus* (Plate XXXIII), is one of the most intelligent of our domestic animals, and is by no means the stupid creature which common parlance makes him.

While the horse is full of pride, impetuosity, and ardor, the ass is mild, humble, and patient, and bears with resignation the most cruel treatment. Most abstemious in its habits, it is content with the coarsest herbage, which other beasts will not touch, even such as thistles and weeds. A small quantity of water is sufficient for it, but this it requires





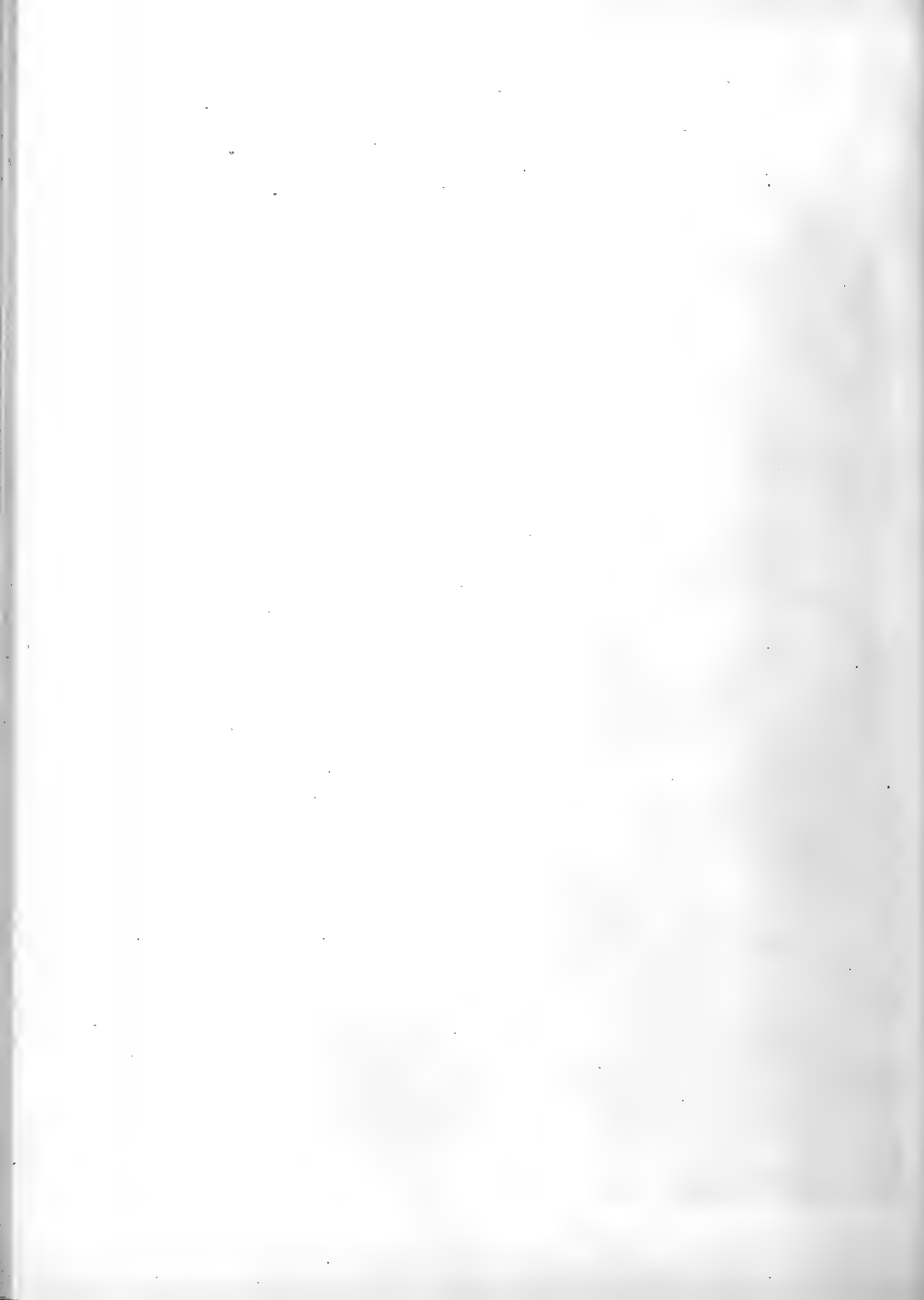
QUAGGA

ASS

ZEBRA

WILD ASS

PLATE XXXIII. UNGULATA.



pure and clear. It will not, like the horse, wallow in mud or water; and as its master too often forgets to groom it, it performs this duty by rolling itself on the turf or the heather when opportunity offers. It has sharp sight, an excellent sense of smell, and an ear of keen acuteness. If it is laden too heavily, it remonstrates by drooping its head and lowering its ears. "When it is teased," says Buffon, "it opens its mouth and draws back its lips in a disagreeable manner, giving it a mocking and derisive air."

The Ass walks, trots, and gallops like the horse, but all its movements are shorter and slower. Whatever pace it employs, if too hardly pressed, it soon becomes tired; if not hurried, it is most enduring. It sleeps less than the horse, and never lies down for this purpose except when worn out with fatigue. Buffon says that it never utters its long and discordant cry, which passes in inharmonious succession from sharp to flat and from flat to sharp, except when hungry, or desirous of expressing its amorous feelings. Sometimes, however, it brays when frightened.

Attaching itself readily and sincerely, it scents its master from afar, and distinguishes him from all other persons, manifesting joy when he approaches. It recognizes without difficulty the locality which it inhabits, and the roads which it has frequented. When young, it cannot fail to please by its gayety, activity, and gracefulness; but age and ill-treatment soon render it dull, slow, and headstrong.

The Ass carries the heaviest weight in proportion to its size of all beasts of burden; it costs little or nothing to keep, and requires, so to speak, no care; it is a most useful auxiliary to the poor man, more especially in rugged mountainous countries, where its sureness of foot enables it to go where horses could not fail to meet with accidents. It is, therefore, the horse of those of small means; the abstemious and devoted helper of the poor.

The Ass is exceedingly common in all parts of Europe, and many stories of its cunning are told. It can open gates and doors which baffle all the efforts of the horse, and has been known even to fasten them after it passed through. An Ass, attacked by a bull-dog, seized it in his teeth, carried it to a river, and then lay down on it.

Another Ass displayed a singular discrimination of palate, being celebrated for his love of good ale. At one roadside inn the landlady had been very kind in supplying the donkey with a glass of his loved beverage, and the natural consequence was, that the animal could never

be induced to pass within a moderate distance of the spot without going for his beer. Neither entreaties nor force sufficed to turn his head in another direction, and his master was in such cases obliged to make the best of the matter, and permit the animal to partake of his desired refreshment. He had a curious knack of taking a tumbler of beer between his lips, and drinking the contents without spilling a drop of the liquid, or breaking the glass. So curious a sight as a donkey drinking beer, was certain to attract many observers, who testified their admiration by treating the animal to more beer. His head, however, was fortunately a strong one, for only once in his life was he ever seen intoxicated, and on that solitary occasion his demeanor was wonderfully decorous, and marked by a comic air of gravity.

But it is in Egypt that the Ass plays the most conspicuous part; in Cairo, donkey-riding is universal, and no one ventures beyond the Frank quarter on foot. Bayard Taylor gives a vivid description of these animals: "The donkeys are so small, that my feet nearly touched the ground, but there is no end to their strength and endurance; their gait is so easy and light, that fatigue is impossible. The passage of the bazaars seems at first quite as hazardous on donkey-back as on foot; but it is the difference between knocking somebody down and being knocked down yourself, and one certainly prefers the former alternative. There is no use in attempting to guide the donkey, for he won't be guided. The driver shouts behind, and you are dashed at full speed into a confusion of other donkeys, camels, horses, carts, water-carriers, and footmen. In vain you cry out '*Bess*' (enough), *Piacco*, and other desperate adjurations; the driver's only reply is, 'Let the bridle hang loose!' You dodge your head under a camel-load of planks; your leg brushes the wheel of a dust-cart; you strike a fat Turk plump in the back; you miraculously escape upsetting a fruit-stand; you scatter a company of spectral, white-masked women, and at last reach some more quiet street, with the sensations of a man who has stormed a battery. At first this sort of riding made me very nervous; but presently I let the donkey go his own way, and took a curious interest in seeing how near a chance I ran of striking or being struck. Sometimes there seemed no hope of avoiding a violent collision; but by a series of the most remarkable dodges, he generally carried you through in safety. The cries of the driver running behind, gave me no little amusement. 'The howadji comes! Take care on the right hand! Take care on the

left hand! O man, take care! O maiden, take care! O boy, get out of the way! The howadji comes!' Kish had strong lungs, and his donkey would let nothing pass him, and so wherever we went we contributed our full share to the universal noise and confusion."

The color of the Ass is a uniform gray, a dark streak passing along the spine, and another stripe being drawn transversely across the shoulders. In the quagga and zebra these stripes are much more extended. In size, and in other respects, the Ass differs according to its locality. The largest are those of the Spanish Peninsula, which are nearly as large as a horse, and remarkably handsome.

The flesh of the Ass has a disagreeable taste, so that it never can become popular as public food; but that of their foals, on the contrary, is very tender, and differs but little from veal.

As a strengthening agent, or as a mild and light article of food for invalids, the milk of the Ass has long been considered excellent. The Greeks of antiquity made use of it for this purpose. It contains more milk-sugar and less caseous matter than cow's milk; but it should invariably be taken from a young and healthy animal in good condition, which has been fed abundantly on wholesome food. As it is the secretion of a non-ruminant animal, ass's milk is naturally more easy of digestion than the milk of the cud-chewing cow.



CHAPTER VI.

THE ZEBRAS.

THE ZEBRAS OR TIGER-HORSES—THE QUAGGA—THE DAUW, OR BURCHELL'S ZEBRA—HARRIS'S DESCRIPTION OF IT—THE ZEBRA PROPER—HUNTING THE ZEBRA—CROSS-BREEDS—THE MULE—THE HINNY—INSTANCES OF THEIR FERTILITY—DARWINISM.

THE three species which we are now about to describe are natives of Africa. They equal the Asiatic Wild Asses in speed and beauty of form, but far surpass them in richness of color and boldness of marking. As they are all distinguished more or less by tiger-like stripes, they have been formed by some writers into a genus named *Hippotigris*, or "Tiger-horse." The Roman emperor Caracalla, in the year 211 A. D., is described as slaying with his own hand, in the circus, an elephant, a rhinoceros, and a tiger-horse.

The Zebras, or Tiger-horses, are all characterized by a compact body, powerful neck, a head intermediate between that of the horse and the ass, rather long ears, an upright mane, which is not so thick as that of the horse, and a tail with long hair at the end. They all have the coat marked with bright colored stripes. The south of Africa is their birth-place, although one species probably is found north of the equator.

THE QUAGGA.

The QUAGGA, *Equus Quagga* (Plate XXXIII), resembles the horse more than the ass in figure. The body is well made, the head graceful and moderate in size, the ears short, the legs powerful. A short mane rises along the whole neck, the tail is covered with hair from the root, but the hairs are much shorter than in the horse. The ground color of the head, back, and loins is brown, the belly and hairs of the tail white. Grayish-white stripes appear on the head, neck, and shoulders. On the face these marks are close together, and run from the forehead to the muzzle; on the shoulders they run transversely, and are placed wider

apart. Ten stripes, visible in the mane also, are on the neck, and four on the shoulders; a few, very faint and at long distances, can be traced on the hind quarters. A broad black stripe runs along the spine, the ears are white within, yellowish-white with brown stripes outside. A full-grown Quagga measures about thirteen hands, or a little under.

It is a native of the plateau of Caffraria, and is tamed without difficulty. The Dutch colonists of the Cape keep them with their herds, and if a hyæna threatens to attack the cattle, the domesticated Quagga will attack and beat down the enemy with its fore-hoofs, ultimately trampling it to death.

THE DAUW.

The DAUW, *Equus Burchellii*, is the noblest of all the tiger-horses, being most like the genuine horse. It is the same size as the Quagga, and possesses a round body with a very arched neck, strong feet, and a mane five or six inches long; its tail resembles that of the Quagga. Its coat is smooth, cream-colored above, and white below. Fifteen narrow black stripes run upward from the nostrils, seven going straight to the forehead, the remainder going obliquely along the cheeks. A black stripe with white borders runs along the spine, ten broad black stripes cross the neck and mane, and contain between them narrow brown bands. Similar stripes surround the whole body, but the legs are free from them, being uniformly white. This species is found in large herds south of the Orange River in South Africa. It avoids the rocky and hilly districts, and is only found on the plains in company with ostriches, antelopes, and gnus. The Dauw is never seen with the quagga or zebra, and avoids their society. It is supposed to seek the company of the ostrich because that gigantic bird is remarkably watchful and circumspect, and this saves the cunning Dauw from the trouble of keeping watch for itself against the approach of an enemy.

Like many other gregarious animals of Southern Africa, the Dauw is found to make periodical migrations for the purpose of supporting itself with the food that has failed in its original district. In times of scarcity, the Dauw, together with several species of antelope, visits the cultivated lands, and makes sad havoc among the growing crops. When rain has fallen, and the forsaken districts have regained their fertility, the Dauw leaves the scene of its plunder, and returns to its ancient pasturage.

The Dauw is capable of a partial domestication, and can be tamed to a considerable extent. It is, however, considered as possessing an uncertain temper, and is of too obstinate a disposition to be of much use to man. By the Kaffirs it is called Peet-sey, and the Dutch colonists have given it the name of Bontequagga.

Respecting its habits in its wild state, Captain Harris writes: "Fierce, strong, fleet, and surpassingly beautiful, there is perhaps no animal in creation, not even excepting the mountain zebra, more splendidly attired, or presenting a picture of more singularly attractive beauty, than this free-born of the desert. A dark pillar of dust rises from the plain, and, undisturbed by any breath in heaven, mounts upward in the clear azure sky like a wreath of smoke—three ill-omened vultures soaring in circles above it. Nearer and more near rolls on the thickening column, until several dark living objects are perceived dancing beneath it. Emerging from the obscurity, their glossy and exquisitely variegated coats glittering in the sun's rays, the head of a column of Burchell's zebras appears, and instantly afterward the serried horde sweep past in gallant array, their hoofs clattering on the hard gravel like a regiment of dragoons. Tearing by at racing speed, straining neck and neck with their shaggy, whimsical-looking bovine allies, the gnus, their own striped and proudly curved necks seem as if they were clothed with thunder, and their snowy tails are streaming behind them. Now the troop has wheeled and halted for an instant to reconnoitre the foe. A powerful stallion advances a few paces with distended nostrils and stately gait, his mane newly hogged, and his ample tail switching his gayly checkered thighs. Hastily surveying the huntsmen, he snorts wildly, and instantly gallops back to his cohort. Away they scour again, neighing and tossing their striped heads aloft, switching their mule-like tails in all the pride of fleetness and freedom."

THE ZEBRA.

The ZEBRA, *Equus Zebra* (Plate XXXIII), is the most conspicuous and beautiful of the whole tribe. The general color is a creamy white, marked regularly with velvety black stripes that cover the entire head, neck, body, and limbs, and extend down to the very feet. It is worthy of note, that the stripes are drawn nearly at right angles to the part of the body on which they occur, so that the stripes of the legs are horizon-

tal, while those of the body are vertical. The abdomen and inner portions of the thighs are cream-white, and the end of the tail is nearly black. These stripes are, however, in the male, rather brown and yellow. The skin of the neck is developed into a kind of dewlap, and the tail is sparingly covered with coarse black hair. By the Cape colonists it is called "Wilde Paard," or Wild Horse. It is, however, less like the horse than the Dziggetai or Kulan, described in our previous chapter. It resembles the Dziggetai much more than the Dauw, as it is always found in hilly districts, and inhabits the high craggy mountains in preference to the plains. It is timid, and flies at the sight of any strange object, and in captivity is described as fierce, obstinate, and nearly untamable. A young female, however, that was caught young and sent to the Jardin des Plantes of Paris, was so tractable that it allowed itself to be approached and led almost as readily as a horse. Mr. Rarey, the American horse-tamer, had, he confesses, more difficulty in taming a zebra than any horse which he had seen, but he succeeded at last in subduing it.

The three species just described possess an equal degree of intelligence, and equal acuteness of sense. A certain wildness, cunning, and courage is common to them all, and all have an infinite love of liberty. They defend themselves bravely against all beasts of prey; the hyænas leave them at peace; the lion alone, perhaps, can conquer one of the tiger-horses; the leopard attacks only the weak ones, the adults being able to repel him. As usual, the worst enemy of these harmless creatures is man. The difficulty of the chase and the beautiful skin of the animal attract the European sportsman; the Cape colonists are passionately devoted to it, and the Abyssinians seem also to hunt any zebras that come in their way. Europeans shoot the tiger-horses, the natives spear them, but very commonly the pretty brutes are taken in pitfalls and then slain, for the dead animal alone is of any use to the natives, who regard its flesh as a dainty. The Boers of the Cape never touch it, but leave the animal to be eaten by their Hottentot servants. When wounded, the Zebra gives a kind of groan which Andersson compares to the gasps of a drowning man.

In striking contrast to the ass, the tiger-horses are very silent. The Zebra's voice is rarely heard, and its subdued neighings have a melancholy sound. The Quagga, according to Cuvier, repeats about twenty times the syllables Oa, oa, or Qua, qua, from which the Hottentot

name of the species is probably derived. The Dauw repeats about three times the sounds Yu, yu, yu.

All these animals bear captivity well, and if well taken care of, will propagate. Very numerous cross-breeds have been procured by various combinations of the Ass and Kulan with the Quagga and Zebra, and the offspring of the Ass and the Zebra has again been crossed with the Pony. In most cases these mongrels were most like their father. A thoroughbred mare in England had, by a Quagga, a filly which resembled its mother in color, being a chestnut with very few stripes. This filly was crossed with a thoroughbred horse, and the foal retained the short mane and some of the stripes of its grandsire. All the future foals of the thoroughbred mare that had been bred to the Quagga were more or less striped, although their sire was a black horse.

THE MULE.

In its size and neck and shoulders, the Mule inherits the fine shape of the Mare. From the Ass it derives the length of its ears, its almost naked tail, its sure-footedness, strong constitution, and its bray. Its hair is short, rough, and generally of a brownish-black color; there are, however, many Mules which have gray or chestnut coats, with a stripe along the back of dark hair, as well as bands of the same shade around the limbs. It is a long-lived animal, even occasionally reaching the age of forty-five to fifty years. Almost omnivorous in reference to herbage, Mules have an advantage that cannot be too highly valued; moreover, a level country or mountainous region equally suits them; provided neither are too damp. Although patient, it will not submit to ill-treatment without bearing malice.

The cross between a stallion and an ass is called a Hinny. It has the small size, long ears, and ungraceful figure of its mother, but derives from its sire the thinner and longer head, the tail covered with hair its entire length, and its neighing voice.

In all mountainous regions the Mule is indispensable; in South America it is to the natives what the camel is to the Arabian. Its strength, endurance, and sure-footedness render it of inestimable value for the transportation of merchandise. In the plantations of our Southern States, and in the farms of the West it is of the utmost service. It is seldom, however, used by us for riding, while the Spaniard and Spanish

American gentleman is as proud of his mule as an American is of his trotter. In older days the mule was the favorite beast of the clergy, and the Pope used to ride about, drawn by a team of white mules.

As a rule, neither the Mule nor the Hinny will produce offspring, but instances where a mule has brought forth are not unknown. In the year 1762, a female mule was crossed with a gray American horse, and gave birth to a beautiful foal of a fox-red color, with a black mane, which was broken in to ride when three years old. She continued to have foals every two years, till she had produced five. Other observations of later date place beyond doubt the occurrence of other similar cases.

The question of the fertility of mules has been often debated. In these days men have more eagerly than ever asserted and denied the doctrine that "all hybrids are sterile," for it is closely involved with the doctrine of the origin of species by natural selection and climatic influences, and therefore opposed to the teaching of those who maintain that every species is derived from one originally created pair which has continued "to bring forth after its kind."



CHAPTER VII.

THE TAPIRS.

THE FAMILY TAPIRIDÆ—THE AMERICAN TAPIR—ITS TRUNK—ITS HABITS—THE TAPIR AS A DOMESTIC ANIMAL—A TAPIR HUNT—PECULIAR MARKS OF THE YOUNG TAPIR—THE MALAY TAPIR—ITS TRUNK—ITS COLOR—DISCOVERY OF THE ANIMAL—CHINESE ACCOUNT—THE PINCHAQUE.—BAIRD'S TAPIR.

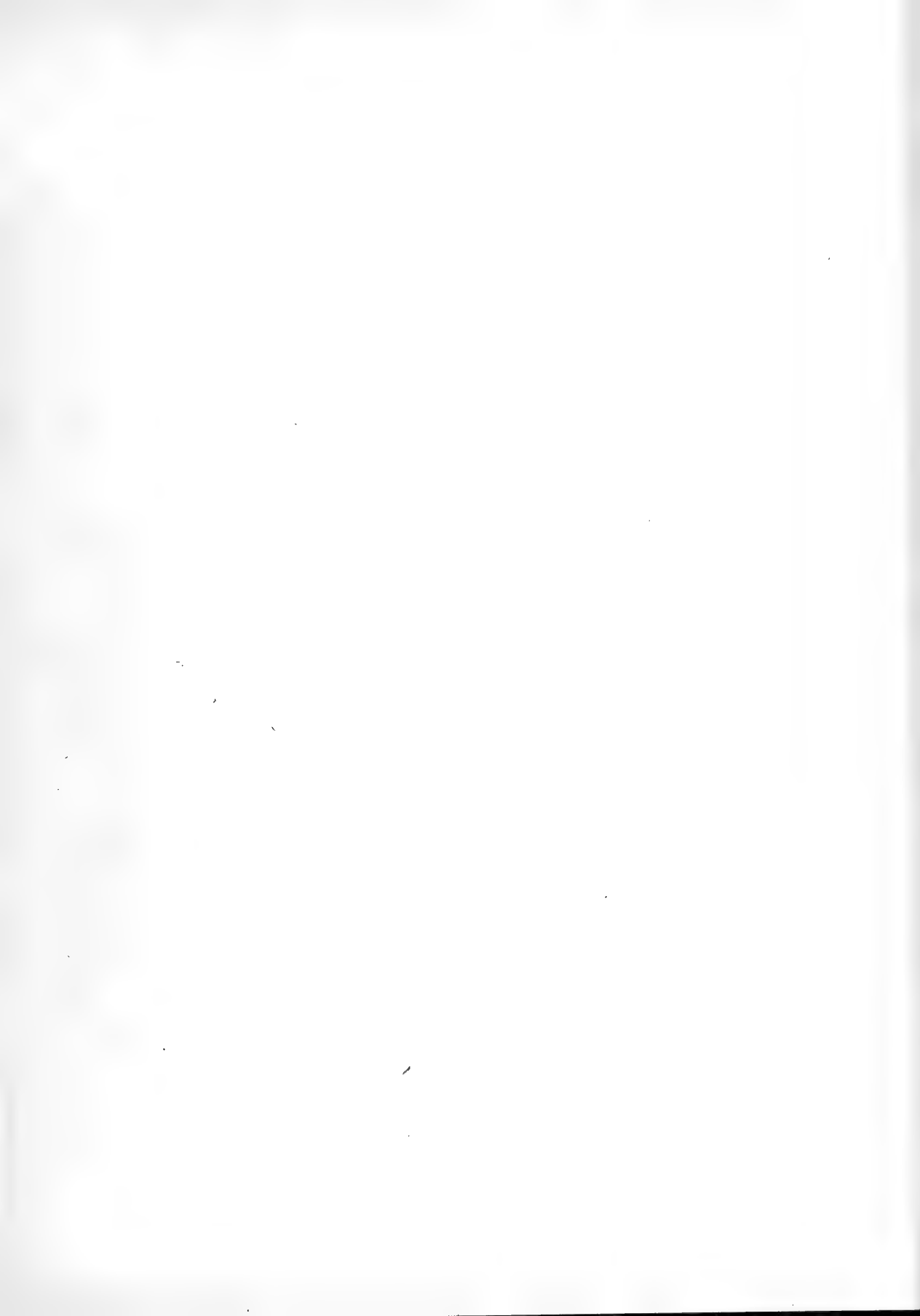
THE family TAPIRIDÆ consists of a small group of animals which are found in the equatorial forests of South America, and in the Malay Peninsula and Borneo. For a long time only *two* species were known, but recently Dr. Gray has discovered four species in the Andes of New Granada and Ecuador, and two more in Central America.

The Tapirs are comparatively small, stout-built animals, that appear to stand half-way between the elephants and the swine. They have an elongated, narrow head, slender neck, short rudimentary tail, and legs of moderate length; the ears are short and broad; the eyes oblique and small. The upper lip is prolonged like an elephant's trunk, and hangs down over the lower lip; the fore-feet have four toes, the hind-feet, three; the hair is short, smooth, and thick.

The American Tapir has been known to naturalists for a long time, but the Malay Tapir has only been known since the beginning of this century to Europeans, although it has been described for centuries in Chinese works. As is usually the case when a family has representatives in the old and new world, the old world species seem more highly developed than those that live in the new.

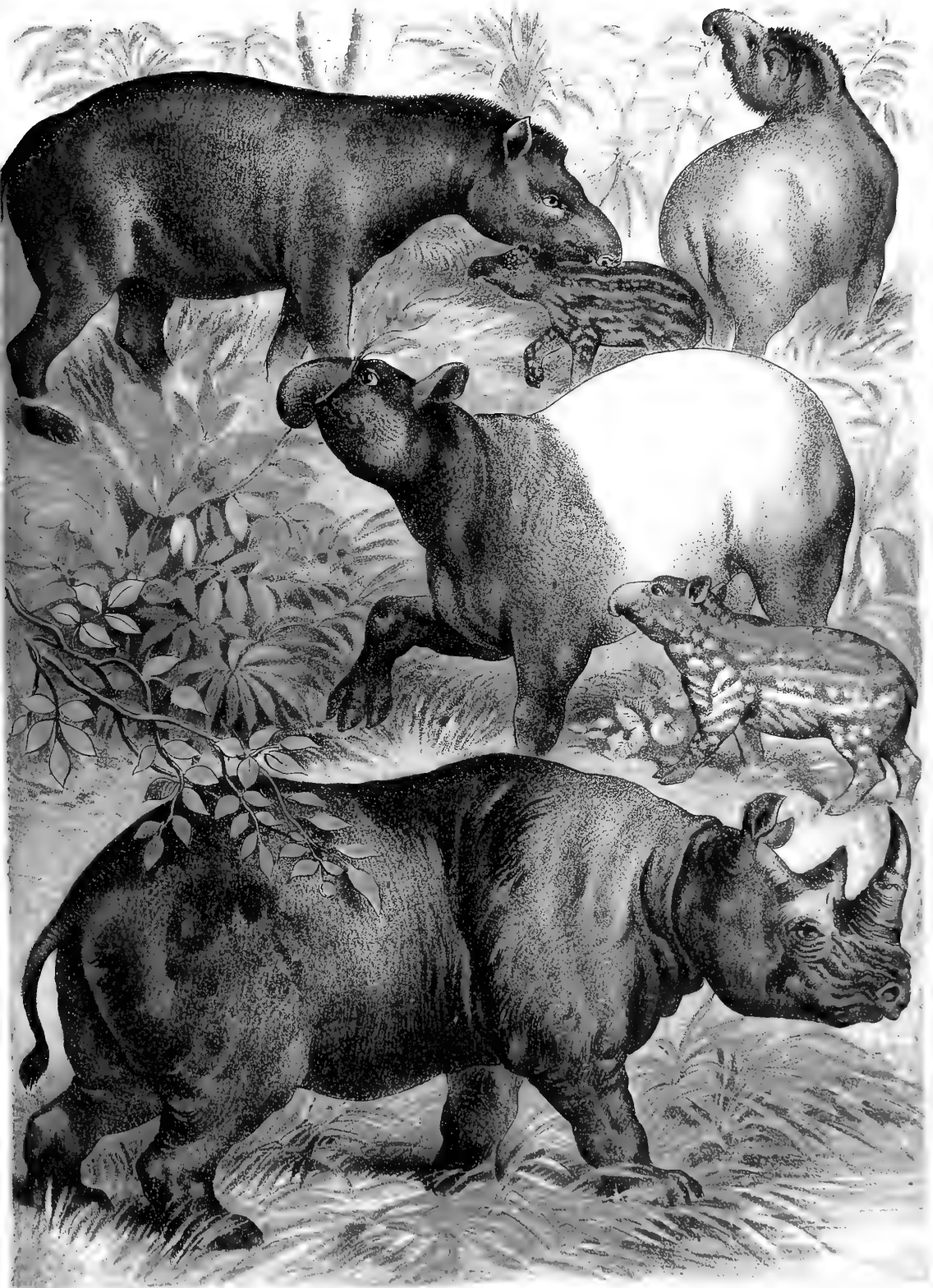
I.—GENUS TAPIRUS.

The AMERICAN TAPIR, *Tapirus terrestris* (Plate XXXIV), was mentioned by travelers a few years after the discovery of America; they regarded it as a kind of hippopotamus, and it appeared in works of



1918

Received of the
Hon. Secy. of the Navy
the sum of \$100.00
for the purchase of
the U.S.S. Albatross
No. 402



SOUTH AMERICAN TAPIR
MALAYAN TAPIR
BLACK RHINOCEROS
PLATE XXXIV UNGULATA



natural history under the name of *Hippopotamus terrestris*. But, about the middle of the eighteenth century it began to be better known, and at present we possess very accurate accounts of it, and its habits.

The Tapir measures about six feet in length from the nose to the tail, and its height to the withers is about four feet. The body is fat, and terminates in a broad rump. The head, which is pretty large, is compressed on the sides; the eyes are small; the ears elongated, and the animal can contract or enlarge them; the nose is prolonged a few inches, in the shape of a trunk. This addition, which is naked and flesh-colored at the tip, can be diminished to half and elongated to double its quiescent length, but is without that movable finger-like extension which is the characteristic of the elephant's proboscis; so it can be of no use in seizing objects or in sucking up water. The Tapir takes its food directly with its mouth; when it drinks, it raises its contracted trunk in such a way as to prevent its being wetted. The neck is rather long; and the legs are strong and thick. The anterior extremities are terminated in four toes, each of which is provided with a little, short, rounded hoof; the posterior extremities have but three toes. The tail is very short and stumpy. The thick, hard skin of this animal is covered with short hair, very close and smooth, of a more or less dark brown, except under its head, its throat, and the tips of its ears, where it is of a whitish color. The male has on his neck a short mane, composed of stiff bristles, of about an inch and a half in length; this decoration is sometimes seen on the female.

In the densely wooded regions which line the banks of the rivers of tropical America the Tapir lives alone, hidden in the forests and in the most secluded retreats. Following always the same track in its excursions through the woods, it forms well-trodden footpaths, which the sportsman can easily recognize. It sleeps during the day, and wanders at night to seek its food. Sometimes, however, rainy weather brings it from its hiding-place during daylight, when it goes to the swamps, in which it delights to wallow, or to the streams, for it is a great water lover, and can swim and dive with an ease which almost justifies the old naturalists in calling it a "river-horse." Although a large animal, and very strongly made, it falls a victim to many destroyers, the jaguar being the most terrible of its enemies. It is said that when the jaguar leaps upon the Tapir's back, the affrighted animal rushes through the brushwood in hopes of sweeping away its deadly foe, and if it be fortunate enough to gain the river's bank, will plunge into the water,

and force the jaguar, who is no diver, to relinquish his hold. The tough, thick hide with which the Tapir is covered is of great service in enabling the animal to pursue its headlong course through the forest without suffering injury from the branches. When it runs, it carries its head very low, as does the wild boar under similar circumstances.

In disposition the Tapir is very gentle, and does not attack human beings except when wounded and driven to bay. It then becomes a fierce and determined opponent, and is capable of inflicting severe wounds with its powerful teeth. The hunter's dogs are often dangerously wounded by the teeth of the despairing Tapir. The voice of the Tapir has a curious, shrill, whistling sound; it is but seldom uttered, and is in ridiculous disproportion to the size of the animal. Schomburgk indeed believed that it was only uttered by the young ones; but the observation of captive Tapirs show that it is the usual voice of the animal. The senses of hearing and scent appear to be equally sensitive, but its sight is weak. During the daytime it is seldom seen, preferring to lie quietly hidden in the deep underwood during the hotter hours of the day, and to emerge at night in order to obtain food, and meet its companions. The nocturnal journeys which the Tapir will make are of considerable extent, and the animal proceeds straight onwards, heedless of bank or river, surmounting the one, and swimming the other, with equal ease. The food of the Tapir is generally of a vegetable nature, and consists of young branches and various wild fruits, such as gourds and melons.

The Tapir is often seen in menageries, and bears captivity well; of course it requires a warm stall and protection from the cold of winter, as, like other importations from the tropics, it is very subject, in our variable climate, to diseases of the lungs. It is reported that in Brazil attempts have been made to tame the Tapir into a really domesticated animal, less for the sake of its food, than for the purpose of making it a draught animal. And indeed it might be worth the trouble of trying the experiment, for they are easily tamed. Frederick Cuvier has given us a few details of the habits of a young Tapir with which he was acquainted. This animal was gentle and confiding, and appeared to have no will of its own. It did not defend its food, but allowed the dogs and goats to partake of it together with itself. When it was let loose into an enclosure, after having been shut up for some time, it showed its joy by running round it several times. It also playfully seized by the

back the puppies with which it was brought up. When it was forced to leave a place it liked, it complained by uttering a few plaintive cries. Frederick Cuvier assures us that if the Tapir would be of any use to us, it could be very easily domesticated. Isidore Geoffroy Saint-Hilaire also wished the experiment of domesticating this animal in Europe to be tried; but his idea was never carried out.

“Not less easy to feed than the pig,” says Saint-Hilaire, “the Tapir seems to me eminently suited to become one of our domestic animals. When it has no creatures of its own kind to associate with, I have seen it seeking the society of all the animals that were near, with an eagerness without an example in other Mammalia. The Tapir would be useful in two ways to man: its flesh, especially when improved by proper diet, would furnish a wholesome and at the same time an agreeable food; and as it is much larger than the pig, the Tapir might be of great service as a beast of burden to the inhabitants of the south of Europe, and, after a time, to those of colder countries.”

The Tapirs are eagerly hunted. The hide is valuable for its thickness and toughness, and whips made from it are exported in large numbers from the Argentine States. The claws are regarded by the Indians as a great medicine, and a sovereign cure for the falling sickness if worn round the neck, or, after having been reduced to powder, taken inwardly. Schomburgk describes a hunt: “As we advanced, we saw a Tapir with its young on a sand-bank, but scarcely had the word ‘Maipuri’ passed the lips of our Indians, than the animals disappeared in the thick bush that lines the shore. We landed at once, and as soon as we had scrambled through the bush we saw that the fugitives were making for the reeds and prickly grasses that covered the plain. Our dogs were in the boat, and we had no desire to attempt to advance through the reeds, but our Indians glided between the dangerous grasses like serpents. Soon two shots were heard, then shouts of triumph. Our Indians rushed in, and thus we found a road till we came to the prey. While we were standing around it, our dogs came up and took up the scent of the young one. Its whistling cry indicated that it was near the edge of the reed-bed; it soon broke cover, followed by the dogs and thirty Indians whose yells were mingled with the baying of the dogs. The animal grew weaker, and after an obstinate resistance, was secured and carried to our boat.”

The young Tapir does not resemble the old ones in color. The back

is brown, the upper part of the head is thickly covered with white circular spots, and on each side of the body there run four uninterrupted rows of spots of lighter color which extend over the limbs. As the animal grows older these spots form stripes, and at the end of the second year disappear. The mother is not prolific, as she only bears one young one in a season.

THE MALAY TAPIR.

The MALAY TAPIR, *Tapirus indicus* (Plate XXXIV) is known also by the name of KUDA AGER, two Malay words which signify "River-Horse." It is distinguished from the other members of the genus by its more considerable size, and its more slender body; the head is more pointed, the trunk is more developed, the feet more powerful, the mane is absent. The construction of the trunk-like nose is very remarkable. In the American Tapir this is round; in the Malay Tapir it presents the same section as the trunk of an elephant, that is, round on the upper, flat on the lower surface, and exhibits the finger-like conformation which is so noticeable in the proboscis of the elephant. The color of the Malay species is also very peculiar. The head, the neck, and the body as far as the shoulder-blades, as well as the legs, thighs, and tail are deep black, the rest of the body is white. At some distance, therefore, the animal looks as if it was covered with a sheet. Both the white and black hairs shine in an extraordinary manner. The size of a full-grown male has not been accurately ascertained; an adult female measured nearly eight feet in length, including the tail; she is said to be larger than her mate.

It is astonishing, that with all the intercourse that has existed for centuries between Europe and the East, nothing certain was known respecting this animal until the year 1819. Cuvier had asserted that there was no chance in our days of discovering any large mammal; one of his pupils, named Diard, in reply, sent him a sketch of the Kuda-Ager, or Maiba, as the Hindoos call it. He added: "When I first saw at Barrackpore the Tapir, a sketch of which I send, I was surprised that such a large animal had not previously been noticed, and I was still more surprised when I found in the Asiatic Society the head of a similar animal, with the remark that it was as common in the peninsula as the elephant or rhinoceros." Diard, however, was in error in supposing the creature was quite unknown even to Europeans. A Chinese Natural

History, Pen-tsao-kan-a now describes it as follows: "The ME is like a bear: its head is small, its legs short, its short brilliant hair is black and white. It has the trunk of the elephant, the eyes of the rhinoceros, the tail of a cow, and the feet of a tiger." Pictures of it are very common in Chinese and Japanese Books for Children.

We are still without good accounts of its life in the woods, and even the descriptions of its habits in captivity are far from satisfactory. It may be assumed, however, that it does not differ in its modes of life from the American species already described.

The PINCHAQUE, *Tapirus villosus*, was discovered by M. Raulin during his residence in the Andes. It has a head which resembles strongly that of a fossil Tapir found in the tertiary deposits of the Pampas, the nasal bones being more elongated than in any other species at present existing. This Tapir, from living at a considerable elevation, and therefore in a comparatively cold climate, is entirely covered with long hair which is of a brown color. It is, in consequence, called *Tapirus villosus*, or "The Shaggy Tapir." It does not appear to extend far over the Andes. Gray gives the "Cordilleras" as its habitat, but it seems confined to Ecuador and the United States of Colombia, where it dwells at about eight to twelve thousand feet above the sea.

GENUS ELASMOGNATHUS.

This genus has been formed by Dr. Gray to contain one or two species of Tapirs which inhabit Central America from Panama to Guatemala. He gives the generic characteristics as follows: "The internasal cartilage is ossified nearly the whole length, the bony part produced beyond the end of the nasal." Of the species this learned naturalist enumerates, we need only mention one; the so-called *Elasmognathus Dowii* being a very doubtful form.

BAIRD'S TAPIR, *Elasmognathus Bairdii*, is distinguished by possessing a very short and close fur, the color of which is dark brown, approaching closely to black, but the chest is white, and the cheeks are light brown. The young have the peculiar striped arrangement which is so remarkable in the young of the preceding genus.

Baird's Tapir is a native of the Isthmus of Panama, and has been found as far north as Mexico. It is thought to be the largest of the American Tapirs.

CHAPTER VIII.

THE RHINOCEROS.

THE FAMILY RHINOCEROTIDÆ—GENERAL DESCRIPTION—THE HORN—PECULIAR STRUCTURE OF THE HORN—KNOWN TO THE ANCIENTS—WOOD-CUT BY ALBERT DURER—ARAB SUPERSTITIONS—HAUNTS OF THE RHINOCEROS—A NOCTURNAL ANIMAL—ITS FOOD—ITS HABITS—ITS SENSES—ITS FITS OF RAGE—MATERNAL AFFECTION—ITS FRIENDS THE SMALL BIRDS—CAPTIVE RHINOCEROS—USES OF ITS HIDE.

THE family RHINOCEROTIDÆ is especially characteristic of Africa and Northern and Malayan India. Four or five species, all two-horned, are found in Africa, where they range over the whole country south of the desert to the Capé of Good Hope. In the east of Asia there are also four or five species which range from the forests at the foot of the Himalayas eastward through Anam and Siam to Sumatra, Borneo, and Java. Three of these Asiatic species are one-horned, the others found in Sumatra and Java are two-horned. All these species are so much alike, that most naturalists do not consider them as forming distinct genera. Gray, however, divides the Asiatic Rhinoceros into two genera, *Rhinoceros* and *Ceratorhinus*, and the African into two, *Rhinaster* and *Ceratotherium*.

The RHINOCEROTIDÆ are all clumsy and unwieldy-looking animals of considerable size, characterized by a remarkably elongated head, the front part of which bears one horn, or two in a line, a short neck, a powerful body, entirely or almost entirely devoid of hair but covered with a thick armor-like hide, a short tail, short stumpy legs, all of which terminate in three toes enveloped in hoofs. The mouth is disproportionately small, the upper lip is developed into a trunk-like process, while the under-lip is square and truncated, the eye is small, the ear rather large. The hide, which is almost impenetrable, is in some species divided by folds of soft and pliant skin into a series of shield-like plates, in others it lies close to the body with only a few slight folds. The few hairs which appear on the animal are confined to

the borders of the ears and the tip of the tail, with occasionally a few bristles on the back. The most peculiar feature of the creature is its horn or horns. This is a very curious structure, and worthy of a brief notice. It is in no way connected with the skull, but is simply a growth from the skin, and may take rank with hairs, spines, or quills, being indeed formed after a similar manner. If a Rhinoceros horn be examined—the species of its owner is quite immaterial—it will be seen to be polished and smooth at the tip, but rough and split into numerous filaments at the base. These filaments, which have a very close resemblance to those which terminate the plates of whalebone, can be stripped upward for some length; and if the substance of the horn be cut across, it will be seen to be composed of a vast number of hairy filaments lying side by side, which, when submitted to the microscope and illuminated by polarized light, glow with all the colors of the rainbow, and bear a strong resemblance to transverse sections of actual hair. At the birth of the young animal, the horn is hardly visible, and its full growth is not attained for several years.

As the horn is employed as a weapon of offence, and is subjected to violent concussions, it is set upon the head in such a manner as to save the brain from the injurious effects which might result from its use in attack or combat. In the first place, the horn has no direct connection with the skull, as it is simply set upon the skin, and can be removed by passing a sharp knife round its base, and separating it from the hide on which it grows. In the second place, the bones of the face are curiously developed, so as to form an arch with one end free, the horn being placed upon the crown of the bony arch in order to diminish the force of the concussion in the best imaginable manner. The substance of the horn is very dense, and even when it is quite dry, it possesses very great weight in proportion to its size. In former days it was supposed to bear an antipathy to poison, and to cause effervescence whenever liquid poison was poured upon it. Goblets were therefore cut from this material, and when gorgeously mounted in gold and precious stones, were employed by Eastern monarchs as a ready means for detecting any attempt to administer a deadly drug.

Although the Rhinoceros is at present confined to the Torrid Zone, we have evidence that it once was more widely spread. The traveler Pallas saw in Siberia the feet of a Rhinoceros which had been found in the banks of a river; they were still covered with skin. The head was

afterward discovered and sent to St. Petersburg. This fossil species was of a yellow color, with a thick hide destitute of folds, covered with stiff hair projecting from a soft woolly undercoat.

The Rhinoceros has long been known. Its figure occurs in the hieroglyphics of Egypt; many pious persons identify it with the "unicorn" of the Bible, forgetting that "unicorn" is merely a conjectural translation of the Hebrew word designating an animal of the bovine family. Pliny tells us that Pompey exhibited a Rhinoceros B. C. 61, in the arena at Rome. "The Rhinoceros," he writes, "is the born foe of the elephant. It whets its horn on a stone, and, when fighting, aims at the belly." He adds, that at the period of his writing, the animal was found at the island of Meroe in the Nile. Strabo saw one in Alexandria. Martial describes a fight between one and a bear. The Rhinoceros, he says, was very sluggish and slow to engage, but finally tossed the bear as a bull tosses a dog. The Arabian writers are the first to distinguish between the African and Asiatic species, and the Rhinoceros plays a conspicuous part in the Arabic tales of magicians. Marco Polo is the first European in modern times to mention the animal, and in 1513 King Emmanuel of Portugal received a living specimen from the East Indies. Albert Durer made a wood-cut representing it; unfortunately he was guided by a very imperfect drawing sent from Lisbon to Germany. For about two hundred years this wood-cut was the only representation of the Rhinoceros. Chardin, at the beginning of the last century, sent a better sketch from Ispahan, and at present accurate representations of most of the species have been published.

Although all the *Rhinocerotidae* have the same general traits, yet each species has its own peculiarities, some being exceedingly irritable and bad-tempered, others harmless and gentle. They are everywhere more dreaded than the elephant. The Arabs of the Soudan believe that magicians assume the form of the monster, which is accursed from the beginning—"Not the Lord, the all-creating, made them, but the Devil, the all-destroying, and the Faithful must have nothing to do with them. The Mussulman must quietly get out of their road, in order that he may not defile his soul, and be rejected at the day of judgment."

The favorite haunts of the Rhinoceros are well-watered regions, swampy lands, rivers that overflow their banks, and lakes with sedgy and muddy shores, near which grassy plains extend. Before a creature of such weight, and protected with such an armor, the densest jungle opens

its most impenetrable thickets, and the most terrible thorns are powerless. Hence we find them in great numbers in the forest lands, from the shore up to the height of ten thousand feet above the sea. Some species seem to prefer the elevations. The Java Rhinoceros is more numerous in the hills where many grassy pools and swamps are scattered; the African Rhinoceros, which lives in the prickly mimosa thickets of Central Africa, is not rare in West Abyssinia at seven thousand feet above the sea. Water is indispensable; every day the huge animal rolls himself in the mud; for in spite of its thick hide, it is very sensitive to the attacks of insects, against whose stings nothing but a good coating of mud can protect it. Plunging into the soft mud, they lie and grunt for pleasure. When the coating of mud dries and falls off, the Rhinoceros seeks to get temporary relief from his insect pests by rubbing himself against the trunks of the trees.

The Rhinoceroses are more active by night than by day; they dislike great heat, and sleep during the noontide in some shady spot. They sleep very deeply, and are easy to approach when they are thus buried in repose. Gordon Cumming reports that even the little birds, which always accompany the Rhinoceros, and warn him of danger when sleeping, in vain endeavored to awaken one which he was preparing to shoot. Some Hottentots, led by the creature's loud snores to its sleeping-place, put their guns close to his head and fired; the sleeper never stirred; they loaded again, and killed it at the next discharge. About midnight the Rhinoceros takes a mud-bath, and goes to his feeding-grounds, where he lingers for hours. Afterward, he roams wherever he pleases; he passes through the bush and jungle, never changing his course except to avoid the larger trunks, and in India he forms long, straight paths, where all the shrubs at the sides are broken down, and the ground trodden hard; the elephant, on the contrary, pulls up by the roots the brush that stands in his way. These paths always lead to water, and would be very useful to the traveler if he could be sure of not meeting their constructor.

As regards food, the Rhinoceros is to the Elephant what the Ass is to the Horse. He loves hard fodder, thistles, reeds, prairie grass, and the like. In Africa it eats the prickly mimosa, especially a low, bushy variety which, on account of its crooked thorns, has been called the "Wait-a-bit thorn." During the rainy season, the Rhinoceros approaches nearer to the cultivated land, and does incalculable damage to the farmers, for his

appetite is enormous, and even in captivity the animal requires nearly sixty pounds weight of food a day. The Indian species uses its finger-like lip to seize tufts of grass, and to convey them to its mouth. As the throat is enormous, it swallows its food half-masticated. Small trees or shrubs are often dug up by the aid of its horn, which it inserts beneath their roots. But in their food, also, the various species differ. The Indian Rhinoceros prefers twigs; the Sumatran, grass; the African, the branches of the mimosa, which it cuts off "as if with a pair of shears," while it is poisoned by the Euphorbium which the White Rhinoceros eats with impunity.

The Rhinoceroses pass their lives eating or sleeping. Unlike the elephants, they do not live in herds; their troops never exceed ten members. In this society there is little harmony, each lives for itself, and does what it chooses. Between the sexes, however, intimate and permanent friendships are formed, and pairs may be often seen which seem to act in common; and in captivity both sexes display a tender affection for their mates. Usually the Rhinoceros walks slowly, and is awkward in lying down or rolling, but he is not so unwieldy as he looks. He can not turn actively, nor can he climb; but when once in motion on level ground he runs pretty quick at a brisk *trot*, for he does not *pace* like the camel or elephant. He holds his head very low, and when enraged shakes it from side to side, and raises his stumpy tail. He can keep up this trot for a considerable time, and is dangerous even to well-mounted hunters, especially where the jungle is thick, while elephants with a howdah have no chance with him. He swims well, and has been seen to dive to the bottom of pools for the purpose of digging up aquatic plants with his horn.

The Rhinoceros possesses a very acute sense of hearing and of smell. He often pursues his enemy by scent alone, and when enraged, regards neither the number nor quality of his opponents. He charges straight on a line of armed men, or on the most inconsiderable object. Red colors provoke his anger, even when the wearer or bearer of the offensive garment is quite peaceable. His anger knows no limits; he cuts at the bushes near him, or plows long furrows in the ground. A writer, describing the single-horned species, says that "it is a mistake to suppose that the horn is their most formidable weapon. I thought so myself at one time," he adds, "but have long been satisfied that it is merely used in defence, and not as an instrument of offence. It is with their

cutting-teeth" (lower canines) "that they wound so desperately. I killed a large male," this writer asserts, "which was cut and slashed all over its body with fighting; the wounds were all fresh, and as cleanly made as if they had been done with a razor—the horn could not have been used here." Another one he had wounded halted and, out of pure rage, cut at the jungle right and left, exactly as a boar uses his tusks. "A medical friend's servant, who was sauntering through the forest, was actually disemboweled by a Rhinoceros. He examined the wound immediately, and I heard him say afterward that if it had been done with the sharpest instrument, it could not have been cleaner cut. This could not have been done with the horn."

The extraordinary irritability of the Rhinoceros conceals in a great degree its real intelligence. While far inferior to the elephant, it yet is superior to most of the ruminants; and in captivity soon learns to know its keeper, and submit to his wishes. We still, however, know too little of the animal in its wild life. The female defends its young at all hazards. A hunter in India discovered a female with its young one; the mother rose up and slowly retired, pushing the little one before her with her snout. The hunter rode up and made a cut at her with his sabre, but the weapon only left a few white marks on the solid hide. The mother endured patiently all his blows till her offspring was safe in the bush. Then she turned, gnashing her teeth, on the assailant. His horse had the sense to run away, the Rhinoceros pursued, smashing and crashing through all obstacles. When she reached the hunter's attendants, she charged them too, and when they climbed some trees, she attacked them; the huge trunks quivered under the blows of the enraged beast, which was finally shot in the head. A young Rhinoceros was born on board a ship in London in 1872, but, to the great loss of science, it died in three or four days, deeply lamented by Mr. Bartlett.

Pliny's remark about the hostility of the Rhinoceros and the Elephant is a mere fable, of course. But if the Rhinoceros has no hereditary enemy, it has an hereditary friend. All African travelers relate that the Borélé is attended by a small bird which lives on the parasitic insects abounding on its patron's ample hide, and which wakens him from slumber when danger draws nigh. "They are his best friends," writes Gordon Cumming, "and seldom fail to rouse him. I have often chased a Rhinoceros for miles; and during the chase the birds sat upon his back. When I put a ball into his shoulder, they fluttered about six feet above

him, screaming, and then resumed their station. Sometimes boughs of trees swept them away, but they soon returned. I have shot a Rhinoceros by night, and the birds remained with it till morning, thinking it was asleep, and tried to awaken it when I came up." Other enemies than man the Rhinoceros need not fear. Lions and tigers know that their claws are powerless, and that the paw which can prostrate an ox would not be felt by the armor-clad pachyderm. Man, however, in all regions, pursues the Rhinoceros, and modern improvements in musketry have rendered him an easy victim to the European sportsman. When unaccustomed to the sight of intruders, the animal takes to flight; but when it has been repeatedly disturbed, it does not wait to be attacked, but commences hostilities, and fights to the death.

The Rhinoceros is constantly found in our menageries, where it shows itself, as a rule, good-tempered, ready to take food from the spectators' hands, and tame enough to be allowed to walk about in a paddock. It ought to be bathed in or sprinkled with lukewarm water every day. How long they will live is not known, but captive ones in India have been said to have attained the age of forty-five. The use which can be made of the Rhinoceros does not compensate for the damage he does. He is intolerable where regular cultivation exists. All parts of the animal, however, have their uses. The blood, as well as the horn, are highly esteemed in the East for their medicinal qualities. Cups and drinking-vessels of rhinoceros-horn are deemed a necessary in the house of a wealthy man, for such cups reveal the presence of poison in any fluid poured into them. The horn is used also for the handles of sabres, and when polished, has a beautiful, soft, yellowish tint. Shields, breast-plates, dishes, and other utensils are made from the hide: the flesh is eaten, the fat and marrow employed as salves of magic efficacy. The Chinese say that after swallows' nests, lizards' eggs, and little dogs, nothing is such a dainty as the tail of a rhinoceros.



CHAPTER IX.

THE ASIATIC RHINOCEROSSES.

THE ONE-HORNED RHINOCEROSSES—THE INDIAN RHINOCEROS—ITS THICK HIDE—MODE OF HUNTING—
THE WARA OR JAVANESE RHINOCEROS—THE EMPEROR BABER—THE TWO-HORNED RHINOCEROS
OR BADAQ OF SUMATRA—THE FIRE-EATING RHINOCEROS—THE ROUGH-EARED RHINOCEROS.

DOCTOR GRAY, in his last Catalogue of Mammalia, groups the Asiatic Rhinoceroses into two genera, *Rhinoceros* and *Cerat-rhinus*. The former comprehends those species which have the armor-like hide divided into distinct shield-like plates, the latter those in which the hide has divisions only at the shoulders and the loins; the former have one horn, the latter two; there are also differences in the dentition of the genera.

THE ONE-HORNED RHINOCEROS.

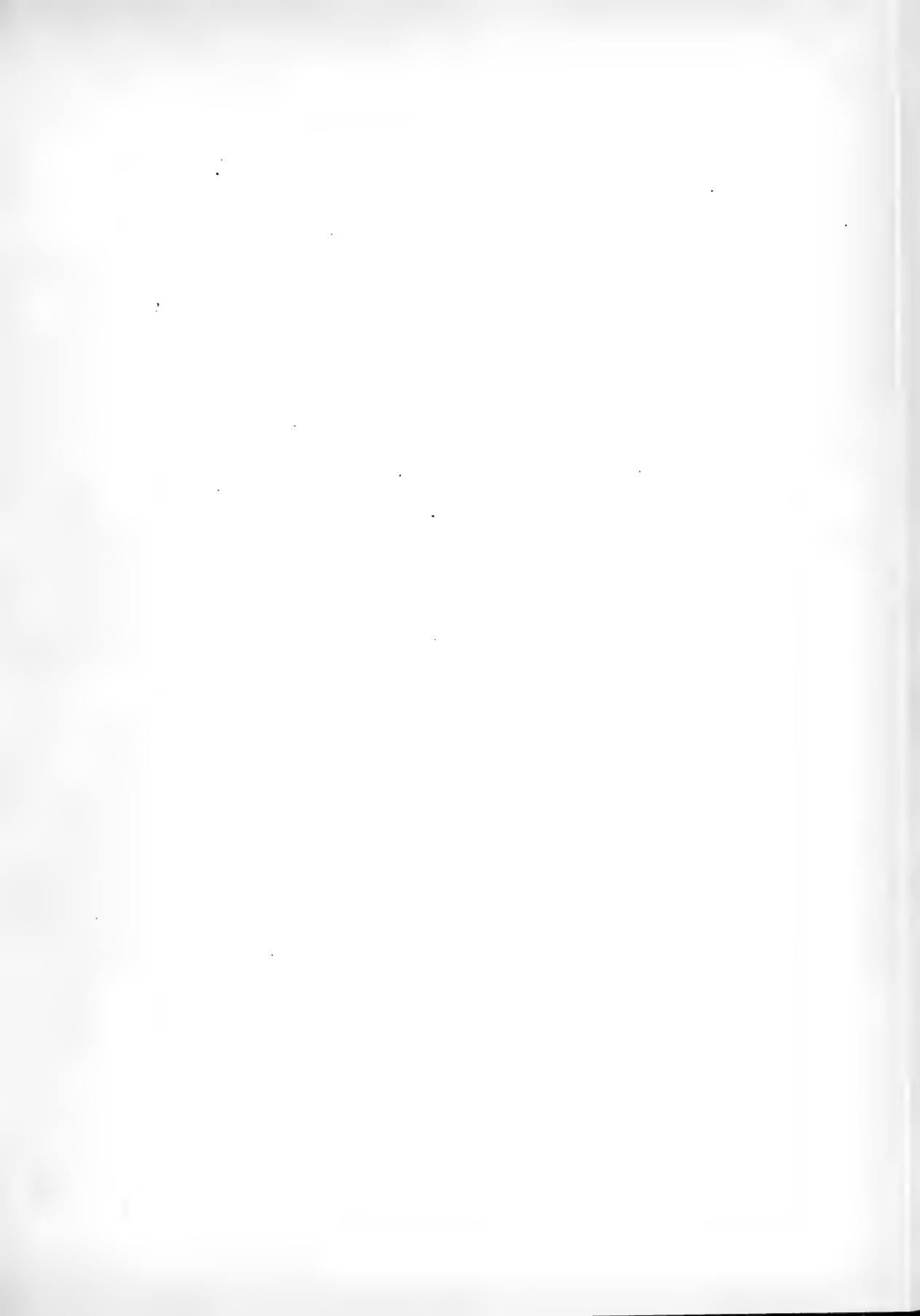
The INDIAN RHINOCEROS, *Rhinoceros Indicus* (Plate XXXV), attains a length of twelve feet, including its tail, and stands about five feet high; its weight is about forty-five hundred pounds. Its head is short and triangular; its mouth, of a moderate size, has an upper lip, which is longer than the lower, pointed and movable. It has in each jaw two strong incisor teeth. Its eyes are small; its ears are rather long and movable. The horn upon its nose is pointed, conical, not compressed, sometimes two feet in length, and slightly curved backwards. This singular weapon is composed of a cluster of hairs closely adherent; for when the point is blunted, it is often seen divided into fibres resembling the hairs of a brush. This horn is, however, very firm and hard, of a brownish-red on the outside, of a golden-yellow inside, and black in the centre.

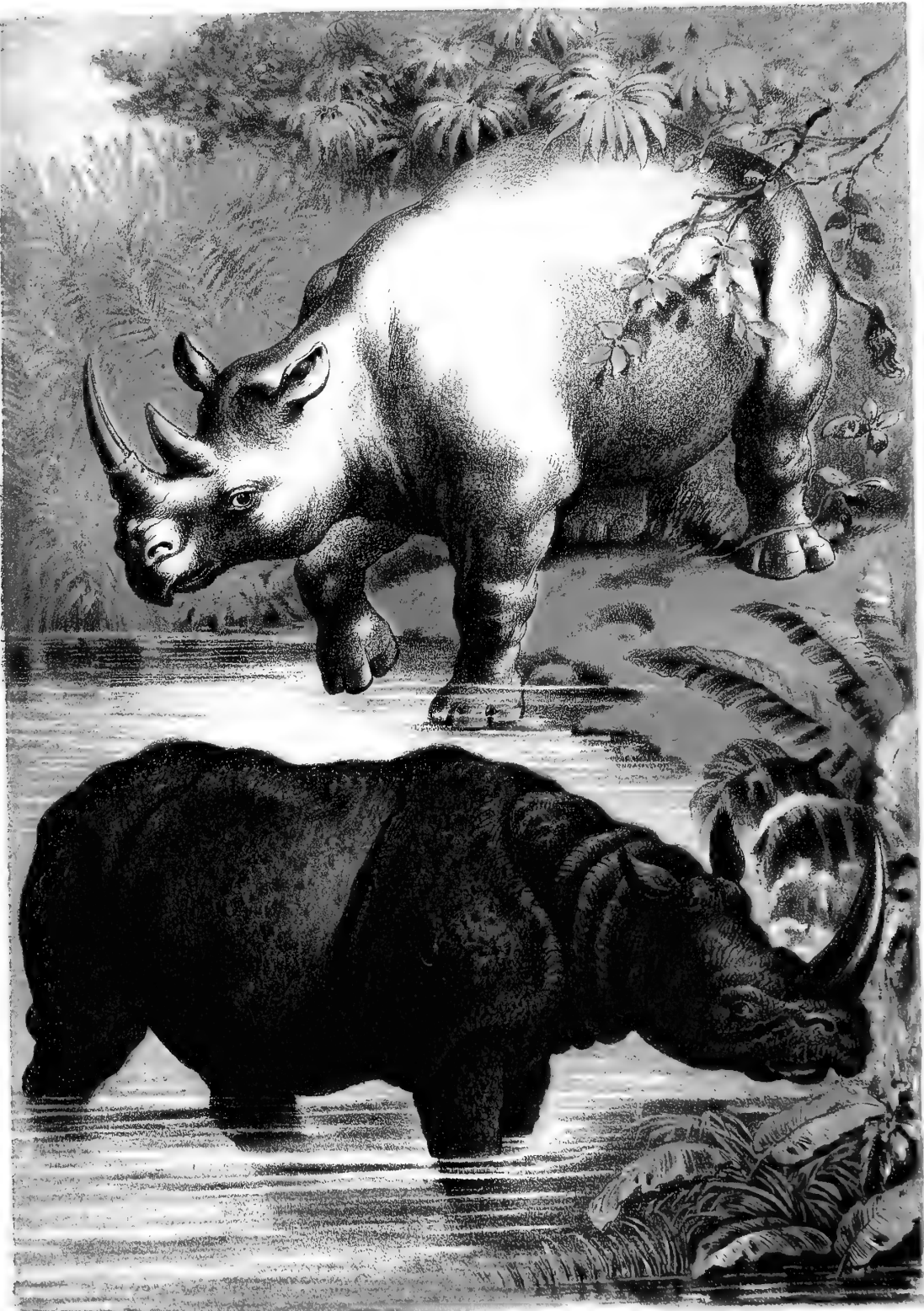
The thick, horny hide lies upon a thick layer of loose cellular tissue, and is thus capable of being easily moved to and fro. This integument is divided into plates by regular deep folds which exist even in the newborn young ones. The skin in these folds is very soft and thin, while the

hard plates, which can be lifted up by hand, are as thick and solid as boards. The first fold runs just behind the head around the neck, forming below it a kind of dewlap; from this fold two oblique folds, one on each side, run backwards and upwards, deep at first, but vanishing at the withers; from the centres of these folds a pair of creases runs forward to the back of the neck. Behind the withers is a very conspicuous deep fold which descends behind the shoulder-blade, and then turns horizontally over the fore-arm and passes in front of it. Another deep fold commences at the loins, and descends obliquely in front of the thigh, sending out other folds toward the tail. The hide appears divided into three grand pieces, one on the head and shoulders, another one on the body, the third on the hind-quarters. The animal is thus defended with a shield on its back, one on each shoulder, one on the rump, and one on each thigh. This hide has been compared to a suit of armor of well-adjusted pieces. It is, however, so thick and hard that, without these creases or folds, the animal, imprisoned as it were in its armor, could scarcely move. It is of a dark color, nearly bare, generally provided with only a few coarse and stiff hairs on the tail and ears, occasionally with curly woolly hairs on certain parts of the body. But each of these shields is everywhere covered with irregular, round, more or less smooth, tubercles of horn, which lie so thick together on the outside of the legs that these limbs look as if they were covered with scale-armor. The skin in the folds is of a dark flesh-color.

The tubercular prominences on the hide sometimes assume an extraordinary degree of development. In the old wood-cut by Albert Durer, the Rhinoceros is represented with horns on the shoulder-plates as well as on the nose. In the Zoological Gardens of Antwerp, a Rhinoceros eighteen years old was remarkable for the size of these tubercles; some were as large as hazel-nuts, others on the collar-bone and on the skin before the ears attained a length varying from two to five inches. In the centre of the neck there was a group of five perpendicular horns, one of which was over three inches in height. These little horns fell off from time to time, and were quite different in structure from the wart-like knobs which occur on the sides of the animal. A Rhinoceros in the Zoological Gardens of Moscow did actually shed a horn, and another grew in its place. There can be no doubt this happens with wild animals.

The Indian Rhinoceros is at present restricted to the Terai, an unhealthy, marshy tract at the foot of the Himalayas, skirting Nepaul,





WHITE RHINOCEROS
INDIAN RHINOCEROS

PLATE XXXV. UNGULATA.



Sikkim, and Bhotan, being more common in the eastern portion of the district, and may perhaps occur in the hill ranges east and south of the Brahmaputra River.

In India, in former times, the Rhinoceros was hunted on light, quick horses. The huntsmen followed it from afar off, and without any noise, till the animal became tired and was obliged to lie down and sleep. Then the sportsmen approached it, taking care to keep to leeward, for it has a very acute sense of smell. When they were within shot, they dismounted, aimed at the head, fired, and galloped away; for if the Rhinoceros is only wounded, it rushes furiously upon its aggressors. When struck by a bullet, it abandons itself wholly to rage. It rushes straight forward, smashing, overturning, trampling under foot, and crushing to atoms everything which comes in its way.

THE JAVANESE RHINOCEROS.

The JAVANESE RHINOCEROS, *Rhinoceros sondaicus*, obtains its English epithet from the belief that it was a species peculiar to Java. This is not the case, for it is found in Tenasserim and the Sunderbunds, and is often confounded with the Indian Rhinoceros. The difference, indeed, between the two species is not sufficiently striking to be noticed by ordinary beholders unless the two animals were close together. The *Rhinoceros sondaicus* is about a third less in size than the Indian Rhinoceros; its coat of mail is much the same except that the tubercles on the hide are smaller and of uniform size, while the polygonal facets of the skin have a few small bristles growing upon a depression in the centre of each. The strong fold or plait at the setting-on of the neck is continued across the shoulders; the neck-folds are less heavy and pendulous, and the posterior plate crossing the buttock from the tail is less extended.

The Javanese Rhinoceros, or Wara as it is called by the natives, is reported to be a timid animal, but an instance is related of one attacking a sailors' watering-party in Java. It is diffused, more or less abundantly, over the whole Indo-Chinese region and the Malayan peninsula, but is not found in Sumatra. In Java it is found in the most elevated regions, ascending with astonishing swiftness even to the tops of the mountains. Its retreats are discovered by deeply-excavated passages which it forms along the declivities of the hills. In Bengal it is found not only in the Sunderbunds, but in the Rajmahal hills, near the Ganges, and several

have been killed within a few miles of Calcutta; it lives in these cultivated districts on growing rice and vegetable roots.

In the time of Baber, the founder of the Great Mogul dynasty, the Rhinoceros occurred near Benares, in Central India. In his notice of the animals peculiar to Hindustan, after describing the elephant, the imperial author remarks: "The Rhinoceros is another. This also is a huge animal. The opinion prevalent in our countries that a Rhinoceros can lift an elephant on its horn is probably a mistake. It has a single horn over its nose upwards of a span in length; but I never saw one of two spans." From this it would seem that the particular species referred to is *Rhinoceros sondaicus*, inasmuch as Baber would probably have been able to obtain larger examples of the horn of *Rhinoceros indicus*. "Out of one of the largest of these horns," he adds, "I had a drinking-vessel made and a dice-box, and about three or four fingers' bulk of it might be left. Its hide is very thick. If it be shot at with a powerful bow drawn up to the arm-pit with much force, the arrow enters three or four fingers' breadth. They say, however, that there are parts of its skin that may be pierced, and the arrows enter deep. On the sides of its two shoulder-blades, and of its thighs, are folds that hang loose and appear at a distance like cloth housings. It is more furious than the elephant, and cannot be rendered so tame. It strikes powerfully with its horn, with which, in the course of these hunts, many men and many horses were gored." This description of a One-horned Rhinoceros is unmistakable, but it is strange to read that these animals could be killed with arrows.

The Wara is hunted for the sake of its horn, which is in great demand in China. Pitfalls are dug in the paths it is known to traverse, and the bottom of the pits planted with sharp stakes; the whole is then covered with branches and twigs. The Rhinoceros comes along, unsuspecting, treads on the treacherous boughs, and is either impaled at once, or at all events rendered helpless. The adults are slain because they cannot be extricated from the pit; the young ones are led away captive.

THE TWO-HORNED ASIATIC RHINOCEROS.

The SUMATRAN RHINOCEROS or BADAQ, *Rhinoceros sumatranus*, is the basis of Gray's genus *Ceratorhinus*. It is a comparatively small animal, which certainly never much exceeds four feet in height; but its horns

sometimes attain a beautiful development, more especially the anterior one, which is much longer than the other, slender except at base, and has a graceful curvature backward, more or less decided in different individuals; the other, or posterior horn, is not placed close behind the first, as in the different two-horned African species, but at a considerable distance from it, and it has a corresponding backward curvature. An anterior horn of this small Rhinoceros in the British Museum measures thirty-two inches along its front, and is seventeen inches in span from base to tip. The posterior horn is very thick, short, and pyramidal. A pair of horns of this species is a beautiful object when carved and polished, and set with the bases upward and on a parallel in a carved black wooden stand, similar to those upon which Chinese metallic mirrors are mounted. The wealthy Chinese give such extravagant prices for fine specimens that they are exceedingly difficult to be got hold of by any one else. A pair upon the head was estimated to be worth twenty-five dollars; and the price, as usual, increases with the size and length to a sum much higher. The natives of Sumatra assert that sometimes a third horn is seen, but this is doubtless such a development as that already mentioned in our description of the Indian Rhinoceros.

This Rhinoceros has a smooth hide, thinly but conspicuously covered with short, coarse, black hair; there are folds about the neck, a distinct fold behind the fore-quarters, a slight crease before the hind-limbs, but nothing comparable to the coat of mail of the one-horned varieties. The hide is rough, but easily cut with a knife. Both lips are broad and non-prehensile, and the animal therefore grazes rather than browses. The tail terminates in a thin tuft. The head is peculiarly long, the neck short and heavy, and the limbs very clumsy. It is a very quiet creature, and an adult male has been seen to fly in terror from a native wild dog.

The Asiatic Two-horned Rhinoceros has been supposed, until recently, to be peculiar to the island of Sumatra, as the smaller one-horned Rhinoceros is to that of Java; but both of them are widely diffused over the Indo-Chinese countries, and throughout the Malayan peninsula, the smaller one-horned being likewise found in Java, and the Asiatic two-horned also in Borneo as well as in Sumatra. The two-horned species has been killed in one of the hill ranges immediately to the southward of the Brahmaputra River, so that its range may be said to extend northward into Assam. It is worthy of notice that the full-grown female of this species becomes very speedily tame and tractable. It is probable

that Rhinoceroses described as existing in the southeast of China belong to this species. The Burmans speak of the Fire-eating Rhinoceros, and Professor Oldham's camp-fire was attacked by one which proved to be of the two-horned species.

All the three species above described occur in the southern provinces of British Burmah; the *Rhinoceros indicus* in the high range called the Elephant-tail mountain, the *Rhinoceros sondaicus* in the extreme south, and the *Rhinoceros sumatranus* between the tenth and seventeenth degrees of north latitude. The first is the shyest, the last is the wildest, the middle one the mildest in character.

The ROUGH-EARED RHINOCEROS, *Rhinoceros lasiotis*, is the name given by Sclater to the small one-horned elephant found in the peninsula of Malacca and Farther India. It is usually considered to be identical with the Badak. The first specimen to which a separate species was given was captured by a strange accident. Some English officers on duty in the northern part of the Bay of Bengal, collecting elephants for the army, heard that a rhinoceros had got into some quicksand and could not get out by its own efforts, but two hundred of the inhabitants of the vicinity had succeeded in rescuing it by casting ropes over it, and had fastened it to two trees, where it was in the best condition, and so fierce that they durst not let it loose. Captain Hood and Mr. Weekes proceeded to the spot with eleven elephants; they found a female rhinoceros eight feet long and four feet high, with horns only slightly developed. They placed it between two elephants and took it to Chittagong, where it became tame very soon. It was a difficult matter to induce the elephants to assist in the capture, and when the savage beast was fastened to them, a scream from it threw them repeatedly into alarm. At last the march began till a river was reached, which had to be crossed by swimming. The elephants entered it boldly, but the rhinoceros refused and was dragged through the stream by her two companions, for she refused to swim a stroke. Finally, the rhinoceros was brought safe to Calcutta, and thence shipped to Europe.



CHAPTER X.

THE AFRICAN RHINOCEROS.

THE BORELE OR LITTLE BLACK RHINOCEROS—THE SWORD-HUNTERS OF ABYSSINIA—THE KEITLOA
—THEIR FIERCENESS—THE MOMOGOO OR WHITE RHINOCEROS—HUNTING ADVENTURE OF MR.
OSWELL—THE KOBABOBA—PROBABILITY OF ITS EXTINCTION.

THE African Rhinoceroses are all two-horned, but are formed by Gray into two genera: *Rhinaster* with a prehensile upper-lip, and *Ceratotherium* with a non-prehensile upper-lip, which are known to travelers as the Black and White Rhinoceros respectively. Each genus has two species.

THE BLACK RHINOCEROSES.

The BORELE OR LITTLE BLACK RHINOCEROS, *Rhinoceros bicornis* (Plate XXXIV), is the commonest of the African species, and is easily distinguished from the Asiatic two-horned species by its upper-lip and the shape of its horn. The foremost horn is of considerable length and inclines backward, while the second is short and conical.

The Borele is a véry fierce and dangerous animal, and is more feared by the natives than even the lion. Although so clumsy in shape and aspect, it is really a quick and active creature, darting about with lightning speed, and testing the powers of a good horse to escape from its charge. Like many other wild animals, it becomes furiously savage when wounded, but it will sometimes attack a passenger without the least provocation. On one occasion an angry rhinoceros came charging down upon a wagon, and struck his horn into the bottom plank with such force as to send the wagon forward for several paces, although it was sticking in deep sand. He then left the wagon and directed his attack upon the fire, knocking the burning wood in every direction, and upsetting the pot which had been placed on the fire. He then continued his

wild career in spite of the attempts of a native who flung his spear at him, but without the least effect, as the iron point bent against the strong impenetrable hide, which covered its huge carcass.

The skin of this animal does not fall in heavy folds, like that of the Asiatic species, but is nevertheless extremely thick and hard, and will resist an ordinary leaden bullet, unless it be fired from a small distance. The skin is employed largely in the manufacture of whips, or jamboks, and is prepared in a rather curious manner. When the hide is removed from the animal it is cut into strips of suitable breadth and laid on the ground. These strips are then hammered for some time in order to condense the substance of the skin, and when they are dry are carefully rounded with a knife and polished with sandpaper. One of these whips will continue serviceable for several years. The horn of the Borele, from its comparatively small dimensions, is not so valuable as that of the other species, but is still employed in the manufacture of drinking-cups and sword-handles. Its value is about half that of ivory.

When wounded, the Black Rhinoceros is a truly fearful opponent, and it is generally considered very unsafe to fire at the animal unless the hunter is mounted on a good horse or provided with an accessible place of refuge. An old experienced hunter said that he would rather face fifty lions than one wounded Borele; but Mr. Oswell, the well-known African sportsman, always preferred to shoot the Rhinoceros on foot. The best place to aim is just behind the shoulder, for, if the lungs are wounded, the animal very soon dies. There is but little blood externally, as the thick loose skin covers the bullet-hole, and prevents any outward effusion. When mortally wounded the Black Rhinoceros generally drops on its knees.

One of a party of Namaquas shot a Borele, and, approaching to what he thought the carcass, stood astride of it and stabbed it. At the touch of the cold steel the beast rose up and made off at full speed with its dismayed rider. The Borele stopped when it had run forty or fifty paces, and was killed by a lucky shot.

"The Borele," says Mr. Chapman, "is a dumpy, plump-looking animal of a very dark color, very lively in his actions, always on the trot, very nervous, wary, and fidgety, often flying round in a fury whether he has observed danger or not, making the hunter sometimes believe that he has been discovered. When he fancies he sees or hears anything, he lifts one foot, tosses up his horn and nose and sinister little eyes, and

presents altogether a picture of the most intense and earnest scrutiny and attention, wheeling round with great rapidity, and by his active gestures and startling snorts often rendering the nerves of the inexperienced hunter very unsteady. On the whole his actions are those of a lively pig." This Rhinoceros extends as far north as Abyssinia, where it was seen by the traveler Bruce. In that country it is pursued and killed by the *agageer* or Sword-hunters. Two men ride on the same horse. One dressed, and armed with javelins; the other naked, with nothing but a long sword in his hand. The first sits on the saddle, the second rides behind him on the horse's rump. Directly they have got on the track of the quarry, they start off in pursuit of it, taking care to keep at a great distance from the Rhinoceros when it plunges into the thickets, but the moment it arrives in an open spot they pass it, and place themselves opposite to it. The animal, in a rage, hesitates for a moment, then rushes furiously upon the horse and its riders. These avoid the assault by a quick movement to the right or the left, and the man who carries the long sword lets himself slide off on to the ground without being perceived by the Rhinoceros, which takes notice only of the horse. Then the courageous hunter, with one blow of his formidable sabre, cuts through the tendon of the ham or hock of one of the monster's hind legs, which causes it to fall to the ground, when it is dispatched with arrows and the sword.

THE KEITLOA.

The KEITLOA, *Rhinoceros Keitloa*, is distinguished from the Borele by having horns of nearly equal length. The hind horn, which is straight, grows to two feet and a half or more in length, being often as long as the anterior horn, although as a rule the latter is the longer. The upper-lip is very pendulous, the neck is somewhat long, the head is not thickly covered with wrinkles. At its birth the horns are only indicated by a prominence on the nose, and at six years of age are only nine inches long. The Keitloa is a terribly dangerous opponent, and its charge is so wonderfully swift that it can hardly be avoided. One of these animals that had been wounded by Mr. Andersson, charged suddenly upon him, knocked him down, fortunately missing her stroke with her horns, and went fairly over him, leaving him to struggle out from between her hind legs. Scarcely had she passed than she turned and made a

second charge, cutting his leg from the knee to the hip with her horn, and knocking him over with a blow on the shoulder from her fore-feet. She might easily have completed her revenge by killing him on the spot, but she then left him, and plunging into a neighboring thicket, began to plunge about and snort, permitting her victim to make his escape. In the course of the day the same beast attacked a half-caste boy who was in attendance on Mr. Andersson, and would probably have killed him had she not been intercepted by the hunter, who came to the rescue with his gun. After receiving several bullets, the rhinoceros fell to the ground, and Mr. Andersson walked up to her, put the muzzle of the rifle to her ear, and was just about to pull the trigger, when she again leaped to her feet. He hastily fired and rushed away, pursued by the infuriated animal, which, however, fell dead just as he threw himself into a bush for safety. The race was such a close one, that as he lay in the bush he could touch the dead rhinoceros with his rifle, so that another moment would probably have been fatal to him.

The Keitloa is of a dark neutral gray color, as seen from a distance. This animal droops behind, and has a stiff, clumsy, and awkward walk. He feeds on bushes and roots, is nervous and fidgety when discovered, but confines his movements generally only to the head and horns, moving them about in an undecided manner, first one way, then the other. He is not so excitable as the Borele. But both are fierce and energetic animals, and so active and swift that they cannot be overtaken on horseback. The Keitloa, it may be added, is more an inhabitant of rocky hills, while the Borele loves the thorny jungle. The Keitloa, as well as the Borele, extends as far north as Abyssinia. It exceeds, however, the latter in height, sometimes measuring six feet at the shoulder.

"Both species," writes W. C. J. Andersson, "are extremely fierce, and, excepting the buffalo, are, perhaps, the most dangerous of all the beasts of Southern Africa. Seen in its native wilds, either when browsing at its leisure or listlessly sauntering about, a person would take this beast to be the most stupid and inoffensive of creatures; yet, when his ire is roused, he becomes the reverse, and is then the most agile and terrible of animals. The Black Rhinoceroses are, moreover, subject to sudden paroxysms of unprovoked fury, rushing and charging with inconceivable fierceness animals, stones, and bushes; in short, every object that comes in their way." "The Black Rhinoceros," writes Gordon Cumming also, "is subject to paroxysms of sudden fury, often ploughing

up the ground for several yards with its horns, and assaulting large bushes in the most violent manner. On these bushes they work for hours with their horns, at the same time snorting and blowing loudly, nor do they leave them in general until they have broken them to pieces. During the day they will be found lying asleep, or standing indolently in some retired part of the forest, or under the base of the mountains, sheltered from the power of the sun by some friendly grove of umbrella-topped mimosas. In the evening they commence their nightly ramble, and wander over a great extent of country. They usually visit the fountains between the hours of nine and twelve o'clock at night; and it is on these occasions that they may be most successfully hunted, and with the least danger."

The food of the Black Rhinoceros, whether the Borele or the Keitloa, is composed of roots, which the animal ploughs out of the ground with its horn, and of the young branches and shoots of the wait-a-bit thorn. It is rather remarkable that the black species is poisoned by one of the Euphorbiaceæ, which is eaten with impunity by the two white species.

THE WHITE RHINOCEROSES.

The WHITE RHINOCEROS or MOHOGOO, *Rhinoceros simus* (Plate XXXV), so called from its pale color, is a very different animal from those of which we have been treating. It grows to more than six feet and a half high at the withers, where there is a sort of square hump, and the head is a foot longer than in the Keitloa, being nearly one-third of the entire length of the body, with an exceedingly long anterior horn, attaining to more than four feet in length, while the hind horn is very short, not exceeding seven or eight inches. "Its color," remarks Mr. Chapman, "is of such a light neutral-gray, as to look nearly as white as the canvas tilt of a wagon." His fellow-traveler, Mr. Baines, describing a freshly-killed one, tells us that "the skin was of a light pinky-gray, deepening into a bluish neutral tint on parts of the head, neck, and legs. The limbs, shoulders, cheeks, and neck were marked with deep wrinkles, crossing each other so as to have a lozenge-shaped reticulated appearance; but the only approach to a fold was a slight collar-like mark across the throat. The mouth was very small, and the limbs were dwarfish compared with the bulk of the carcass. The eyes were small and set flat on the side of the head, with no prominence of brow, and in such a posi-

tion that I should doubt very much the assertion that the Rhinoceros can see only what is straight before it. I should think, on the contrary," continues Mr. Baines, "that anything exactly in front would be absolutely hidden from its view." Mr. Chapman estimated the weight of one of these White Rhinoceroses as being probably not less than five thousand pounds avoirdupois.

"The male," he says, "measures six feet eight inches at the withers, carries his head so low that the chin nearly sweeps the ground, and is constantly swaying his head to the right and left when suspicious. The calf, instead of going behind or at the side, always precedes the dam, and when fleeing is helped on by her horn or snout. The back of this animal is tolerably straight, the croup being as high, or even higher, than the withers. It moves each ear alternately backwards and forwards when excited, and the ears, when thrown forward, turn as if on a pivot, so as to bring the orifice innermost. In the other African Rhinoceroses the two ears are moved together, and not alternately. The ears are pointed or tufted."

This animal is of a comparatively mild and gentle disposition; and, unless in defence of its young, or when hotly pursued, or wounded, will very rarely attack a man. "It is gregarious in families," remarks Mr. Chapman, "the individuals comprising which are greatly attached to each other; and it utters a long sound, and not such a startling, whistling snort as the Borele does. It is an indolent creature, and becomes exceedingly fat by eating grass only." Elsewhere, he remarks of a herd of eight which he observed at a drinking-place: "The Rhinoceroses, all of which were of the white kind, occupied each twelve minutes to drink their fill, after which they wallow in the mud, or else go to their regular sleeping-places. At these their dung is found accumulated sometimes to the amount of a ton or more. They like the warmth of the manure to lie in. The sounds emitted by these animals is something like the coughing of a horse, and when in distress, a stifled asthmatic cry; when in pain they squeal like a storm-whistle." According to Gordon Cumming and others, their flesh is excellent, and even preferable to beef. The speed of this species is very inferior to that of the others, so that a person well mounted can easily overtake and shoot them.

But in spite of its usual gentleness the White Rhinoceros is sometimes pugnacious, as the following anecdote related by Mr. Oswell displays: "Once as I was returning from an elephant chase, I observed a

huge white rhinoceros a short distance ahead. I was riding a most excellent hunter—the best and fleetest steed that I ever possessed during my shooting excursions in Africa—at the time; but it was a rule with me never to pursue a rhinoceros on horseback, and simply because this animal is so much more easily approached and killed on foot. On this occasion, however, it seemed as if fate had interfered. Turning to my after-rider, I called out: ‘By heaven! that fellow has got a fine horn! I will have a shot at him.’ With that I clapped spurs to my horse, who soon brought me alongside the huge beast, and the next instant I lodged a ball in his body, but, as it turned out, not with deadly effect. On receiving my shot, the Rhinoceros, to my great surprise, instead of seeking safety in flight, as is the habit of this generally inoffensive animal, suddenly stopped short, then turned sharply round, and having eyed me most curiously for a second or two, walked slowly toward me. I never dreamed of danger. Nevertheless, I instinctively turned my horse’s head away; but strange to say, this creature, usually so docile and gentle—which the slightest touch of the reins would be sufficient to guide—now absolutely refused to give me his head. When at last he did so, it was too late; for, notwithstanding the rhinoceros had only been walking, the distance between us was so inconsiderable, that by this time I clearly saw contact was unavoidable. Indeed, in another moment I observed the brute bend low his head, and with a thrust upward, strike his horn into the ribs of the horse with such force as to penetrate to the very saddle on the opposite side, where I felt its sharp point against my leg. The violence of the blow was so tremendous as to cause the horse to make a complete somersault in the air, coming heavily down on its back. With regard to myself, I was, as a matter of course, violently precipitated to the ground. While thus prostrated, I actually saw the horn of the infuriated beast alongside of me; but seemingly satisfied with his revenge, without attempting to do farther mischief, he started off at a canter from the scene of action. My after-rider having by this time come up, I rushed upon him, and almost pulling him off his horse, leaped into the saddle; and without a hat, and my face streaming with blood, was quickly in pursuit of the retreating beast, which I soon had the satisfaction to see stretched at my feet.”

The flesh of the White Rhinoceros is apt to be rather tough, but is of good flavor. The best portions are those which are cut from the upper part of the shoulder and from the ribs, where the fat and the lean

parts are regularly striped to the depth of two inches. If a large portion of the meat is to be cooked at one time, the flesh is generally baked in the cavity of a forsaken ant-hill, which is converted into an extempore oven for the occasion ; but if a single hunter should need only to assuage his own hunger, he cuts a series of slices from the ribs, and dresses them at his fire. The hide of the Mohogoo is enormously thick, and gives a novice no little trouble to get it from the body, as it is as hard as a board, and nearly as stiff. An adept, however, will skin the animal as quickly and easily as if it were a sheep.

THE KOBABOBA, *Rhinoceros Oswellii*, is much rarer than either of the preceding species, and is found far in the interior, mostly to the east of the Limpopo River. The peculiar manner in which this species carries its horns makes it a very conspicuous animal. In all the other species the horns are curved, and incline rather backward ; but in the Kobaoba the foremost horn is nearly straight, and projects forward, so that when the animal is running the tip of the horn nearly touches the ground. Indeed, the extremity of an adult Kobaoba's horn is generally rubbed down on one side, owing to the frequency with which it has come in contact with the earth. The head of this and the preceding species is always carried very low, forming a singular contrast to the saucy and independent manner in which the Borele carries his head.

The long horn of this species sometimes exceeds four feet in length, and is almost straight. The best ramrods are manufactured from it, and a ramrod four feet long has been seen. Mr. Chapman, however, believes that the Kobaoba is only an old Mohogoo. He writes : " I believe that wherever guns are to be found at present the White Rhinoceros is not allowed to reach its prime, and will soon be extinct. In newly-opened countries we always find long-horned Rhinoceroses at first. These are selected and shot by every new-comer for their long horns. I have never found a person yet who could conscientiously say that he had seen a young or middle-aged Kobaoba that was distinguished from a Mohogoo —not even a Bechuana or Bushman." That traveler, however, nevertheless believes in the existence of a second species of flat-lipped and grass-eating African Rhinoceros, but he gives no description of it.



CHAPTER XI.

THE HIPPOPOTAMUS.

THE HIPPOPOTAMUS OR RIVER HORSE—DESCRIPTION—HABITS—FAVORITE HAUNTS—FOOD—VIOLENCE
WHEN PROVOKED—MATERNAL AFFECTION—MODES OF HUNTING—PITFALLS AND DOWNFALLS—
HARPOONING—THE HIPPOPOTAMUS IN CAPTIVITY—THE SMALL OR LIBERIAN HIPPOPOTAMUS.

THE family HIPPOPOTAMIDÆ contains only *one* genus, the *Hippopotamus* or “River-horse,” as we call it by a literal translation of the Greek name of this monstrous animal which haunts the rivers of tropical Africa. The ancient Egyptians more appropriately named it the “River-swine,” and it seems to have been in old times common in the Nile River; delineations of it occur in the ancient wall-paintings of the Old Kingdom of Memphis. To hunt the River-horse seems to have been one of the favorite sports of the Egyptian nobles, who are depicted in the act of harpooning it, or dragging it ashore by means of iron barbs attached to ropes. The Bible describes it under the name of Behemoth: “He eateth grass like an ox, his bones are as strong pieces of iron, he lieth under the shady trees, in the covert of the reeds and fens, he drinketh up a river.” The Greek and Roman writers make repeated mention of it, and give pretty accurate descriptions of it. At present, however, the Hippopotamus has receded as civilization has advanced, and is only found high up the course of the Nile. In the year 1600 two River-horses were captured at the Damietta mouth of the Nile, but none are now to be seen in Egypt, nor even in Nubia, where, at the beginning of this century, Ruppell saw them in numbers. In the Soudan, however, and in all the larger rivers and lakes of Africa, they still abound. Wherever men have firearms the river-horse has vanished; where men have only lances it holds its ground. It is not till we are in the interior of the continent that we see the beasts represented in the hieroglyphic paintings; there, together with the pavian and the crocodile, the elephant and the rhinoceros, we meet the Hippopotamus.

GENUS HIPPOPOTAMUS.

The HIPPOPOTAMUS, *Hippopotamus amphibius* (Plate XXXVI), is, after the elephant and the rhinoceros, the largest of terrestrial mammalia; its absolute height is about five feet, as its legs are extremely short, but the actual bulk of its body is very great indeed. The head is nearly square and very bulky; the small ears and the oblique eyes, as well as the immense nostrils, are the highest points of a plane formed by the face and brow; the muzzle is large and swelling; the upper-lip, descending in front and at the sides, partly hides the under-lip; the nostrils are surrounded by a muscular apparatus which closes them under water; the upper part of the head is devoid of hair, and is pinkish in color. The rest of the huge body, which is equally hairless, is of a brown color, curiously marked with lines like the cracks in old varnish, and dappled with some very black spots which can only be seen in certain lights and on close examination. The tail is very short and has a few bristle-like hairs. Each foot has four toes, each enclosed in its hoof. The mouth is enormously large, extending nearly from eye to eye, and is armed with teeth which differ from those of the SUIDÆ, less by their number than by their shape; the incisors of the lower jaw lie almost horizontally with their points turned forward, while those of the upper-jaw are placed vertically; the canines are large and curved, forming almost a semicircle, and have their outer surface deeply channeled. The teeth are very solid and close-grained, and are extremely white in color; a large tooth will weigh five to eight pounds. With their teeth the Hippopotamus can cut grass as neatly as if mown with a scythe, and can sever a pretty thick stem of the bushes by the river.

The Hippopotamus is, as its name implies, most aquatic in its habits. It generally prefers fresh water, but it is not at all averse to the sea, and will sometimes prefer salt water to fresh. It is an admirable swimmer and diver, and is able to remain below the surface for a very considerable length of time. In common with the elephant, it possesses the power of sinking at will, which is the more extraordinary when its size is considered. It usually prefers the stillest reaches of the river, where it finds an abundance of aquatic plants. Only when this supply of food is scanty does it quit the stream. Possessed of an enormous appetite, having a stomach that is capable of containing five or six bushels of nutriment, and furnished with such powerful instruments, the Hippopotamus is a





HIPPOTAMUS

PLATE XXXVI UNGULATA



terrible nuisance to the owners of cultivated lands that happen to be near the river in which the animal has taken up his abode. During the day it is comfortably asleep in its chosen hiding-place, but as soon as the shades of night deepen it issues from its den, and treading its way into the cultivated lands makes sad devastation among the growing crops. Were the mischief to be confined to the amount which is eaten by the voracious brute, it would still be bad enough, but the worst of the matter is that the Hippopotamus damages more than it eats by the clumsy manner of its progress. The body is so large and heavy, and the legs are so short, that the animal is forced to make a double track as he walks, and in the grass-grown plain can be readily traced by the peculiar character of the track. It may therefore be easily imagined that when a number of these hungry, awkward, waddling, splay-footed beasts come blundering among the standing crops, trampling and devouring indiscriminately, they will do no slight damage before they think fit to retire.

The Hippopotamus is a gregarious animal, collecting in herds of twenty or thirty wherever food is plentiful, and never straying far from its feeding-place. In favorable spots where woods clothe the banks of the stream and aquatic vegetation is abundant in the water, the monsters of the river are soon discovered. At intervals of three or four minutes the traveler observes a vapory column rising about a yard above the surface, and hears a peculiar snort or bellowing, and beholds the shapeless head of the creature appear, a reddish or reddish-brown mass with two points, the ears, and four protuberances, the eyes and nostrils; often indeed only the latter are visible. The rest of the huge carcass is seldom exhibited. The approach of even a large boat does not disturb or alarm the animal, which stares with stupid astonishment at the intruders without interrupting its ascent and descent in the waters. In the narrower and shallower streams where the dry season leaves much of the channel dry, the hippopotami form deep troughs in the bed of the river, in which they can dive and hide themselves. Sometimes several of these troughs, each of which can contain four or five, are united by channels. They never leave the water except in utterly unfrequented spots, where they come to land and lie, half asleep, in the reed-beds, as happy and complacent as so many swine wallowing in the mud. Small birds, such as the *Hya Egyptiacus*, walk over the huge bodies and pick off sundry parasites, and, according to the Arabs, act as guardians to the slumbering monsters. It is a fact that at the slightest cry of these birds they retire

into the water, but, except where they have learned to dread man, they are careless and sluggish in their movements. The day thus passes in alternate dozing and waking, but at night the herd becomes livelier. The grunting of the males rises to a roar, and all the troop begin to sport in the stream; they regularly follow boats on a night voyage, and cause with their snorting and grunting, their bellowing and splashing, an endless tumult. They swim with remarkable activity, rising, sinking, wheeling or advancing with consummate skill, and when progressing peacefully, scarcely disturb the water. When angered, however, they spring forward with a violence that sets the water in a turmoil, and sometimes destroy or upset boats. When disturbed while they are sleeping or basking on the bank, they show that they are more active than they seem; they will plunge from a height of six yards and send behind them a wake like a small steamboat.

When feeding, on landing, the Hippopotamus is not only destructive to the fields of the husbandman, but dangerous to man and beast. With blind fury it attacks everything which comes in its way, and those who describe it as a peaceable, good-natured animal, can never have seen it in anger. Even when in the water the monster is not to be trusted implicitly. Lieutenant Vidal, in sailing up the Tembi River, in south-western Africa, suddenly felt his boat raised up and the steersman flung overboard. The next instant a giant hippopotamus appeared, and rushed with open jaws at the boat; it seized it with its terrible teeth and tore out seven of the planks. The boat had probably grazed the monster's back with its keel. On land the River-horse is still more dangerous. Here they cannot be relied on to take flight; they rush on like a savage boar and seize the object of their fury, tearing it with their teeth and trampling it down with their feet. A single bite has been known to kill a man. A female with her young one is most to be dreaded, for every object seems to provoke her fury. She never leaves the little one for a moment, and watches every movement; at times she plays awkwardly with her calf; at times she carries it on her back. The young sit astride of her short neck, and the mother seems to rise to the surface more often than she herself requires in order to let her offspring breathe. It is not advisable to approach a female when thus engaged. One whose calf had been speared on the previous day made at the boat in which Dr. Livingstone was sitting, and drove her head against it with such force that she lifted the bows completely out of the water.

There are various modes of hunting this mischievous but valuable animal, each of which is in vogue in its own particular region. Pitfalls are universal throughout the whole hippopotamus country, and lure many an animal to its destruction without needing any care or superintendence on the part of the men who set the snare. They are simply pits dug across the path of the Hippopotamus, and provided with a sharp stake in the centre. There is also the "down-fall," a trap which consists of a log of wood, weighted heavily at one end, to which extremity is loosely fixed a spear-head well treated with poison. This terrible log is suspended over some hippopotamus path, and is kept in its place by a slight cord which crosses the path and is connected with a catch or trigger. As soon as the animal presses the cord the catch is liberated, and down comes the armed log, striking the poisoned spear deep into the poor beast's back, and speedily killing it by the poison, if not from the immediate effects of the wound.

The white hunter of course employs his rifle and finds that the huge animal affords no easy mark, as, unless it is hit in a mortal spot, it dives below the surface and makes good its escape. Mortal spots, moreover, are not easy to find, or when found, to hit; for the animal soon gets cunning after it has been alarmed, and remains deeply immersed in the water as long as it is able, and when it at last comes to the surface to breathe, it only just pushes its nostrils above the surface, takes in the required amount of air, and sinks back again to the river bed. Moreover, it will often be so extremely wary that it will not protrude even its mouth in the open water, and looks out for some reeds or floating substances which may cover its movements while breathing. As a general rule it is found that the most deadly wound that can be given to a hippopotamus is on the nose, for the animal is then unable to remain below the surface, and consequently presents an easy mark to the hunter. A heavy ball just below the shoulder always gives a mortal wound, and in default of such a mark being presented, the eye or the ear is a good place to aim at.

The most exciting manner of hunting the Hippopotamus is by fairly chasing and harpooning it, as if it were a whale or a walrus. This mode of sport is described very vividly by Mr. Andersson.

The harpoon is a very ingenious instrument, being composed of two portions, a shaft measuring three or four inches in thickness and ten or twelve feet in length, and a barbed iron point, which fits loosely into a socket in the head of the shaft, and is connected with it by means of a

rope composed of a number of separate strands. This peculiar rope is employed to prevent the animal from severing it, which he would soon manage were it to be composed of a single strand. To the other end of the shaft a strong line is fastened, and to the other end of the line a float or buoy is attached. As this composite harpoon is very weighty it is not thrown at the animal, but is urged by the force of the harpooner's arm. The manner of employing it shall be told in Mr. Andersson's own words: "As soon as the position of the hippopotami is ascertained, one or more of the most skillful and intrepid of the hunters stand prepared with the harpoons, while the rest make ready to launch the canoes should the attack prove successful. The bustle and noise caused by these preparations gradually subside. Conversation is carried on in a whisper, and every one is on the *qui-vive*. The snorting and plunging become every moment more distinct; but a bend in the stream still hides the animals from view. The angle being passed, several dark objects are seen floating listlessly on the water, looking more like the crests of sunken rocks than living creatures. Ever and anon one or other of the shapeless masses is submerged, but soon again makes its appearance on the surface. On, on glides the raft with its sable crew, who are now worked up to the highest state of excitement. At last the raft is in the midst of the herd, who appear quite unconscious of danger. Presently one of the animals is in immediate contact with the raft. Now is the critical moment. The foremost harpooner raises himself to his full height, to give the greater force to the blow, and the next instant the fatal iron descends with unerring accuracy in the body of the hippopotamus. The wounded animal plunges violently, and dives to the bottom; but all his efforts to escape are unavailing. The line or the shaft of the harpoon may break; but the cruel barb once imbedded in the flesh, the weapon (owing to the toughness and thickness of the beast's hide) cannot be withdrawn. As soon as the hippopotamus is struck one or more of the men launch a canoe from off the raft, and hasten to the shore with the harpoon-line, and take a round-turn with it about a tree or bunch of reeds, so that the animal may either be 'brought-up' at once, or, should there be too great a strain on the line, 'played' (to liken small things to great) in the same manner as the salmon by the fishermen. But if time should not admit of the line being passed round a tree or the like, both line and 'buoy' are thrown into the water, and the animal goes wherever he chooses. The rest of the canoes are now all launched from off the

raft, and chase is given to the poor brute, who, so soon as he comes to the surface to breathe, is saluted with a shower of light javelins. Again he descends, his track deeply crimsoned with gore. Presently—and perhaps at some little distance—he once more appears on the surface, when, as before, missiles of all kinds are hurled at his devoted head. When thus beset the infuriated beast not unfrequently turns upon his assailants, and either with his formidable tusks, or with a blow from his enormous head, staves in or capsizes the canoes. At times, indeed, not satisfied with wreaking his vengeance on the craft, he will attack one or other of the crew, and with a single grasp of his horrid jaws either terribly mutilates the poor fellow, or it may be, cuts his body fairly in two. The chase often lasts a considerable time. So long as the line and the harpoon hold the animal cannot escape, because the ‘buoy’ always marks his whereabouts. At length, from loss of blood or exhaustion, Behemoth succumbs to his pursuers.”

When an animal is killed the rejoicings are great, for not only is the ivory of great commercial value, but the flesh is very good eating, and the hide is useful for the manufacture of whips and other instruments. The fat of the hippopotamus, called by the Cape colonists “zee-koe speck,” or sea-cow bacon, is held in very high estimation, as is the tongue and the jelly which is extracted from the feet. The hide is so thick that it must be dragged from the creature’s body in slips, like so many planks, and is an inch and a half in thickness on the back, and three-quarters of an inch on the other portions of the body.

The Hippopotamus may be seen in many zoological gardens. These specimens have all been captured when young after the death of their mother. The Roman emperors had some specimens, but from the time of Heliogabalus down to the year 1850 only one hippopotamus reached Europe. In the year 1849 the British consul in Egypt expressed to Abbas Pasha a desire to have a hippopotamus. Orders were sent to the governor of Nubia to forward one to Cairo. He sent some troops up the river to procure the desired animal. The troops did not fall in with their prize till they had reached a distance of fifteen hundred miles above Cairo. A large female hippopotamus being wounded, was in full flight up the river; but presently a ball or two reached a mortal part, and then the maternal instinct made the animal pause. She fled no more, but turned aside, and made toward a heap of brushwood and water-bushes that grew on the banks of the river, in order (as the event showed) to

die beside her young one. She was unable to proceed so far, and sank dying beneath the water. The action, however, had been so evidently caused by some strong impulse and attraction in that direction, that the party instantly proceeded to the clump of water-bushes. Nothing moved—not a green flag stirred; not a sprig trembled; but directly they entered, out burst a burly young hippopotamus-calf, and plunged head foremost down the river-banks. He had all but escaped, when amidst the excitement and confusion of the picked men, one of them who had “more character” than the rest, made a blow at the slippery prize with his boat-hook, and literally brought him up by burying the hook in his fat, black flank. Two other hunters—next to him in presence of mind and energy—threw their arms round the great barrel-bellied infant, and hoisted him into the boat, which nearly capsized with the weight and struggle. The hunting-division of the army, headed by the commander-in-chief, arrived at Cairo with their prize on the 14th of November, 1849. The journey down the Nile, from the place where he was captured, viz., the White Nile, had occupied between five and six months. This, therefore, with a few additional days, may be regarded as the age of this hippopotamus on reaching Cairo. The color of his skin at that time was for the most part of a dull reddish tone.

When these animals have been allowed to lead their natural mode of life they have bred regularly. In captivity the mother displays the same watchfulness, the same resolution to defend her offspring, which is so conspicuous in their wild state. Her jealousy is so great that she renders the rearing of the young one a very perilous task, and is apt to injure it by her awkward attempts to aid it. This difficulty has been successfully overcome in many instances, and a young Hippopotamus is frequently the attraction of traveling menageries.

The SMALL HIPPOPOTAMUS, *Hippopotamus liberiensis*, is found in certain portions of West Africa. Its most distinguishing feature is the presence of only two incisor teeth in the lower jaw. It is much smaller than the River-horse of Egypt or South Africa.



CHAPTER XII.

THE PECCARIES.

THE SWINE FAMILY—GENERAL CHARACTERISTICS—THE PECCARIES—THE COLLARED PECCARY—ITS COURAGE AND FIERCENESS—THE WHITE-LIPPED PECCARY—ITS HABITS—METHODS OF HUNTING THE PECCARY—FLESH OF THE PECCARY.

THE family SUIDÆ comprises *five* genera, the best known of which is that embracing our common domestic Hog. Gray, after a careful study of all the specimens in the British Museum, has thought himself justified in forming the family into *three* sub-families,—SUINA or Swine, DICOTYLINA or Peccaries, and the PHACOCHÆRINA or Wart-hogs; but these groups approach so closely to each other that they cannot be regarded as really forming sub-families.

The members of this family, when compared with the heavy, unwieldy creatures we have just described, may be regarded as gracefully formed. The head is conical with a truncated snout, which, although possessed of considerable mobility, is used only for the purpose of rooting in the ground, and distinguishing by its tactile powers the substances which are suitable for food. They have on all their feet two large middle toes, armed with strong hoofs, while the lateral toes are too short to touch the ground. The canine teeth bend upward so as to form projecting tusks, which in some species attain an extraordinary development.

The SUIDÆ are found in all parts of the globe except New Holland. Large woodland swamps, where the bush is thick and the grass high, are their favorite haunts; they love the neighborhood of water, and are fond of rolling in the mud. Most of them are gregarious animals, nocturnal in their habits, and much more active than they seem; their walk is pretty quick, their gallop a succession of leaps, each accompanied by a grunt. They all are excellent swimmers, and will cross the sea from one island to another. Their senses of smell and hearing are excellent, but the eye is small and the sight is far from sharp. As a rule they fly from

danger, but when hard pressed fight gallantly, using their tusks with great force and skill. The males defend the females, and the females their offspring, with great devotion. They are all omnivorous in the full sense of the word; they eat whatever is eatable; many, however, are from circumstances restricted to a vegetable diet.

In general, all the species are very prolific, and the young ones are remarkably pretty and active creatures, without any of that appearance of imperfection which usually characterizes new-born animals. They grow quickly and attain maturity soon, and hence they are always found in large numbers.

I. GENUS DICOTYLES.

The *two* species of this genus are peculiar to South America, extending from Mexico to Paraguay. They spread also northward into Texas, and as far as the Red River of Arkansas. The tusks in this genus are not turned outward, and the exterior lateral toe of the hind-foot is wanting. The generic name *Dicotyles* means "double cupped," and is given to the animal on account of a peculiar open gland on the back.

THE COLLARED PECCARY.

The COLLARED PECCARY or TAJACA, *Dicotyles torquatus* (Plate XXXVII), is a small pig about three feet long; the head is short, the muzzle slender, and the tail short. The thick bristles which cover its body are dark-brown with yellow and black rings, and are somewhat longer on the back of the neck. The prevailing color is dark-brown, but on the shoulders and round the neck is a broad band of a yellowish-white color, from which this species has obtained its name. The open gland on the back always discharges a fluid of a most fetid odor, which however seems to be grateful to the possessors of it, as they are often seen mutually rubbing each other's backs with their snouts.

Although the Peccary is a very harmless animal to outward view, it is a very dangerous enemy, in spite of its light weight (fifty to sixty pounds) and its short tusks; for these tusks are shaped like a lancet, double-edged and acutely pointed, and inflict terrible wounds. No animal can withstand the united attacks of the Peccary; fear is a feeling to which it is an utter stranger, and even the jaguar is forced to abandon the contest and to shrink from encountering the circular mass of Pec-

caries. Schomburgk, whose accounts are perfectly trustworthy, writes: "As we were passing through a woody oasis I heard a peculiar noise like the galloping of horses. With the cry '*Poinka!*' the Indians cocked their guns and drew their bows, and soon an innumerable herd of peccaries came in sight. When they saw us they stopped in their charge for an instant, then grunting loudly rushed past us. I was so surprised by the sudden appearance of the creatures that I forgot to shoot at first, and raised my gun to make up for lost time, but my arm was seized by an Indian. When the main herd was past and some stragglers came in sight, the Indians began to use bow and gun. They affirmed that it was most dangerous to fire into the middle of a herd, for the peccaries dispersed in all directions, and tore with their tusks every living thing that came in their way; while if the stragglers only are attacked, the main body pursues its course." In Webber's *Romance of Natural History* there is a very amusing account, too long to be quoted, of the consternation caused during a bear-hunt by a charge of peccaries which scattered men, dogs, and bear in a common confusion. Another traveler writes as follows: "While pushing my way through a wood my dog started a peccary; suddenly eight or ten burst through the underwood, and before I could realize the scene had finished my unlucky companion with their sharp teeth. I suddenly found myself surrounded; I killed several, but it was no use; my ammunition was soon expended, and it was only by clubbing my gun that I fought my way to a tree, and with more than one wound from their incisors, reached a secure position. Here I remained besieged till they dispersed."

THE WHITE-LIPPED PECCARY.

The TAGNICATE, or WHITE-LIPPED PECCARY, *Dicotyles labiatus*, is larger than the preceding animal, assembles in larger herds, is fiercer in its disposition, and works more woe to the farmer.

The White-lipped Peccary derives its name from a band of white hairs that crosses the upper jaw, and covers nearly the whole of the lower. The color of the adult animal is black-brown, flecked with a gray grizzle, but when young it is striped. A slight mane runs along its neck, and its ears are fringed with long and stiff hairs. It is a most mischievous animal, as it makes long marches over the country, ravaging the crops in its progress, and always choosing, with a perversely excel-

lent taste, the best maize and grass. Its cry is a sharp, shrill grunt, and when angry, it clashes its teeth smartly together, producing a sound which is recognizable at some distance, and is very useful to the hunters, as it serves to give timely notice of the animal's approach.

In all the woody lowlands of South America, and even as high as three thousand feet above the sea, both species of Peccary are abundant. The Tagnicates roam the forests in herds of hundreds, under the guidance of the strongest male, changing their abode every day, and always on the move. In their journeys, neither the open country, which otherwise they seldom visit, nor the rivers delay them. If they come to open ground, they cross it at full speed; if they encounter a stream, they plunge in without hesitation. The herd advances in close order, the males leading, each female followed by its young. Their approach is heard from some distance, not so much by reason of their grunting as by the crashing of the brush through which they are dashing. Their migrations are performed in search of food, for they live chiefly on fruits and roots, varying this sometimes by devouring serpents, lizards, and the larvæ of insects. In their movements they resemble the common swine, but have neither its voracity nor its filthiness; they only eat what they need, and only wallow during the extreme heats.

The usual resting-place of the Peccary is in the hollow of a fallen tree, or in some burrow that has been dug by an armadillo and forsaken by the original inhabitant. The hollow tree, however, is the favorite resort, and into one of these curious habitations a party of Peccaries will retreat, each backing into the aperture as far as he can penetrate the trunk, until the entire hollow is filled with the odd little creatures. The one who last enters becomes the sentinel, and keeps a sharp watch on the neighborhood. The native hunters take advantage of this curious habit to immolate great numbers of these animals. There are two methods of Peccary killing—by the gun, and by the sword and pitchfork.

In the former method the hunter takes up his temporary abode in some concealed spot that commands the entrance of the tree or hole in which the Peccaries are known to sleep. As soon as the sentinel has assumed its post, the hunter takes a careful aim at the forehead, and kills it with a single ball. Its place is at once taken by its successor, which, in its turn is shot, and so on till the whole family is exterminated. Schomburgk describes the chase of the Peccary, and states that when dogs are employed they are trained to cut off stragglers and keep them at bay

till the hunter comes up. If the sportsman has no dog, he mounts a tree and imitates the bay of a hound. The Peccaries, with every bristle set on end, surround the tree from which the voice of their hereditary foe is heard, and gnash their teeth. If the hunter is armed with bow and arrows he can kill several of the animals, but the report of a gun scatters them. At times this method has an unfortuate termination. An Indian who had thus attracted a herd to a tree, was unlucky enough to find the branch upon which he was seated give way beneath him; he caught hold of another as he fell, but his feet were so near the ground that the Peccaries began to bite them. He managed to struggle out of the way, when the herd attacked the musket which he had dropped, and tore the stock to pieces. The Indians are always glad to drive the Tagnicates into a river, for although they swim well, they are comparatively helpless. The Indians leap into the stream and hit them on the snout with a stick; a few blows dispatches a Peccary. The Tagnicates are hunted for their flesh as well as on account of the damage they do. In the plantations a large pit is often dug, into which dogs and men drive the intruders, which are then killed by lance-thrusts.

The young Peccary can be easily tamed, and becomes as tame as our pigs; it is soon attached to its new home and new companions, especially to the men about it, whose voices it knows and whom it loves to accompany in their walks. It will announce the approach of strangers by its grunts, and attacks fiercely all strange dogs. The Tagnicate especially shows itself susceptible of domestication.

The flesh of both the species of Peccary is eaten by the Indians; it is said to have a pleasant taste, not at all like pork. If the animal has been hunted, the dorsal gland must be at once cut out, otherwise the whole flesh contracts its disgusting odor.



CHAPTER XIII.

THE TRUE SWINE.

THE GENUS SUS—RELIGIOUS PROHIBITIONS—THE BOAR OF VALHALLA—THE BOAR'S HEAD—THE WILD BOAR OF EUROPE—HUNTING THE WILD BOAR—THE WILD HOG OF INDIA—THE DOMESTIC HOG—ANECDOTES OF THE HOG—BREEDS OF HOGS—THE BERKSHIRE—TRICHINIASIS.

THE true swine are divided into *three* genera, one of which, *Babirusa*, is confined to the islands of Celebes and Boura; another, *Potamochoærus*, is wholly African; while the third, *Sus*, is found throughout Asia and Europe. It is a remarkable fact that these hardy, omnivorous animals should have entirely died out in North America, except a few peccaries in the southern part, to which they are comparatively recent immigrants.

GENUS SUS.

This genus comprises *fourteen* species, and its generic characteristics are three incisors, one canine tooth, triangular in shape and curved upwards, with seven molars in each jaw, forming a total of forty-four teeth; a thin curling tail, and in the female eight to ten teats.

All the species of swine are unclean to the Jew and the Moham-
medan, and it is almost impossible for us to form an idea of the horror and loathing with which the ancient Hebrews regarded the hog. We are told in the Book of Maccabees that the Jews allowed the temple to be dedicated to Olympian Jupiter, they submitted to the abolition of the Sabbath, and they consented to walk in the procession of the feast of Bacchus, but when swine's flesh was put before them, they refused to touch it. The reason for the Mosaic prohibition is not easy to discover. It is by no means certain that the flesh of the hog is harmful in hot climates, and in its wild state the animal is very cleanly. In the West, on the other hand, the hog has always furnished a staple article of food; the Roman and Greek physicians considered pork the most nutritious meat,

and the ancient trainers gave it exclusively to the athletes and gladiators of the arena. Our Teutonic ancestors believed that the flesh of the boar Sœhrimnir was the daily food of the gods and heroes who dwelt in Valhalla. King Ragnar Lodbrog, when dying, sang "I am filled with joy when I think of the feast preparing for me in Odin's palace." Reminiscences of this mythical repast gave rise to the introduction of the boar's head at solemn festivals. At the Christmas dinner at New College, Oxford, a boar's head is brought to table in a long procession, while the choristers of the chapel march before it singing a Latin hymn. We need not mention the enormous proportions to which the American trade in pork has attained. It is not too much to say that pork is the chief article of diet in the world, and supplies the bone and muscle of the Chinese porter, as well as of the Irish peasant, or our own farmers.

THE WILD BOAR.

The WILD BOAR, *Sus aper* (Plate XXXVII), is still common in the forests of the continent of Europe. Its whole body is covered with blackish-brown bristles which form a sort of mane on the neck when the animal is excited. The lower canine teeth curve outward and upward, and give a severe wound; the toes are close together, and in walking the hind-foot is brought forward as far as the heel, and a little outside of the front-foot. Till the age of six months old, the young of the Wild Boar is, like the young peccary, striped in alternate bands of light and brown fallow color. The old males live alone, but the females continue with their young ones for at least two years. In deserted forests troops of females are found, which live on good terms, and combine for mutual defence, forming a circle when attacked.

In summer, Wild Boars are principally to be met on the outskirts of forests, in the approaches to fields or vineyards, and near swamps, where they retire during the heat of the day to refresh themselves by wallowing in the muddy water. In autumn, they permanently reside in the forests, in the heart of which they establish their winter retreat.

Dark, damp localities are generally chosen for their lairs: here they lie hid during the whole day, and only leave in the evening or at night to seek their food. They dig up the ground in search of worms and the larvæ or grubs of cockchafers; and they also devour reptiles, birds' eggs, and all the young animals they can surprise. Field-mice, moles, and

even young rabbits are likewise favorite food. Acorns, chestnuts, and beech-nuts constitute a large portion of their vegetable diet. They often lay waste fields of potatoes, maize, and other grain. A whole crop is sometimes destroyed by these animals in a single night. When they root up the soil in search of their food, they invariably proceed in a straight line; and as the furrows which they make are as broad as their heads, experienced sportsmen can thus tell the size of the animal whose track they are following.

In Germany and France the chase of the Wild Boar occupies a prominent position in the list of field sports, but it is occasionally dangerous sport. This savage animal is not alarmed by the pursuit and the barking of dogs; but the sound of horns, the cries of the sportsmen, and the report of guns terrify it. It runs with a rapidity and a lightness which surprise us when we consider its heavy, thickset figure. Its route is invariably straight, and if any imprudent hunter does not get out of its way, he is certain to be upset; but it will not turn from its course to attack any one. If it is wounded, it changes its tactics, and rushes on all within reach. When fatigue or loss of blood prevents its flight, it places its back against a bush or tree, and makes a most vigorous resistance. Those hounds which approach too closely are frequently ripped up. But there is always found, in a well-trained pack, some intelligent and knowing member, which keeps baying the game at a safe distance, and confuses the boar with its ferocious barking until a favorable moment occurs, when, with a bound, it seizes the game at its weak point—the ear. The furious animal is then powerless, and is easily slain by the hunter. It is considered, however, more sportsmanlike to await the charge of the boar with the boar-spear in hand. The chase is then a most exciting one, for the boar is a terrible antagonist, his charge is made with lightning swiftness, and, together with his furious eyes and lips dripping with foam, he is a sufficiently formidable foe to disconcert any one who is not possessed of good nerves and a steady hand. The animal has an awkward habit of swerving suddenly from his course, snapping at the spear-head and breaking it from the shaft. He also, when the hunter is on horseback, will charge at the horse instead of the rider, and rising on his hind legs, in order to give the blow greater force, will lay open the horse's flank and instantly disable it.

The flesh of the Wild Boar is esteemed a great delicacy; it is more tender and savory, and less fat than that of the domestic animal.

The Wild Boar, such as we have described it, is found in France, Germany, Belgium, Poland, Austria, the Danubian Principalities, Southern Russia, and Spain. In Asia it extends from the Caucasus to the Amoor, and is probably identical with the Wild Boar of Syria and Asia Minor, which is called scientifically *Sus libycus*. Beyond the limits just mentioned occur other species which still require investigation. Such are the Crested Hog, *Sus cristatus* of India, the *Sus andamanensis*, the *Sus barbatus* of Borneo, *Sus vittatus* of Java, *Sus leucomystax* of Japan, and *Sus sennacensis* of North-eastern Africa, and others. Of these we need only mention the first.

The WILD HOG OF INDIA, *Sus cristatus*, is superior in size, strength, and swiftness to the European species.

This animal is a sad plague to the agricultural population of India, as it makes terrible havoc among the crops, and is especially fond of frequenting the sugar-canes, eating them and chopping them into short lengths, which it forms into hut-like receptacles for its young. The boar is a most fierce and savage animal, and if driven from the cane-brake, will rush at any man or animal that may be within his reach, and cut them terribly with his sharp tusks. Even the sow can do considerable damage with her teeth, but instead of ripping like her mate, she bites sharply and rapidly. When the animal is fairly roused, and takes to his heels, he puts the mettle of the swiftest and stanchest horse fairly to the test, and even on ground where the horse has all the advantage, he will frequently distance his pursuers, and regain his domicile in the cane-brake. Among the plantations are numbers of old disused wells, the sides of which have fallen in and were never properly filled up. In these wells the wild hog loves to lie, for the mouth of the well is so overgrown with thick verdure that the aperture is scarcely visible even to a person that stands on its brink, while from those who are not aware of its precise locality it is entirely hidden.

The spear is generally employed in boar-hunting, or "pig-sticking," as the sport is familiarly termed, and is either thrown from the horse's back, or is held like a lance and directed so as to receive the animal's charge. When driven to bay, the Indian boar is as savage an animal as can be imagined, as with flashing eyes and foaming mouth he dashes first at one and then another of the horsemen, sometimes fairly driving them from the spot, and remaining master of the field. The unevenness of the ground over which the chase is pursued, adds to the difficulty of the sport.

THE DOMESTIC HOG.

The Domestic Hog is a wild boar which has, by long servitude, been modified physically and morally. Captivity, however, has by no means deprived it of its courage. When Baron de Rutzen settled in England, he stocked his park with some wild boars from Germany, which became the terror of the neighborhood. One day, however, a most domestic boar belonging to a farmer escaped from his sty, immediately gave battle, and slew and nearly devoured the champion of the intruders.

The Hog is not more voracious than the cow, the dog, or the sheep, for each of these animals will eat to repletion if furnished with a large amount of food, and will become inordinately fat in consequence of such high feeding. In its wild state it is never found overloaded with fat, and, as has already been seen, is so active an animal that it can surpass a horse in speed, and is so little burdened with flesh that it can endure throughout a lengthened chase. Neither is it naturally a dirty creature, for in its native woods it is as clean as any other wild animal. But when it is confined in a narrow sty, without any possibility of leaving its curtailed premises, it has no choice, but is perforce obliged to live in a constant state of filth. We may remark that it can eat poisonous herbs, such as hemlock, and is not injured by poisonous snakes. Common experience proves that it can exterminate the rattlesnake.

Leigh Hunt characterizes a pig as an animal "having a peculiar turn of mind; a fellow that would not move faster than he could help; irritable, retrospective, picking objections, and prone to boggle; a chap with a tendency to take every path but the proper one, and with a side-long tact for the alleys." Man takes advantage of this peculiar obstinacy, and induces the pig to go one way by pulling his tail in an opposite direction. The moral and mental philosophy of a pig's existence is thus ingeniously set forth by Sir Francis Head: "With pigs, as with mankind, idleness is the root of all evil. The poor animal, finding that he has absolutely nothing to do, having no enjoyment, nothing to look forward to but the pail which feeds him, must eagerly (or, as we accuse him, greedily) greet its arrival. Having no business or diversion—nothing to occupy his hours—the whole powers of his system are directed to the digestion of a superabundance of food. To encourage this, nature assists him with sleep, which, lulling his better faculties,

leads his stomach to become the ruling power of his system—a tyrant that can bear no one's presence but his own. The poor pig thus treated, gorges himself, sleeps, eats again, sleeps, awakes in a fright, screams, struggles against the blue apron, screams fainter and fainter, turns up the whites of his little eyes, and dies!"

But though the progress of modern civilization may not have advanced far into pigdom, yet do we occasionally hear of shrewd knacks and habits acquired by these animals. The jungle-hog of India, we are told, makes his bed of meadow-grass; this he cuts down with his teeth, as if it were done with a scythe, and piles it up into oblong heaps, as regularly as thatch on houses. When he has thus collected a large heap, he creeps under it to rest; when he leaves it he creeps out at the other end without disturbing it. He remains quite invisible when in his house, but leaves a loop-hole through which to have an eye upon his enemies. In China it is not rare to see harnessed together a woman, a horse, a pig, and an ass. In Minorca an ass and a hog are occasionally yoked together to a plough; and Pennant speaks of a Morayshire farmer who used a cow, a sow, and two horses, to form his team. In Hertfordshire a farmer once went to St. Alban's market in a small cart drawn by four hogs; and a hog has been known to submit to the saddle and bridle. In some parts of Italy and France pigs are employed to hunt for truffles. A string is tied to the animal's leg, and he is led into the fields where truffles grow; wherever he stops, smells the soil, and roots up the ground, there truffles will be found. A good pig of this kind is worth about forty dollars.

When King Louis XI of France was sick, all means were tried in vain to amuse him, till one of his courtiers discovered a peasant who was the happy possessor of some young pigs that danced to the bag-pipe. The creatures were dressed up with a coat and hat, scarf and sword. They could jump about to the music pretty well, but could only with great difficulty stand on their hind legs. Other dancing pigs have been exhibited in modern times, and the "learned pig" could play euchre, exhibiting a capacity hardly to be expected from so maligned a creature. Among other calumnies, there is prevalent an idea that, whenever the Hog takes to the water, he cuts his own throat with the sharp hoofs of his fore-feet. This, however, is by no means the case, for the animal is an admirable swimmer, and will often take to the water intuitively. In one of the Moray Islands, three domestic pigs belonging to the same litter

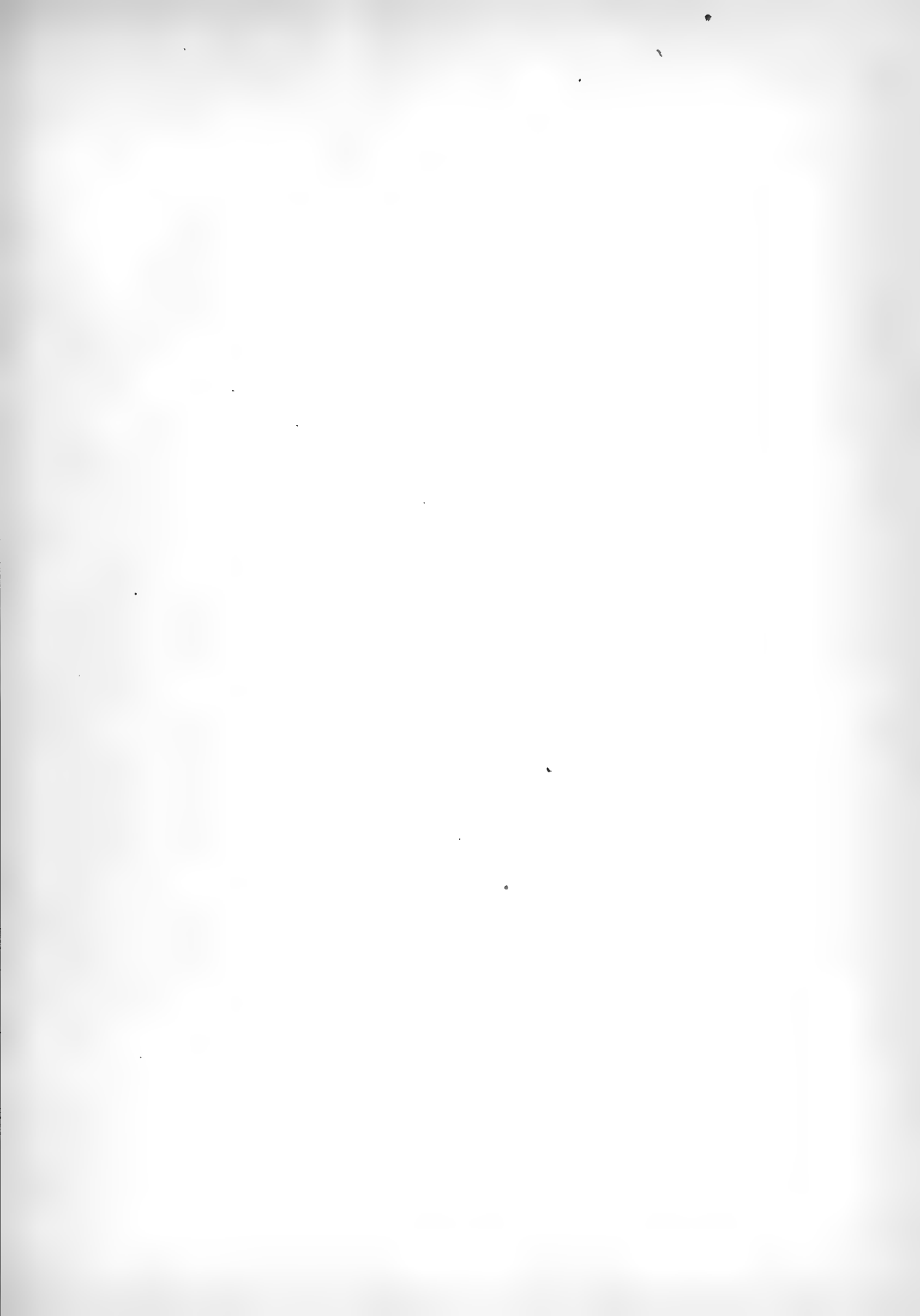
swam a distance of five miles ; and it is said that if they had belonged to a wild family, they would have swum to a much greater distance.

The Domestic Pig may be said to be a manufactured production, a veritable monster when compared with the primitive pig. The Hog is either kept in a sty continually, or allowed, as in districts where acorns, chestnuts, and the like abound, to run about during some portion of the year. When the animals are confined, the styes ought to be kept clean and warm. The fecundity of this animal is remarkable. A sow usually has two litters a year, each of from twelve to fifteen ; a Leicestershire sow is reported to have given birth to three hundred and fifty-five young ones in twenty litters, and the famous military engineer Vauban, when discussing the provisioning of towns, calculated that one sow would produce in ten generations 6,434,838 pigs. Yet the sow is often a very bad mother, and constant watching is required to prevent her eating her young as soon as they are born.

The BERKSHIRE HOG (Plate XXXVII) is one of the modern favorite varieties. It is hardy, rapid of growth, and furnishes excellent pork, and firm bacon. The Windsor and Leicester or Harrison-breed become in ten or twelve months so fat, that the neck, face, and eyes almost disappear.

Every part of the Hog, down to the bristles, is turned to some useful purpose. The head-quarters of the pork-trade are Cincinnati and Chicago, from which cities an enormous export goes on to all parts of Europe, in addition to the supplies sent to our eastern cities.

In a work intended for the popular eye, we may be allowed to diverge from the natural history of the Hog and say a few words on a disease respecting which alarm occasionally arises. This disease is caused by the consumption of uncooked pork, and is called TRICHINIASIS. The trichine is a minute worm, with difficulty visible to the naked eye, for it has scarcely as large a diameter as a very fine hair, and in length is rarely over two millimetres. It is found in the intestines, where it lives and produces its young, which are at first in the grub or worm state. When pork containing the trichine grubs is eaten by man, these pass into his intestines. But this abode not suiting them, they cut their way out, and get into the veins, when they are carried along with the blood in the circulating torrent, and finally lodge in the muscles. This is the part of the human form which is preferred by the trichine. It gnaws, separates, and dissects the muscular and tendinous fibres, producing intolerable pain. This disease has made the greatest ravages in the North of Ger-







BABYROUSSA
WART HOG

WILD BOAR
COLLARED PECCARY
DOMESTIC HOG

PLATE XXXVII. UNGULATA.



many, where raw ham is much eaten. France, however, seems to have till lately enjoyed complete immunity from it.

Although this epidemic only rarely appears, we will state the best means for preventing its development. They are as follows:

1st. Watch carefully over the food of the pigs, and never give them animal substances about which there is the least suspicion: 2d. Inspect carefully the pork, if possible, with a microscope: 3d. Cook most thoroughly every piece of pork, bacon, ham, etc., before use.

The experiments which have been made to determine the amount of cooking that is necessary to destroy the trichines give the following results:

1st. The trichines are killed in hams by a protracted salting, or in sausages by subjecting them to strong smoking, continued for twenty-four hours. 2d. They resist ordinary smoking for three days; if prolonged, however, it appears to destroy them. 3d. Cooking pork by boiling is not certain to kill them, *unless performed most thoroughly.*



CHAPTER XIV.

THE RIVER-HOGS, BABYROUSSA, AND WART-HOGS.

THE RIVER HOGS—THE PENCILLED HOG—THE BUSH HOG, OR BOSCH-VARK—EDWARDS' RIVER-HOG—THE BABYROUSSA—ITS PECULIAR TUSKS—THE WART-HOGS—HIDEOUS APPEARANCE—THE AFRICAN WART-HOG, OR VLACKE VARK—THE WART-HOG OF ÆLIAN OR ENGALLO.

WE will conclude our account of the *Suidæ* with *three* genera belonging to Africa and the islands of the Eastern Ocean. They are all very remarkable in appearance, but as yet we have almost no information respecting their modes of life while they enjoy their savage freedom. They are all gregarious, all omnivorous, all fond of low-lying swampy lands for their dwelling-place.

THE RIVER-HOG.

The River-Hogs are the handsomest specimens of the whole hog-family; they have a long face, a moderately long snout, large but narrow and sharp-pointed ears, which are ornamented with a tuft of hair, and a tail with a bushy tip. All the *three* species are African. A marked peculiarity in these creatures is a long protuberance between the eye and nose.

GENUS POTAMOCHÆRUS.

The PENCILLED HOG, *Potamochoærus pictus*, has been known since the beginning of the sixteenth century. It is much smaller than the European boar, but attains a length of four feet, and stands nearly two feet high. The hide is covered with short, soft, thickly-placed, smooth-lying bristles which grow long on the cheeks and under-jaw, forming a short mane on the back of the neck, a bushy brush under the eye, and a pair of whiskers on the cheeks. The color is a reddish-yellow, or a brownish-red shading off into yellow. This beautiful bright color extends over the

back, neck, and sides; but the forehead, cranium, and ears, as well as the legs, are black. The long hairs which we have described on the face and around the eyes and the mane are white, or yellowish-white. The young ones, like all young wild swine, are striped, and are very lively and prettily marked.

Although this hog was known and had been seen in captivity by Markgrave in the sixteenth century, we still know little respecting its wild life on the coast of Guinea and near the Camaroons River. The first living pair which was brought to Europe arrived at the London Zoological Gardens in 1852, and specimens are still rare in collections. They do not, in captivity, display any great divergence in their habits from the common wild boar. They may be described as good-natured, on the whole, not permitting their keeper to take liberties with them, but not displaying the vicious temper of the much smaller peccaries. They required to be well-sheltered from the English climate, and seemed to enjoy rolling in their deep bed of straw in which they half-buried themselves. Like the domestic sow, these hogs ate their offspring, not merely when newly-born, but gradually during the first week.

The BUSH HOG, *Potamochoerus Africanus*, is another species, inhabiting South Africa; it is somewhat larger than the one just described, and has a more savage expression, which does not belie its temper. It is called by the Dutch Boers the BOSCH-VARK, and chiefly frequents hollows or excavations in the forests. It is very variable in color, some specimens being dark brown, others brown and white, others bright chestnut. An English traveler writes: "Where the locality is sufficiently retired and wooded to afford shelter to the bush-bucks which I have mentioned, we may generally expect to find traces of the Bush Pig. The Bush Pig is about two feet six inches in height and five feet in length; his canine teeth are very large and strong, those in the upper-jaw projecting horizontally; those in the lower, upwards. He is covered with long bristles, and taking him all in all, he is about as formidable-looking an animal, for his size, as can be seen. The Bosch-Varks traverse the forests in herds, and subsist on roots and young shrubs. A large hard-shelled sort of orange, with an interior filled with seeds, grows in great quantities on the flats near the Natal forests; this is a favorite fruit of the wild pigs, and they will come out of the bush of an evening and roam about in search of windfalls from these fruit-trees.

The Kaffir tribes, although they refuse to eat the flesh of the domestic

pig, will still feast without compunction on that of its bush brother. In the bush I always found the Kaffirs disinclined to encounter a herd of these wild swine, stating as their reason for doing so that the animals were very dangerous; they also said that the wounds given by the tusks of this wild pig would not readily heal. The Kaffirs are much annoyed by these wild pigs, which destroy their gardens, and leave narrow openings in the fences through which the Busch Vark walks only to fall into a deep pit in which is a pointed stake, where he is killed by the assegais of the Kaffirs. The tusks are considered great ornaments, and are worn suspended round the neck by a string.

EDWARDS' RIVER-HOG, *Potamochoerus Edwardsii*, is an allied species, found only in Madagascar, where it indicates a later migration from the mainland than in the case of the other mammalia of the island.

THE BABYROUSSA.

The Babyroussa is an exceedingly formidable-looking animal. Its extraordinary tusks, with their long upward curve, have given rise to the native name by which it is commonly known. Babi-rusa means "stag-hog," and characterizes the creature very imperfectly. This appellation, when literally translated, led many old travelers to suppose that it was derived from the speed and agility of the animal, but in these respects it bears no comparison to the fleet and bounding stag.

GENUS BABYROUSSA.

This third division of the *Suidæ* contains only *one* species.

The BABYROUSSA, *Babyrusa Alfurus* (Plate XXXVII), is found only in the Celebes islands. It reaches a considerable size, measuring nearly four feet in length, and standing two feet and a half high. The back is arched, the feet have four toes, the hide is thick, rough, and wrinkled in deep folds near the ears and neck. The general color is a dirty gray; the tail is thin and pendulous.

This strange creature is notable for the curious manner in which the tusks are arranged, four of these weapons being seen to project above the snout. The tusks of the lower jaw project upward on each side of the upper, as is the case with the ordinary boar of Europe, but those of the upper jaw are directed in a very strange manner. Their sockets, instead of pointing downward, are curved upward, so that the tooth, in

filling the curvatures of the socket, passes through a hole in the upper lip, and curls boldly over the face. The curve, as well as the comparative size of these weapons, is extremely variable, and is seldom precisely the same in any two individuals. The upper tusks do not seem to be employed as offensive weapons; indeed, in many instances they would be quite useless for such a purpose, as they are so strongly curved, that their points nearly reach the skin of the forehead. The female is devoid of these curious appendages.

From all accounts, the Babyroussa seems to be a very fierce and dangerous animal, being possessed of great strength, and able to inflict terrible wounds with the tusks of the lower jaw. A naval officer who had experienced several encounters with this creature, spoke of it with great respect, and seemed to hold its warlike abilities in some awe. The adult male Babyroussa is considerably larger than the boar of England, and the officer above mentioned affirmed that he had seen them as large as donkeys. It is a very good swimmer, and will take to the water for its own gratification, swimming long distances over arms of the sea.

Except in the island of Celebes and the adjacent islands, the Babyroussa has not been discovered either in the Moluccas or in New Guinea, although its tusks have been seen in the hands of the Papuans. Its habits are like those of other swine; its gait is a quick trot, its gallop is lighter than the wild boar's. The first pair brought to Europe was given by Marcus, the Dutch governor of the Moluccas, to the French naturalists Quoy and Gaimard. They seemed to feel the cold weather exceedingly, shivering continually, and hiding themselves, even in summer, in their straw: they both died of the change of climate. Others, however, have been brought to London.

THE WART-HOGS.

The animals of this genus are grouped by Gray into a sub-family. They are the most repulsive looking of all the *Suidæ*; they are strongly built, and remarkable for their hideous head, and the peculiar dentition. The sides of the face bear three extraordinary protuberances, one pointed and movable, at one time turned upward, at another time hanging beneath the eye: a second projects out laterally, while the third runs along the under jaw up to the corner of the mouth. The eyes are small and project like those of the hippopotamus, and are surrounded by a large semicircular fold; the ears are pointed, the snout broad and oval.

The short limbs have four hoofs; the fore-legs have a broad callosity on the pastern joint. The hide, with the exception of some long hairs on the cheeks and neck, is covered with short, sparse bristles. The canine teeth are directed upward and outward; the last grinder is remarkably elongated. The color of the animal is reddish-brown, and it sometimes reaches the length of five feet and the height of two feet six inches. There are *two* species of the genus.

GENUS PHACOCHÆRUS.

The AFRICAN WART-HOG, *Phacochærus Æthiopicus* (Plate XXXVII), has very large protuberances on the face, and very strong, curved tusks. It is called VLACKE-VARK by the Dutch settlers at the Cape, and INGORLOOK by the Betsuani. They live in holes in the ground, are gregarious, and very dangerous to the unwary traveler.

This animal is not devoid of sagacity, as was proved by Gordon Cumming: "I selected the old boar for my prey, and immediately separated him from his comrades. After ten miles of sharp galloping, we commenced ascending a considerable acclivity, where I managed to close with him, and succeeded in turning his head toward my camp. He now reduced his pace to a trot, and regarded me with a most malicious eye, his mouth a mass of foam. He was entirely in my power, as I had only to spring from my horse and bowl him over. I felt certain of him, but resolved not to shoot as long as his course lay in the direction of my wagon. At length, surprised at the resolute manner in which he held for my camp, I headed him; when, to my astonishment, he did not in the slightest swerve from his course, but trotted along behind my horse like a dog following me. This at once aroused my suspicions, and I felt certain that the cunning old fellow was making for some retreat; so I resolved to dismount and finish him. Just, however, as I had come to this resolution, I suddenly found myself in a labyrinth of enormous holes, the haunt of the ant-bear. In front of one of them the wild boar pulled up, and charging stern foremost into it, disappeared from my disappointed eyes, and I saw him no more. I rode home for my men, and returning, we collected grass and bushes, and tried to smoke him out, but in vain." Smith asserts that the Wart-Hog seldom declines a combat; none but the most expert huntsmen dare attack it; it rushes out suddenly, strikes right and left, and fights to the death.

The first living Wart-Hog from the Cape of Good Hope came to the Hague in 1775. At first it seemed quiet, but it soon showed its savage temper by killing its keeper.

ÆLIAN'S WART-HOG, *Phacochærus Æliani*, is more widely extended than its congener, being found in the Cape de Verde Islands, New Guinea, Abyssinia, and Mozambique. It is called "Haroja" by the Abyssinians, "Dosar" by the Somali, and "Halaf" by the Arabs. Buffon gives it the appellation of "Engallo." It is easily distinguished from the foregoing by the presence of incisor teeth, and by a slight depression of the bones of the forehead. Its color is an earthy-brown, thinly clothed with bristles, except along the spine, where a well-developed mane, six or eight inches long, appears. The tail is nearly naked, but tufted at the tip.

Both species live chiefly on roots and bulbs, which they dig up with their powerful tusks, aided by a kneeling position to facilitate the lever-like action; they vary their diet, however, with the larvæ of insects, worms, and lizards, and even devour any carrion that may come in their way. Specimens of both species have been brought to Europe for various Zoological Gardens, and no difference in their habits can be seen; they are both unsusceptible to kindness, and never display any attachment to their keepers. The females are not so savage as the males, but are equally devoid of all affection towards man. The flesh of the Wart-Hog is, according to the accounts of Schweinfurth, less palatable than that of the wild boar; when fresh, it produces severe dysentery. The Abyssinian Christians, as well as their Mohammedan neighbors, deem it unclean, and refrain from tasting it, differing in this respect from the Kaffir tribes in the south of the African Continent.



CHAPTER XV.

THE CAMEL.

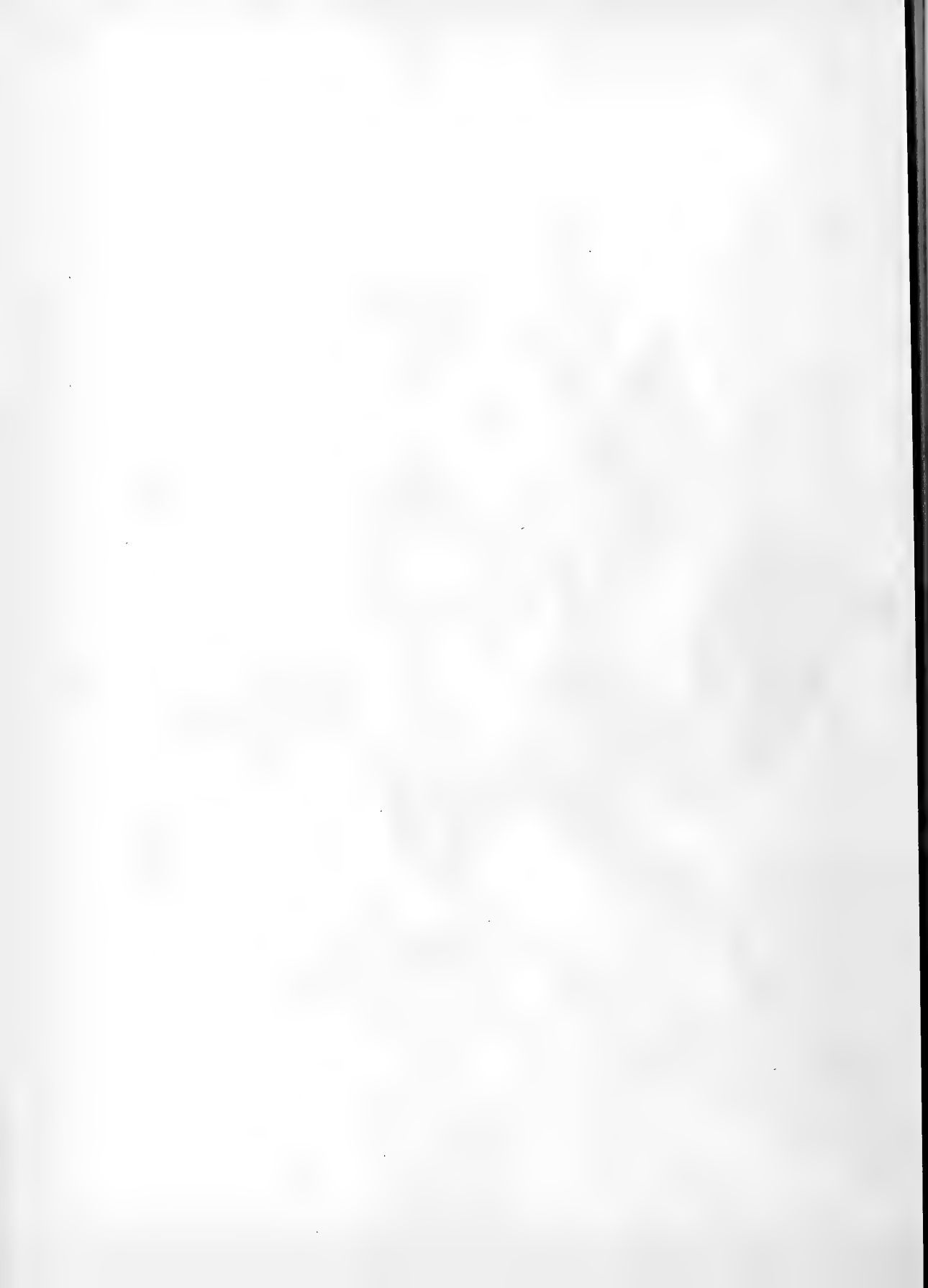
THE RUMINANTS—THE CAMELIDÆ—THE CAMELS OF THE OLD WORLD—THE ARABIAN CAMEL, OR DROMEDARY—THE CAMEL IN THE BIBLE—THE CAMEL IN EUROPE—THE CAMEL IN AFRICA—ITS FOOD—ITS POWERS OF RESISTING THIRST—ITS SPEED—MODE OF RIDING—ITS BEHAVIOR WHEN LOADING—ITS VICES—ANECDOTE OF LATIF PASHA—ITS VALUE—THE TWO-HUMPED CAMEL OF BACTRIA.

THE remaining families of the order with which we are now engaged are sometimes placed together as an order *Ruminantia*. The division thus made is superfluous, yet all the animals that “chew the cud,” although different in many respects from each other, have a certain general resemblance. They all live on vegetable food, they devour grass, leaves, young shoots, and roots, as well as grain. Most of them are, even when wild, of greater benefit than injury to man, although where the cultivation of the soil has been carried to a great height, some species cannot be tolerated by the husbandman. Both the wild and tame ruminants minister in many ways to the service of man. Their flesh and their hide, their horns and their hair, are all of high value. In a state of domesticity the Ruminants are docile, patient, and enduring, and are, in fact, indispensable. Three families alone have, up to this time, remained undomesticated, the Muskdeer, the Giraffes, and the Antelopes. All the others contain some members which man has made his slave and assistant, while all the wild species are objects of the chase; and on this account are treated with almost royal honors by lovers of the “noble art of Venery.”

THE CAMELS.

The family CAMELIDÆ consists of a very restricted group of *two* genera, comprising *six* species; the majority of the species now existing only in a state of domestication. The leading characteristics of the







CAMEL

PLATE XXXVIII. UNGULATA.



family are cushions developed more or less on the soles of the feet, the absence of horns, and a cleft upper lip. North Africa, Central Asia, and Southwestern America are the original homes of these animals. The two species found in the Old World are entirely domestic animals, no longer occurring in a state of nature; in the New World two of the four species are domesticated, but two still retain their independence.

GENUS CAMELUS.

The *two* species of this genus are both natives of the Old World; they are remarkable for their size, and for the possession of one or two humps. They have a small, strongly arched head; their ears are slightly developed, but their sense of hearing is excellent. The eyes have oblong horizontal pupils, are gentle in expression, and protected by a double eyelid; their power of sight is very great. The nostrils are situated at some distance from the extremity of the upper lip, and externally appear like two small slits which the animal can open or close at will. The lips constitute a very delicate organ of touch, and the camel has an extremely acute sense of smell. The head, which is as a whole exceedingly repulsive in appearance, is carried on a long neck, which, when the animal moves slowly, describes a graceful arched curve. The Camel possesses callosities on the breast, knees, and insteps, as well as on the *patella* and heels. The feet are bifurcated. The two toes on each foot are not enveloped in horn, and have only on the last joint a somewhat short and hooked nail. A hard and callous sole covers the bottom of the toes—a characteristic which enables them to walk with ease on loose sand, where the elephant would be useless, and the horse soon exhaust its strength. The hump of the camel is a very curious part of its structure. The Arabs say that it feeds upon its hump, for when it suffers from privation and fatigue the protuberance diminishes, and will often nearly vanish at the end of a long and painful journey. As the animal is intended to traverse the parched sand-plains, and to pass several consecutive days without the possibility of obtaining liquid nourishment, there is an internal structure which permits it to store up a considerable amount of water for future use. For this purpose, the honeycomb cells of the "*reticulum*" are largely developed, and are enabled to receive and to retain the water which is received into the stomach after the

natural thirst of the animal has been supplied. After a Camel has been accustomed to journeying across the hot and arid sand-wastes, it learns wisdom by experience, and contrives to lay by a much greater supply than would be accumulated by a young, inexperienced animal.

Buffon has said that the Camel is the real treasure of the East. It feeds the inhabitants with its milk and flesh, and its hair furnishes them with clothes. Without its use as a beast of burden, nations separated from each other by vast stretches of desert could not carry on any trade. Without it, the Arab could not inhabit those arid countries in which he dwells. With it, this "ship of the desert," as the Eastern nations have called it in their figurative and symbolical language, life is possible even in such places as Buffon has called "the blank spots in nature."

THE CAMEL OF ARABIA.

The CAMEL, *Camelus Arabicus*, or DROMEDARY, *Camelus Dromedarius*, (Plate XXXVIII), has only one hump. It attains a height of about six to seven feet, and a length of from nine to ten feet. Many varieties are found, arising from difference of location. The Camel of the desert is a thin, tall, long-legged creature; that of the cultivated regions of North Africa is a heavy, stout animal. Between a *Bishareen* or pure-bred camel of the Nomad tribes, and a common pack-camel of Egypt there is as great a difference as between the pure Arab steed and a Flemish dray-horse. The term Dromedary is ordinarily restricted to the high-bred animals used for riding.

The Camel is found at present only as a domestic animal, in the regions of Africa lying north of the twelfth degree of latitude, and of the extreme west of Asia. Its distribution coincides with that of the Arabian race. From Arabia it has spread eastward through Syria to Persia, where the two-humped, or Bactrian camel appears, and westward through Africa to the shores of the Atlantic Ocean. There is no representation of this very remarkable beast in the Egyptian monuments, but it is mentioned in Egyptian documents of the fourteenth century before Christ. In the Bible, the earliest mention of the Camel is in the Book of Genesis, where we read that Abram took on his journey "sheep and oxen and camels" (Gen. xii, 16). Many years after, we are told how Rebekah offered water to Jacob's camels at the well, and when Jacob was about to leave Laban camels are mentioned (Gen. xxiv, 10-19) as

forming a considerable portion of his wealth. One of the plagues that fell upon Egypt (Exod. ix, 3) destroyed the camels with the other cattle. Job had three thousand, and afterward six thousand camels; and the Amalekites possessed "camels without number, as the sand by the seashore for multitude" (Judges vii, 12), and the Reubenites took from the Hagarites fifty thousand camels. By the Mosaic law the Camel may not be eaten; but its milk was probably used by the Jews, for the Hebrews had no such aversion to this one of the "prohibited animals," as they always evince toward the hog. They used it as a beast of draught, for Isaiah (ch. xxi, v. 7) speaks of a "chariot of camels," but naturally its chief use was as a beast of burden.

The Camel is essentially a desert animal, and attains his highest development in the driest and hottest regions. In Egypt, where food is plentiful, he loses his most precious qualities: near the Equator, where the vegetable world approximates in character to that of South America or Southern Asia, he no longer can live. Up to the twelfth degree of latitude he flourishes; a couple of degrees further, he dies without any explicable cause. The reason seems to be, that the Camel can thrive in dry heat, but dies in moist heat. Some attempts to domesticate the Camel in Europe have been made. In 1622, Ferdinand de Medici introduced some into Tuscany, and at San Rossore, near Pisa, the camels live on a wide sandy plain as happy as in their original home; they numbered in 1840 one hundred and seventy-one. In Southern Spain the Camel has been found to succeed admirably. In 1858 camels were employed in Texas and Arizona. But the greatest success has attended the introduction of them into Australia.

In the North and East of Africa camels are kept in vast numbers. Many Arab tribes have them by thousands and hundreds of thousands. Before the railroad from Cairo to Suez was open, at least six hundred camels a day were employed in conducting the service between those places. Still greater is the number of camels employed in the great caravans between the North of Africa and the negro countries. The tribe of Tibbo have two hundred thousand of them, the Berbers possess more than a million. In Arabia, the province of Nedjed is the most famous for them, and it supplies Syria, Hedjaz, and Yemen with them, beside sending thousands to Asia Minor. The number of camels that perish yearly in the passage of the desert cannot be counted, but travelers tell that the tracks of the caravans are for miles lined with their

bones so closely that the road seems to pass through a heap of bleaching skeletons.

The Camel lives entirely on vegetables, and is not particular what he eats. The driest and most withered herbage of the desert, sharp reed-grass, half-dead twigs enable him to support life for weeks. Under certain circumstances, an old mat or an old date-basket is a delicacy for him. In Soudan, the houses which are thatched with grass required to be protected from his attacks. No thorns or prickles seem to affect his palate; he will eat twigs of the mimosa, the spikes of which will even penetrate the sole of a boot. When at evening the caravan rests, the camels are turned out, and they rove from tree to tree, eating off every accessible branch. But more juicy food is always acceptable to them; in the fields of millet, beans, peas, and corn of all kinds, they work fearful havoc. During long journeys through the desert, when it is necessary to keep the burden as light as possible, the Arab takes a little barley for his camel, and gives him about two hands-full. But, in general, the leaves of various trees are their favorite food. If the Camel is living on juicy plants, he can go without water for weeks. Most of the accounts respecting the animal's power of abstaining from water are, however, fables. Stories that they can travel fourteen or twenty days without water are laughed at by the Arabs. In the dry season, the Camel on a journey must not only have sufficient food and water, but a rest of nearly one day in four. Only in rare cases, usually when one of the expected wells is dry, is the Camel permitted to go so long without water. The opinion that the large cells in the first division of the stomach serve as reservoirs for water, and that in extreme need the traveler can, by killing his camel, obtain water, is declared by Brehm to be unfounded. That distinguished traveler, who knows the camel as well as a farmer knows the horse, says that he had put inquiries to all camel-drivers, and they all affirmed that they had never heard such a monstrous lie. He tells us that he has seen camels killed which had been drinking the day before, and convinced himself that it was utterly impossible to drink any fluid which had been for twenty-four hours in the stomach mixed with the Camel's food and gastric juices; the very smell of a Camel's stomach when cut open being intolerable. But we must remember that men dying of thirst are not very particular as to the quality of the liquid which may save their lives. The water obtained from the stomach of the Camel is light-green in color, very unpleasant,

but hardly more so than that which is carried in leathern bags on the Camel's back, exposed to the heat of the sun.

It is a pleasant sight to see the thirsty camels approach a well. Stupid as they are, they never forget where they have once drank. They raise up their heads, snuff the air with half-shut eyes, lay their ears back, and begin to run at a pace which compels the rider to hold on firmly to his saddle. When the well is reached, they crush and crowd each other in their haste to drink, uttering horrible bellowings. They drink for three minutes without interruption, their bodies swell visibly, and when the journey is resumed, the fluid is heard awash in the stomach like water in a half-filled cask.

When one sees a camel standing in repose, one can scarcely believe that it can vie in speed with a horse. But it can do so. The camels of the desert can accomplish distances and speeds such as no other tame creature can attempt. The ordinary pace, indeed, is not very rapid. "In crossing the Nubian desert," says Captain Peel, "I paid constant attention to the march of the camels, hoping it might be of some service hereafter in determining our position. The number of strides in a minute with the same foot varied very little, only from thirty-seven to thirty-nine, and thirty-eight was the average; but the length of the stride was more uncertain, varying from six feet six inches to seven feet six inches. As we were always urging the camels, who seemed, like ourselves, to know the necessity of pushing on across that fearful tract, I took seven feet as the average. These figures give a speed of 2.62 geographical miles per hour, or exactly three English miles, which may be considered as the highest speed that camels, lightly loaded, can keep up on a journey. In general, it will not be more than two and a half English miles. My dromedary was one of the tallest, and the seat of the saddle was six feet six inches above the ground." But the post-riders, mounted on camels of good blood, perform journeys of incredible rapidity. On such a camel Mohammed Ali rode from Cairo to Alexandria, a distance of seventy-five miles, in twelve hours. Another camel did the same distance in nine hours, including the loss of an hour in twice crossing the Nile. Such are the camels which the Towaregs use for war and in their predatory excursions. Mounted on his fleet dromedary, the warrior (Plate XXXVIII) crosses with inconceivable speed the desert that separates him from the tribe he is going to attack, or the home to which he is returning.

The Arabs desire three things in a good Camel; he must have a soft back, must not require the whip, and must not scream when he gets up or lies down. The first requisite is a necessary one, even for an Arab. Nothing is so disagreeable as the gait of the Camel. An Englishman declares that any one who wishes to practise camel-riding at home can do so by taking a music-stool, screwing it up as high as possible, putting it into a cart without springs, sitting on the top of it cross-legged, and having the cart driven diagonally over a newly ploughed field. The Arab mode of riding is to pass one leg over the upright pommel, which is merely a wooden peg or stake, and to hitch the other leg over the dangling foot. When the Camel increases its speed to a gallop, the rider grasps with his right-hand the cantle of the saddle, for the movement of the animal when galloping throws the rider forward with a violent jerk. The second requisite of a good camel, that is, not to require the whip, we can all understand. The third, however, can only be appreciated by those who have been present when a pack-camel has been loaded. The voice of the Camel cannot be described. Groans, moans, growls, bellowings, and screams follow in a most extraordinary succession. A traveler gives the following account of the Camel's behavior.

"The camel, when he is not eating or drinking or being loaded, is invariably chewing the cud. His long, crooked jaw is in perpetual motion, and when he is told to lie down to receive his burden, he does so without varying this incessant masticatory process. He awkwardly bends his fore-knees, drags his hind-legs under him, and comes to the ground with a curious kind of flop. All this time his long, melancholy face shows not the slightest indication that he knows what he is lying down for; and this unmistakable hypocrisy, I think, stamps the Camel as an animal of a very high order of intellect. But in a few seconds the expression on the Camel's face undergoes a striking alteration. As he sees the driver approaching him with a box on his shoulder he seems at last to understand the indignity and torture to which he is about to be submitted, and the astonishment, virtuous indignation, and dismay on the ill-used animal's countenance ought certainly to make some impression on the stony heart of the driver. They never have the slightest effect. The man binds the first box on the wretched animal's back, and goes away to get another. Then the Camel, wisely abandoning his efforts to move man to compassion, points his hairy nose upward, and howls his wrongs to the skies.

“Never in circus, pantomime, or show, have I seen anything half so ludicrous as the Camel’s appearance at that moment. His upper lip is curled back from the teeth, his under lip doubles up and drops down as though he had no further use for it, his great mouth opens so wide that one can see about half a yard down his throat; and out of the cavern thus revealed come a series of the most astonishing howls that ever startled the air—howls of such abject misery that it is difficult to avoid the conclusion that the Camel’s heart is breaking; and this impression is strengthened by the tears that flow copiously down the wailing animal’s elongated cheeks, and drip from the end of his nose. In the utterance of each note of woe, the Camel seems to be exerting the utmost power of his lungs, but he is all the time holding a large force in reserve, and as the driver adds box after box to the pile on his back, a howl more resonant and heart-rending than the last testifies to each addition to the creature’s misery; and never, except when he is absolutely engaged in trumpeting his agonies into space, are the great watery eyes of the Camel removed from the person of his persecutor; they follow him wherever he goes, and express through their tears contempt, indignation, astonishment, and dismay. I think it must have been this extraordinary habit on the part of the ‘ship of the desert’ that gave rise to the well-known expression: ‘It’s the last straw that breaks the Camel’s back.’ But the Eastern driver has no fear of any such catastrophe, and piles up the load until it reaches almost the proportions of an elephant’s burden. Then, the cases being bound fast with ropes, the Camel is told to rise, and the animal, feeling that he has conscientiously done his whole duty by entering his protest at every stage of the work, contentedly accepts the unavoidable result, stops his tears, suppresses his cries, gets up on his feet, and, resuming his occupation of chewing the cud, is ready for the week’s march that usually lies before him.”

Brehm describes the Camel as the most unamiable, stupid, obstinate, and bad-tempered creature that can be imagined. Compared with it an ox is sensible, a mule is docile, an ass a loveable animal. Maliciousness and stupidity are the bases of its character; cowardice, wrong-headedness, irrational obstinacy, ingratitude, and a hundred other vices must be added to fill up the picture. The Camel exhales an odor nearly as offensive as the skunk’s, his cries torture the ear, and its unspeakably dull-looking head on its long ostrich-like neck do not conciliate one’s regard. When we know that no Camel ever shows the slightest affec-

tion for his master, but on every opportunity deliberately resists every wish, we may find some excuse for the hard hearts of the Arabian camel-drivers. The cowardice of the Camel is extraordinary. The roar of a lion scatters a caravan, every beast throws off its burden and rushes away. The howl of a hyæna, the sight of a monkey or of a dog terrifies it. It lives with no animal on terms of friendship. The horse cannot endure it, and on its part it seems to regard all animals with the dislike which it displays toward man. Its intelligence is small; it has only one great talent, namely, that of making a man mad.

The young Camel, when just born, is a strange-looking creature; it is covered with long, thick, soft woolly hair, the hump is small, the callosities on the joints scarcely visible. As it grows the wool increases in thickness and length, and the creature is strikingly like the South American species. It is weaned at the beginning of the second year, and then its training commences. It is accustomed to do without sleep, and to suffer the extremes of hunger, thirst, and heat. In its third year it is usually set to work, and by the end of the fourth year is considered capable of being employed in lengthened journeys. The camels for riding are trained to pace, not to gallop. The saddle is a dish-like frame perched on the hump, and held by three strong girths. The bridle consists of a leathern thong surrounding the creature's muzzle. No bit is used. Around the saddle hang weapons, holsters, cartridges, and bags of dates and water-skins, and the saddle itself is covered with sheepskins dyed red or blue. The saddle of the pack-camel is not fastened by girths, but kept in position by the burdens which are skilfully arranged to balance. It is often stated that if a camel has been overloaded, it will, even when the load is removed, refuse to rise; this is not true. It remains lying when overladen, because it cannot rise, but when the weight is lessened, it gets up at once.

In desert-journeys the load of a camel is about three hundred and fifty pounds. In Egypt, however, the drivers piled up such loads that the government interfered, and fixed the weight to be placed on the unfortunate animal at five hundred and fifty pounds. One day Latif Pasha was sitting in his courtyard holding judgment in true Oriental fashion. A huge, heavily laden camel stalked in through the open gateway. "What does the beast want?" cried the Pasha. "See, its load is illegal! Weigh it." The camel had been carrying one thousand Arab pounds. The driver next appeared, in some astonishment. "Do you not

know," thundered the Pasha, "that your camel ought to carry only seven hundred pounds? By the beard of the Prophet, and by the Almighty who has created man and beast, I will show you what it is to torture an animal! Give him five hundred blows." The driver was duly bastinadoed. "Now go!" said the judge; "if your camel ever brings a complaint again, it will be worse for you."

The Camel is subject to many diseases, especially in the low latitudes. In the Soudan, a fly is said to be very destructive. Most camels, however, die in their vocation. The simoom, or hot wind of the desert, is their deadliest foe. They scent the poisonous blast hours before the storm bursts. They become alarmed and anxious long before the sweltering heat which heralds the tempest is felt by man, and hurry forward at full speed. When the tempest breaks, no inducements can urge them onward; they lie down with their heads stretched out on the ground to leeward. They undoubtedly suffer as much as their riders, who, after the simoom has passed, feel as if every limb was broken, and who experience that feeling of weariness which usually is felt only after long sickness. When the camels are loaded, after the hot blast has passed, they show in every step what torments they feel. Their thirst increases, their weakness becomes more pronounced as they advance. A Camel suddenly falls; no words, no lashes move him to rise. The Arab, with tears in his eyes, leaves him to his fate; next morning the Camel is dead; before noon comes, the vultures are circling round the carcass, and before evening, the hyæna cannot find enough to satisfy its hunger.

Independently of its value as a beast of burden, the Camel is most precious to its owners, as it supplies them with food and clothing. The milk mixed with meal is a favorite dish among the children of the desert, and is sometimes purposely kept until it is sour, in which state it is very grateful to the Arab palate, but especially nauseous to that of a European. The Arabs think that any man is sadly devoid of taste who prefers the sweet new milk to that which has been mellowed by time. A kind of very rancid butter is churned from the cream by a remarkably simple process, consisting of pouring the cream into a goat-skin sack, and shaking it constantly until the butter is formed. The flesh of the Camel is seldom eaten, probably because the animal is too valuable to be killed merely for the sake of being eaten. Sometimes, however, in a season of great festivity, a rich Arab will slay one of his camels, and calling all his friends and relations to the banquet, they hold high festival upon the

unaccustomed dainty. The long hair of the Camel is spun into a coarse thread, and is employed in the manufacture of broad-cloths and similar articles. At certain times of the year, the Camel sheds its hair, in order to replace its old coat by a new one, and the Arabs avail themselves of the looseness with which the hair is at these times adherent to the skin, to pluck it away without injuring the animal.

The name of caravan has been given to companies formed in the desert by the assemblage of travelers, who thus, through numbers, avoid the insults and robberies of the brigands scattered around and over its immense confines. These caravans use Camels and Dromedaries for their beasts of transport; the former are loaded with the baggage and provisions, the latter are reserved to carry the travelers. When all are loaded and ready to start, an Arab, who acts as guide, precedes them, the Camels and Dromedaries following in line. This guide sings a monotonous and modulated plaintive song, indicating to his attendants by the quickness or slowness of its measure, when they are to increase or slacken their pace. When the guide's voice ceases, the whole troop halts and kneels to be unloaded, and they are turned loose to gather the scanty herbage found in the vicinity.

THE CAMEL OF BACTRIA.

The BACTRIAN or TWO-HUMPED CAMEL, *Camelus Bactrianus* (Plate XXXIX), is distinguished by two humps, one at the withers, another at the rump.

The general formation of this animal; its lofty neck, raising its head high above the solar radiations from the heated ground; its valve-like nostrils, that close involuntarily if a grain of drifting sand should invade their precincts; its wide cushion-like feet, and its powers of abstinence, prove that, like its Arabian relative, it is intended for the purpose of traversing vast deserts without needing refreshment on the way. This species is spread through Central Asia, Thibet, and China, and is domesticated through a large portion of the East.

It is the beast of burden for the traffic between China and South Siberia or Turkestan. The Kirghis Tartars set less store by it than the horse, but the Mongols prize it as the Arabs prize the Dromedary. The Bactrian Camel is much better tempered than the Arabian species; it is

much more docile ; its complaints are only murmurs, not the ear-splitting cries of the Dromedary. It is, however, equally stupid and cowardly. A hare springing up, says Przewalski, throws it into abject terror ; a stone by the roadside frightens it out of its senses. It screams at the sight of a wolf. It feeds on the vegetation of the steppes which other animals avoid ; salt is indispensable for it ; it drinks the salt-water of the brackish lakes and licks up the crystals deposited on their margins.

The shape of the animal necessitates a peculiar saddle. Thick folds of felt are laid on the two humps, and on them is placed the framework to which its load is fastened. A strong animal will carry four hundred and fifty pounds a distance of about twenty miles a day. In summer it can go for three, in winter for five to eight days without food or drink, and it requires to rest one day in eight. The journey from Peking to Kiatka is accomplished in about a month, after which it has a rest of about a fortnight ; but in the West it is never worked so hard. When the hair begins to fall off it is treated more kindly ; it is covered with felt coverings, and is allowed a respite from labor. The Bactrian Camel receives unceasing care. The Mongols regard it as the most fragile of animals, for although it can stand the icy storms of the winter and the toils of journey, it falls an easy victim to the climate of their summers. In winter it is never unsaddled ; in summer the saddle is removed as often as possible, but never before the animal has become cool. It keeps up with the caravan as long as it can, but when it falls, it refuses to rise, and is left to the care of the inhabitants of the nearest village.

The height of the Bactrian Camel is rather more than that of the Arabian. Its color is brown, varying into sooty-black, or dirty-white.



CHAPTER XVI.

THE LLAMAS.

THE AMERICAN CAMELIDÆ—THE GENUS AUCHENIA—THE GUANACO—ITS HABITS—THE LLAMA—ITS USE AS A BEAST OF BURDEN—THE ALPACA OR PACO—ITS WOOL—THE VICUÑA—INDIAN HUNTS.

THE American representatives of the family CAMELIDÆ are, like all American animals, smaller than their Old World kindred. They are to the Camel, as the Puma is to the Lion. The former, indeed, being dwellers in the mountain ranges, cannot be expected to attain the size of the "ships of the desert." They are distinguished from the camels not only by their less size, but by the absence of a hump, by their large ears and eyes, and their long woolly coats. The feet are very different from those of the true camels, the toes being completely divided, and furnished with a small rough cushion beneath, and a strong claw-like hoof above, so that the foot can take a firm hold of the rocky and uneven ground on which they live. Altogether, they have a very ovine look, suggesting to the spectator a long-legged, long-necked sheep.

GENUS AUCHENIA.

Naturalists are not agreed as to the number of species into which the South American camels ought to be divided. Some attribute the differences between the various kinds to the effects of domestication, but the natives—with whom the investigator, Tschudi, agrees—always assert that there are *four* distinct species. Two of these, the Guanaco and Vicuña, are still wild; the Llama and Alpaca, on the other hand, have been tamed since time immemorial. They were the beasts of burden in Peru when the Spanish conquerors first entered the kingdom of the Incas, and the Peruvians themselves have a tradition that the taming of these creatures took place in those far back days when their gods used to walk the

earth. The first European invaders everywhere found herds of Llamas in the possession of the Andean mountaineers, and describe the animals in unmistakable terms. Xerez, who wrote of Pizarro's conquest of Peru, says: "Six leagues from Caxamarca, Indians live who have flocks of sheep; some of them are so large that they are used as beasts of burden." Don Pedro de Cieza, in 1541, writes: "In no part of the world are there so many strange sheep as in Peru, Chili, and some provinces of La Plata. They are the most useful creatures that God has created, for the natives could not live without them. They are about the size of an ass, with the neck of a camel, and the look of a sheep. They are very tame and docile. The natives call them Llamas. Another kind is called Guanaco; these are somewhat larger, and run with great agility. Another variety of these sheep is named Vicuñas; they roam about in the desert; their wool is finer than that of the Merino sheep. There is also another sort called Paco, with still longer wool. Without these animals, intercourse with Potosi would be impossible." This passage is quoted to show that three hundred years have made no change whatever in the characteristics of these animals, and that therefore there is good reason for making *four* species of these useful creatures.

All the *Auchenia* dwell on the lofty plateaux of the Cordilleras. They prefer the colder regions, and are only found in the low country at the extreme south of the chain of the Andes in Patagonia. Near the equator they live at a height of four thousand yards above the sea. During the rainy season the wild varieties retire to the highest ridges of the mountains, and in the dry season descend into the valleys. They live in herds, very often of several hundreds, and are hunted with great ardor by the various Indian tribes.

THE GUANACO.

The GUANACO, *Auchenia guanaco*, is about the size of the Virginia deer, standing a little over six feet high. The body is relatively short and compact, the neck thin and curved, the upper lip prominent and deeply cleft; the nostrils are capable of being closed; the ears are about half the length of the head, and very mobile; the legs are slender and long, the toes cleft to the middle, the soles have rough cushions, but the fore-legs have not the callosities which the other varieties possess, like the camel. A coat of long, rich, but sparse hair

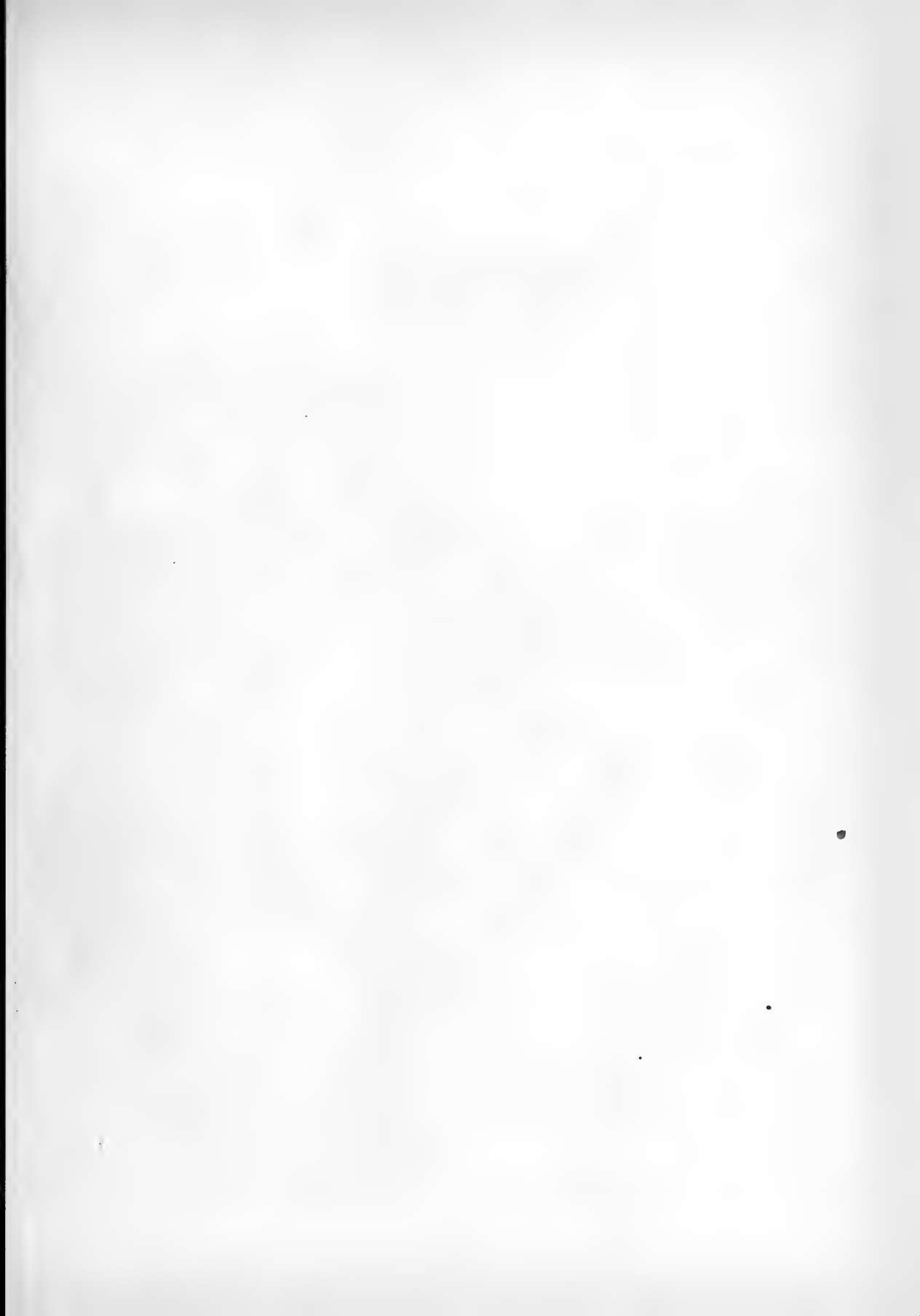
covers the body ; it consists of a short, fine layer of wool, through which grows longer and thinner hair. This coat is short on the face, but on all other parts of the animal except the legs, forms a wool-like fleece, which, however, is never as fine as that of the Llama. The general color is reddish-brown.

The Guanaco extends along the Cordilleras from the island of Tierra del Fuego to Northern Peru, and is especially abundant in the southern part of the chain of the Andes. It prefers mountain plateaux, but Darwin found it in great herds in the low plains of Southern Patagonia. It ascends, during spring, when the herbage is coming up at high elevations, as far as the line of eternal snow, but in the dry season it returns to the lower valleys. It avoids the snow-fields ; its feet are not adapted for walking on the slippery surface. At times the Guanacos make long journeyings, and Darwin saw herds of them on the coast at Bahia Blanca. They are not afraid of the sea, and swim fearlessly.

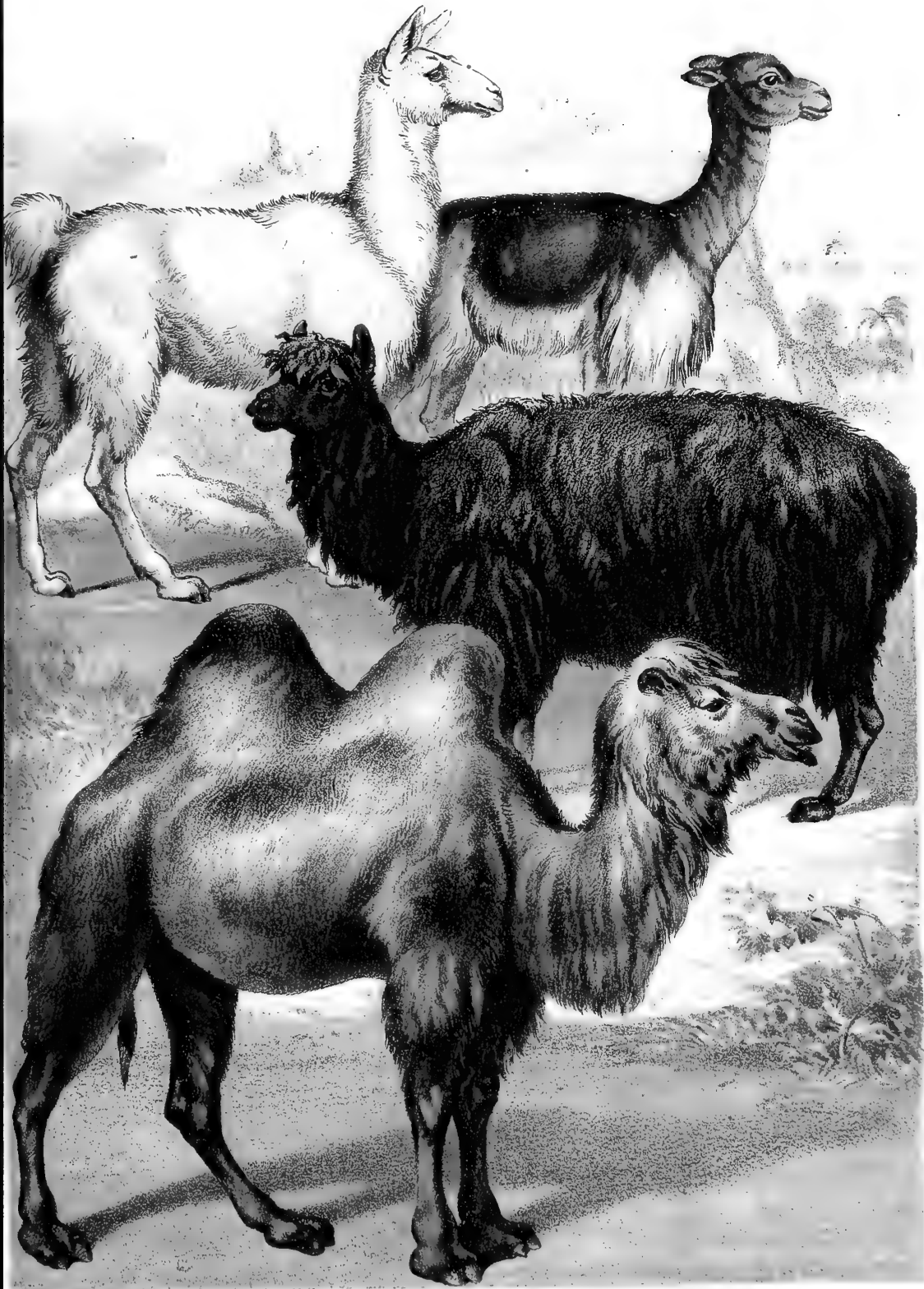
The herds usually consist of from twelve to thirty members, although one of five hundred has been seen. Generally the herd consists of females under the guidance of an old male. It wanders by day from one valley to another, browsing with pauses ; it never feeds by night. It seeks a drinking-place morning and evening, and the Guanacos seem to prefer brackish water to fresh. The movements of these animals are quick and lively, although they have not the speed often attributed to them ; a good horse can soon overtake them. Their gait is a short gallop, and is, like the camel's, a *pace*. They climb admirably, and run like the chamois on the verge of the steepest precipices, where a man cannot find standing-room. When reposing, they lie down like the camel on the breast and legs, and chew their cud in a dreamy state of complacency.

The Guanacos are usually shy and wild, flying away when anything suspicious comes in sight. The leader of the herd precedes it by some paces, and keeps a good look-out while the females are feeding. When danger is approaching, he sets up a neighing scream, and all the flock takes flight, the leader bringing up the rear. Like many animals, however, they are curious, and Darwin says that if the hunter lies on the ground and kicks his legs in the air, they will draw near to see what strange creature it may be ; even the report of his rifle does not frighten them, they think it part of the performance.

The Guanaco, in common with the other species, is rather short-tempered, and has a very unpleasant habit of displaying its anger by







LLAMA

ALPACA
BACTRIAN CAMEL

VICUGNA

PLATE XXXIX UNGULATA



discharging a shower of half-digested food and saliva over the offender. Formerly, this salival discharge was thought to be acrid, and capable of raising blisters upon the human skin. This, however, is fortunately not the case, although the assault is eminently disagreeable, on account of the ill scent of the ejected liquid. In its wild state the Guanaco seems to have little or no idea of resistance, being easily held by a single dog until the hunter can come up and make sure of his prize. But in domesticated life, it seems to imbibe a spirit of combativeness, for it will kick with both hind legs, and deliver severe blows with the knees of those limbs. With his rivals the male fights desperately, with teeth and feet.

The Guanaco is hunted for its flesh and hide; it is pursued by dogs, driven to bay, and then lassoed. In the lowlands they are often killed by the gun. A wounded Guanaco at once hastens to a river, in order to die on its banks; indeed they all, when they feel death approaching, seem to seek certain definite places. "On the banks of the Santa Cruz," Darwin writes, "the ground beneath the bushes was white with bones. These bones were not broken or gnawed, and could not therefore have been dragged there by beasts of prey. The Guanacos had crept there to die." The Guanaco cannot be domesticated. When quite young it can be taught to follow its master like a dog, but when it grows old it uses every effort to escape. It can be easily kept in captivity.

THE LLAMA.

The LLAMA, *Auchenia llama* (Plate XXXIX), is found most abundantly in Peru. It is larger than the Guanaco, and is distinguished by possessing callosities on the breast and fore-knee. Its color varies; white, black, piebald, skewbald, dark-brown, fox-red, and even yellowish animals have been seen. The Llama is of the greatest service; it not only supplies food, but transports all merchandise. Its usual load is one hundred and fifty pounds, but some will carry a hundred pounds more. It can march at the rate of ten leagues a day for five days in succession. Its gait is so steady, that little fastening is requisite to keep the load on its back. About three hundred thousand are in constant use for bringing silver bars from the mines to the smelting works, and carrying back provisions. Acosta writes: "I have often wondered at the sight of these herds of sheep transporting two or three thousand bars of silver, worth three hundred thousand ducats, without any other attendance

than a few Indians. They love the cold air of the mountains, and retain their health even when covered with ice and snow." "Nothing can be prettier," another traveler says, "than a train of these animals marching one behind the other in the greatest order, following a leader who is adorned with a tastefully decorated halter, a bell, and a little flag on his head. Thus they march along the snowy summits of the Cordilleras, or the sides of the precipices where not even a mule can go. The conductor needs no goad or whip to urge them on or guide them. They advance quietly and without a rest." Like the Guanacos, they are curious and keep constantly looking around them, and are equally timid, dispersing at any alarm, when the conductor has an arduous task in collecting them. The use of the Llama as a beast of burden is gradually, however, being superseded by that of the ass.

The flesh of the Llama is a favorite article of diet, and that of the lamb of one year is a great dainty; the older animals are killed to obtain "jerked" or dried meat.

The Llama is seen in nearly every Zoological Garden, even in the collection in the Central Park, New York. It appears to be more amiable when kept in the society of its congeners, and soon knows its keeper, but towards strangers it shows itself easily irritated, and if provoked, discharges its filthy spittle in his face. It lives and breeds in captivity and requires very little care.

THE ALPACA.

The ALPACA or PACO, *Auchenia paco* (Plate XXXIX), is smaller than the Llama, very like a sheep, with a long neck, and well-shaped head. The wool is long and very soft, and white or black in color.

The Alpacas live in large herds, which pasture all the year on the plateaux, and which are only collected to be shorn. There is, perhaps, no more obstinate animal than the Alpaca. When one is separated from the herd, it flings itself on the ground, and neither coaxing nor flogging can make it get up; it will rather die than stir; the only way to induce it to exert itself is to bring up another herd, and then it condescends to join itself to them. The wool attains the length of nearly four inches, and has from time beyond the memory of man been spun into garments. The coarser wool is called by the Indians *Hanaska*, the finer *Cumbi*; they make from it table-cloths and other things which are remarkable

for wearing well and having a smooth surface. The Incas of Peru had great masters in the textile art. The most skilful lived near the Lake of Titicaca. They dyed the wool with various herbs. The present Indians have lost the art, except in its ruder manufactures of coverlets and cloaks. The best wool is sent to Europe, where, as we all know, it is spun and woven into a variety of articles.

All attempts to acclimatize Alpacas in Europe have failed. Nor do they succeed any better in Australia. An Englishman named Leeds was sent out by the government of New South Wales to procure the animals from Bolivia. But the Bolivian government forbade the exportation, and only after great difficulties did he manage to ship three hundred Alpacas. Five years later, after the government had spent fifteen thousand pounds, scarcely a dozen of the animals were alive, while the young ones born from the imported ancestors were in a very poor condition. There are, however, many places where they might be domesticated, but it is not worth the while to do so, such places being already occupied by more profitable animals. The Alpacas are enduring, require little attention, and breed fast, and in addition to their wool supply good flesh. They are never used for carrying burdens, but kept solely for the hair and flesh. To obtain the former, the herds are annually driven in and shorn, which is no light task with an animal so full of natural obstinacy. The shearing over, they are again turned loose.

THE VICUÑA.

The VICUÑA, *Auchenia vicuña* (Plate XXXIX), is intermediate in height between the Llama and the Alpaca. It is distinguished by its short, kinky wool, of exceptional fineness. The top of the head, the back of the neck, the back and loins, are covered with hair of a peculiar reddish-yellow color. The lower side of the neck and of the limbs are of a bright ochre-yellow; the hair on the breast and stomach, which measures nearly five inches, is white. The Vicuñas in the rainy season seek the crest of the Cordilleras; but they avoid stony districts, because their hoofs are tender. In summer they revisit the lowlands, following the supply of food. They browse all day long. The herds consist of a male and five or six females, the former always keeping watch. He gives the alarm at the sight of danger, and when the herd retreats, covers the rear.

In the hills where they dwell, it is impossible to ride them down. The sportsman has to shoot them. By a strange contrast, a herd of guanacos disperse when the male leader is killed, but the Vicuñas, *treu bis an dem Tod*, gather around the wounded leader, and can be shot down to the very last one. If the first shot kills a female, then the whole flock scurries away.

The Vicuñas, according to Acosta, are very timid, and flee at the approach of the hunter, driving their young before them. They do not increase in numbers rapidly, and during the reign of the Incas, the subjects of the kingdom were forbidden to hunt them, the chase being reserved for the monarch himself. Since the Spanish conquest they have diminished considerably, for the conquerors hunt the males and females alike. The Indians do not use firearms in the chase. They take stakes and immense coils of rope. The former they place about twelve to fifteen feet from each other, and unite by the rope which is raised about two feet from the ground. A large circle is thus enclosed, leaving an entrance two hundred feet broad. The women who accompany the hunters hang rags of all kinds on the rope. The men, many of whom are mounted, then make a wide circuit and drive the Vicuñas toward the enclosure. When enough have been collected, the entrance is closed. The timid animals dare not pass the ropes with the fluttering rags, and are easily lassoed, or caught with the *bolas*. These latter consist of three balls, two heavy, one light, of lead or stone, united by a long thong. The lighter ball is taken in the hand, and the others whirled around the head. All are then let go, and fly toward the object aimed at, which they at once encircle in the thong. If the hind-legs of the animal are aimed at, the *bolas* envelop them so tightly that every motion is impossible. The Vicuña is then killed, and its flesh distributed among those who participate in the hunt; the fells are given to the church. Bolivar, the founder of the Republic of Bolivia, forbade the slaughter of Vicuñas; he ordered them to be shorn when captured. But this operation has proved almost impossible. The hunts in the time of the Incas were grand affairs; thirty thousand Indians were assembled; the circuit they formed would be fifty miles, and all wild animals were driven into the toils. The bears, cougars and foxes were slain, as well as a certain number of stags, roebucks, and vicuñas. At present, it is said that if guanacos are thus enclosed they break through the ropes and are followed by the vicuñas. Hence, skilful huntsmen do not drive the former.

Tschudi was present at one of these hunts, which lasted for a week, at which one hundred and twenty vicuñas were killed.

The young Vicuña is easily tamed, but, like all its kindred, becomes mutinous as it grows older. A clergyman had a pair which lived with him quietly for four years. At the end of that time the female ran away, and sought to join a herd of her wild kindred. They drove her away with bites and pushes, and she remained a solitary wanderer on the hills. For months, sportsmen and travelers encountered her, for she was conspicuous by the bright collar which had been placed around her neck, but she fled from their approach.

It may be added, that since the establishment of the Alpaca manufacture by Sir Titus Salt at Bradford, England, the wool of all the *Auchenia* has become an article of commerce, and is worked up, either alone, or mixed with other textile materials, into numerous and beautiful fabrics. Dress-goods, umbrellas, gloves, and other articles too numerous to mention are woven from the wool of the various species. The hair of the guanaco is the most valuable, being longer in the staple, and of a silky, soft texture. The natives of Peru prefer, however, that of the vicuña, from which they weave robes and mantles which have quite the appearance of silk, and which, as the hair does not need to be dyed, last for a very long time.



CHAPTER XVII.

THE MOUSE DEER.

THE TRAGULIDÆ OR HORNLESS DEER—DISPUTES OF NATURALISTS—THE KANCHIL—ITS APPEARANCE AND HABITS—ATTEMPTS TO INTRODUCE IT TO EUROPE.

THE family TRAGULIDÆ is a group of small, deer-like animals with tusks in the upper-jaw, and having some structural affinities with the camel. The musk deer, *Moschus moschiferus*, was formerly classed in this family, but a minute examination of its structure by the celebrated French naturalist M. Milne-Edwards has shown it to be more closely allied to the true deer. The Chevrotains or Mouse-deer, as the TRAGULIDÆ are called, differ from the Musk-deer by having only three divisions in the stomach, and by the absence of a gland to secrete musk. They are usually divided into *two* genera: TRAGULUS comprising *five* species, which range over all India to the foot of the Himalayas and Ceylon, and through Assam, Malacca, and Cambodia to Sumatra, Borneo, and Java; and HYOMOSCHUS, forming *one* species, found in Western Africa.

Naturalists, however, are by no means agreed respecting the classification of the *Tragulidæ*, and many deny that the differences that exist are such as to justify the creation of *two* genera, or even the number of species assigned. As a matter of fact, all classification depends upon anatomical peculiarities, rather than on anything which the ordinary observer would detect. In a work intended for the general public, we have no hesitation in neglecting the refined distinctions of the professional naturalists. Fancy, therefore, a delicate deer-like creature with a slender, graceful head, no horns, beautiful bright eyes, and legs as thick as a lead-pencil, with the tiniest hoofs, a short, little tail, and soft, smooth hair,—and you have the Mouse-deer.

The KANCHIL, *Tragulus pygmæus* or *Javanicus* (Plate XLII), is, including the tail, about a foot and a half long, and stands about eight

inches high. The hair on the head is of a reddish fawn color, almost black on the top of the skull; on the back it is brown with a reddish-yellow shade, strongly marked with black along the spine; the abdomen is white. A white streak runs from the under-jaw to the shoulder, then, lower down, comes a dark streak which divides in the throat, and encloses another band of white. The limbs are fawn-yellow, the upper arm reddish, the feet dull fawn color. The difference of color is produced by the peculiar coloring of the hairs. On the back they have the lower half white, then bright yellow occurs, while the tips are black. In proportion, therefore, to the degree in which the black points fall off, or as the light ring is more or less prominent, does the general color of the hide differ. The white spots consist of pure white hair. The older males have projecting canine teeth. The hoofs are of light-brown horn.

Java, Singapore, Penang, and other neighboring islands with the Malay Peninsula are the homes of this charming little creature. Allied species represent it in Sumatra, Borneo, and Ceylon. In Java it lives in the hills, rather than in the lowlands, preferring the lower edge of the primæval forests which cover the hills. There it lurks in the fringe of brushwood, from which it can sally forth and in a few minutes reach the grassy slopes below. It is never seen in herds. During the day it lives retired, reposing and ruminating in the densest thickets. When twilight comes, it sallies forth to browse on leaves, herbs, and berries. Water is indispensable for its existence.

All the movements of the little animal are extremely graceful and light, and marked with great vivacity. It can take long leaps, and skilfully avoids all difficulties in its way. But its delicate limbs soon refuse their office, and it would be easily the prey of its enemies, if it did not possess a peculiar method of defence, which in this country is usually considered to be the especial prerogative of the opossum. When it can not conceal itself in the underwood, and plainly sees that escape is impossible, it lies down and pretends to be dead. The hunter stoops to grasp his victim, but before his hand can reach it, the Mouse-deer has made a spring and disappeared like lightning. The natives of Java assert that the male Chevrotain has another way of escaping the attacks of beasts of prey. They say it leaps up in the air and hangs itself by its long canine teeth to a projecting branch! Sir Stamford Raffles tells us that the Javanese can find no better means to describe a consummate trickster, than the words "He is as cunning as a kanchil."

Various attempts have been made to introduce the Mouse-deer into Europe. A pair presented to the Queen of England was forwarded by her Majesty to the Zoological Gardens in the Regent's Park, London, but they died in two months. Brehm had several in the Thiergarten of Berlin; they were very cleanly, always dressing and licking their fur. Their large and beautiful eyes lead one to expect a great amount of intelligence, but this is not the case; the tiny creature is placid and quiet, passing the day in eating, chewing the cud, and sleeping. Its delicate soft voice is a weak piping.

"By the kindness of the government," writes Bodinus, "we received a pair of chevrotains. In spite of great attention, fresh grass, clover, bread, milk, and oats, they could not be brought into good condition. Under these circumstances I changed their diet to berries. They devoured them eagerly, and good results followed. The large eyes grew brighter, the hair became sleeker and more brilliant, the body plumper, and I was convinced that the tiny creatures could be kept in perfect health on milk and bread, and some green stuff.

The Javanese, who call the animal Poetyang, hunt it zealously, and esteem highly its tender and sweet flesh. The slender legs are often mounted in gold and silver, and used for tobacco-stoppers.



CHAPTER XVIII.

THE DEER.

THE CERVIDÆ—THEIR ANTLERS—THE PROCESS OF GROWTH OF THE ANTLER—THE SHEDDING OF THE VELVET—HABITS OF THE CERVIDÆ—THE VARIOUS GENERA—THE ELK OF THE OLD WORLD OR THE MOOSE OF THE NEW WORLD—THE ELK OF SWEDEN—THE MOOSE OF CANADA—HABITS—MODES OF HUNTING.

NO group in the whole order can be more easily described than the family CERVIDÆ. They are ruminant animals, with antlers or horns that are shed. Compared with this striking characteristic, all other distinguishing features are superfluous. The Deer form an extensive group of animals equally adapted for inhabiting forests or open plains, the Arctic regions, or the Tropics. They range, in fact, over the whole of the great continents of the globe, with the one striking exception of Africa, where they are only found on the shores of the Mediterranean.

The distinctive characteristic, then, of the animals of this group consists in the texture, shape, and manner of growth of their frontal protuberances. These projections, which are called *antlers*, and not horns, are bony, solid, and more or less branching; they are also devoid of the horny casing which exists in all hollow-horned Ruminants. They fall off, and are renewed periodically every year up to a certain age.

In the adult individual the antler is composed of a cylindrical or flattened stem, according to the genus, which is called the *brow-antler*, from which branch out at intervals slighter and shorter additions, called *tines* or *branches*. The base of the brow-antler is surrounded with a circle of small bony excrescences, which afford a passage to the blood-vessels intended to provide for the growth of the antler; these are called *burrs*.

The whole process of the growth, shedding, and renewal of the antlers is so peculiar, and so entirely different to anything which we see in any other animal, that a somewhat lengthy account of the process is

necessary. Soon after birth, the place destined by nature to bear the antlers is indicated by a considerable development of bone on the forehead. During the sixth or eighth month of the animal's existence, two small elevations or *knobs* make their appearance; these remain permanently during its whole life. From each of these *knobs* grows a cartilaginous prolongation, which soon assumes a bony texture.

Until they become perfectly hard, these two early sprouts are protected against any external friction by a kind of velvety skin, which serves as a vehicle for the calcareous matter, and dries up as soon as ossification is accomplished, the beast freeing them from the velvet by rubbing its head against a tree. The technical name for these bony developments during the first year of the deer's life is that of *dags*. They are simply straight horns. They are shed in the second year, and are then replaced with *antlers*, which bear one *branch* or *tine*. In the spring of the third year the same process is repeated, but the new *antlers* bear an additional *branch* or *tine*, and this augmentation of the number of the *tines* at each annual reproduction of the *antlers* goes on till the animal reaches maturity. The junction of the *antler* with the bony frontal development or *knob* is very close. The root of the antlers throws out processes of various size which fit into corresponding depressions in the *knob*, while processes running from the *knob* in turn insert themselves into depressions in the root of the *antlers*. A close dove-tail joint is thus formed, and the union is so perfect, that in a newly-grown antler it cannot be detected, even by a vertical section through the *antler* and the *knob*; but when the antler is full grown and hardened, it can be seen in the section as a very fine zigzag line. If violence is applied to an *antler* before it is ready to be shed, it does not break off at this joint, but the whole *knob* is torn away from the frontal bone. The shedding is effected by the weight of the antlers. Some days previous to this event the skin around the *knobs* becomes loose; the deer avoids striking or pushing with his antlers, and betrays that there is an unaccustomed sensation in the place. There is usually an interval, sometimes of only a few minutes, sometimes of several days, between the dropping off of the two antlers. The deer hangs his head and ears, and shows clearly that if the process is not painful, it is all events uncomfortable. When one of the antlers is fallen, he carries his head on one side, and keeps shaking it, so as to get rid of the other. Immediately after the shedding, the reproduction of the bony ornaments of the head begins. This renewal is a very curious

phenomenon, and we owe to the patience of Dr. Sœmmering the best account of the whole interesting process: "Immediately after the shedding of an antler, the lower surface of it is dry, or rather not bloody, the blood-vessels being quite dead and empty. At the edge of the *knob*, between the *burrs*, the openings of numerous canals are visible, containing arterial vessels which spring from the external carotid, and are developed in an extraordinary manner while the antler is growing. When the antlers have both been shed, the deer seems worn out and spiritless; he feels that he is defenceless, and seeks solitary places. The round surfaces on which the antlers rest are covered with a coat of blood and lymph, and surrounded by a ring containing vessels which contribute to the displacement of the antlers. The rush of blood to the *knobs* is checked by the old antler, the vessels become congested and form this thick ring, cutting off the antler from the brow, and undermining it. It is from this vascular ring that vessels proceed which contribute a secretion of calcareous matter for the formation of the new growth. The *dags*, or first year's horns, rest on a protuberance of the frontal bone which diminishes in height each year as each successive shedding of the antlers removes a layer from it. By the fourteenth day a vascular tumor has filled up the place left by the shed antler, and spread over the hairy skin of the *knob*, especially in the anterior region, to form the lowest or eye-tine. On the twentieth day the protuberance, which is burning hot to the touch, begins to be covered with white hair, and increases rapidly. By the thirtieth day all the points of the future antler are indicated by more or less prominent divisions and folds, and over the edge of the hairy knob is a bluish vascular ring, the beginning of the *burrs*. On the forty-fifth day the last division has not taken place, but by the fiftieth day all the tines are pretty long. The upper portion of the antler is completely formed by the eightieth day, but is still covered with very sensitive velvet. By the hundred and twentieth day the antler is fully grown and the tines ossified to the end."

Such a process is without parallel in natural history. As soon as the growth is complete, and the ossification finished, the *burrs* increase in size; they strangulate the blood-vessels, and the velvet loses its vitality, and is soon rubbed off against the branches or trunks of trees. The horns annually fall off early in the year. As a rule, antlers are found only on males, but have been seen on barren females. It is probable that the various functions devolving on the female, such as gestation,

parturition, and giving suck, divert the nourishing fluids from the head and concentrate them in other organs, and this is the physiological cause which deprives the weaker sex of antlers.

The modes of life of the *Cervidæ* are as different as their dwelling-places. Some live, like chamois, on the rocks, some hide themselves in the thick forests, some frequent arid steppes, others, swamps and morasses. They are all social animals, many kinds forming large herds. During the summer the males usually leave the herds, and may often be seen wandering about together. At other times, they are deadly foes, and terrible combats ensue. The female has one or two young ones annually; no prettier group of animals can be seen than a hind and her fawns, with their large, soft, innocent eyes, and graceful movements. But neither the majestic appearance of the male, with his branching antlers, nor the tenderness of the female, have saved the deer from the fate which attends all animals that man cannot enslave! Their presence cannot be reconciled with modern agriculture. In America they are rapidly becoming scarcer as the country is filled up, and in Europe they are merely preserved, some species for sport, some for ornament, otherwise they would long ago have disappeared.

If we include the Musk-deer, and an allied genus lately discovered in China, the family *Cervidæ* must be distributed in *eight* genera, most of which contain only one species.

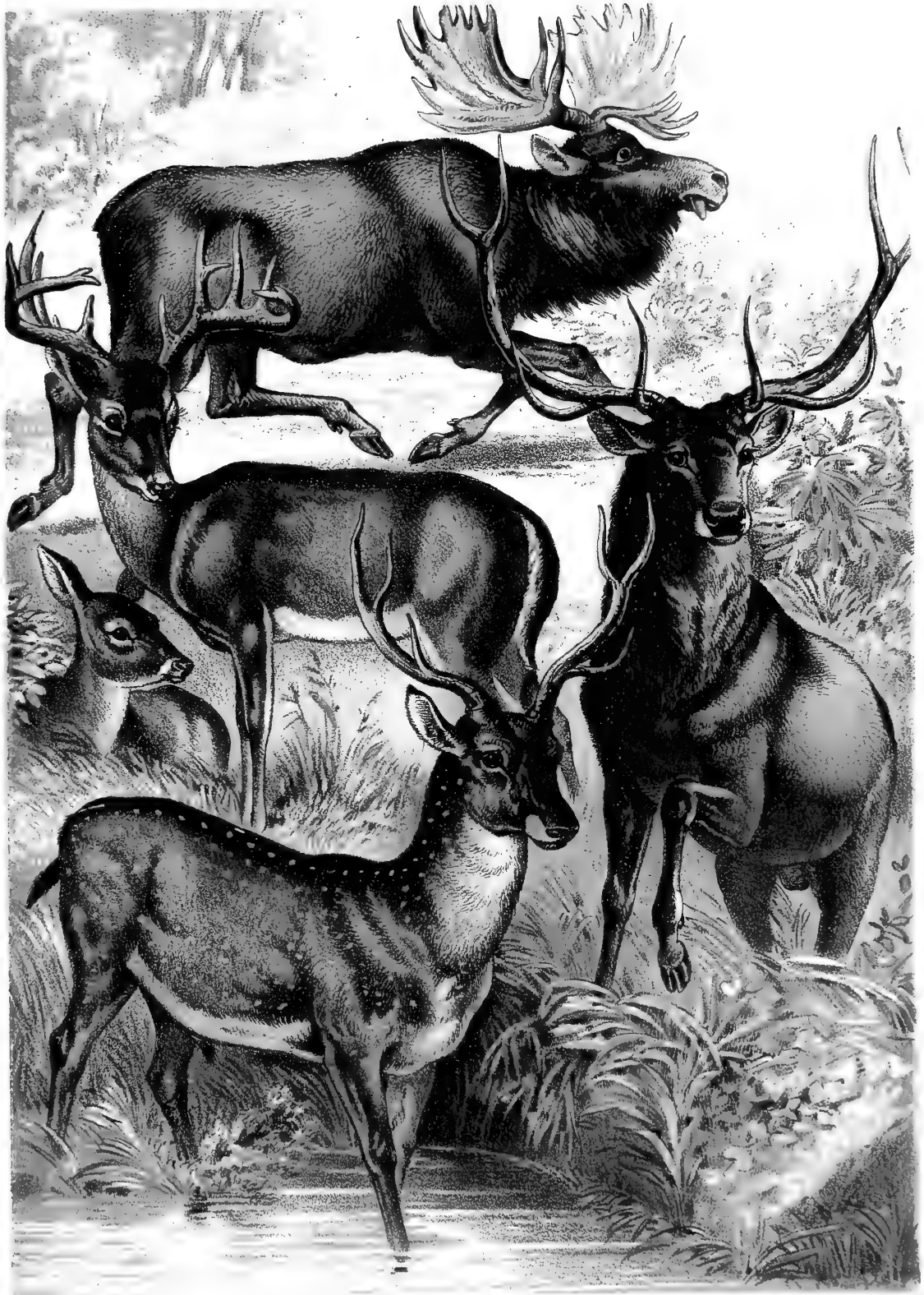
Nearly all the members of this family are remarkable for the elegance of their shape, the dignity of their attitudes, the grace and vivacity of their movements, the slenderness of their limbs, and the sustained rapidity of their flight. They have a very short tail; moderately sized and pointed ears; their nostrils are generally situated in a muzzle, and their eye is clear and full of gentleness. In most of the species there is, below the internal angle of the eye, a small depression, called a tear-pit, which is nothing but a sort of gland, secreting a peculiar fluid. This gland is not, as might be supposed from the name, the place from which the tears proceed.

GENUS ALCES.

The ELK or MOOSE ranges all over Northern Europe and Asia as far north as East Prussia, the Caucasus, and North China, and over Arctic America to Maine on the East, and British Columbia on the West. Wallace assigns to the genus only *one* species; adding that the American







VIRGINIA DEER

MOOSE DEER

WAPITI OR ELK

AXIS

PLATE XLI. UNGULATA.



species may, however, be distinct, although very closely allied to that of Europe. Much confusion exists in the use of both the names Elk and Moose. The animal commonly known in America as the Elk is the WAPITI, *Cervus Canadensis*. In Ceylon, Elk designates a large species of deer; while in Africa, it is applied to an antelope. The true Elk is the animal known in our Northeastern States as Moose.

THE MOOSE OR ELK.

The ELK, *Alces palmatus* or *Alces malchis* (Plate XLI), has been long known in Europe. Cæsar found it in the Black Forest, and several of the later Roman emperors exhibited specimens in their triumphs. In the great German epic, the Nibelungen Lied, the name Elk occurs; it is applied to an animal found in all parts of Germany, and antlers of elks are often discovered in the woods of Brunswick, Hanover, and Pomerania. In this last province large herds existed in the sixteenth century. But the decrease has been rapid. In the seventeenth and eighteenth centuries only a few could be found in Saxony and Siberia. A herd has been preserved to the present day in the Royal Forest near Tilsit, which in 1874 numbered seventy-six members. The Elk is now confined in Europe to Norway, Sweden, and Russia. In Asia it extends to the Amoor River, abounding near the Lena and Lake Baikal, ranging northward as far as any tree will grow.

The Moose or Elk is the largest of all the deer tribe, attaining the extraordinary height of seven feet at the shoulders, thus nearly equaling an ordinary elephant in dimensions. The horns of this animal are very large, and widely palmated at their extremities, their united weight being so great as to excite a feeling of wonder at the ability of the animal to carry so heavy a burden. To support such a load a short and very thick neck is necessary. It does not reach its full development until its fourteenth year. The muzzle is very large, and is much lengthened in front, so as to impart a most unique expression to the Elk's countenance. The color of the animal is a dark brown, the legs being washed with a yellow hue. Its coat, which is composed of coarse, rough, and brittle hair, rises into a small mane on the nape of the neck, and on the spine. The long black hair under the throat forms a kind of beard, and in the male animal covers a considerable protuberance. Its speed is very great, and its endurance wonderful, but the pace is usually a trot,

not a gallop. It has been known to trot uninterruptedly over a number of fallen tree trunks five feet in thickness.

The Elk swims with great facility. During the summer it submerges its whole body, except the head, and in this way preserves itself from the stings of the horse-fly: thus it passes the greater portion of the day, while it principally subsists upon aquatic herbage. It is also partial to damp forests and marshy localities. This animal feeds off the ground with difficulty, on account of the shortness of its neck; in order the better to reach the grass, it kneels or straddles its fore-legs. It prefers, however, to browse off the young shoots, buds, and bark of trees, thus furnishing hunters with sure proofs of its vicinity. When the ground is hard and will bear the weight of so large an animal, the hunters are led a very long and severe chase before they come up with their prey; but when the snow lies soft and thick on the ground, the creature soon succumbs to its lighter antagonists, who invest themselves in snow-shoes and scud over the soft snow with a speed that speedily overcomes that of the poor Elk, which sinks floundering into the deep snow-drifts at every step, and is soon worn out by its useless efforts.

The skin of the Elk is extremely thick, and has been manufactured into clothing that would resist a sword-blow, and repel an ordinary pistol-ball. The mad emperor of Russia, Paul, carried on a regular war of annihilation against the Elks, as he considered elk-skin the only material fit to be made into breeches for his cavalry. The flesh is sometimes dressed fresh, but is generally smoked like hams, and is much esteemed. The large muzzle or upper lip is, however, the principal object of admiration to the lovers of Elk-flesh, and is said to be rich and gelatinous when boiled, resembling the celebrated green fat of the turtle.

Among the Carnivora, the chief enemies of the Elk are the same as those of the reindeer, namely, the bear, the wolf, and the glutton.

The Elk, when captured young, may be completely tamed without difficulty. It recognizes the person who takes care of it, and will follow him like a dog, manifesting considerable joy on seeing him after a separation. It goes in harness as well as the Reindeer, and can thus perform long journeys. For two or three centuries it was used for this purpose in Sweden, but the custom is now given up. It is impossible to understand why hardly any attempts have been made to domesticate such a useful animal in those climates suited to it, and thus prevent the destruction which threatens to entirely extirpate the race.

The Elk lives in a family composed of a male, a female, and the young of two generations.

THE MOOSE.

The MOOSE, *Alces Americanus*, which is also called the BLACK ELK and the FLAT-HORNED ELK, is said by the naturalists who form it into a separate species to be distinguished from the European variety by deeper indentations in the palmated antlers, by the slightness of the beard, and the darker color of its coat. Its antlers are larger than those of the European Elk, sometimes weighing seventy-five pounds and measuring thirty-two inches long and thirty-one broad. "The Moose deer," Hamilton Smith writes, "is higher than a horse, and when seen fully grown and in all its spread of antlers, makes a striking impression."

The Moose is confined to the northern regions of the continent, Canada, and New Brunswick, sometimes appearing in Maine and Northern New York. Franklin saw it at the mouth of the Mackenzie River in 65° north latitude. Its habits and food, as well as its general configuration, are those of the Elk of the Old World. From its custom of browsing on trees and eating the bark, the Indians gave this animal the name of *musee* or "wood-eater," whence comes our word Moose.

The young Moose can be easily tamed, and learn in a few days to know their keeper and follow him with confidence. But as they grow older, they grow worse in temper, and become savage and dangerous.

Audubon, who had the gratification of bringing a Moose down with his rifle and examining it in detail, states that to him he appeared awkward in his gait, clumsy in his limbs, and inelegant in form. The head, he adds, is long and clumsy, the snout is long and almost prehensile, the eye deep-seated, and small in comparison with the jackass-like head.

During the winter several of these animals associate together and form groups of two, three, or four, and make what is technically called "a yard" by beating down the snow; in such places they feed on all the branches they can reach, stripping the trees of their bark, and breaking boughs as thick as a man's thigh. When obliged to run, the male goes first, breaking the way, the others tread exactly in his tracks, and when their path runs through other "yards," they all join together, still going in Indian file.

The seasons for hunting the Moose are March and September. The

sun then melts the snow on the surface, and the nights being frosty form a crust which greatly impedes the animal's progress. It is necessary for the hunter to have two or three small curs that can run upon the snow without breaking the crust; their use is to annoy the Moose by barking at its heels. The males when thus pressed stop, and the hunter can come up and dispatch them while their attention is thus engaged. Another method of hunting is described by Audubon: "In September two persons in a canoe paddle by moonlight along the shore of the lake, imitating the call of the male. He answers the call, and rushes down to meet his rival. The man in the bow of the canoe fires; if the animal is only wounded he makes for the shore, and can be tracked by his blood to the place where he has lain down, and where he is generally found unable to proceed further." Sometimes hunters find out the beaten tracks of the Moose leading to some spring, and bend down a sapling with a strong noose over his path. If his branching antlers pass through the dangling snare, he makes a struggle which disengages the rope holding down the sapling. It springs up, and the Moose is strangled. At other times they are "pitted," but their legs are so long that this method of securing them seldom succeeds. The skill of a moose-hunter is mostly tried in the winter; he must track the creature by its footmarks in the snow, keeping always to the leeward of the chase. The difficulty of approach is increased by a habit which the Moose has of making daily a sharp turn in its route; the hunter therefore forms his judgment, from the appearance of the country, of the direction it is likely to have taken. When he has discovered by the footmarks and other signs that he is near the chase, he approaches cautiously; if he gets close without being seen, he breaks a small twig, which noise alarms the animal. It starts up, stops, and offers a fair mark to the hunter. The method of "calling" is efficacious in the rutting season. A sportsman writes of it as follows: "Calling is the most fascinating, disappointing, exciting of all sports. You may be lucky at once, and kill your Moose the first night you go out, perhaps at the very first call you make. You may be weeks and weeks, perhaps the whole calling season, without getting a shot. Moose calling is simple enough in theory; in practice it is immensely difficult of application. It consists in imitating the cry of the animal with a hollow cone made of birch-bark, and endeavoring by this means to call up a Moose near enough to get a shot at him by moonlight, or in the early morning. He will come straight up to you, within a few yards—walk

right over you almost—answering, ‘speaking,’ as the Indians term it, as he comes along, if nothing happens to scare him; but that is a great if. So many unavoidable accidents occur.”

In December Moose-deer cast their horns; by April their successors begin to sprout; by the end of June full form is developed, but not till many weeks later are they denuded of velvet. At one year the bull-calf throws out a brace of knots an inch in length; in the second season these are about six inches long; the third year they increase to nine or ten inches with a fork; in the fourth season palmation is exhibited at many points. “Twenty-three,” writes Mr. Parker Gilmore, “is the greatest number of points I have seen on one head, and the weight of the horns exceeded seventy pounds.

The “Moose Wood” or “Pennsylvania Maple,” *Acer Pennsylvanicus*, derives its name from the fact that the Moose browse on it by preference. The Indians, we may add, believe that after a feast on Moose-flesh they can travel three times as far as after any other food.



CHAPTER XIX

THE REINDEER AND THE CARIBOU.

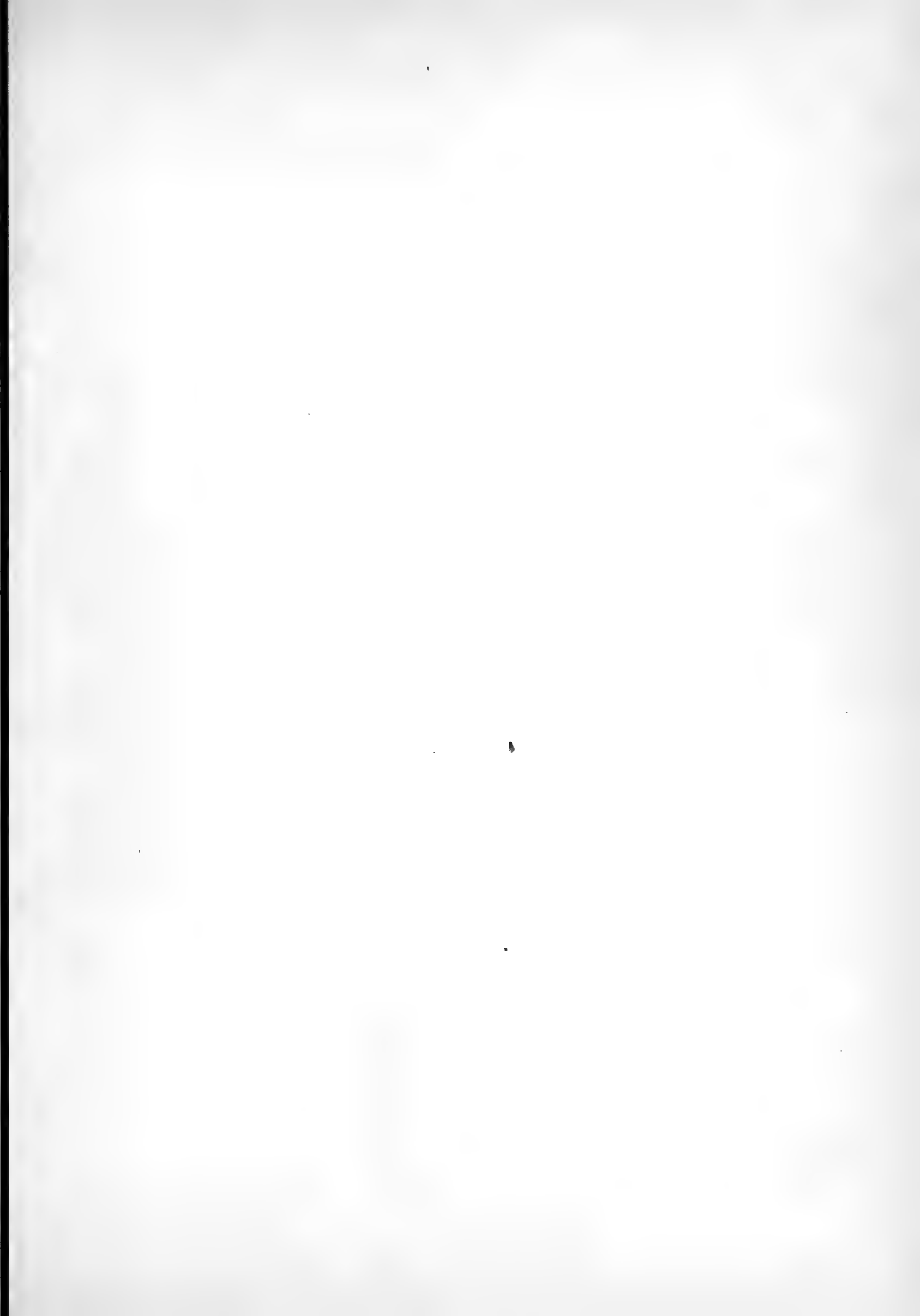
THE REINDEER—ITS LIFE IN NORTHERN EUROPE—ITS LIFE IN SIBERIA—ITS LIFE WHEN DOMESTICATED—ITS VALUE—THE CARIBOU—MODES OF HUNTING IT.

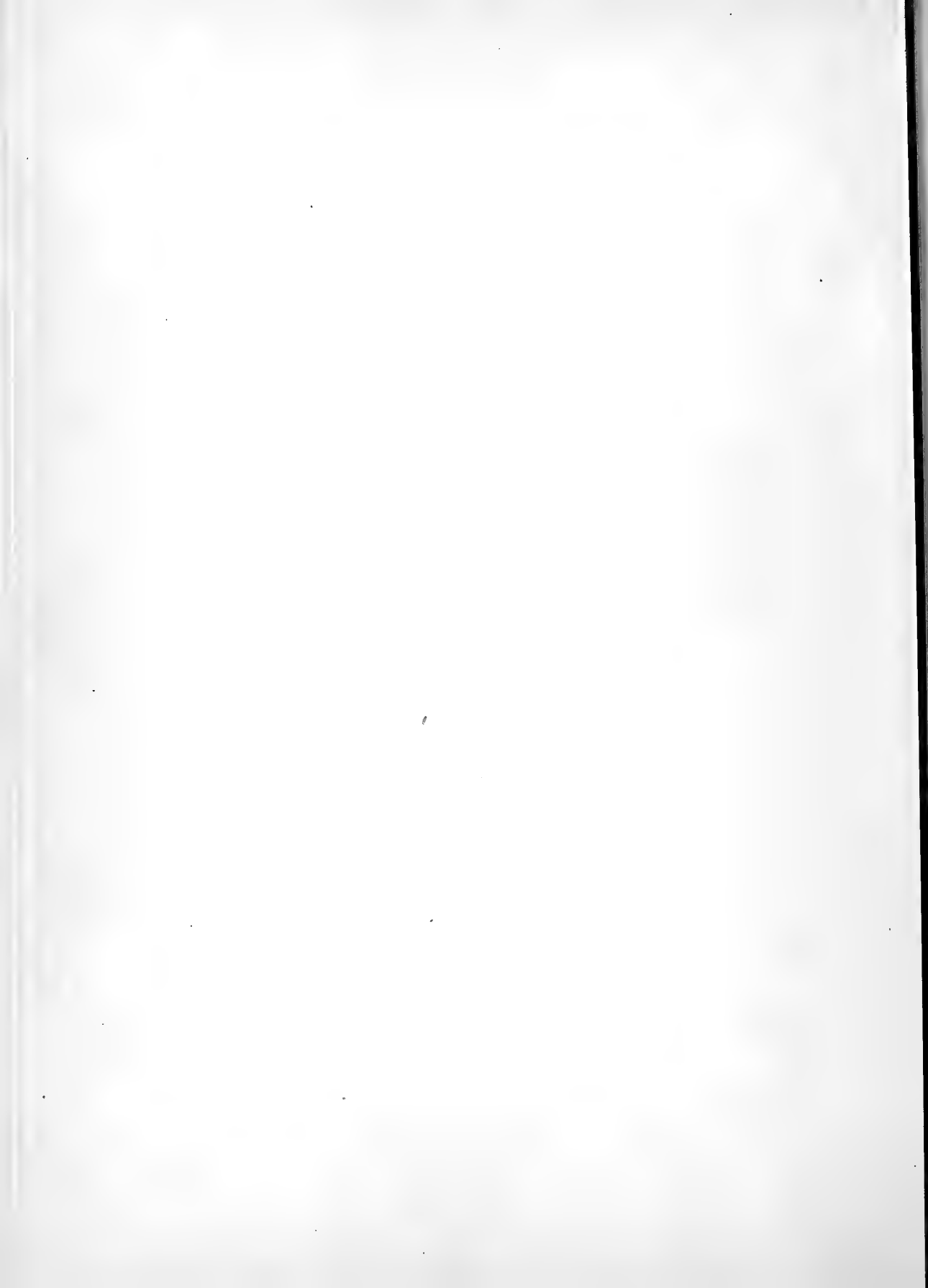
IN the case of the Reindeer, as with the Elk, naturalists are not agreed as to whether the American variety attains to the dignity of a separate species or not. Wallace, and other high authorities assign but *one* species to the genus which we are now about to describe.

GENUS TARANDUS.

In this genus the animals of both sexes possess antlers, the arrangement of which is very characteristic. From the principal stem, which is round and short, spring two branches of flattened shape, the longest of which tends upward with various twists terminating in an indefinite number of points; the other, more moderate in size, stretches horizontally over the muzzle. The hoofs are very broad and long; the head is wide and ox-like, but there is no muffle, and the nostrils open in the midst of the hair. The legs, although finely made, are less slender than those of the stag. The feet are covered all over with stiff hair, even on the under parts, an arrangement which facilitates the animal's tread on ice, or icy snow. Its coat is rough, of a grayish-brown color, and is long under the throat, becoming in the winter woolly in texture, and often white in color. The eye of the Reindeer is protected from the blinding glare of the snow by a third nictitating eyelid, which, at the animal's will, covers the whole eye.

The Reindeer may be described as the most valuable of the *Cervidæ*. Whole tribes depend on it for their existence and well-being, and it is more necessary to them than the horse or ox to ourselves.







CARIBOU

REINDEER
PLATE XL UNGULATA

MUSK DEER



THE REINDEER.

The REINDEER, *Tarandus rangifer* (Plate XL), is a native of the icy deserts of the Arctic regions. It is found in Spitzbergen, Greenland, Lapland, Finland, and the whole of Northern Russia, as well as in Siberia and Tartary. In Russia it sometimes migrates southward as far as the range of the Caucasus.

The ancients were well acquainted with the Reindeer. Cæsar describes it, Pliny confounds it with the elk, Ælian relates that the wild Scythians used deer instead of horses. But the first good account of the animal is found in the work of Scheffer, published 1675, and in the next century the great Linnæus, who had personally seen and observed it, gave a complete description of the animal.

“There is no animal,” writes Brehm, “in which the burden of servitude, the curse of slavery, is so evident as in the Reindeer. No two creatures of the same family can be so different as the tame and the wild Reindeer. The former is a miserable slave of a poor miserable master, the latter is a lord of the mountain, as agile as the chamois. When we see a troop of wild and a herd of tame Reindeer, it is almost impossible to believe that they are members of the same genus.”

The Reindeer is naturally a child of the mountains, and loves the wide, treeless, mossy plateaux which the natives of Scandinavia call “Fjelds.” The barren expanses where a few Alpine plants grow between the rocks, or the heaths covered with Reindeer-moss, are its favorite abode. Woods and woodlands it usually avoids. In the north of Siberia, according to Pallas, it is sometimes found in the forests making annual journeys from the woods to the hills and back again, according to the season. Their chief object in leaving the forests in the summer months appears to be their hope of escaping the continual attacks of mosquitoes and other insect-pests that are found in such profusion about forest land. The principal plague of the Reindeer is one of the gadflies, peculiar to the species, which deposits its eggs in the animal's hide, and subjects it to great pain and continual harassment. Even in the domesticated state the Reindeer is obliged to continue its migrations, so that the owners of the tame herds are perforce obliged to become partakers in the annual pilgrimages, and to accompany their charge to the appropriate localities.

Toward the end of May, the wild Reindeer leave the forests and proceed toward the northern plains. They are thin, and covered with wounds caused by the flies, but when they return in autumn, they are healthy and fat, and supply an excellent article of food. In some years this migration consists of thousands which, although divided into herds of two or three hundred, follow close after each other, so that the whole form an enormous column. Their track is always the same. In Siberia a body of them has been seen which required two hours to pass the point of observation. Equally long are the migrations of the Reindeer in the Western Hemisphere. They leave the continent of America in spring, and, using the frozen sea as a bridge, appear in Greenland, sojourning there till the end of October, when they retrace their steps. In Norway they do not migrate to the same extent, merely changing one mountain range for another, ascending to the glaciers and snow-fields when summer is burning. The Wild Reindeer always live in companies, which are larger than the herds of other deer, and more resembling the herds of antelopes in South Africa. The writer has seen herds of twelve to twenty in summer in the snows of the Fille Fjeld near Nystuen, but in winter they gather to the number of three or four hundred.

The Reindeer is admirably adapted by the conformation of its hoofs for those northern regions which in summer are a morass, and in winter a field of snow. Their gait is a quick walk, or a trot. At every step a peculiar crackling is heard like the noise produced by an electric spark. This noise is not caused by collision of the hoofs, or by one part of the hoof striking against the other. Even tame reindeer can produce the sound without lifting a foot from the ground, by merely swaying the body. It seems to be produced in the interior of the limb, just like the noise caused by pulling one's fingers. The Reindeer is an excellent swimmer, and the wild ones never hesitate to plunge into any stream that crosses their path.

All the senses of the Reindeer are good; its power of smell is remarkable, it can hear as keenly as a stag, and its sight is so sharp that a hunter, even coming against the wind, has to conceal himself most carefully. They are, according to the testimony of all sportsmen, shy and cunning in the highest degree. During the summer their food consists of Alpine plants, in winter they scrape away the snow with their feet, and eat the lichens on the rocks.

The chase of the Reindeer is of the highest importance to the North-

ern tribes. Many of those in Siberia depend entirely on the Reindeer for food, clothing, conveyance, and shelter. The chase of the Reindeer decides whether there will be famine or prosperity, and the season when these animals migrate is the harvest-time. The hunters attack them when crossing a river, and the slaughter made on these occasions can be best described as immense.

The Reindeer is domesticated by the Lapps and Finns, as well as by the Samoyede tribes, the Ostzaks, Tunguses, and others in Siberia. According to Norwegian statistics, the Lapps in that kingdom possess seventy-nine thousand reindeer. It is the support and pride, the joy and riches, the plague and torment of the Laplander. He is the slave of his Reindeer; where they go, he must follow. He has to be out for months, tormented in summer by the mosquitoes, half-killed in winter by the cold, and with no other companion than his dog. The latter is an indispensable auxiliary; watchful, sagacious, reliable, it obeys every sign of its master, and will for days together keep the herd together by its own independent action. The uses to which the tame Reindeer is put are manifold. The Lapps use it for driving, the Tunguses mount and ride on their backs. On even ground it can travel seven or eight miles an hour, but its ordinary pace is four or five miles.

The mode of harnessing and driving the Reindeer is most simple. A collar of skin is fastened round its neck, and from this a trace hangs down, which, passing under the belly, is fastened into a hole bored in the front of the sledge. The rein consists of a single cord fastened to the root of the animal's antlers, and the driver drops it on the right or left side of the back, according to the side to which he wishes to direct the animal. The vehicle being very light, traveling may be rapidly performed in this equipage, but not without running some risk of breaking your neck; for, to avoid being upset, one must be very skilful in this sort of locomotion. The Laplander becomes by practice a perfect master of this art.

We have not yet mentioned the most important articles this Ruminant of the Arctic regions yields man. The female produces milk superior to that of the cow, and from it butter and cheese of excellent quality are made. Its flesh, which is nutritious and sweet, forms a precious alimentary resource, and almost the only one in the polar regions. Its coat furnishes thick and warm clothing, and its skin is converted into strong and supple leather. The long hairs on the neck of this animal are also

used for sewing, while out of its tendons string is manufactured. From the old antlers of the Reindeer various utensils are made, such as spoons, knife-handles, etc., and when the horns are young, gelatine is extracted from them by submitting them to a severe course of boiling. Their excrement, when dried, is formed into bricks, which serve for fuel. Many tribes even turn to advantage the cropped lichens contained in the stomach of a slaughtered animal. The Esquimaux and Greenlanders add to these lichens chopped meat, blood, and fat; when this is smoke-dried, they are extremely fond of it. The Tunguses, or nomadic inhabitants of Siberia, add wild berries to the above northern delicacy, then make it into cakes, which rank high among the articles of their *cuisine*.

THE CARIBOU.

The CARIBOU, or American Reindeer, is considered by some naturalists as identical with the species above described. We shall take the liberty of regarding it as a separate species for the purpose of description.

The CARIBOU, *Tarandus caribou* (Plate XL), is larger than the Reindeer, has smaller antlers and a darker color, and lives mostly in the forests. It has never been brought under the sway of man, nor used for any domestic purposes. The Caribou lives in herds varying from ten to three hundred in number, and is an object of chase for both white and red hunters. The Esquimaux take it in an ingeniously constructed pitfall. A hole, about five feet deep, and capable of holding several deer, is dug out. It is then covered with a slab of ice or frozen snow, which is balanced on two pivots, so that when the Caribou treads upon it, it gives way, and precipitates him into the pit. Other tribes are said to make a large inclosure into which the deer is driven. In the inclosing fence numerous narrow gaps are left, and in each gap a strong running noose is suspended. The Caribou, in its attempts to escape, makes for one of these treacherous outlets, and is caught by the fatal noose. Some Indians go in couples to the chase. The sportsman who goes first carries in one hand a Caribou's antler; the other sportsman, who follows his leader closely, bears a bundle of twigs, which he rubs against the antler borne by his partner. When the herd perceives the approach of this remarkable object, it stands still in astonishment. The Indians creep up to the gazing Caribou till they are within range, then both fire their guns at once, then run toward

the herd, loading as they run, and discharge a second couple of shots. But these shots must be well directed in order to kill. In most cases, however, the pursuit of the Caribou is a long affair, for it is not only a very strong but a very enduring animal, and often leads its pursuers a chase of four or five days. A small herd of these animals was chased continually for a week, when the original hunters were tired out, and gave up the pursuit to a new party. Whenever practicable, the Caribou makes for the frozen lakes, and then it is sure to escape, although in a very clumsy and ludicrous fashion. Rushing recklessly forward, the Caribou will be suddenly startled by some object in front, and falls on the ice in a sitting posture, in which attitude it slides for a considerable distance before it can recover its feet. As soon as it does so, it rushes off in another direction, and with the same results. Still, the speed attained is so great that the hunters always give up pursuit when the animal gets upon ice.

During the greater part of the year, the flesh of the Caribou is dry and tasteless, and when eaten seems to have no effect in satiating hunger. There is, however, a layer of fat, sometimes two or three inches in thickness, that lies under the skin of the back and croup in the male, and is technically termed the *depouillé*. This fatty deposit is so highly esteemed that it outweighs in value the remainder of the carcass, including skin and horns. The marrow is also remarkably excellent, and is generally eaten raw. When pounded together with the *depouillé* and the dried flesh it makes the best pemmican, a substance which is invaluable to the hunter. Even the horns are eaten raw, while they are young and soft. The skin is very valuable, especially when taken from the young animal; and when properly dressed, it is an admirable defence against the cold and moisture of the inclement North.



CHAPTER XX.

THE TRUE DEER.

THE TRUE DEER—THE WAPITI—THE RED DEER OF EUROPE—THE VIRGINIA DEER OR CARCAJOU—THE PERSIAN DEER—THE INDIAN SPECIES—THE BARASINGA—THE AXIS DEER—THE SAMBUR—THE MANED STAG—THE HOG DEER—THE SOUTH AMERICAN SPECIES—THE PAMPAS DEER—THE RED DEER OR GUASUPITA.

THE True Deer range over the whole of the great continents, except that they do not go beyond 57° north in America, and a little further in Europe and Asia. In South America they extend over Patagonia, and even to Tierra del Fuego. They are found in the north of Africa, and over the whole of the Oriental region and beyond it, as far as the Moluccas and Timor.

GENUS CERVUS.

In this genus it is only the male animals which carry antlers. These antlers are round, and bear more or less numerous tines. The lachrymal grooves attain a considerable size. Many of the *forty* species comprised in this genus differ from each other so slightly that we give only those in which the difference is strikingly marked.

THE WAPITI.

The WAPITI, *Cervus Canadensis* (Plate XLI), is the largest of all the true Deer. The adult male measures nearly five feet in height at the shoulders, and about eight feet from the nose to the tail. It is very commonly known by the name of Elk.

The herds of Wapiti vary in number from ten or twenty to three or four hundred; but each one is always under the command of an old leader. When it halts, the herd halts; when it moves on, the herd follows; they all wheel right or left, advance and retreat with almost

military precision when it commands. The proud position of ruler is gained by dint of many a fight; and the combats are unusually fierce, often indeed ending in the death of one of the rivals. Sometimes both perish miserably; their branching horns become inextricably locked, and the two adversaries, united in a common fate, slowly succumb to hunger and thirst. When the antagonists meet, they do not push with their horns, but, backing from each other for about twenty feet, with blazing eyes, hair turned the wrong way, and heads lowered, rush together like knights in the tourney, with tremendous speed. At the moment of contact there is a snort of defiance, then a crash of horns, and then each backs off for a new start. This combative nature is retained even in captivity. Audubon relates the following anecdote: "A gentleman in the interior of Pennsylvania, who kept a pair of Wapiti in a large woodland pasture, was in the habit of taking pieces of bread or a few handfuls of corn with him when he walked in the inclosure, to feed these animals, calling them up for the amusement of his friends. Having occasion to pass through his park one day, and not having furnished himself with bread and corn for his pets, he was followed by the buck, who expected his usual gratification. The gentleman, irritated by its pertinacity, turned round and hit it a sharp blow, upon which, to his astonishment and alarm, the buck, lowering his head, rushed at him and made a furious pass with his horns. Luckily, the man stumbled as he attempted to fly, and fell between two prostrate trunks of trees where the Wapiti was unable to injure him, although it butted at him repeatedly and kept him prisoner for more than an hour." On the other hand, General Dodge says that, "in a close encounter with either man or dog, he is not to be compared for a moment, as a dangerous animal, with the common red deer."

These deer are great travelers, and when not molested walk in single file, but when disturbed, they run together like a flock of sheep; and then, when they again advance, form a wedge-shaped mass, the leader at the point. If this leader is shot, all the followers stop, huddle together, and seem to consult. Then another deer steps to the front, and acts as leader. This peculiarity of having to stop and select new leaders when one is killed, enables a good marksman to bring down several deer. "The gravest objection to this style of shooting," writes General Dodge, is that, nine times out of ten, the leader is a doe. The buck rarely takes the lead, and if he brings up the rear, it is because his fat prevents him

from running faster. His favorite position is in the middle of the herd, surrounded by admiring females." It is therefore very difficult to get a good shot at him.

The Wapiti is a good swimmer, and even when very young, will fearlessly breast the current of a wide and rapid river. Like many of the larger animals, it is fond of submerging itself under water in the warm weather for the sake of cooling its body and of keeping off the troublesome insects. It is also a good runner, and although burdened with its large and widely-branched horns, can charge through the forest haunts with perfect ease. In performing this feat, it throws its head well back, so that the horns rest on the shoulders, and shoots through the tangled boughs like magic. Sometimes a Wapiti will make a slight miscalculation in its leap; Mr. Palliser saw one strike a small tree so forcibly with its forehead that the recoil of the trunk threw the Wapiti on its back upon the ice of a stream which it had just crossed.

The food of the Wapiti consists of grass, wild pea-vine, various branches, and lichens. In winter it scrapes the snow with its fore-feet, so as to lay bare the scanty vegetation below. When alarmed or excited, it utters a peculiar whistling sound which may be heard at the distance of a mile on a clear quiet day. The buck's call for the doe is a deep bellow, said to be the natural E of the organ.

The flesh is in great favor among hunters, and the skin is also very valuable, being employed in the manufacture of mocassins, belts, thongs, and other articles in which flexibility and strength are required. The teeth are employed by the Indians in decorating their dresses, and a robe thus adorned, which belonged to Audubon, was valued as worth thirty horses. The horns also are used for various purposes, and it is said that in no two individuals are the horns precisely alike.

THE RED DEER.

The RED DEER or STAG, *Cervus Elaphus* (Plate XLII),¹ is one of the nearest kindred of the Wapiti. It is one of the most noble and stately of animals, and exceeds in size all others of this genus except the Wapiti. It is found in nearly every country of Europe except the far North, and in a great part of Asia, extending southward to the Caucasus and the mountains of Mantchooria. In all thickly inhabited regions it has been either exterminated or very much reduced in numbers. It is still abun-

dant, however, in Poland and Hungary, Styria, Carinthia, and the Tyrol. It prefers mountainous to level districts, and loves to frequent long stretches of forest. With regard to it in Great Britain, Wood writes: "In the olden days of chivalry and Robin Hood, the Red Deer were plentiful in every forest; and especially in that sylvan chase which was made by the exercise of royal tyranny at the expense of such sorrow and suffering. Even in the New Forest itself the Red Deer is seldom seen, and those few survivors that still serve as relics of a bygone age, are scarcely to be reckoned as living in a wild state, and approach nearly to the semi-domesticated condition of the Fallow Deer. Many of these splendid animals are preserved in parks or paddocks, but they no more roam the wide forests in unquestioned freedom. In Scotland, however, the Red Deer are still to be found, as can be testified by many a keen hunter of the present day, who has had his strength, craft, and coolness thoroughly tested before he could lay low in the dust the magnificent animal, whose head with its forest of horns now graces his residence."

The Red Deer forms troops of various sizes, divided according to sex or age. The females and calves usually keep together; the older stags form smaller bands, but the master-stags live alone till the breeding season comes on. At all times the herd, when traveling, follows a doe; the buck appears last of all. If we see in a herd several stout bucks, we can with certainty look for a still stouter one some five hundred paces behind. In winter the Red Deer comes down from the mountains, and when its horns are soft, it avoids the forests. The color varies slightly according to the time of year. In summer its coat is a warm reddish-brown, but in winter the ruddy hue becomes gray. The young, which are born about April, have their fur mottled with white upon the back and sides, the white marking gradually fading as they increase in size. The young deer, for a short time after its birth, is very helpless, and crouches close to the ground till it looks like a block of stone when it has been warned by its mother that danger is nigh.

All the movements of the stag are full of grace and dignity, and its speed, when it is in full gallop, is incredibly swift. Immense leaps are executed with sportive lightness, all obstacles surmounted, and lakes or streams crossed by swimming. Its senses of hearing, smell, and sight are highly developed; it can scent a man perhaps about six hundred yards off, and hears the slightest rustle made by its pursuer. Like many animals it seems to have a love for some kinds of music; the notes of a

flute will attract it, or at least bring it to a standstill. The stag does not seem possessed of much intelligence; it is shy, but not cautious; it acts without reflection when its passions are aroused. Although it has several times been partially tamed, and even trained to run in harness, the stag is a very unsafe servant, and at certain seasons becomes dangerous. In attacking, it uses its fore-feet with terrible effect, the hard, sharp-edged hoofs being formidable weapons.

Formerly, the stag was placed in Europe under the protection of the severest penalties, its slaughter being visited with capital punishment on the offender if he could be known and arrested. Indeed, a man who murdered his fellow might hope to escape retribution except by the avenging hand of some relation of the slain man, but if he were unfortunate or daring enough to dip his hands in the blood of a stag, he could hope for no mercy if he were detected in the offence.

THE VIRGINIA DEER.

The VIRGINIA DEER or CARCAJOU, *Cervus Virginianus* (Plate XLI), is a very beautiful species, remarkable for its peculiar horns, which are of moderate size, bent boldly backward, and then suddenly curved forward. Its color is a light reddish-brown in spring, slaty-blue in autumn, and dull brown in winter. The abdomen, throat, and chin are white. It is considerably smaller than the species which we have described above, seldom exceeding five feet and a half in length, or three feet and a quarter in height. It is found everywhere in North America from Canada to Mexico, and from the Atlantic Ocean to the Rocky Mountains. It has a strong attachment to certain localities, and if driven from its resting-place on one day, it will surely be found on the next day within a few yards of the same spot. Sometimes it chooses its lair in close proximity to some plantation, and after feasting on the inclosed vegetables, leaps over the fence as soon as its hunger is satiated, and returns to the spot which it had previously occupied. The animal, however, does not often lie in precisely the same bed on successive nights, but always couches within the compass of a few yards. It is a very good swimmer, and loves to immerse itself in rivers to get rid of ticks and mosquitoes. When swimming, only the head appears above the surface; and the creature moves so fast as to be hard to overtake by a

boat. Audubon gives the following anecdote: "We recollect an occasion when, on sitting down to rest on the margin of the Santee River, we observed a pair of antlers on the surface of the water, near an old tree, not ten steps from us. The half-closed eye of the buck was upon us; we were without a gun, and he was therefore safe from any injury we could inflict upon him. Anxious to observe the cunning he would display, we turned our eyes another way and commenced a careless whistle, as if for our own amusement, walking gradually toward him in a circuitous route, until we arrived within a few feet of him. He had now sunk so deep in the water that an inch only of his nose and slight portions of his prongs were seen above the surface. At length, we suddenly directed our eyes toward him, and raised our hands, when he rushed to the shore, and dashed through the rattling cane-brake in rapid style." It has been seen crossing broad rivers, and, when hard pressed by dogs, has even swum boldly out to sea.

In those parts of the country where it is unable to visit the plantations, the Carcajou feeds on the young grasses of the plains, being fastidiously select in choosing the tenderest herbage. In winter it finds sustenance on various buds and berries, and in autumn it finds abundant banquets under the oaks, chestnuts, and beeches; but, excepting in the months of August, September, and October, the Carcajou is in very poor condition. It is then, however, very fat, and the venison is of remarkably fine quality. It is in October and November that the buck becomes so combative, and in a very few weeks he has lost all his sleek condition, shed his horns, and retired to the welcome shelter of the forest.

The sight of the Carcajou does not seem to be very keen, but its senses of scent and hearing are wonderfully acute.

It is a thirsty animal, requiring water daily, and generally visiting some stream or spring at nightfall. It is remarkably fond of salt, and resorts in great numbers to the saline springs, or "salt-licks," as they are popularly termed. The Deer do not drink the briny water, but prefer licking the stones at the edge where the salt has crystallized from the evaporation of the water.

The Virginia Deer has been often tamed. A pair kept as pets by Audubon were most mischievous creatures. They would jump into his study-window, and when the sashes were shut would leap through glass and woodwork like harlequin in a pantomime. They ate the covers of his books, nibbled his papers, and scattered them in sad confusion,

gnawed the carriage-harness, cropped all the garden-plants, and finally took to biting off the heads of his ducklings and chickens.

The skin of the Carcajou is peculiarly valuable to the hunter, for when properly dressed and smoked, it becomes as pliable as a kid glove, and does not shrivel or harden when subjected to the action of water. Of it are formed the greater part of the Indian's apparel, and it is also employed for articles of civilized raiment.

As the Carcajou feeds, it always shakes its tail before it lowers or raises its head. So by watching the movement of the tail, the hunter knows when he may move toward his intended prey, and when he must lie perfectly quiet. So truly indicative of the animal is this habit, that when an Indian wishes to signal to another that he sees a Carcajou, he moves his fore-finger up and down. This sign is invariably understood by all the tribes of North American Indians.

THE PERSIAN DEER.

The PERSIAN STAG, *Cervus Wallichii*, differs from the Red Deer of Europe only in its heavier build, and by possessing a stronger development of mane on the neck. It is a magnificent animal, but calls for no further remark.

THE DEER OF INDIA.

The *five* specimens of the genus which we are now about to describe, are natives of the Eastern regions of the Old World, and each of them is regarded by some naturalists as the representative of a sub-genus.

THE BARASINGA.

The BARASINGA, *Cervus barasinga*, is the type of the so-called *Recurvus* group. The head is short and pointed, the ear large and very broad, the eye large and beautiful, the legs long but powerful. The antlers, although they cannot be called properly palmate, yet approximate to the form of the elk's horns, and are characterized not only by their breadth, but by their repeated ramifications. The coat is rich and thick, each hair being long and fine, but the general appearance is that of a rough fur. The color in summer is a golden-brown, with a dark streak along the back between two rows of small golden spots. Long bristles are scattered over the muzzle and around the eye.

The Barasinga is found in Farther India, but it is not known whether it prefers the mountains or the lowlands. It is lively and courageous, and, unlike most deer, it "bells" at all seasons of the year: its voice being a short bleat, very like that of a young goat.

THE AXIS DEER.

The AXIS DEER, *Cervus axis* (Plate XLI), is a species well known in India and Ceylon. The horns are placed on long footstalks, and simply forked at their tips. The color of the animal is a rich golden-brown with a dark stripe along the back between two series of white spots. The sides are covered with white spots arranged in oblique curved lines. It is nocturnal in its habits, and is not so active or restless as many other deer. It loves to lie in the low jungle-lands near a stream, where it sleeps all through the hot day. As far as marking and color go, the Axis Deer is the most beautiful of its race.

THE SAMBUR.

The SAMBUR, *Cervus Aristotelis*, is often regarded as the type of a sub-genus to which the name *Russa*—from a Malay word meaning "stag"—has been given. It is a large, powerful animal, quite as large as the Red Deer, and equally active. Its horns, like those of the Axis Deer, are set on a long foot-stalk, with a prong projecting forward just above the crown, and the tip forked. The color is a sooty-brown, with a patch of tan over the eyes. It is a savage and ill-tempered beast, and is found throughout India, and in Sumatra and Malacca.

THE MANED STAG.

The MANED STAG, *Cervus hippelaphas*, is scarcely inferior to the Red Deer in size, and possesses the usual characteristics of the Russine group in the formation of its horns. The color of its coat varies with the seasons. In summer it consists of rough, sparse hair of a brownish-fawn color which is hard to describe. Both sexes are of the same color, even the young ones do not possess the dappled coats which distinguish the young of most of the *Cervidæ*. The buck is conspicuous by a strong mane which develops itself on the lower part of the neck and chin.

As far as is known, this deer is confined to the islands of Java, Sumatra and Borneo, and in India, where it is found in abundance, but in small

herds. It lies in the long jungle-grass during the heat of the day, and at nightfall begins to browse. It is very fond of water, drinking frequently. It runs with great swiftness and endurance, but interrupts its extended gallop by frequent short leaps or bounds. When walking, its pace is stately, like the so-called Spanish pace sometimes taught in the riding-school. It lifts its foot carefully, stretches it out before it and sets it gracefully down, accompanying each step with a corresponding movement of the head.

The chase of this deer is a favorite amusement of the Javanese princes, who use only sword and spear to kill it, or running nooses to capture it alive.

THE HOG-DEER.

The HOG-DEER, *Cervus hylaphus*, is the representative of a sub-genus *Hylaphus*, and is one of the clumsiest-built species. Its body is thick, the legs, neck, and head short; the antlers are short, thin, and three-pronged, and stand wide apart. The usual color is a beautiful coffee-brown, darkening in the male to deep black-brown. In all the Hog-deer some traces of dappled marks can be discovered, but in the young these spots are larger and clearer. In Bengal it is often hunted on horseback, and killed by the stroke of a sword. The venison is said to be excellent.

SOUTH AMERICAN DEER.

South America is the home of a species of deer which is by some naturalists regarded as the type of a genus *Blastoceros*, which is characterized by upright horns with three or five prongs.

The PAMPAS DEER, *Cervus campestris*, is the best known variety. It attains a length of four feet and a half, and a height of about three feet. Its coat is thick, rough, and shining, of a reddish-brown color on the back, but gray on the abdomen; the tip of the tail is pure white, and a white ring surrounds the eye, and white spots mark the upper lip.

The greater part of South America is the home of this very common deer. It loves open and dry plains, and even when chased, avoids swamps and woodlands. Its senses are very acute, and its movements active, so that if it has a start, the best horse cannot overtake it. By day it hides itself in the long grass, and lies so still that one may ride

close past it without rousing it. It is usually taken by the lasso. The hunters form a half-circle, and wait till another party with dogs drive the game towards them. The lasso is then thrown over the horns or around the feet. The native name of this deer is Gua-zu-y.

The GUASUPITA, *Cervus rufus*, may be regarded as a representative of a group to which the title *Subulo* has been given, and which is characterized by moderate size, slender build, and two short, often rudimentary horns. These horns are thick at the root, but end in a sharp point. All the animals of this group have a rather long, well-haired tail. The Guasupita stands about two feet high, and attains a length of three feet and a half. The neck is short and slender, the ears large but not especially long, the eyes small and lively, the tear-grooves almost invisible, the limbs tall, slender, and very gracefully built. The prevailing color is a yellowish-brown, which becomes grayish on the forehead, and quite gray on the lower side of the body.

This deer inhabits Guiana, Brazil, and Peru. They live on the plains as well as on the mountains, preferring everywhere forest-land, and avoiding the open country. They do great injury to any plantations in their neighborhood, destroying the melon-shoots, the young corn, and the beans. They display great caution and timidity in commencing their forays, looking carefully around, and at the slightest alarm plunging back into the woods. Their pace is swift, but they have little endurance, and can be ridden down by a well-mounted horseman.



CHAPTER XXI.

THE FALLOW DEER, ROE DEER, AND MUSK DEER.

THE GENUS DAMA—FALLOW DEER—GENUS CAPREOLUS—ROE DEER—GENUS CERVULUS—MUNTJAK OR KIDANG—GENUS MOSCHUS—MUSK DEER—ITS ABODE—HABITS—THE MUSK.

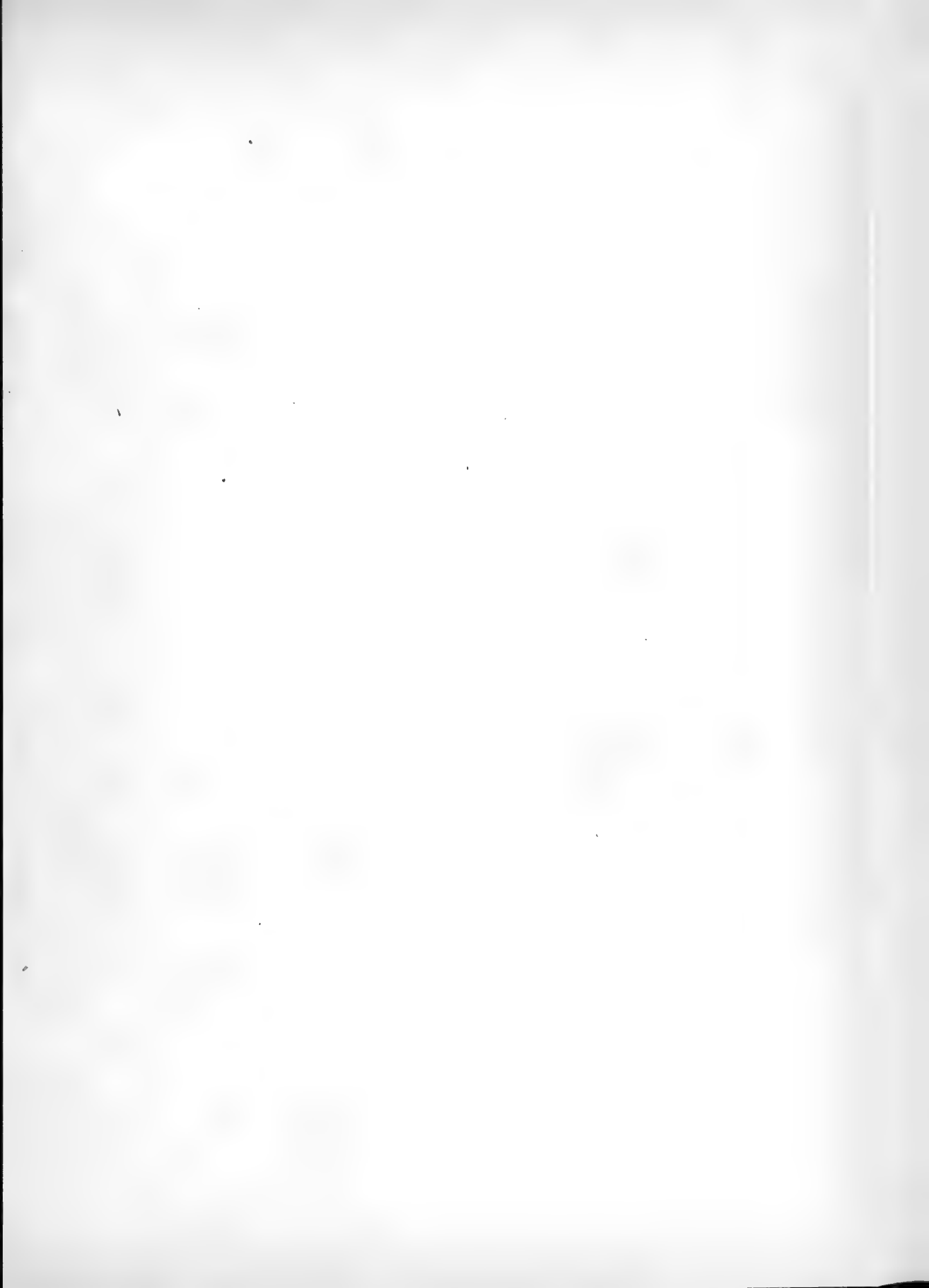
WE conclude our account of the *Cervidæ* with some Old World genera which have no representatives either in North or South America. The animals contained in them are less in size than those we have been describing, but if they are less stately, they are quite as beautiful and graceful as the magnificent animals we have mentioned in our previous chapters.

GENUS DAMA.

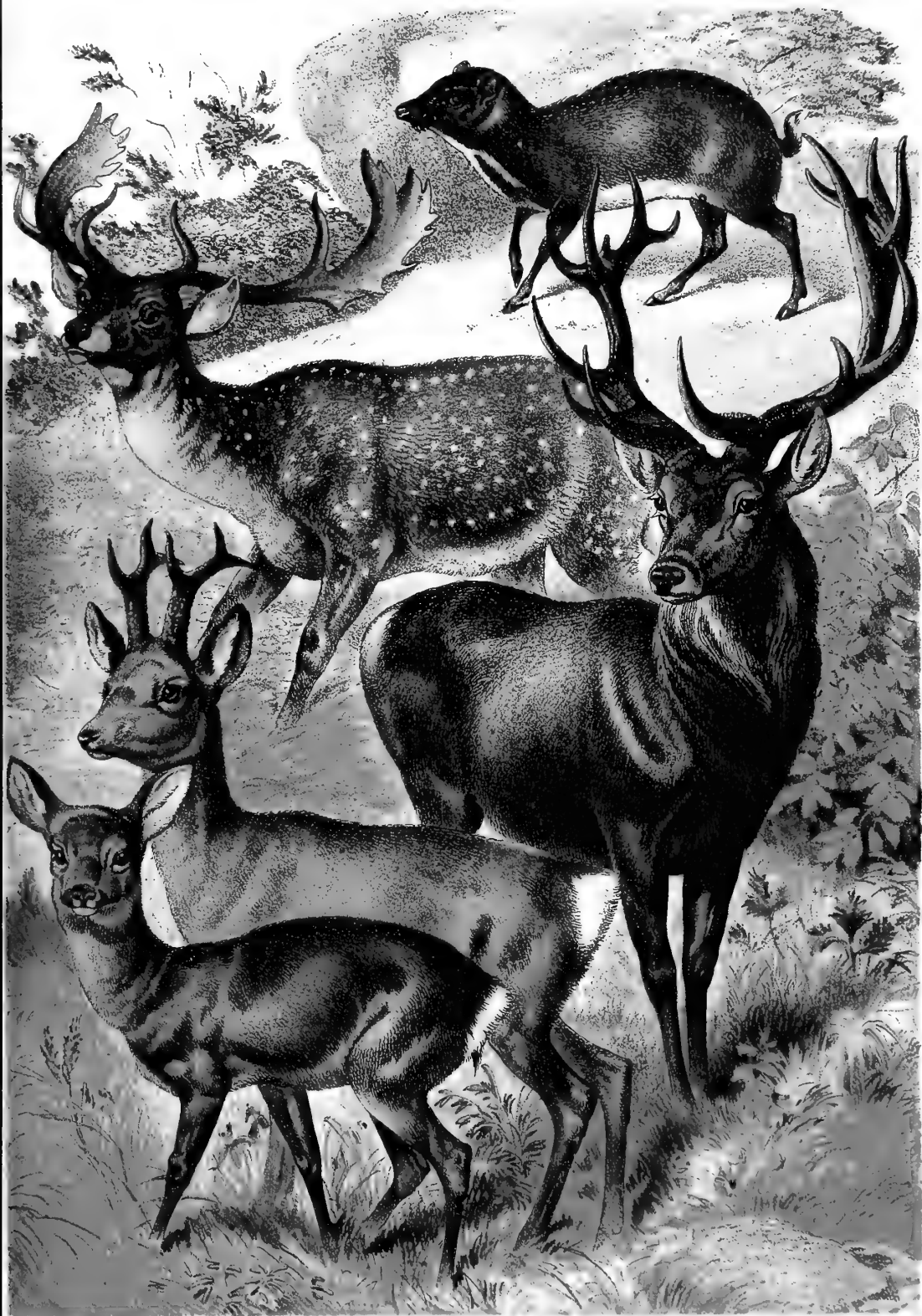
The *only* species of this genus is distinguished from the Stag by its spreading palmated horns and its spotted coat. In the latter respect it resembles the *Axis*; in the former, the Reindeer: and some naturalists place it next to the *Tarandus* in their classification.

THE FALLOW DEER.

The FALLOW DEER, *Dama vulgaris* (Plate XLII), seems to have spread over Europe from the shores of the Mediterranean Sea. It extends to the south of those inland waters as far as the northern limits of the desert of Sahara; it is found in Tunis, the Greek islands, Sardinia, and Spain. It does not love the severe climates of the North, and does not venture beyond Southern Norway and Sweden. It is, at the present day, most numerous in England; it is not even there in a wild state, but







MOUSE DEER

FALLOW

STAG

ROEBUCK

PLATE XLII UNGULATA



kept in the parks of the large landowners, where it adds much to the beauty of the scene. Soft slopes of undulating land, where the grass is short and thick, alternating with shady dells, where the fern grows high, are its favorite haunts. There is hardly a more interesting sight than a herd of these graceful and active creatures, either lying calmly under the shadow of a broad clump of trees, or tripping along the sward under the guidance of their leaders, the old and sober proceeding at their peculiarly elastic trot, and the young fawn exerting all kinds of fantastic gambols by way of expressing the exuberance of youthful spirits. The color of the animal is a reddish-brown, spotted with white, with two or three white lines on the body, and dark rings round the muzzle and the eyes. The legs are shorter and less powerful than those of the stag, and the body is proportionately stouter, the neck is shorter, and the tail considerably longer. There is often great variety of color in the Fallow Deer; specimens of a pure white color are not uncommon, but black ones are very rare. In its habits it resembles the stag, but as it is always seen in a state of comparative domestication, it is less shy and timid. It runs very fast, and is an excellent leaper. It forms larger or smaller herds, in which there is always one master-deer, who often couches alone in solitary state, apart from the rest of the herd, and accompanied by a few chosen does whom he honors with his preferences. In his absence, the herd is commanded by the younger bucks, but they take care to keep out of his way when he condescends to join the community.

The food of the Fallow Deer consists chiefly of grass, but it is very fond of bread, and will sometimes display a very curious appreciation of unexpected dainties. They have often been seen to eat ham-sandwiches in spite of the mustard, and enjoy them so thoroughly that they pushed and scrambled with each other for the fragments as they fell on the ground. At Magdalen College, Oxford, where many deer are kept, it used to be a common amusement to tie a crust to a piece of string, and let it down to the deer out of a window. The animals would nibble the bread, and as it was gradually drawn aloft by the string, would raise themselves on their hind-legs, in order to reach it. But when the master-deer loomed in the distance, all retired, leaving him to eat the bread in solitary state. It was curious to see how a single deer would contrive to take into her mouth the entire side of a "half-quartern" loaf, and though it projected on each side of her jaws, would manage, by dint

of patient nibbling, to swallow the whole crust without ever letting it drop out of her mouth.

The Fallow Deer display great susceptibility to music; even the wildest will come near and listen to the notes of a horn. Sportsmen in Germany sometimes avail themselves of this taste for melody to allure the poor creature within range of the gun.

It is from the Fallow Deer that the best venison is procured, that of the stag being comparatively hard and dry. The skin is well known as furnishing a valuable leather, and the horns are manufactured into knife-handles and other articles of common use. The shavings of the horns are employed for the purpose of making ammonia, which has therefore been long popularly known under the name of hartshorn. The height of the adult Fallow Deer is about three feet at the shoulders. It is a docile animal, and can be readily tamed. Indeed, it often needs no taming, but becomes quite familiar with strangers in a very short time, especially if they should happen to have any fruit, bread, or biscuit, and be willing to impart some of their provisions to their dappled friends.

GENUS CAPREOLUS.

The Roe Deer inhabits all Temperate and Southern Europe to Syria, with a distinct variety in Northern China. We will confine our remarks to the best known of the *two* species.

THE ROE DEER.

The ROE DEER, *Capreolus vulgaris* (Plate XLII), is smaller than the Fallow Deer, being only two feet and a quarter in height at the shoulder. The antlers rise up straight, without any prong projecting forward over the eye, and fork rather than branch, throwing out one prong in front, and one or two behind, according to age. The antler, from the base to the first fork, is thickly covered with wrinkles. The head is short, the neck slender and longer than the head, the fore-quarters powerful, the legs long and slender; the eyes are large and lively, with long lashes on the upper lid, the lachrymal groove very small; the ears are of moderate length, and stand wide apart. The thick coat of the Roebuck alters according to the season. In summer the back and sides are of a reddish-

brown, in winter of a brownish-gray color, but the lower side of the body is always lighter colored. The fawns, as is usual with nearly all deer, display white or yellow dapplings. Milk-white Roes are by no means unfrequent, and in Germany raven-black specimens have been seen by some sportsmen.

The Roe Deer is found in all Europe, except the high North, and in the greatest part of Asia. It prefers to frequent the larger forests, whether they are on the plain, or on the mountains, provided that the underwood is thick, and that there is plenty of shade. It seeks the higher grounds in summer, and descends in winter to the low lands. In Siberia this change of dwelling assumes the character of a regular migration. It possesses a much greater love of liberty than the Fallow Deer does, and seeks change of abode, of food, and of society. In its motions it is active and graceful. It can execute astonishing leaps, crossing without apparent exertion wide ditches and high hedges. It swims well. All its senses are keen, and it is very cautious and shy. It is more irritable and worse-tempered than the stag, and in old age becomes dangerous and not to be trusted.

The Roe Deer never forms large herds like the Red Deer. During the greater part of the year it lives in family fashion, usually with only one doe; but in winter occasionally several of these families unite and live together. The food of the Roe Deer is nearly the same as that of the Stag, but it selects the more tender plants. Leaves and young shoots, green corn, and the like, constitute its favorite diet. Pure water is a necessity, and it is fond of licking salt.

Speaking of this animal, Mr. St. John makes the following remarks. After stating that when captured young it can readily be tamed, he proceeds to say:

“A tame buck becomes a dangerous pet, for after attaining to his full strength, he is very apt to make use of it in attacking people whose appearance he does not like. They particularly single out women and children as their victims, and inflict severe and dangerous wounds with their sharp-pointed horns. One day, at a kind of public garden, I saw a beautiful but small Roebuck in an enclosure fastened by a chain which seemed strong enough and heavy enough to hold down an elephant. I asked the reason for this cruel treatment of the poor animal. The keeper of the place informed me that small as the Roebuck was, the chain was quite necessary, as he had attacked and

killed a boy of twelve years old a few days before, stabbing the poor fellow in fifty places with his sharp-pointed horns. Of course I had no more to urge in his behalf."

GENUS CERVULUS.

The *four* species of this genus are found in all the forest districts of the Oriental region, from India and Ceylon to China, as far north as Ningpo and Formosa, and as far south as the Philippine Islands, Borneo, and Java. They are all small animals, and have very short imperfect horns. The distinguishing characteristics of the genus consist in the possession of two large tusk-like canines in the upper jaw, and in an extraordinary development of the cranial bones which form elongated pedestals for the support of the two pronged horns; the forehead is marked with three deep vertical folds of skin.

THE MUNTJAK.

The MUNTJAK or KIDANG, *Cervulus muntjak*, the best known species, is about the size of the Roebuck. It is rather slenderly built, with a compact body, moderately long neck, short head, long and fine limbs, and a short hairy tail. The coat is short, smooth, and thick; the color a yellowish-brown, darkening into chestnut on the middle of the back. The inner sides of the limbs, as well as the chin and throat, are white. The antlers are cream color.

Sumatra, Java, Borneo and Banca, and the Malay Peninsula, are the homes of the Muntjak. Horsfield writes: "The Muntjak selects for its resort certain districts to which it forms a peculiar attachment, and which it never voluntarily deserts. Many of these are known as the favorite resort of the animal for several generations. They consist of moderately elevated grounds diversified by ridges and valleys tending toward the acclivities of the more considerable mountains or approaching the confines of extensive forests." "The Kidang," the same author observes, "is impatient of confinement, and is not fitted for the same degree of domestication as the stag. It is, however, occasionally found in the enclosures of natives and Europeans, but requires a considerable range to live comfortably. It is cleanly in its habits, and delicate in the choice of food. The flesh affords an excellent venison. The natives eat

the males, but have an aversion to use the females as food." The Muntjak is monogamous, and whenever a troop of them is seen, it proves to consist of the members of a single family.

The Kidang is regularly hunted by the Javanese. It leaves a good scent, and can be easily followed by hounds. When it sees itself pursued, it does not, like the stag, run straight onward, but, after a short burst at its highest speed, it slackens its pace and describes a large curve calculated to bring it back to its original starting-point. The natives assert that it is a weak, lazy creature. If it is followed up perseveringly, it will finally push its head into a thick bush, and stand there motionless, as if it were in complete security. The dogs used in the chase are commonly the half-wild Paria dogs. The Muntjak, when brought to bay, knows how to make good use of his small antlers, and makes many a hound bite the dust. In the island of Banca the favorite method of taking the Kidang is by driving it into a space between two long hedges which gradually come nearer to each other, and are furnished at the narrow exit with nooses suspended from the trees. The Kidang is driven in by dogs, and as he attempts to escape, is caught by the horns.

GENUS MOSCHUS

The members of this hornless genus are sometimes classed as a distinct family, but they differ in no important points of organization from the rest of the *Cervidæ*. They are found in Central Asia from the Amoor River to the Himalayas and the Siamese mountains, above eight thousand feet elevation.

THE MUSK DEER.

The MUSK DEER, *Moschus moschiferus* (Plate XL), is the *only* species known. It is about the size of the Roebuck, but stands lower in the front than the hind quarters. Its legs are slender, the neck short, the head rounded at the muzzle, the eyes of moderate size with long lashes, and the ears are oval. The hoofs are small and narrow, but can be extended by means of a fold of skin between the two parts so that they form, in connection with the false-hoofs which reach to the ground, a sure support for the animal on the snow-fields and glaciers. The coat is thick and close, becoming longer at each side of the breast, and on the

throat; the hairs forming it are stiff, long and twisted, and display the most perfect cellular structure of all kinds of hair. The color of these deer is various; hardly two specimens can be found alike in this respect. Some are dark, some a dirty-white, others reddish-brown, others yellowish-brown, while others have longitudinal lines of light-colored spots on the back. The canine teeth project, in the male, outside of the mouth, and are curved backward; these tusks are sometimes as much as three inches in length. Both sexes are devoid of horns.

The popular as well as scientific name of this deer is derived from the possession of a powerfully odorous secretion. The musk-pouch lies near the navel, and communicates with the air by two small openings. Small glands placed in the interior of this pouch secrete the musk: the average quantity found in an animal when at maturity is thirty grammes, or four hundred and fifty grains Troy. The secretion when dried becomes a granular mass, which at first is reddish-brown, but finally darkens to a coal-black shade. The odor decreases as the musk becomes darker, and is quite destroyed by mixture with sulphur or camphor. If burnt, it gives out an offensive smell.

Neither the Greeks nor the Romans, although they were curious about all kinds of odoriferous substances, knew anything about this animal. On the other hand, the Chinese have used this musk for thousands of years. Our first knowledge of it came from the Arabs. Aboo Senna writes that the best musk came from Thibet, and was produced by an antelope-like creature which had two projecting tusks. Marco Polo, the celebrated Venetian traveler, describes the animal, and calls the musk "the finest balsam known by man."

The Musk Deer is found most abundantly on the Tibetan slopes of the Himalaya, near Lake Baikal, and in the mountains of Mongolia. Here they are killed by hundreds. In the Western Himalaya they are found in the lower part of the range, never in herds, but usually in pairs. They love grassy slopes that are near thickets, in which they can hide by day, for they only venture at twilight to visit the treeless feeding-grounds. Although the deer is eagerly pursued on account of its musk, yet it is by no means timid, and seldom runs away, unless molested. Its gait is a series of short leaps followed by a brief pause. When it is at liberty, it has never been heard to utter a sound; it does not even call for its mate, but when captured, it utters a kind of scream. Its tracks are very remarkable, as both the false hoofs leave a clear impression.

All its movements are quick; it runs like an antelope, leaps like a goat, and climbs like a chamois; it swims broad streams, and crosses, almost without leaving a trace, fields of snow in which any dog will sink.

In Siberia the chase of the Musk Deer is an important branch of industry; the usual method is by fixing running nooses in places through which the deer is driven. The flesh is uneatable by Europeans. It is the musk-pouch which rewards the hunter. Official reports give the numbers of Musk Deer killed in Siberia every year, as fifty thousand, of which nine thousand are males. The best musk, however, is not from Siberia, but from China. It is very much adulterated by the Chinese dealers before it reaches the markets of Europe.

GENUS HYDROPOLIS.

This is a new genus, of *one* species, discovered by Mr. Swinhoe. It inhabits China from the Yang-tse-Kiang northward. Its nearest affinities are with *Moschus*. Other new forms inhabiting North China are *Lophotragus*, which is hornless, and *Elaphodus*, which has horns about an inch long.



CHAPTER XXII.

THE GIRAFFE.

THE CAMELOPARDALIDÆ OR GIRAFFES—ITS SIZE AND APPEARANCE—ITS HABITAT—ITS ADAPTATION TO ITS LOCATION—ITS MOVEMENTS—ITS FOOD—ITS SENSES—GIRAFFES IN LONDON AND PARIS—MODES OF HUNTING—MEANING OF THE WORD “GIRAFFE.”

THE family CAMELOPARDALIDÆ or Giraffes, now consist of but a *single* species of a *single* genus, which ranges over all the open country of Africa. It is almost entirely absent from West Africa, which is more especially a forest district. During early epochs of the world's history, these animals had a wider range. Extinct species have been discovered in Greece, in the Siwalik hills of Western India, and in the island of Perim in the Red Sea, while an extinct genus *Helladotherium*, more bulky but not so tall as the Giraffe, ranged from the South of France to Greece and Northwestern India.

GENUS CAMELOPARDALIS.

The name of this genus was given to the remarkable animals that bear it because the ancient writers saw in it a “mixture of the Camel and the Leopard.” It is one of those strange forms which men may be excused for having believed to be fabulous. Even at the present day, neither education nor experience diminishes the astonishment with which we view this extraordinary creature. Tallest of all the dwellers upon earth, it raises its stately head far above any animal that walks upon the surface of our globe. It seems, indeed, to be rather the fancied form of something devised by the brain of an eccentric artist, than an animal who lives, moves, and has its being among the creations with which we are familiar. Its singular proportions and the peculiarity of its gait, as well as its variegated coat, have always excited curiosity.

THE GIRAFFE.

The GIRAFFE, *Camelopardalis girafa* (Plate XLIII), is the *only* representative of the family. The enormously long neck, the tall legs, the finely formed head with large, beautiful clear eyes, and two peculiar cranial excrescences covered with skin, are its leading characteristics. Its total length is about seven feet and a half, but its height to the shoulder is fully ten feet, and to the head eighteen to twenty feet. The tail, including the tuft of hair at its termination, is about forty inches long. From the muzzle to the root of the tail the distance is nearly fourteen feet. The weight is about one thousand one hundred pounds. These proportions alone are striking, but its construction is as remarkable as its size. The Giraffe seems made out of portions of different animals. The head and body resemble those of the horse; the neck and shoulders, those of the camel; the ears, those of the ox; the tail, that of the ass; the legs are imitations of those of the antelope; the color and markings are borrowed from the panther. The result naturally is, a certain want of symmetry. The short body is out of proportion with the neck and legs; the sloping back is no beauty; even its height does not give it grace. The head is beautiful, the eyes wonderful, the markings agreeable; but the whole is peculiar.

The eyes of the Giraffe are large, vivacious, brilliant, and yet soft; they are *spiritual* eyes. The ears are well-formed, and very movable. Between the two cranial developments which are commonly called horns is a round protuberance, almost like a third horn. The neck is as long as the fore-legs. It is thin, and adorned with a mane, but possesses only seven vertebræ, the same number as is found in ordinary animals. The body is broad at the chest, the withers much higher than the rump; the almost vertical shoulder-blades are very distinct. The legs are of almost equal length; it is to the elongation of the shoulder-blades that the height of the fore-quarters is due. The hoofs are small and fine. On the knee-joints are callosities like those of the camel. The skin is very thick and very smooth, except the mane, the tail-tuft, and two tufts of dark hair, which adorn the "horns." The ground color of the coat is a sand-yellow, becoming darker on the back, and passing into white on the belly; on this ground are placed large, irregular, angular spots of a brownish color, so closely arranged that the yellow tints appear like network. These marks are smaller on the neck and limbs.

The mane is streaked fawn-color and brown, the front of the ears is white, the back brownish; the tufts of hair are black. Males, when they grow old, become darker; the females lighter, as if bleached.

The Giraffe is a silent animal, and has never been heard to utter a sound even when in the agonies of death. In its native land it is so strongly perfumed with the foliage on which it feeds, that it exhales a powerful odor, which is compared by Gordon Cumming to the scent of a hive of heather honey.

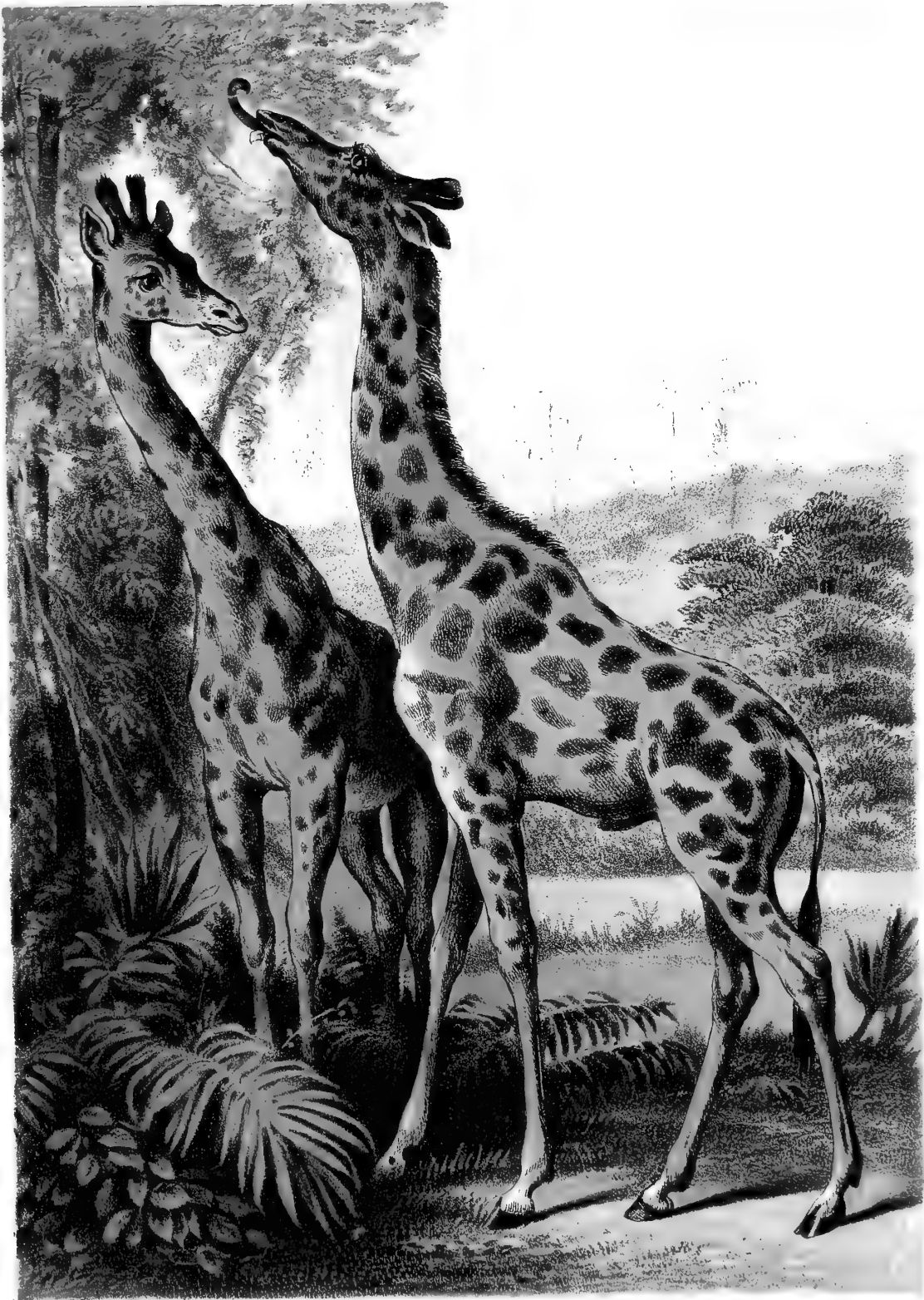
In the present day, the Giraffe inhabits Africa, between the 17th degree north latitude, and 24th degree south latitude, commencing with the southern border of the Sahara, and ending at the Orange River. It is found in Abyssinia, Darfour, Kordofan, and on the White Nile, but does not appear in Senegambia, or on the Congo. Its home is on the wide plains, and is defined by the growth of various kinds of mimosa. It is never seen in mountainous or forest-clad districts.

In its native haunts, the marvellous adaptation of the animal to its abode is clearly perceptible. "When one sees a herd of Giraffes," writes Gordon Cumming, "in a grove of the picturesque spreading mimosas which ornament the plains, and of which it can reach the topmost twigs, one must be lost to all sense of natural beauty if the sight is not an attractive one." All other observers agree in this remark. "No animal in the whole world," says Baker, "is so picturesque as the Giraffe in its native dwelling-place." The harmony in color between the animal and the trees on which it browses is striking. "Often have I," says Cumming, "been in doubt respecting the presence of a whole herd of Giraffes till I examined them with a telescope: even my native attendants confessed that their sharp trained eyes were, at times, deceived; they often took the tree stems for Giraffes, and Giraffes for old trees." When they are seen on the treeless plain, at the edge of the horizon, when the evening sunlight is shining, they seem supernatural creatures. Usually they are found in small troops of six or eight, but occasionally, where it feels itself safe, in larger numbers. Gordon Cumming met bands of thirty and forty, but gives the average number as sixteen. Baker saw herds of sixty to hundred. Brehm never saw more than three together.

The movements of the Giraffe are peculiar. It is seen to most advantage when walking quietly; it is then dignified and graceful. It advances with a slow, measured pace, moving the two legs of the same side. When galloping it is by no means graceful. "The Giraffes when







GIRAFFE

PLATE XLIII. UNGULATA.



running away," writes Liebtenstein, "presented such an extraordinary sight, that with astonishment and laughter I forgot the whole chase. With the disproportion between the fore and hind quarters, and between the height and the length, quick movement presented great difficulties. It cannot trot; it can only gallop. And this gallop is so awkward and clumsy that, judging by the slowness with which the limbs are moved, one would fancy that a man could overtake it on foot. But this slowness is compensated for by the length of the stride, for each stride measures fourteen to eighteen feet. The peculiar formation of its fore-quarters compels it to throw back its neck in order to throw the centre of gravity away from the fore-legs. Every movement of the neck is accompanied by a spring of the hind-legs. Thus the neck keeps swinging to and fro, like the mast of a ship rolling." At the same time it lashes its sides with its long tail, and often turns its head to look with its lovely eyes whether its pursuers are drawing nigh.

Most extraordinary is the position assumed by the Giraffe when it has to lift anything from the ground, or to drink. It spreads its fore-legs out wide apart from each other, till it can reach the ground with its long neck. When it lies down, it first sinks on its fore-knees, and then draws up its hind-legs, finally resting on its breast like the camel. It sleeps lying on one side, with its head on its hind legs. Its sleep is light, and only of short duration. It can go for several days without sleep, and seems to repose standing. The Giraffe is not adapted to eat grass, but to strip leaves from the trees. For this purpose its uncommonly flexible tongue is of as great service as the trunk is to the elephant. It can take up with it the smallest object, and pluck the most tender leaf. "In our Zoological Gardens," Owens writes, "many a lady has been robbed by the Giraffes of the artificial flowers in her bonnet. The animal is guided in the selection of food less by the smell than by the eye, and hence it is often deceived when it has seized artificial flowers with its pliant tongue. In its wild state it consumes chiefly twigs, buds, and leaves of the mimosa. In South Africa the "wait-a-bit" thorn and camel-thorn constitute most of its diet; in North Africa the Karrat-mimosa or the climbing plants which cover the trees are eagerly devoured by it. As the trees just mentioned are not taller than the Giraffe, it easily procures its food, for its lips and tongue are as insensible to the needle-like thorns as the camel's. It seldom eats grass, but does not despise it when it is green. When its food is juicy, it can do with-

out water for a long time, and hence when the leaves are fresh, it is met with in places where there is no water for miles. But in the dry season, when the foliage is parched, it goes long distances to pools or ponds in the river beds. The Giraffe stands up while it chews the cud; it chiefly ruminates by night, and does not spend much time in the process.

The senses of the Giraffe, especially those of sight and hearing, are highly developed. Its intellectual qualities are not inferior. It is prudent and cautious, very amiable and good-natured. It is a peaceful, gentle creature, that lives in harmony not only with its own kind but with other animals. In case of need it defends itself with courage, striking powerful blows with its long, sinewy legs. It is in this fashion that the males fight with each other, and that the female defends her young from the crouching *Felidæ*; she has been known to knock down even a lion. The keepers of menageries have often to be on their guard, although they generally are on good terms with the Giraffe. It is full of curiosity, and seems to be gratified by the presence of visitors, whom it investigates with an air of great interest. It was a little more than fifty years since Giraffes were first seen alive in Europe, after a very long interval. The Pasha of Egypt heard that the Arabs of Senaar had brought up a pair of Giraffes on camel's milk; he ordered them to be brought to Cairo, and resolved to send them as presents to the kings of England and France. They arrived at their destinations in 1827, and in Paris, fashions *à la girafe* became in vogue. Since then, numerous specimens have been imported, most of them being brought from the country between the Blue Nile and the Red Sea. At present, the Arabs do a regular and profitable trade in catching and selling these animals. Twenty-four were sent to Germany alone in 1874. The Giraffes require great attention when kept in captivity. They are attacked with a disease in the bones, which is named "Giraffe-sickness." It arises from want of exercise and proper food. Plenty of room and a warm surface to stand on are indispensable requisites for its health. Hay, carrots, onions and different vegetables form its principal diet in captivity, but to this provender the keeper ought to add some tannic acid, a substance in which the mimosa is very rich.

The Giraffe is an object for the native as well as the European hunter. The former hunt it on horseback, and when they overtake it, cut the tendon Achillis. They esteem its flesh very highly. Europeans usually stalk it—a difficult task, as the animal's enormous length of neck

enables it to see for a great distance. The natives employ the pittali also. For this purpose a very curiously constructed pit is dug, being about ten feet in depth, proportionably wide, and having a wall or bank of earth extending from one side to the other, and about six or seven feet in height. When the Giraffe is caught in one of these pits, its fore-limbs fall on one side of the wall, and its hind-legs on the other, the edge of the wall passing under its abdomen. The poor creature is thus balanced, as it were, upon its belly across the wall, and in spite of all its plunging, is unable to obtain a foothold sufficiently firm to enable it to leap out. The pitfalls for the capture of the hippopotamus and the rhinoceros are furnished with a sharp stake at the bottom; but it is found by experience that, in the capture of the Giraffe, the transverse wall is even more deadly than the sharpened stake. The Giraffe is easily traced by its "spoor," or footmarks, which are eleven inches in length, pointed at the toe and rounded at the heel. The pace at which the animal has gone is ascertained by the depth of the impression, and by the scattering of disturbed soil along the path.

The slain Giraffe is used for many purposes. Its skin is made into leather, its tail-tuft forms a fly-flapper, its hoofs are worked up like horn. Yet it must be said, for the credit of the natives of Africa, that they pride themselves more on possessing living than dead Giraffes. In the villages of the interior, the traveler will often see a pair of Giraffes raising their gentle heads high over some garden-wall, or else walking about the streets like cows. When Brehm was traveling on the Blue Nile, a Giraffe came to the boat as if to welcome him. It approached with perfect confidence, and eat bread out of his hand as if it had been an old acquaintance. It came every day afterward to be caressed. The name Girafe, the naturalist adds, is a corruption of the Arabic Serâfe, which means the "lovable," and fitly designates this noble creature.



CHAPTER XXIII.

THE HOLLOW-HORNED RUMINANTS.

THE BOVIDÆ—THE THIRTEEN SUB-FAMILIES—THE BOVINÆ—THE GENUS BOS—THE DOMESTIC OX—
THE WILD CATTLE—THE CATTLE OF THE PAMPAS—CATTLE OF AFRICA—DOMESTIC CATTLE—
THE HIGHLAND CATTLE—THE DURHAM—THE ALDERNEY.

THE large and important family BOVIDÆ includes all the animals commonly known as oxen, buffaloes, antelopes, sheep and goats. Some naturalists have classed them in three, some in four or five distinct families. Zoologically, they are all briefly and satisfactorily defined by the words with which this chapter is headed, "hollow-horn ruminants," and although they present wide differences in external form, they pass so insensibly into one another, that no satisfactory definition of the smaller family-groups can be found. As regards the distribution of the family it may be said that, as a whole, they are almost confined to the great Old World continent, only a few forms being found in North America. Different types prevail in different regions; thus, antelopes prevail in Africa, sheep and goats in the northern parts of Europe and Asia, and oxen are perhaps best developed in the far East.

Following the arrangement adopted by Wallace from Sir Victor Brooke, we subdivide the family into *thirteen* sub-families. The first of these sub-families BOVINÆ is one of the best marked groups in the family. It comprises the Oxen and Buffaloes, and their allies, and has a distribution very nearly the same as that of the whole family. The animals comprehended in it are large and strong; their chief characteristic being more or less round and smooth horns, a broad muzzle, with nostrils wide apart, and a long and tufted tail. The udder of the females has four teats. The skeleton displays a thick and powerful form. The skull is broad at the brow, and slightly narrowed in at the muzzle. The orbits of the eyes are round and project laterally; the processes on which the horns are placed grow from the back part of the skull. The smooth and

round horns have, in many cases, wrinkles about the base. The coat is usually short and smooth, but in some species forms a mane-like growth on certain parts.

Slow and awkward as the *Bovinae* appear, they are capable of quick movements. They are all good swimmers, and cross broad streams without hesitation. Their strength is extraordinary, and their endurance wonderful. Their sense of smell is good, so also is that of hearing; but their powers of sight are not highly developed. The wild species display more intelligence than the domesticated ones. In general, they exhibit a gentle and confiding disposition toward all animals which do not annoy or threaten them, but show the highest courage and fierceness toward beasts of prey, and usually use their terrible horns so effectively as to come off victorious. The sub-family BOVINÆ contains *six* genera, the first of which contains our domestic ox.

THE OX.

There has been considerable dispute concerning the origin of these patient and useful creatures. Ratimeyer asserts that three different wild stocks have given rise to the forty or fifty varieties of domestic oxen. He supposes that the Broad-faced Ox is the progenitor of the Norwegian Mountain-Ox; the Long-faced Ox, of the cattle which existed in Switzerland during the Stone Age, and which the German naturalist believes were introduced into Britain by the Romans; while the *Bos primigenius*, or Original Ox, has produced the cattle found on the continent of Europe.

GENUS BOS.

The DOMESTIC OX, *Bos taurus*, has been so modified in form, habits, and dimensions by long intercourse with mankind, that it has developed into many permanent varieties. We regard the genus as containing only *one* species. We will begin our description with the European varieties, from which our own domestic cattle are descended, and reserve an account of the Domestic Ox of India for a subsequent chapter (Chap. XXV), in which we speak of the Indian Wild Cattle of the genus *Bibos*.

The variety which approaches most nearly to the original species is still preserved in a half-wild state in some parts of England and Scotland. The most celebrated herds are those of Lord Tankerville at Chillingham, and of the Duke of Hamilton at Hamilton Palace.

THE WILD CATTLE.

The WILD CATTLE, as they are called, are of moderate size, strongly but not clumsily built; their hair is short and thick, becoming longer and curly on the head and neck, and with a slight indication of a mane as far as the withers. The color is milk-white, with the exception of the muzzle, the ears, the horns, and hoofs. The color of the ears varies according to the breed. The cattle of Chillingham have the interior of the ear red; those of Hamilton have it coal black; the former have brown muzzles, the latter black. Both have black hoofs, and black tips to their horns. These distinctions of color in the two breeds are kept up by a strict process of weeding out all calves that do not conform to the standard. In Hamilton, all calves with brown marks are put to death; in Chillingham, a black muzzle and ear is the creature's death-warrant. The herds at Gisburne in Yorkshire, and Chartly in Staffordshire, resemble the oxen of Chillingham; those that used to be at Drumlanrig and Cumbernauld were of the Hamilton variety. In all cases a superstition prevails that danger threatens the owner's house and family if a black calf is born in the herd.

According to Lord Tankerville, the cattle of Chillingham have all the peculiarities of wild animals. They hide their young, feed by night, and sleep by day. In summer they are seldom seen, preferring at that season the shade of the wood; in winter they come to the places where they are accustomed to be fed, and then a man on horseback can ride almost into the middle of the herd. When they are alarmed or provoked at the intrusion of a strange human being within the limit of their territories, they toss their heads wildly in the air, paw the ground, and steadfastly regard the object of their dislike. If he should make a sudden movement, they scamper away precipitately, gallop round him in a circle, and come to another halt at a shorter distance. This process is continually repeated, the diameter of the circle is shortened at every fresh alarm, till the angry animals come so near the spectator that he is glad to escape as best he can. They are usually shot when they are six years old. The flesh is not different from that of the common ox. The herds are maintained out of family pride, and the annual expense is heavy. They present a majestic sight as they gallop between the gray, gnarled trunks of the primeval oaks of the old Caledonian forest.

THE CATTLE OF THE PAMPAS.

We have already spoken of the herds of horses descended from the domesticated horse which roam over the wide plains of South America. A similar phenomenon is presented in the enormous herds of cattle which are found there. At the discovery of this continent no cattle existed in South America. Columbus imported some on his second voyage into San Domingo, and in 1540 some Spanish bulls and cows were landed in the southern parts of the continent. Circumstances favored their rapid increase, the herds became too large to be always watched, and soon wandered about in perfect liberty. Within a hundred years of their introduction, they were roaming over the Pampas in hundreds and thousands, and were hunted by the natives as the Northern Indians hunt the Bison of the Plains. At present the plains on both sides of the River Platte and its tributaries are swarming with cattle. They all have owners. Vast establishments named "Estancias" are scattered over the Pampas; and thirty thousand cattle, five thousand horses, and twelve thousand sheep are moderate numbers for the animals belonging to one owner. The cattle of each proprietor are branded with his mark, and are looked after by Gauchos, who display incredible courage, patience, and skill in their occupation, collecting the herds when necessary, or catching those that have to be killed or sold. The cattle are drilled, as far as possible, to assemble on the appearance of the herdsman at a certain spot situated at a convenient distance from the corral, and it is no unusual sight to see thirty-five thousand thus assembled. The proportion of men employed is very small, when compared with the numbers of the oxen. The usual allowance is four men to every five thousand head; thus an extent of two hundred square miles may have only fifty inhabitants.

Those that remain in a half-wild state, are for the most part taken with the lasso, and sold to the drovers in troops of five hundred each. When a five-year-old ox is lassoed by the horns, and he turns out a Tartar, after a few ineffectual shakes of the head to throw off the lasso, he directly darts at the horse, who immediately starts off at full speed, the foaming ox close at his heels, and fast to the saddle with twenty-five yards of lasso. The horse must take all that comes in his way; patches of long grass that reach up the stirrups, the burrows of the viscachas,

and every other obstacle. Should the ox give up the chase suddenly, the rider must immediately check the speed of his horse, otherwise the jerk would break the lasso, or what is worse, it would draw the saddle back to the flanks of the horse, or break the girths; in which case the man would be brought to the ground, and be at the mercy of the furious animal, still with the lasso on his horns, but no longer fast to the horse.

The troops of oxen when formed, are driven at the rate of nine to twelve miles a day to the *Saladero* or Salting establishment.

The hide is the most valuable part of the animal, and the preparation of it is carefully attended to. The workmen lay each hide on the flat of their left hands, scrape off all the beef and fat which may be adhering to the inner coating with a knife in the right hand, trim the edges, and then stretch out the hides by means of stakes driven into the ground, if the skins are to be dried. If they are to be salted, a pile is made of them with layers of salt. Dried hides require much more time and skill than when they are only salted. In the latter case they are packed in casks for exportation; in the former, when shipped, they are tied up in bundles. Hides form the chief export from the River Platte.

AFRICAN CATTLE.

In Africa, the cattle are not only employed for the yoke, but are also educated for the saddle, and are taught to obey the bit as well as many horses. The bit is of very primitive form, being nothing more than a stick which is passed through the nostrils, and to which the reins are tied. One end of the stick is generally forked to prevent it from falling out of its place, and in guiding the animal, the rider is obliged to draw both reins to the right or left side, lest he should pull out the wooden bit. The saddle oxen are not very swift steeds, their pace being about four or five miles an hour; and as their skin is so loosely placed on their bodies that the saddle sways at every step, their rider has no very agreeable seat. In breaking the Ox for the saddle, the teachers avail themselves of the aid of two trained oxen, between whom the novice is tied, and who soon teach it the proper lesson of obedience.

The horns of this variety of the Ox are of marvellous length, having been known to exceed thirteen feet in total length, and nearly nine feet from tip to tip. The circumference of these enormous horns was more than eighteen inches, measured at their bases. One such horn is capable

of containing upwards of twenty imperial pints. These weapons are not only long, but are sharply pointed, and are of so formidable a nature that a lion has been kept at bay during a whole night, not daring to leap upon an animal so well defended. As these horns might prove dangerous to the rider in case of the animal suddenly jerking its head, or flinging him forward by a stumble, the natives are in the habit of trimming them in various fashionable modes, by which the danger is avoided.

Their chief employment at the Cape of Good Hope is in drawing the wagons of the Boers or farmers. Ten or twelve yoke are frequently employed to drag a single vehicle over the tracks of the wild country.

THE SANGA.

The SANGA, which at present is found in all Interior Africa, is remarkable for possessing a hump on the withers. It is a strong, powerfully built animal with long legs and tail. The horns are placed close together at the root, and measure a yard in length. The hair is smooth, fine, and usually of a chestnut color.

DOMESTIC CATTLE.

It is only in America that the Ox has escaped from the thralldom of man. Elsewhere, it is his most valued possession. In general, high honor is paid to it. The Egyptians worshipped their god Apis in the form of an ox, and their Isis, like the Greek Io, is represented with cow's horns. According to the traditions of India an Ox keeps the gates of heaven, and the clouds are said to be the cows which Indra drives to their pasture. The nomads of the Soudan possess countless herds which they keep solely for their milk. The whole of South Russia swarms with cattle. In Hungary the herds are so wild that men dare not approach them; and even in Italy, in the Maremma, the cattle are half-wild. A remarkable contrast is presented by the condition of these animals in Switzerland and Holland. The Swiss lives with his cows in a perpetual exchange of reciprocal acts of kindness; they are never ill-treated or beaten. The best of them are adorned with bells, the leading cow—a black one—bearing the largest. If she is deprived of this honor she manifests her disgrace by lowing incessantly, and losing condition, or by attacking her fortunate rival. In Spain the bull is the hero of the

people. The cattle live like wild ones, never entering a stall, or coming under a roof. Not large, but beautiful and powerful, they have pretty long, very sharp, outward-curving horns. They are revengeful, and never forget a blow. As they roam over the hills of Southern Spain, no wolf, no bear dares to assail them, and the prudent traveler keeps out of their way. The most fierce and active of the bulls are reserved for the bull-fights to which the Spanish nation is so passionately addicted. The bloody and brutalizing spectacle has been often described, and we need not repeat it here.

There is, at the mouth of the Rhone, stretching from the town of Arles to the Mediterranean, a vast extent of marshy land, intersected by woods. This tract has been formed by successive deposits of the river, and is called the Camargue. Large herds of cattle live in an almost wild state in these humid plains and solitary woods. The bulls of the Camargue are all black, of a moderate size, with long tapering horns. Their wild nature, agility, and exceptional strength render them very dangerous to the traveler who intrudes on their domain.

The most ancient documents of historic ages describe the Ox, the Horse, the Dog, and the Sheep, as associated with man. The humble and patient Ox forms the most useful assistant of the small farmer, and also constitutes the main performer of the most important agricultural operations. It helps to till the ground; it drags immense and heavily laden wagons; it takes a part in all the labors of the farm; and after fifteen or sixteen years of a well-spent life, it yields up for the benefit of man its flesh, bones, fat, skin, horns, hoofs, and blood—all of them products which supply with material a host of useful manufactures.

The Ox is neither so dull nor so stupid as is popularly supposed; but, on the contrary, is endowed with a degree of intelligence which, in certain countries, man has developed and turned to his profit; for some of the tribes of South Africa entrust to oxen the care of their flocks, duties which the sagacious Ruminants fulfil with a zeal and intelligence worthy of all praise. Prudence and a quick perception of danger are also qualities possessed by the Ox. If, either by his own fault or that of his guide, he finds himself in a dangerous place, he develops resources for extricating himself quite surprising.

When we are considering the advantages which society derives from them, domestic cattle may be looked at in four different aspects: as beasts of burden, that is, producers of mechanical force applicable to the

cultivation of the soil; as supplying milk; as furnishing meat; and lastly, as makers of manure or fertilizing matter. Allowing all this, the question arises, is it possible to manage the breeding and rearing of the Ox so as to ensure the maximum result of all these four requirements? All the agriculturists who have had any experience in breeding cattle give a negative reply to this question. Qualities so different in their nature as muscular vigor, abundance of milk, fitness for fattening, and richness of fertilizing residuum, cannot, they say, be the attribute of one animal, or one breed; in fact, they exclude one another, and one quality can only be encouraged at the expense of the others. A good breed for work can hardly at the same time be a good breed for the butcher. If, therefore, any one quality is to be specially developed, the others must, to some extent, be sacrificed. By this plan perfection may, at all events, be arrived at in one point, while by a different course of procedure nothing but mediocrity can be attained. This is the principle which ought to guide the agriculturist in the choice and breeding of his cattle, whether for the dairy, the market, or the farm.

For the butcher it is required to produce, as quickly and as economically as possible, an animal excelling in the quality and quantity of its meat. Such are the short-horned breeds. Next to meat, milk is the most valuable product, as it is not only universally consumed in its natural state, but supplies us with cheese and butter. A French farmer, named Guenon, professes to have discovered a method of determining, by examination of the cow, both the quantity and the quality of its milk. He remarked that in cows the hairs on the hinder face of the udders are turned upward, and added to this, these hairs extend more or less over the region of the perinæum, so as to form a figure which he describes under the name of an escutcheon. By a multiplicity of observations, he became assured that a cow's power of giving milk varied in proportion to the size of this escutcheon, and he divided cows into orders and classes accordingly. A commission appointed by the French government made an investigation, and confirmed his hypothesis that, the longer and wider the escutcheon is, the greater are the milking qualities. As far as regards the richness of milk, Guenon considers that it finds its maximum in those cows which have the skin of their udders of a yellowish hue, freckled with black or reddish spots, furnished with fine and scanty hair, and covered with a greasy substance, which becomes detached when it is scratched on the surface.

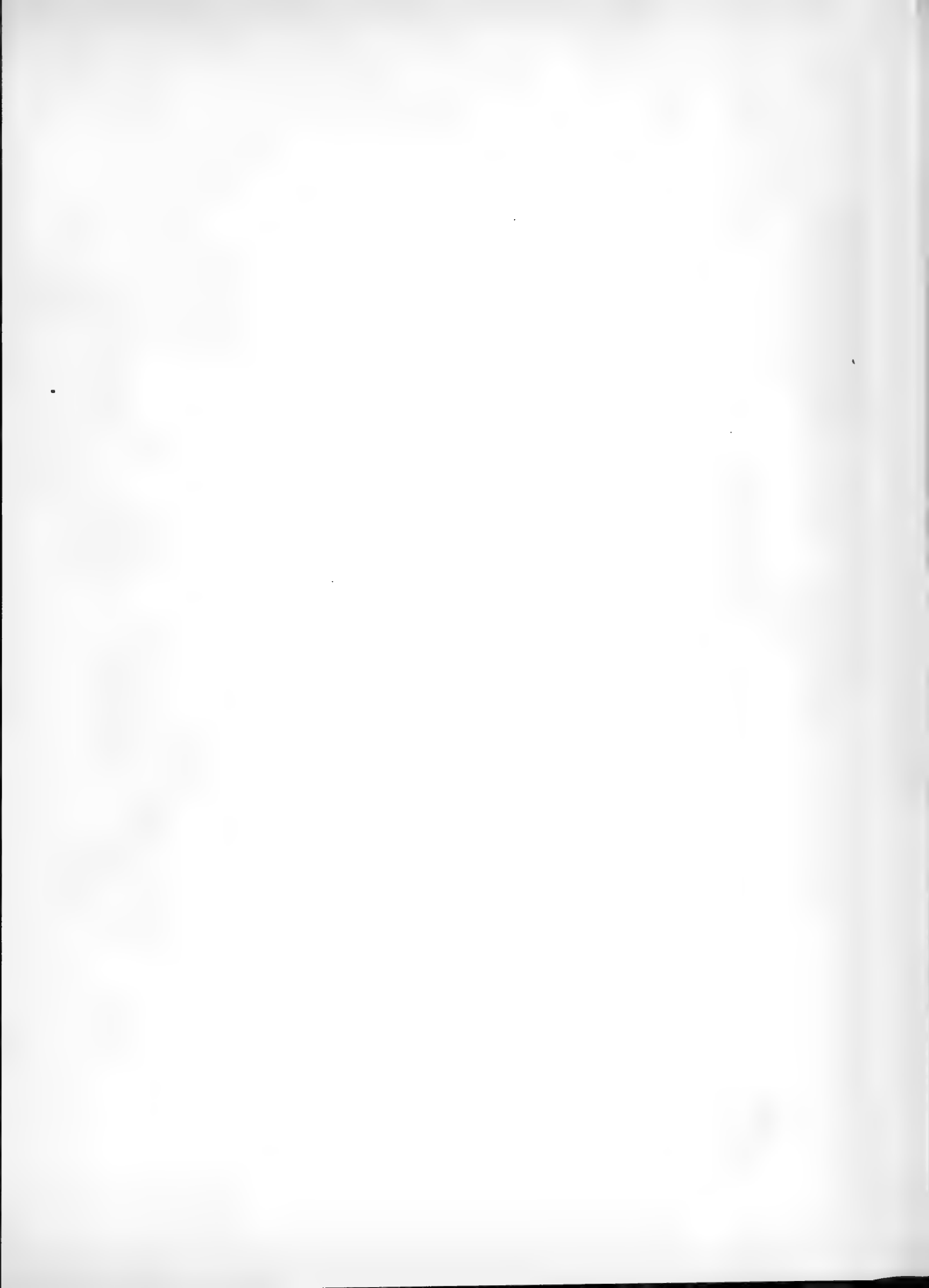
The breeds of cattle in Great Britain are almost as various as the soils of the different districts. They have, however, been conveniently classed into Middle Horns, Short Horns, Long Horns; and Polled, or Hornless Cattle. The Middle Horns are represented by the Devon, Hereford, and the Ayrshire; the Long Horns, by the Lancashire, as improved by the famous breeder Bakewell of Dishley; the Short Horns, by the Durham; and the Polled, by the Suffolk and Angus breeds. From one or other of these breeds our domesticated cattle are mainly descended.

THE SHORT HORNS.

The DURHAM (Plate XLIV), is the progenitor of the modern Short Horn. The breed had always existed in the North of England, especially on the banks of the Tees, but did not attain general celebrity till Mr. Collings astonished the world by showing its capacity for producing animals for the butcher. Under his care the modern or Improved Short Horn came into general favor in England. The first great importation of Short Horns to America took place in 1834, when a combination of farmers brought some to the Scioto Valley in Ohio. In 1853, Mr. Thorne, of Dutchess County, New York, brought here several of the famous "Duchess" and "Oxford" strains. His example was followed by Mr. Cornell of Ithaca, General Wadsworth of the Genesee Valley, and Mr. Alexander of Kentucky. By their enterprise, America, in 1856, possessed specimens of the stock better than any to be found in England. At various sales in this and other States, enormous prices have been paid for American-bred stock for reshipment to England. As a beef-producing animal the Short Horn is unrivalled. It lays on flesh in places where other cattle fail to give it. At the same time the cows, if bred with a view to giving milk, are very valuable, but naturally they become lean during the period in which they are being milked.

THE HIGHLAND CATTLE.

The SCOTCH BULL (Plate XLIV). These animals are small, usually black in color, with a small head, thin ears, and fine muzzle: the face is broad, the eyes prominent, the countenance placid. The horns taper to a point, are of a waxy color, and widely set at the root. The neck is







ZEBU OR BRAHMIN BULL

ALDERNEY COW

SCOTCH CATTLE
DURHAM COW

PLATE XLIV UNGULATA

fine, the breast wide, the shoulders broad, the back straight and flat. The legs are short, straight, and muscular. The whole body is covered with a thick, long coat; thick tufts of hair hang about the face and horns, and that hair is not curly.

THE ALDERNEY.

The ALDERNEY (Plate XLIV) is a breed of small and very elegant cattle exported from the Islands of Jersey and Alderney, in the English Channel. They are essentially a breed for the pail, not for the butcher. The milk they yield is remarkable for its richness and deep yellow color, as well as for the quantity of cream and butter it supplies. The quantity given is not great, eight to twelve quarts a day being a maximum. The Alderney is exceedingly handsome, the head particularly being indicative of blood, and reminding one of the head of the American Elk. It is very gentle and kindly in disposition, loving to be petted. The color is usually light-red, or fawn, occasionally smoky-gray, rarely black. A roan color indicates a cross with the Short Horn. In their native island, the principal food given them is parsnips, and to this diet is attributed the richness of the milk.



CHAPTER XXIV.

THE BISONS.

THE BONASSUS OR EUROPEAN BISON—CALLED ALSO THE AUROCHS—THE REAL AUROCHS EXTINCT—THE FOREST OF BIALOWICZ—DESCRIPTION OF THE BONASSUS—THE BISON OF THE CAUCASUS—THE AMERICAN BISON OR BUFFALO—ENORMOUS NUMBERS—TERRIBLE DESTRUCTION—ESTIMATE OF NUMBERS KILLED—THE MOUNTAIN BUFFALO—DEATH OF A BULL.

IF we are to believe the writings of ancient and mediæval naturalists, there were scattered over a great part of Europe two distinct kinds of wild cattle. Pliny speaks of the *Bonassus*, which he says was distinguished by its rich mane; and of the *Urus*, which was characterized by its huge horns. Both these animals are repeatedly mentioned under the names of "Bison" and "Aurochs" by a series of writers down to the year 1669. Brehm considers we are justified in trusting these accounts of the difference between the Aurochs and the Bison. The former is now extinct. A painting of the first quarter of the sixteenth century represents it as a rough-coated, maneless animal with a large head, thick neck, thin dewlap, and long horns turned out forward and upward. The coat of the creature was black.

GENUS BISON.

This genus comprises *two* species, one found in small numbers in Europe, the other abounding on the prairies of North America. Its generic characteristics are small round horns directed upward and forward, a broad convex forehead, soft long hair, and a large number of ribs. The European variety has fourteen, the American fifteen pairs of ribs.

THE BONASSUS.

The BONASSUS, *Bison bonassus*, is often called the Aurochs, more rarely the Zubr. It is found only in the Russian province of Grodno, where it is preserved by stringent laws in the forest of Bialowicz, a genuine

northern forest about ten miles long by seven broad. No one, except foresters and game-keepers, dwell within its limits. The trees are of enormous age, great height and size; the whole wood, indeed, looks to-day as it looked thousands of years ago. Here this, the largest of European mammals, lives undisturbed. In 1857, the number of Bisons in Bialowicz was estimated at eighteen hundred and ninety, but in 1863 an official count was made which reduced these figures to eight hundred and sixty-four.

The Bison or Bonassus has, perhaps, diminished in size during the lapse of centuries, but it is still a powerful beast. It stands six feet high, is eleven feet long, and weighs from thirteen hundred to seventeen hundred pounds. The head is large and well-formed, the forehead high and broad, the muzzle broad, the ear short and rounded, the eye rather small than large, the neck very powerful. The body is, in the fore-quarters, strongly developed, but slopes to the rump: the tail is thick and short; the legs powerful but not short, the hoofs are rather long, and the false hoofs small. The horns are placed on the sides of the head, first curve outward, then backward, so that the points are over the roots. A thick, rich covering of long, curly hairs and felt-like wool is spread over the whole body, but lengthens on the back of the head into a mane which falls over the brow, and hangs over the temples, while it forms on the chin a long beard, which extends over the whole throat down to the chest. The usual color is light brown, but the beard is dark brown, and the tuft on the tail is black. The cows are noticeably smaller than the bulls, with weaker horns, and less mane.

In summer and autumn the Bisons live in the moister parts of the forest of Bialowicz, but in winter choose drier and higher quarters. The old males live solitary, the younger cattle forming herds of fifteen or twenty in summer, and thirty or fifty in the winter. Each herd ranges in its own limits, and returns to the same spot. The Bonassus feeds chiefly in the mornings and evenings; grass, leaves, buds, and bark constitute its nourishment; they peel the trees as far as they can reach, and bend down the younger ones in order to get at the crown. The movements of the animal are lively enough. They walk quickly, their run is a heavy but effective gallop, during which the head is lowered, and the tail raised. They wade and swim easily. Their disposition varies with their age. The younger ones are good-natured, the older ones irritable and malicious. In general they leave men alone, but the slightest dis-

turbance can excite their anger and render them terrible. The angry Bonassus puts out his dark-red tongue, rolls his red eyes, and dashes with fury at the object of his wrath. An old bull ruled for a long time over the road running through the forest of Bialowicz, and did much mischief. He stopped carriages, or sleighs, especially those laden with hay. If the peasants threatened him, he charged and threw the sleigh over. Horses were terrified at the sight of him, and seemed to lose their senses. The Bonassus and the domestic ox similarly display a mutual repugnance, and even the calves which are brought up by tame cows exhibit no change in this respect.

It has been disputed whether the Bonassus occurs in the Caucasus. The balance of evidence seems to indicate that they are found in Abkasia from the Kuban to the source of the Psib. At a dinner given to General Rosen by a Caucasian chief, sixty silver-mounted bonassus-horns served as drinking-cups. Hunters have shot them on the Great Selentshuga, and say that they extend upward to the snow line.

THE BISON.

The AMERICAN BISON, *Bison Americanus* (Plate XLV), is usually called the Buffalo. "As Buffalo, he is known everywhere," writes General Dodge, "as Buffalo he lives, as Buffalo he dies, and when, as will soon happen, his race has vanished from earth, as Buffalo he will live in story and tradition." It is a giant among our mammals; its bulk, shaggy mane, vicious eye and sullen behavior give it a ferocious appearance, but it really is a mild, inoffensive beast, unwieldy, sluggish, and stupid. A few years ago, the numbers of these animals was past all counting. General Dodge, in 1871, drove from Fort Zara to Fort Larned, a distance of thirty-four miles. At least twenty-five miles of this distance was through an immense herd of buffalo. "The whole country appeared one mass of buffalo; but the apparently solid mass was really an agglomeration of innumerable small herds of from fifty to two hundred animals. When I had reached a point where the hills were only a mile from the road, the buffalo on the hills started at full speed directly toward me, stampeding and bringing with them the numberless herds through which they passed, pouring down upon me in one immense compact mass of plunging animals, mad with fright, and irresist-

ible as an avalanche. When they arrived within fifty yards, a few well-directed shots split the herd, and sent them left and right in two streams." In like manner, whole herds would charge the trains on the Atchison and Santa Fé railroad, and often threw the cars from the track. This senseless obstinacy characterizes the animal even when it encounters natural obstacles. A herd of four thousand tried to cross the South Platte in 1867, when the water was low. The leaders were soon stuck in the mud. Those behind, pressed forward by the column, trampled over their struggling companions, and soon the whole bed of the river, nearly half a mile wide, was filled with dead or dying buffalo. Usually the Buffalo is very careful of the roads by which he passes from one creek to another, and shows an antipathy to steep grades. But when alarmed, he will with impunity climb banks, or plunge down precipices where no horse can follow. Contrary to the statements usually given, General Dodge declares that there is very little fighting among the bulls, and that the small herds have each generally more bulls than cows, seemingly all on the very best terms with each other. These small herds are in no sense families; they are merely instinctive, voluntary and accidental, as regards their individual components. Herds merge together, and herds break up gradually during the process of grazing. The only perceptible change that takes place is that the bulls work themselves out to a new circumference, so as to have the cows and calves within the circle. The bulls have the duty of protecting the calves. An army surgeon asserts that he saw six or eight bulls protecting from wolves a poor little calf which could scarcely walk.

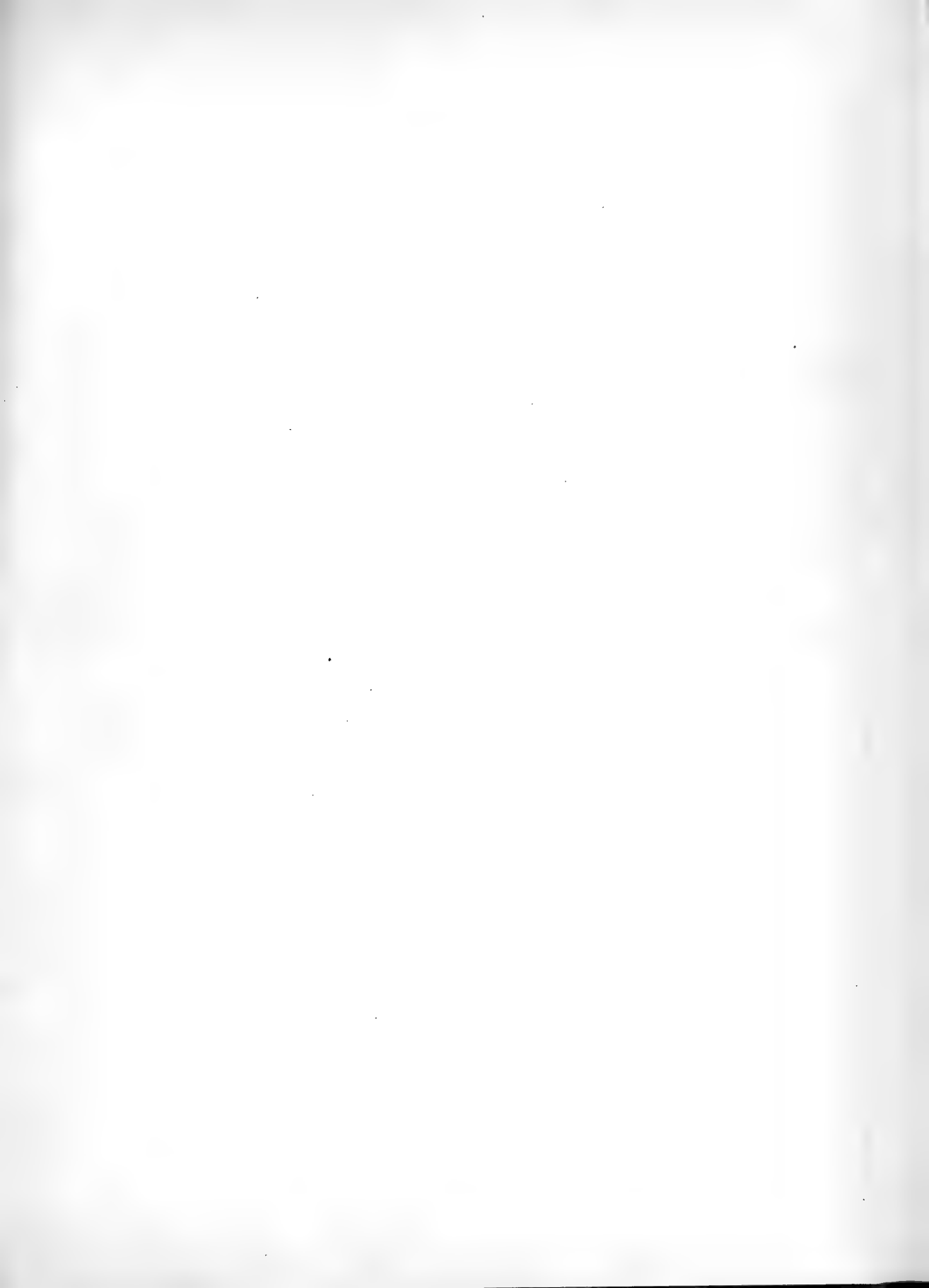
Vast quantities of Bisons are killed annually, whole herds being sometimes destroyed by the cunning of their human foes. The hunters, having discovered a herd of Bisons at no very great distance from one of the precipices which abound in the prairie-lands, quietly surround the doomed animals, and drive them ever nearer and nearer to the precipice. When they have come within half a mile or so of the edge, they suddenly dash toward the Bisons, shouting, firing, waving hats in the air, and using every means to terrify the intended victims. The Bisons are timid creatures, and easily take alarm, so that on being startled by the unexpected sights and sounds, they dash off, panic-struck, in the only direction left open to them, and which leads directly to the precipice. When the leaders arrive at the edge, they attempt to recoil, but they are so closely pressed upon by those behind them that they are carried for-

ward and forced into the gulf below. Many hundred of Bisons are thus destroyed in the space of a few minutes.

A much fairer and more sportsmanlike method of hunting these animals is practised by red and white men, and consists in chasing the herds of Bisons and shooting them while at full speed. This sport requires good horsemanship, a trained steed, and a knowledge of the habits of the Bisons, as well as a true eye and steady hand. The hunter marks a single individual in the herd, and by skilful riding contrives to separate it from its companions. He then rides boldly alongside the flying animal, and shoots it from the saddle. In this method of shooting, the hunter requires no ramrod, as he contents himself with pouring some loose powder into the barrel, dropping a bullet from his mouth upon the powder, and firing across the saddle without even lifting the weapon to his shoulder. The Indians are very expert in this sport, and, furnished only with their bows and arrows, will do a good day's work.

"The difficulty in this style of hunting," to quote again from General Dodge, "is the cloud of dust which prevents very careful aim; the explosion of the pistol creates such confusion among the flying herd, that it is impossible to shoot at any individual buffalo more than once. The danger arises not from the buffalo, but from the fact that neither man nor horse can see the ground which may be rough or perforated with prairie-dog or gopher-holes."

Such slaughter, however, made little or no impression on the numbers of buffalo. Unfortunately, in 1872, it was discovered that their hides were merchantable; buffalo-hunting became an organized trade. The slaughter would seem incredible, but the figures are taken from official sources. In 1872, buffalo were around Fort Dodge in such numbers as to interfere with other game, and sportsmen paid no heed to them. "In 1873, where there were myriads of buffalo the year before, there were now myriads of carcasses. The vast plain which a short twelvemonth before was teeming with animal life was a dead, solitary, putrid desert." In 1874, General Dodge remarks that there were more hunters than buffalo. The hunting-parties engaged in this occupation consist of four men—one shooter, two skinners, and a cook. One shooter, from one spot, in less than three-quarters of an hour, killed one hundred and twelve buffalo within a radius of two hundred yards. During the three years for which General Dodge gives statistics—1872, 1873, 1874—there were 1,378,350 hides sent to market, representing a slaughter of 3,158,730

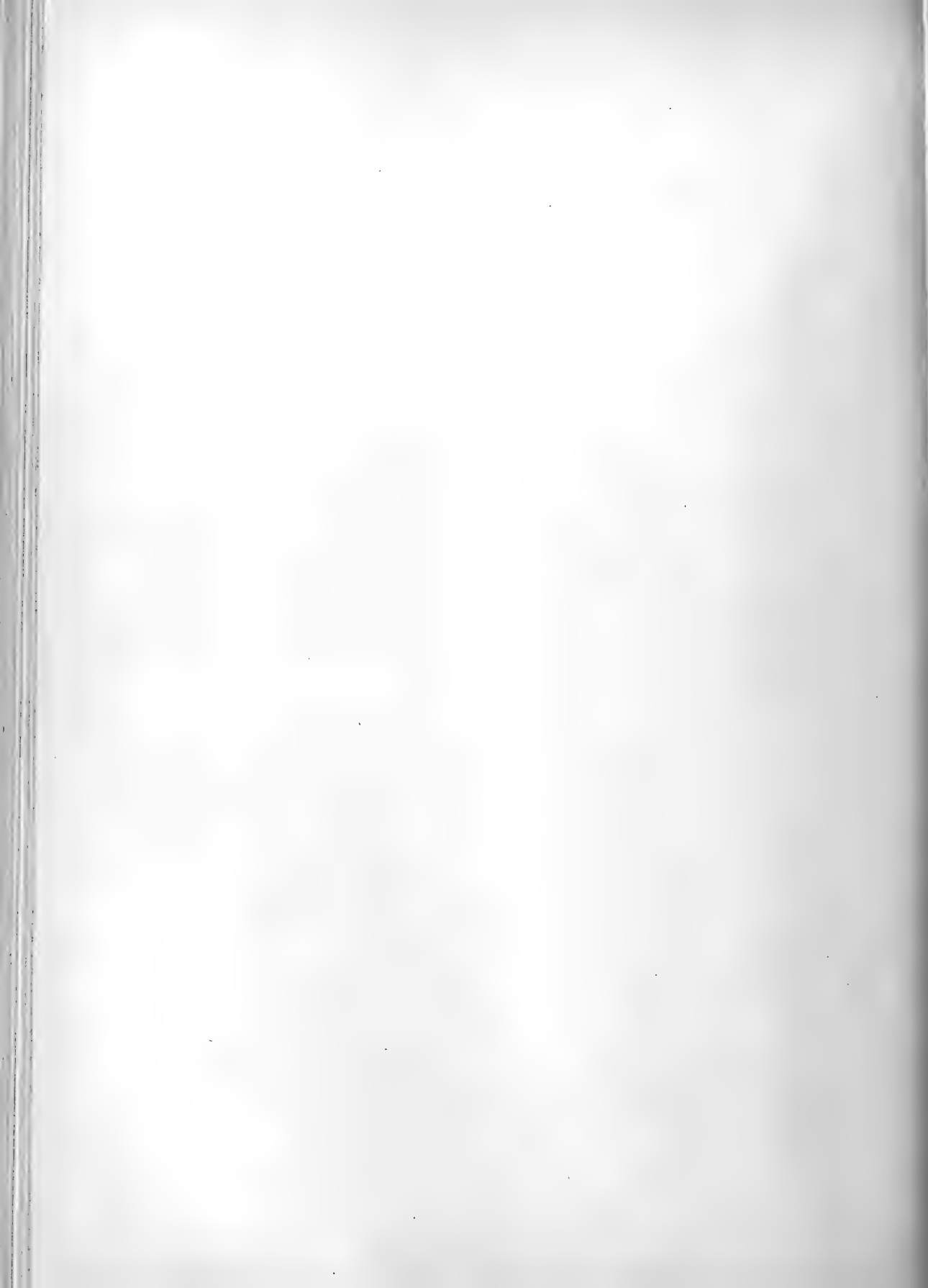






AMERICAN BUFFALO

PLATE XLV. UNGULATA.



buffaloes. Add to this 1,215,000 killed by Indians, and we have the number of nearly four and a half millions. "Nor is this all," he adds. "No account has been taken of the immense numbers killed by hunters who took the skins away in wagons, nor of the numbers sent to St. Louis, Memphis, and elsewhere by other railroads than the Santa Fé and Topeka line. No wonder that men fear that the Buffalo will soon cease to exist. Congress has talked of interfering, but only talked. But in fact, the extinction of the Buffalo is inevitable. Civilization cannot spare room for its ranges. When industry and skill have turned the rich prairies into smiling fields and rich pastures, the Bison will be confined to small reservations, or seen only as curiosities in the Zoological Gardens." The government of the United States has shown a laudable desire to preserve the curiosities of our country. It has rescued from destruction the giant trees of California, and saved from utter annihilation the Sea Lions of Santa Barbara. We need not fear that a nation which has set apart the whole Yellowstone Valley as a National Park, will ever refuse to give to the remnants of our buffaloes—when the day comes that their wild freedom is incompatible with the progress of civilization—a district compared with which the Russian forest which shelters its European congener will appear narrow and confined.

THE MOUNTAIN BUFFALO.

In the so-called Parks of the Rocky Mountains, there is found an animal which old frontiersmen call by the name of Bison. It is to the Buffalo of the plains what a mountain pony is to a well-built horse. It is admirably adapted for its dwelling-place. Its body is lighter, and its legs shorter, thicker, and stronger than those of the Buffalo. It is rare and very shy, seeking out the most retired glens and passes, and scrambling with wonderful agility over the craggy sides of almost inaccessible mountains.

General Dodge writes: "The deep gorges which intersect the mountains that join the Parks are the favorite haunt of the Mountain Buffalo. Early in the morning he enjoys a bountiful breakfast of the rich nutritious grasses, quenches his thirst with the finest water, and, retiring just within the line of jungle whence, himself unseen, he can scan the open, he reposes in comfort till appetite calls him to dinner late in the evening. He does not, like the buffalo, stare stupidly at the intruder. At the first

symptom of danger they disappear like magic in the thicket, and never stop until far removed from even the apprehension of pursuit."

Old mountaineers give marvellous accounts of the number of these animals "many years ago," and ascribe their present rarity to the great snow-storm of 1844, which wrought such havoc with the buffaloes of the plains. The shyness of the Bison renders it difficult to shoot. Two, however, were killed in one afternoon in the Tangall range of mountains between Pike's Peak and the South Park. The following story from the pages of General Dodge will give a good idea of the haunts and habits of this animal:

"One of my friends determined on the possession of a bison's head, and, hiring a guide, plunged into the mountain wilds that separate the Middle from the South Park. After several days, fresh tracks were discovered. The sportsmen started on foot on the trail; for all that day they toiled and scrambled with the utmost caution, now up, now down, through deep and narrow gorges and pine thickets, over bare and rocky crags. Next morning they pushed on, and when both were well-nigh disheartened, their route was intercepted by a precipice. Looking over, they descried on a projecting ledge several hundred feet below, a herd of twenty bison lying down. The ledge was about two hundred feet at widest, about one thousand feet long. Its inner boundary was the wall of rock on the top of which they stood; its outer seemed to be a sheer precipice of at least two hundred feet. This ledge was connected with the slope of the mountain by a narrow neck. My friend selected a magnificent head, that of a fine bull, young but full grown, and both fired. At the report, the bisons all ran to the far end of the ledge and plunged over. The precipice was so steep that the hunters could not follow them. At the foot lay a bison. A long, fatiguing detour brought them to the spot, and my friend recognized his bull—his first and last Mountain Buffalo. The remainder of the herd were never seen after the grand plunge, down which it is doubtful if even a dog could have followed without risk of life or limb."



CHAPTER XXV.

EASTERN CATTLE.

THE DOMESTIC CATTLE OF INDIA—THE ZEBU—THE WILD CATTLE OF INDIA—GENUS *BIBOS*—THE GAYAL—THE GAUR—THE BANTENG—GENUS *POEPHAGOS*—THE YAK—THE PLOUGH YAK—HUNTING THE YAK—GENUS *AÑO*A—THE CHAMOIS—BUFFALO OF CELEBES—ITS FIERCENESS.

AS this chapter is devoted to Indian Cattle, we have included in it the Domestic Cattle of Hindostan, although they belong to the genus *Bos*, and ought properly to be treated of in Chapter XXIII.

THE ZEBU.

The Domestic Cattle of India is commonly known by the name of Zebu, and is, like the Sanga, conspicuous for the curious fatty hump which projects from the withers. These animals are further remarkable for the heavy dewlap which falls in thick folds from the throat, and which gives to the fore part of the animal a very characteristic aspect. The limbs are slender, and the back, after rising toward the haunches, falls suddenly at the tail. The ears are long and drooping, the horns very short, the color of the coat is various, but usually a reddish-brown, or dun.

The Zebu is a quiet and intelligent animal, and is capable of being trained in various modes for the service of mankind. It is a good draught animal, and is harnessed either to carriages or ploughs, which it can draw with great steadiness, though with but little speed. Sometimes it is used for riding, and is possessed of considerable endurance, being capable of carrying a rider for fifteen hours in a day, at an average rate of five or six miles per hour. The Nagore breed is specially celebrated for its capabilities as a steed, and is remarkable for its peculiarly excellent action. These animals are very active, and have been known to leap over a fence which was higher than our five-barred gates, merely for the purpose of drinking at a certain well, and, having slaked their

thirst, to leap back again into their own pasture. As a beast of burden, the Zebu is in equally great request, for it can carry a heavy load for a very great distance.

The Zebu race has a very wide range of locality, being found in India, China, Madagascar, and the eastern coast of Africa. It is believed, however, that its native land is India, and that it must have been imported from thence into the other countries. There are various breeds of Zebu, some being about the size of our ordinary cattle, and others varying in dimensions from a large ox to a small Newfoundland dog.

The well-known BRAHMIN BULL (Plate XLIV), is the most familiar of these varieties. It is so called, because it is considered to be sacred to Brahma.

The more religious among the Hindoos, scrupulously observant of the letter of a law which was intended to be universal in its application, but to which they give only a partial interpretation, indulge this animal in the most absurd manner. They place the sacred mark of Siva on its body, and permit it to wander about at its own sweet will, pampered by every luxury, and never opposed in any wish or caprice which it may form. A Brahmin Bull will walk along the street with a quaintly dignified air, inspect anything and anybody that may excite his curiosity, force every one to make way for himself, and if he should happen to take a fancy to the contents of a fruiterer's or greengrocer's shop, will deliberately make his choice, and satisfy his wishes, none daring to cross him. The indulgence which is extended to this animal is carried to so great a height, that if a Brahmin Bull chooses to lie down in a narrow lane, no one can pass until he gets up of his own accord.

Bishop Heber, in his well-known journal, mentions the Brahmin Bulls, and the unceremonious manner in which they conduct themselves, and remarks that they are sometimes rather mischievous as well as annoying, being apt to use their horns if their caprices be not immediately gratified.

THE WILD CATTLE OF INDIA.

The Wild Cattle ranging the woods and jungles of a great part of the Oriental region from Southern India to Assam, Burmah, the Malay Peninsula, Borneo, and Java form the third genus of the sub-family BOVINÆ, and are divided into *three* species.

GENUS BIBOS.

The GAYAL, *Bibos frontalis*, was first scientifically described by Lambert in 1802, from a specimen which was sent alive to England. These animals are often tamed by the Hindoos and used as domestic cattle, or for improving the breed of the latter. They are large, powerful animals, standing five feet high, and measuring nearly eleven feet, including two feet and a half of tail. No animal better deserves its specific title, *frontalis* or "broad-browed." The unparalleled breadth of the forehead at once strikes the eye. Its body is well proportioned, compact, and powerful; the whole appearance gives an impression of strength and beauty. The head, with its thick muzzle, forms almost a truncated pyramid, the base of which would pass through the roots of the horns and the angles of the under jaw. But the base is not a regular square; the side between the horns is much longer than the others. The breadth of the forehead is about two-fifths of the length of the head. The horns are very thick, and curve slightly outward and backward. The eyes are small, and placed deep in their sockets; the ears are upright, and large, and pointed. A small triangular double dewlap springs behind the chin, ending at each jaw. Three or four deep folds of skin separate the head from a thick, hump-like protuberance which covers the whole neck, withers, and half of the spine. The rest of the body is fleshy, the legs strong but well-formed, the hoofs are short, and straight in front, the tail is thin, and ends in a long tuft. A short, thick and shining coat covers the whole body; it is slightly longer on the throat, and becomes a rich tuft on the tail, and on the fetlocks of the forelegs. The predominant color is deep black, with some white on the throat. The inside of the ear is flesh-color, the horns gray, with black tips. The cow is smaller, and more slightly built than the male, and has much shorter horns.

Some Hindoo tribes regard the Gayal as a sacred animal. It is not slain, but driven into the holy groves. Other tribes, on the contrary, eat its flesh without any compunction, and employ newly-caught ones in bull-fights. The people of Silhoot, Chittagong, and Tepoor possess tame herds of the Gayal, and the English have attempted to introduce it into Bengal. The Gayal lives chiefly in the woody hills which separate Bengal from Arracan. It is a mountain animal, climbing well, and being

very sure-footed. It never attacks mankind, but defends itself against beasts of prey with courage, repulsing even the panther and tiger. The Kuki tribe tame many of them. They place a ball of salt and earth in some place where the wild Gayals pass, and drive some tame ones to the same spot. Both love salt, and remain together for months, new balls of salt being continually supplied. The wild Gayals become friends with their tame brethren, and gradually lose their dread of man. They finally submit to be stroked and handled, and end in becoming domesticated and useful animals.

THE GAUR.

The GAUR, *Bibos gaurus*, is the largest of all the existing members of the Ox tribe, and it may be easily recognized by the extraordinary elevation of the spinal ridge and the peculiarly white "stockings." The general color of the Gaur is a deep-brown, verging here and there upon black, the females being usually paler than their mates. The dimensions of the Gaur are very considerable, a full-grown bull having been known to measure six feet ten inches in height at the shoulders. The great height of the shoulder is partly owing to the structure of the vertebræ, some of which give out projections of sixteen inches in length.

The Gaur associates in little herds of ten, twenty, or thirty in number, each herd generally consisting of a few males and a comparatively large number of the opposite sex. These herds frequent the deepest recesses of the forest. During the heat of noonday, the Gaurs are buried in the thickest coverts, but in the early morning, and after the setting of the sun, they issue from their place of concealment, and go forth to pasture on the little patches of open verdure that are generally found even in the deepest forests. The watchfulness of this animal is extremely remarkable, as, independently of placing the usual sentries, the Gaurs are said to arrange themselves in a circle while at rest, their heads all diverging outward, so as to preserve equal vigilance on every side. They may, however, be readily approached if the spectator be mounted on an elephant, as they seem to regard these huge animals without any suspicion or fear. In all probability, the imperturbable indifference with which they look upon the elephant is caused by the fact that the elephant is never used in Gaur-hunting, and, unless accompanied by human beings, never attempts to attack these animals.

This creature is found in all the large connected woodlands of India from Cape Comorin to the Himalaya, selecting always as its dwelling the thickest parts of the forest, and deep shady glens. In Bahar and the Western Ghauts, they are especially numerous. The country here is a series of abrupt hills with deeply cleft valleys, covered with an impenetrable growth of underwood, thorns, and tree ferns. Here the Gaur has lived since time immemorial, and has compelled the savage carnivora to leave him the undisputed monarch of the region. Like the Gayal, it is eaten by some tribes, and avoided by others, who regard it as akin to the sacred cow. Its flesh is said to be much more delicate to the palate than that of the domestic ox.

THE BANTENG.

The BANTENG, *Bibos Sondaicus*, is a most beautiful species, equalling many of the antelopes in grace, and being distinguished also by its color. It extends over Java, Borneo, and the Eastern part of Sumatra. It loves moist, or well-watered portions of the forests. It lives in small companies, consisting of a leader and six or seven cows. The softest and most juicy grasses which cover the slopes and young leaves and twigs constitute its food, but it prefers, above everything, as an article of diet, the tender shoots of the bamboo.

The timidity of the Banteng renders the chase of it both difficult and dangerous. Although it usually flies, yet when driven to bay, it uses its horns with skill and effect. The cows which are nursing calves are especially to be dreaded, and the Javanese sportsman who ventures to the chase armed only with a forest-knife, runs no slight peril. Adult Bantengs cannot be tamed; calves, however, become completely domesticated, and live in harmony with other cattle. The mild and gentle disposition of the Banteng is in harmony with the beauty of its form. The second or third generation of captives willingly submit to the rule of man, learn to know and love their keeper, and act like our common domestic animal.

GENUS POEPHAGUS.

The YAK, *Poephagus grunniens*, (Plate XLVI), is the *only* species of the genus. The body is stout and powerful, the head large and very broad; the eye, small and dull; the ear, small and round; the horns,

round in front and angular behind; these horns project horizontally and then turn upward and forward, the point curving outward; the neck is short, the withers are elevated into a bison-like protuberance, the tail is long, and covered with bushy hairs that reach the ground; the legs are short and powerful, the hoofs wide, and the false-hoofs well developed. The coat consists of fine, long hair which, on the brow, falls in curling tufts over the face, and on the neck forms a thick waving mane; the legs from the knee downward are covered with smooth, short, close hair. The adult Yak is of a beautiful deep black color, with a silver-gray stripe along the spine. It is from the long tail of the Yak that the Mongols and Turks form the so-called "Horse-tails" which are carried before high officers of state, their number indicating the rank. The tail is used in India as a fly-flapper, under the name of chowrie. The chowries used by princes, or in religious ceremonies, are mounted in gold or silver, and cost large sums, the white ones being especially valuable. The Chinese dye the tails bright red, and wear them as tufts in their caps.

In Thibet the Yak has been domesticated, and is used for riding and as a beast of burden. It always retains, however, a good deal of its original wildness, and is subject to paroxysms of rage. It lives on good terms with the common domestic cattle, and a cross-breed of great robustness is held in high esteem. This variety, often called the "Plough Yak," is altogether a more plebeian-looking animal, humble of deportment, carrying its head low, and almost devoid of the magnificent tufts of long silken hairs that fringe the sides of its more aristocratic relation. Their legs are very short in proportion to their bodies, and they are generally tailless, that member having been cut off and sold by their avaricious owner. There is also another variety which is termed the Ghainorik. The color of this animal is black, the back and tail being often white. When overloaded, the Yak is accustomed to vent its displeasure by its loud, monotonic, melancholy grunting, which has been known to affect the nerves of unpractised riders to such an extent that they dismounted, after suffering half an hour's infliction of this most lugubrious chant, and performed the remainder of their journey on foot.

The Yak is found on the highlands of Thibet between twelve to fifteen thousand feet above the sea. It forms small troops in all parts of Northern Thibet, and large herds where pasture is plentiful. In summer they appear on the grassy meadow-lands near the streams, often to the number of a thousand. They disperse to feed, but collect again to

repose, or when storms are threatening. At any sign of danger they range themselves into a compact body with the calves in the centre, while one or two old bulls go out to reconnoitre the enemy. At the sound of a gun, they gallop away, heads down, tails raised aloft. Clouds of dust envelope them as they fly along, and the earth echoes with the stamping of their hoofs. When resting, the Yak prefers some cool, deep glen, where it can avoid the sunshine, for it dreads heat more than cold, and even when in the shade, lies in the snow. It climbs, like a goat or a chamois, over the most rugged and steep rocks with complete sureness of foot. "The most noteworthy peculiarity of the Yak," writes Przewalski, "is its laziness. Morning and evening it feeds; the rest of the day it devotes to repose, which it indulges in, either standing or lying. The chewing of the cud is the only sign of life; otherwise it remains as motionless as a statue of stone."

This traveler gives an account of hunting the Yak. In Siberia the sportsman usually fires from a rest consisting of a long forked stick. Holding erect the forked rest, and covered with a sheep-skin jacket with the wool outward, he creeps near the game. The latter, probably regarding the moving figure as a kind of antelope, remains stationary. The hunter when near enough fires. The wounded Yak either turns and flies, or charges the assailant. Usually after charging a few yards, the animal pauses, thus offering a steady mark for the shooter. Another ball is put into him. Another charge of a few yards succeeds, and so on till the Yak falls. Its tenacity of life is remarkable. Przewalski followed one till nightfall; he found it dead next morning, with three balls in its head, and fifteen in its breast. To kill a Yak at the first shot is a rare occurrence. The Mongols usually fire in small platoons of six or eight, and from behind a blind, and then follow the trail of blood left by the wounded animal till it—after a day or two—dies from loss of blood.

The Yak has been transported to Europe, and stands the change of climate well. As it supplies excellent wool, savory meat, and rich milk, and as it is indefatigable in labor, and satisfied with commoner food, it would be a valuable addition to our stock of domesticated Ruminants.

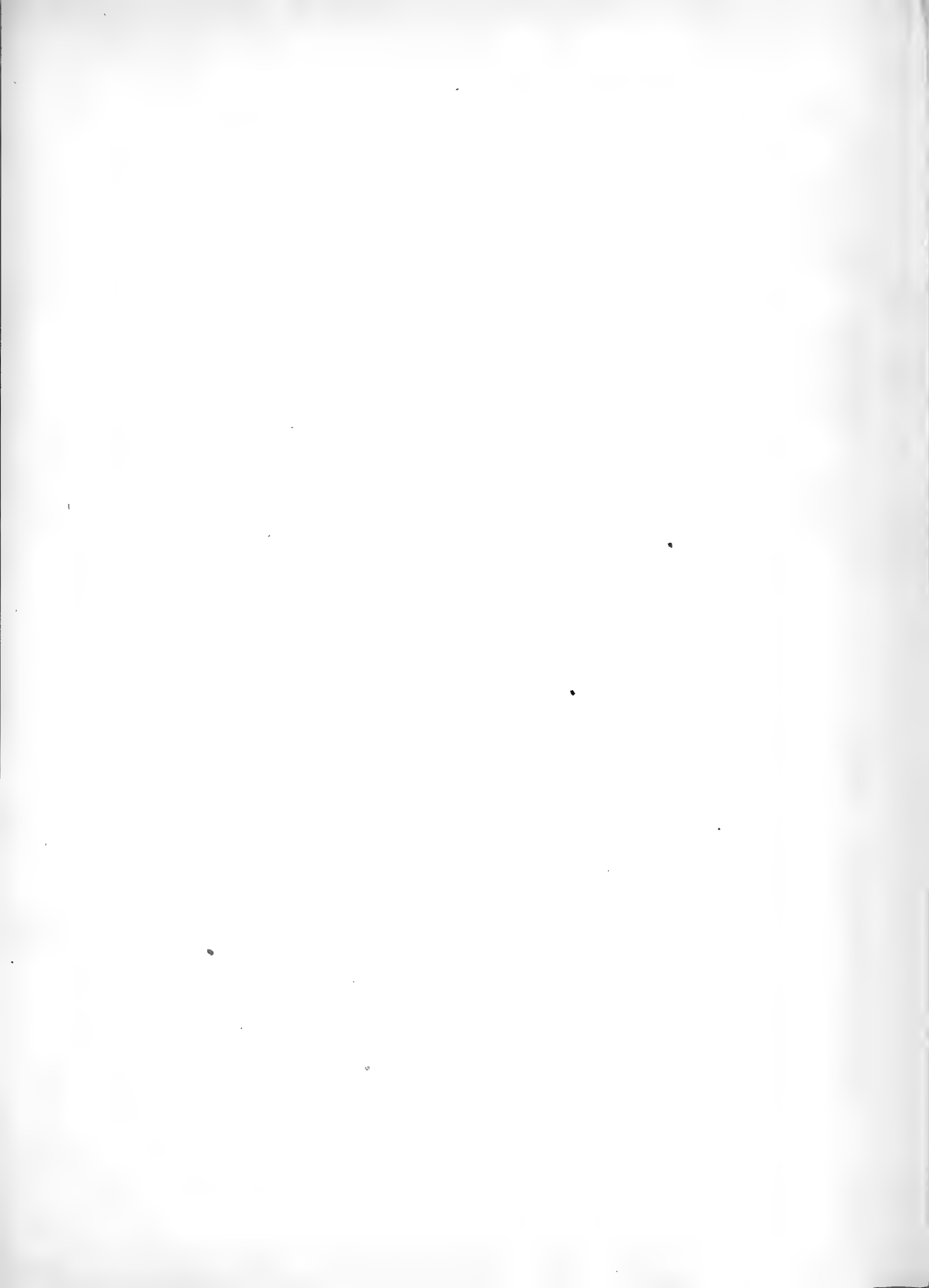
GENUS AÑOÁ.

The AÑOÁ, *Anoa depressicornis*, is the *solitary* species known. For a long time it was placed by naturalists among the antelopes, then it was

removed to the buffaloes, with which indeed it is closely related. Modern classifiers raise it to the rank of a genus. It is the dwarf of the race, measuring only fifty inches in height at the shoulders, with a length of five feet and a half. The head is broad at the brow, but pointed at the muzzle, the eyes are large, and dark brown; the horns are set wide apart, and form nearly a straight line with the face. There is no lachrymal sinus. The hair is of moderate length and thickness, and is usually of a dark-brown color.

Nothing is known of the wild life of the Anoa. It seems to be confined to the island of Celebes, where it is an inhabitant of the mountains. It has been often captured and brought to Europe. It gives the impression of a small cow, is lazy and indisposed to move, standing for hours on the same spot, either eating, or chewing the cud. Like the buffaloes, it is remarkable for its silence; it very rarely utters a short low, more like a groan. It resembles the buffaloes also in its predilection for water and moist places, and its love for water-plants as food. Though so small, it is very fierce. Some of them which were kept in confinement, killed in one night fourteen stags placed in the same inclosure. Brehm has proposed for the animal the name of Chamois-Buffalo; the word *Anoa* means in the Malay language "forest-cow."









MUSK OX CAPE BUFFALO YAK
PLATE XLVI UNGULATA



CHAPTER XXVI.

THE BUFFALOES.

THE GENUS BUBALUS—THE CAPE BUFFALO—DRAYSON'S ACCOUNT—BUFFALO SHOOTING—THE INDIAN BUFFALO—BUFFALO AND TIGER FIGHTS—WILLIAMSON'S ACCOUNT—THE KERABAU—THE DOMESTICATED BUFFALO—ITS HABITS—ITS USES.

THE Buffaloes are heavily built animals with a clumsy figure, short, powerful, and thick legs, a short neck, a broad convex forehead, a large bare muzzle, dull malicious-looking eyes, large, broad, hairy ears, and a rather long tufted tail.

GENUS BUBALUS.

Of the *five* species into which the Buffaloes are divided, three are African, ranging over all the continental parts of the Ethiopian region; one is Indian; one is domesticated in South Europe and North Africa. The animal is subject to considerable modifications in external aspect, according to the climate, or the particular locality in which it resides; and has, in consequence, been mentioned under very different means. In all cases, the wild animals are larger and more powerful than the domesticated ones, and in many instances the slightly different shape, and greater or lesser length of the horns, or the skin denuded of hairs, have been considered as sufficient evidence of separate species.

THE CAPE BUFFALO.

The CAPE BUFFALO, *Bubalus Caffer* (Plate XLVI) is formidable for its strength, and terrible in aspect. The heavy bases of the horns, that nearly unite over the forehead, and under which the little fierce eyes twinkle with sullen rays, give to the creature's countenance an appear-

ance of morose, lowering ill-temper, which is in perfect accordance with its real character.

Owing to the enormous heavy mass which is situated on the forehead, the Cape Buffalo does not see very well in a straight line, so that a man may sometimes cross the track of a buffalo within a hundred yards, and not be seen by the animal, provided that he walks quietly, and does not attract attention by the sound of his footsteps. This animal is ever a dangerous neighbor, but when it leads a solitary life among the thickets and marshy places, it is a worse antagonist to a casual passenger than even the lion himself. In such a case, it has an unpleasant habit of remaining quietly in its lair until the unsuspecting traveler passes closely to its place of concealment, and then leaping suddenly upon him like some terrible monster of the waters, dripping with mud, and filled with rage. When it has succeeded in its attack, it first tosses the unhappy victim in the air, then kneels upon his body, in order to crush the life out of him, then butts at the dead corpse until it has given vent to its insane fury, and ends by licking the mangled limbs until it strips off the flesh with its rough tongue.

Many such tragical incidents have occurred, chiefly, it must be acknowledged, owing to the imprudence of the sufferer; and there are few coverts in Southern Africa which are not celebrated for some such terrible incident. Sometimes the animal is so recklessly furious in its unreasoning anger, that it absolutely blinds itself by its heedless rush through the formidable thorn-bushes which are so common in Southern Africa. Even when in company with others of their own species, they are liable to sudden bursts of emotion, and will rush blindly forward, heedless of everything but the impulse that drives them forward. In one instance, the leader of the herd being wounded, dropped on his knees, and was instantly crushed by the trampling hoofs of his comrades, as they rushed over the prostrate body of their chief.

The flesh of the Cape Buffalo is not in great request even among the Kaffirs, who are in no wise particular in their diet. The hide, however, is exceedingly valuable, being used for the manufacture of sundry leathern implements where great strength is required without much flexibility.

The Cape Buffalo is little larger than an ordinary ox. The strangely shaped horns are black in color, and so large that the distance between their points is not unfrequently four to five feet. They are very wide at

the base, and form a kind of bony helmet which is impenetrable by an ordinary musket-ball. Captain Drayson gives the following description of the animal :

“The hide of this animal is a bluish-black in color, and is so very tough that bullets will scarcely penetrate it if they are fired from a distance, or are not hardened by an addition of tin in the proportion of one to eight. It is of a fierce, vindictive disposition, and from its cunning habits is esteemed one of the most dangerous animals in Southern Africa. The Cape Buffalo is naturally a gregarious animal, but at certain seasons of the year the males fight for the mastery ; a clique of young bulls frequently turn out an old gentleman, who then seeks the most gloomy and retired localities in which to brood over his disappointments. These solitary skulkers are the most dangerous of their species ; and although it is the nature of all animals to fly from man, unless they are badly wounded, or are intruded upon at unseasonable hours, these old hermits will scarcely wait for such excuses, but will willingly meet the hunter half-way and try conclusions with him.

“Although frequently found in large herds on the plains, the buffalo is principally a resident in the bush ; here he follows the paths of the elephant or rhinoceros, or makes a road for himself. During the evening, night, and early morning, he roams about the open country and gorges ; but when the sun has risen high, or if he has cause for alarm, the glens and coverts are sought, and amidst their shady branches he enjoys repose and obtains concealment. The ‘spoor’ of the buffalo is like that of the common ox, the toes of the old bulls being very wide apart, while those of the young ones are close together ; the cow buffalo’s footprints are longer and thinner than the bull’s, and smaller. As these animals wander in the open ground during the night, and retreat to their glens during the day, their spoor may be taken up from the outside of the bush, and followed until the scent leads to the view. When the hunter comes near to his game, of which he should be able to judge by the freshness of the footprints, he should wait and listen for some noise by which to discover their position. Buffaloes frequently twist and turn about in the bush, and do so more especially just before they rest for the day.

“I knew a Kaffir who carried about him the marks of a buffalo’s power and cunning. He was hunting buffaloes one day in the bush, and came upon a solitary bull, which he wounded ; the bull bounded off, but the

Kaffir, thinking him badly hurt, followed after at a run, without taking sufficient precautions in his advance. Now, dangerous as is a buffalo when untouched, he is still more to be dreaded when hard hit, and should therefore be followed with the utmost caution. The Kaffir had hurried on through the bush for a hundred yards or so, and was looking for the spoor, when he heard a crash close to him, and before he could move himself, he was sent flying in the air by the charge of the buffalo. He fell into some branches and was thus safe, for the buffalo was not satisfied with this performance, but wished to finish the work which he had so ably begun. After examining the safe position of his victim, he retreated. The Kaffir, who had two or three ribs broken, reached his home with difficulty, and gave up buffalo-shooting from that day. It appeared that this cunning animal had retraced its steps after retreating, and had then backed into a bush, and waited for the Kaffir to pass.

“A great sportsman at Natal, named Kirkman, told me that he was shooting buffaloes when he was across the Sugela river on one occasion, and having wounded a bull, he was giving him his quietus, when the creature sent forth a sort of moan. Now the buffalo always dies game, and rarely makes any other noise when hard hit. This moan was probably a signal; and as such it was translated by the herd to which this animal belonged, as they suddenly stopped in their retreat, and came to the rescue. Kirkman dropped his gun and took to some trees, where he was in safety. Fortunate it was for him that timber happened to be near, as the savage herd really meant mischief, and came round his tree in numbers. When they found that he was safe from their rage, they retreated.”

The other African species differ but slightly from the Cape species, the specific distinction being in the shape of the horns.

THE INDIAN BUFFALO.

According to Brehm, the Indian Buffalo ought to be regarded as the ancestor of the domesticated species which is found in Italy and Egypt. He considers that we are not yet in a position to define the species very accurately, and regards the “Arni” and the “Bain” as, at most, varieties of the Wild Buffalo which is dispersed through the greater part of India, Ceylon, and South-eastern Asia.

The INDIAN BUFFALO, *Bubalus buffelus*, measures in length nine to ten feet, including the tail, and stands nearly five feet high. The head is short and broad, the neck thick, with folds in front, but without a dew-lap, the body full and round, and raised at the chine, the tail pretty short, and the legs have long broad hoofs, capable of being widely outspread. The eye has a wild defiant look, the horizontal ear is long and broad. The long, strong, smooth horns, thick and broad at the roots, have a triangular section; they rise close together, and at first curve outward and downward, then backward and upward, and finally turn inward and forward. The sparse, stiff, bristle-like hair is rather longer on the forehead and shoulders, while the hind-quarters, breast, belly, and most part of the leg are bare. Thus the color of the dark-gray or black hide is more prominent than that of bluish, brown, or reddish hair. White and piebald specimens are rare.

This animal frequents wet and marshy localities, being sometimes called the Water Buffalo on account of its aquatic predilections. It is a most fierce and dangerous animal, savage to a marvellous degree, and not hesitating to charge any animal that may arouse its ready ire. An angry buffalo has been known to attack a tolerably-sized elephant, and by a vigorous charge in the ribs to prostrate its huge foe. Even the tiger is found to quail before the buffalo, and displays the greatest uneasiness in its presence.

The buffalo, indeed, seems to be animated by a rancorous hatred toward the tiger, and if it should come inadvertently on one of the brindled objects of its hate, will at once rush forward to the attack. Taking advantage of this peculiarity, the native princes are in the habit of amusing themselves with combats between tigers and trained buffaloes. The arena is always prepared by the erection of a lofty and strongly-built palisade, composed of bamboos set perpendicularly, and bound together upon the outside. The object of this contrivance is, that, the surface of the bamboo being hard and slippery, the tiger's claws may find no hold in case of an attempted escape.

The tiger is first turned into the arena, and generally slinks round its circumference, seeking for a mode of escape, and ever and anon looking up to the spectators, who are placed in galleries that overlook the scene of combat. When the tiger has crept to a safe distance from the door, the buffalo is admitted. On perceiving the scent of the tiger, it immediately becomes excited, its hairs bristle up, its eyes begin to flash, and

it seeks on every side for the foe. As soon as it catches a glance of its enemy it lowers its head toward the ground, so that the tips of its horns are only a few inches above the earth, and its nose lies between its fore-legs, and then it plunges forward at the shrinking tiger. Were the latter to dare the brunt of the buffalo's charge, the first attack would probably be the last; but, as the tiger is continually shifting its position, the force of the onset is greatly weakened. Usually the buffalo is victorious, for the tiger, even if successful in the first onset, does not follow up his advantage, and allows his adversary to recover his breath. The buffalo, on the other hand, delivers charge after charge, never giving the tiger time to rest. At last the wearied feline is off his guard, and with a grand rush the buffalo impales him on his horns, and hurls him into the air to fall crushed and lifeless to the earth.

Captain Williamson, in his work on "Oriental Field Sports," describes the Buffalo, and its mud-loving propensities:

"This animal not only delights in the water, but will not thrive unless it have a swamp to wallow in. Then rolling themselves, they speedily work deep hollows, wherein they lie immersed. No place seems to delight the Buffalo more than the deep verdure on the confines of *jeels* and marshes, especially if surrounded by tall grass, so as to afford concealment and shade, while the body is covered by the water. In such situations they seem to enjoy a perfect ecstasy, having in general nothing above the surface but their eyes and nostrils, their horns being kept low down, and consequently hidden from view.

"Frequently nothing is perceptible but a few black lumps in the water, appearing like small clods, for the buffaloes being often fast asleep, all is quiet; and a passenger would hardly expect to see, as often happens, twenty or thirty great beasts suddenly rise. I have a thousand times been unexpectedly surprised in this manner by tame buffaloes, and once or twice by wild ones. The latter are very dangerous, and the former are by no means to be considered as innocent. The banks of the Ganges abound with buffaloes in their wild state, as does all the country where long grass and capacious *jeels* are to be found. Buffaloes swim very well, or, I may say, float. It is very common to see droves crossing the Ganges and other great rivers at all seasons, but especially when the waters are low. At a distance one would take them to be large pieces of rock or dark-colored wood, nothing appearing but their faces. It is no unusual thing for a boat to get into the thick of

them, especially among reedy waters, or at the edges of jungles, before it is perceived. In this no danger exists; the buffaloes are perfectly passive, and easily avoid being run down, so the vessel runs no danger."

The KERABAU is a variety of buffalo found in Ceylon, Borneo, Sumatra, Java, and the Philippine Islands. Its horns attain a monstrous size, the body is nearly devoid of hair, but a tuft springs out between the horns. The Kerabaus that are found wild are not to be considered as wild cattle; properly speaking, they are domesticated cattle that have run wild. They are, however, dangerous to meet, especially for European travelers. Even the tame ones, which are docile enough to a native, evidently dislike a European.

THE DOMESTICATED BUFFALO.

The BUFFALO, *Bubalus vulgaris*, is found in Egypt and in Italy. It was introduced into the former country by the Mohammedan conquerors, and first appeared in the latter in the reign of the Lombard prince, Agilulf. It prefers warm and marshy districts; it thrives in the Delta of the Nile, in the poisonous Campagna of Rome, in the marsh lands of Apulia and Calabria, and in the Maremma of Tuscany. In the Italian fens it is the only representative of the family, as all others quickly perish; in Lower Egypt it is the domestic animal from which milk and butter is procured. Every Egyptian village has a pond for it to wallow in. It is less often seen in the fields than in water, where it lies or stands with only its head and part of the back visible. The period of inundation, when the Nile overflows, is to the Buffalo a time of enjoyment. It swims from place to place, cropping the grass on the dykes, and eating the long reed-grasses; large herds of them are seen playing with each other in the water; and they return home only when the cows want to be milked. It is a pretty sight to see a herd of these creatures crossing the swollen stream, and bearing on their backs women and children. The swimming powers of the Buffalo are wonderful. They act as if water were their natural element; they sport together, dive, roll, and drift at pleasure. They pass at least eight hours a day in the water, and become unruly and disquieted if they cannot reach it. If long deprived of it, they gallop furiously as soon as a stream or swamp comes in sight, in order to plunge into it. Many accidents result, for the animals drag into the flood the wagons to which they are yoked. The

Buffalo is more awkward on land. Its gait is clumsy, and its gallop very heavy and labored.

The first aspect of these buffaloes, as the traveler sees them on the desolate Roman marshes, is calculated to cause alarm. Their look is defiant and savage, their eyes are full of deceit and viciousness. But in Egypt they are good-tempered, and can be managed by a child. Complete indifference to everything except water and fodder is their leading characteristic. They draw the plow or the wagon, they can be led or driven, they will bear a rider or a load. They are easily satisfied, selecting the driest, hardest, most tasteless plants, and this provender suits them, for they give rich, good milk, from which excellent butter is made.

The Buffalo, having the swine-like propensity for rolling in the mud, is often very dirty. Very orthodox Mussulmans suspect it of being too near akin to the unclean pig, and, as it charges furiously at the red standard of Mohammed, the Turks consider it an accursed creature. The Egyptians, looking to its usefulness, piously believe that the Almighty will pardon its acts of impiety. The Buffalo seldom bellows, but the cow lows to call up her calf; the sound is an unpleasant one, midway between a grunt and a bellow.

The flesh of the Buffalo is tough, and is disagreeable to Europeans on account of its musky odor. The hide supplies thick strong leather, and the horns are fashioned into cups.



CHAPTER XXVII.

THE ANTELOPES.

THE ANTELOPES—THE ELAND—THE KOODOO—THE BOSCH-BOK—THE NYLGHAU—THE PASSAN—THE BEISA—THE SABRE ANTELOPE—THE ADDAX—THE SABLE ANTELOPE—THE BLAU-BOK.

THE *eleven* sub-families of Hollow-horned Ruminants which we are about to describe in this and the subsequent chapter, are often grouped together as *Antilopinæ*, and called Antelopes. But the number of Antelopes is so great, and the differences in their form so immense, that a further subdivision is necessary. Some of the Antelopes are as clumsy as cows, others as agile as the roe, some approach the horse in appearance, others the musk-deer, already mentioned. The horns present nearly every form; they are curved, forward, backward, downward, upward, they rise straight, or sweep gracefully aloft like a lyre; they are round, or angular, or, as in one species, forked. The anatomy of them all is very like that of the deer. With one exception, the Prong-horn, they are all denizens of the Eastern Hemisphere, and are especially abundant in Africa.

The first sub-family, TRAGELAPHINÆ, represents to a certain extent the connecting link with the Ox-tribe. The body of the animals contained in it are heavy, thick, and strong, the neck short, the head large, the tail like an ox-tail; the neck has a dewlap, the horns are common to both sexes, and are formed like a screw. The sub-family contains *three* genera.

GENUS OREAS.

The ELAND, *Oreas canna* (Plate XLVII), of which *two* species are known, is the largest of all the African Antelopes, and attains the dimensions of a large ox; it stands six feet high, and is stout in proportion. Its color varies with age, but usually is a pale grayish-brown. The

horns are straight, and spirally twisted. The old males have a strong musky odor. Their food consists of the fragrant herbs which cover the plains. They require very little water, living without it for months, even when the herbage is so dry that it crumbles in the hand.

The heavy build of the Eland renders it an easy prey to the hunter, who can run it down by a steady pursuit. A heavy Eland will weigh over a thousand pounds; the fat around the heart alone weighs fifty pounds. The flesh is cut off as soon as the animal is killed, dried, or salted, then packed in skins for future consumption. The fat is made into candles, and the hide cut up into thongs. The flesh is like beef, but has an unpleasant taste when fresh, which it loses when smoked. The "Bil tongues" are eaten raw, and are a great delicacy. They consist of the tongue cut out its whole length, slightly smoked, and sliced very fine.

The Eland has a wide range. It is abundant near the Cape of Good Hope, and is not uncommon on the White Nile. Its favorite haunts are the grassy plains, where clumps of mimosas rise up like islands in a sea. It is occasionally, however, found in mountainous districts. The herds usually consist of eight or ten animals, and at a distance may be mistaken for cows grazing. Some walk slowly about, others bask in the sun, others lie chewing the cud in the shadow of the mimosa-shrubs. In going to pasture they follow in close order the guidance of an old male, and trot at a good pace. Elands have been brought to Europe, where they have propagated, and many of them may be seen in the parks of wealthy land-owners. They are, however, such large feeders, that the expense of keeping them destroys all hope of profit.

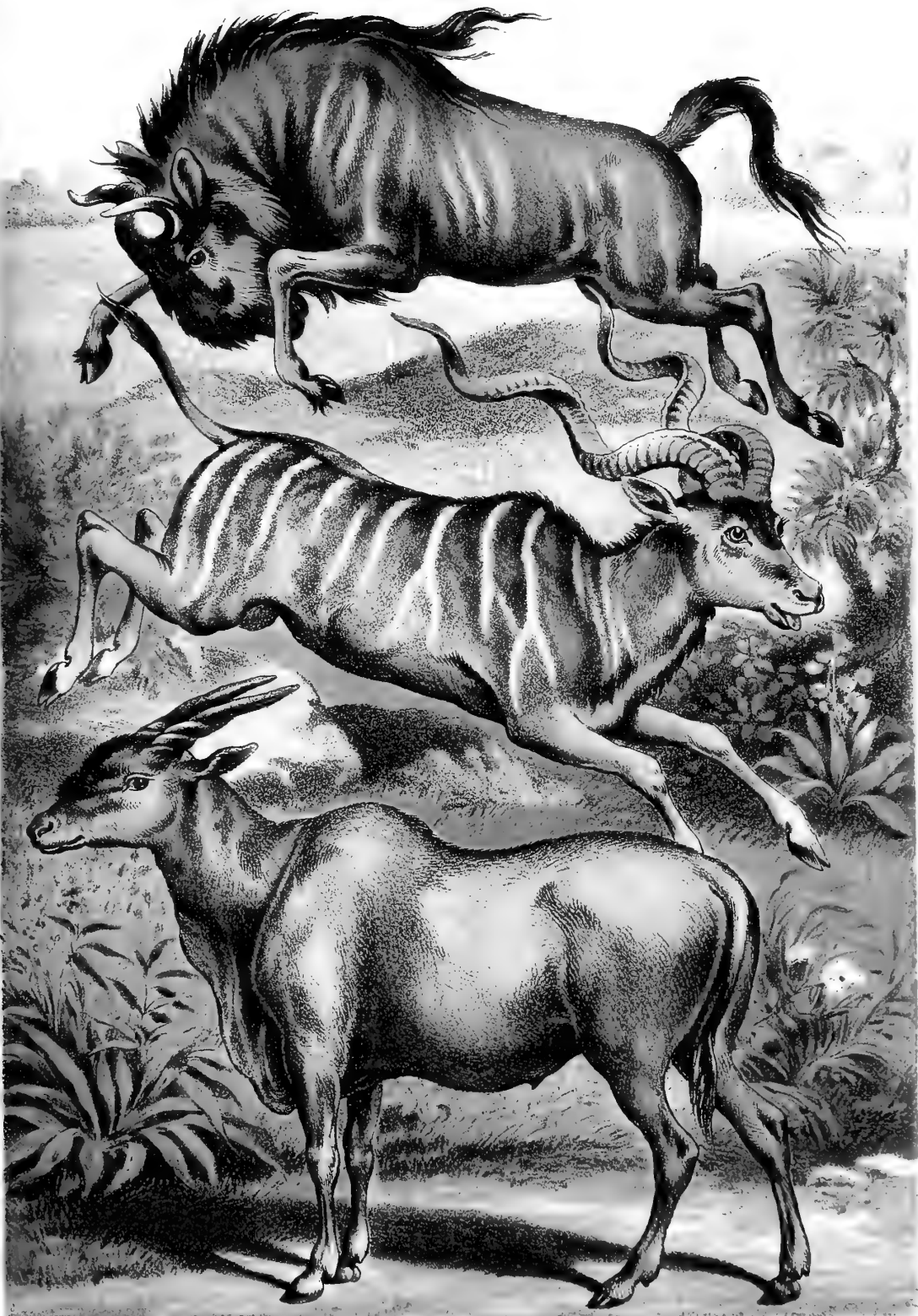
A species called the STRIPED ELAND has been shot in Southern Africa. Except in the color, it resembles perfectly the common Eland.

GENUS TRAGELAPHUS.

The animals comprised in this genus are classed in *eight* genera. They are of graceful form, and attain the size of the Roe Deer. The head is slender, the eyes large, the ear large and broad. Only the males have horns, which are slightly spiral, and set in a line with the face. The hair is thick, and forms a ridge along the spine. The hide is dappled, and curiously marked in the different species.







GNU OR HORNED HORSE
ELAND

KOODOO

PLATE XLVII. UNGULATA.



The KOODOO, *Tragelaphus kudu* (Plate XLVII), is not much inferior to the elk in size, and is of a very imposing appearance. It is widely dispersed over Africa, where it frequents the thorny scrub-forests of the interior of the continent.

This truly magnificent creature is about four feet in height at the shoulder, and its body is rather heavily made, so that it is really a large animal. The curiously twisted horns are nearly three feet in length, and are furnished with a strong ridge or keel, which extends throughout their entire length. It is not so swift or enduring as the Bless-bok, and can be run down without difficulty, provided that the hunter be mounted on a good horse, and the ground be tolerably fair and open. Its leaping powers are very great, for one of these animals has been known to leap to a height of nearly ten feet without the advantage of a run.

The Bushmen have a curious way of hunting the Koodoo, which is generally successful in the end, although the chase of a single animal will sometimes occupy an entire day. A large number of men start on the "spoor," or track, one taking the lead and the others following leisurely. As the leading man becomes fatigued he drops into the rear, yielding his place to another, who takes up the running until he too is tired. A number of women bearing ostrich egg-shells filled with water accompany the hunters, so that they are not forced to give up the chase through thirst. As the chase continues, the Koodoo begins to be worn out with continual running, and lies down to rest, thereby affording a great advantage to its pursuers, who soon come within sight, and force it to rise and continue the hopeless race. At last it sinks wearied to the earth, and falls an unresisting prey to its foes.

The flesh of the Koodoo is remarkably good, and the marrow of the principal bones is thought to be one of Africa's best luxuries. So fond are the natives of this dainty, that they will break the bones and suck out the marrow without even cooking it in any way whatever. The skin of this animal is extremely valuable, and for some purposes is almost priceless. There is no skin that will make nearly so good a "fore-slock," or whip-lash, as that of the Koodoo; for its thin, tough substance is absolutely required for such a purpose. Shoes, thongs, certain parts of harness, and other similar objects are manufactured from the Koodoo's skin, which, when properly prepared, is worth a sovereign or thirty shillings, say five or six dollars, even in its own land.

The Koodoo is very retiring in disposition, and is seldom seen except

by those who come to look for it. It lives in little herds or families of five or six in number, but it is not uncommon to find a solitary hermit here and there, probably an animal which has been expelled from some family, and is awaiting the time for setting up a family of his own. As it is in the habit of frequenting brushwood, the heavy spiral horns would appear to be great hindrances to their owner's progress. Such is not, however, the case, for when the Koodoo runs, it lays its horns upon its back, and is thus enabled to thread the tangled bush without difficulty. Some writers say that the old males will sometimes establish a bachelor's club, and live harmoniously together, without admitting any of the opposite sex into their society.

It is a most wary animal, and is greatly indebted to its sensitive ears for giving it notice of the approach of a foe. The large, mobile ears are continually in movement, and serve as admirable conductors and condensers of sound. From the conduct of a young Koodoo that was captured by Mr. Anderson, and reared by him, the disposition of the animal appears to be gentle, playful, and affectionate. The little quadruped, which was taken at so tender an age that it was fed with milk from a bottle, became strongly attached to its owner, and was a most active and amusing little creature. Domestication to any extent, is, however, not very practicable, as the animal is, in common with the gnou and the zebra, liable to the terrible horse-sickness, which destroys so many of those useful animals.

The color of the Koodoo is a reddish-gray, marked with several white streaks running boldly over the back and down the sides. The females are destitute of horns.

The BOSCH-BOK, *Tragelaphus sylvaticus*, is upward of three feet in height, and five in length. It is gracefully, yet stoutly built. The horns are a foot long, nearly straight, and wrinkled at the base. The general color is dark chestnut, with a white streak along the back, and some white spots about the body. The female is hornless, smaller, and lighter colored. The animal is extremely watchful, and requires the perfection of bush-craft to be surprised.

These beasts are generally found in couples, male and female, although sometimes an old ram leads a hermit life. The Kaffirs frequently caution the hunter about these solitary animals, but they never display any signs of a ferocious disposition except when brought to bay, and under such circumstances even a rat will fight. It is said that the tiger-bosch-katte

(the Serval) has been found dead in the bush, pierced by the horns of the Bosch-bok.

The districts from the Cape of Good Hope to Delagoa Bay and some distance inland are the resorts of this antelope. Although frequently passing from three to four days per week in the bush, the sportsman rarely sees more than a dozen black Bosch-boks, even though their spoor is imprinted on the ground in all directions, thus proving that they are numerous. Seldom by fair stalking can this crafty and wary antelope be slain. The Kaffirs frequently form large hunting parties, and by "spooring" their tracks and surrounding the bush in which they are concealed, drive them out and despatch them with assagais. This is, however, but a butcherly proceeding, and one which no true sportsman would follow. The Bosch-bok is so wary, so rare, and so beautiful an antelope, that any man may feel delighted if he can fairly procure one or two specimens during his sporting career.

The STRIPED ANTELOPE, *Tragclaphus scriptus*, is characterized by a coat of three colors. The head is fawn-gray, the neck and back dark-gray, while the flanks are reddish. The breast is dark-brown, the ridge of hair along the back of the neck is nearly black, but that along the spine consists of hairs with white tips. There is a white spot under the eye, and another near the ear. The front of the legs from the knee to the hoof is white, and the sides are marked with a moderately broad longitudinal stripe, and several narrow vertical ones; these are crossed by transverse stripes, and contain between them oval spots. Oval spots of white are very numerous on the thigh.

These graceful creatures are not rare in Zoological Gardens; they live on common provender, and give little trouble.

GENUS PORTAX.

The NYLGHAU, *Portax pictus*, is the *solitary* species known. It is an inhabitant of the thickly wooded districts of India. It is about four feet high at the shoulders, and nearly seven feet in length. In its general appearance it seems like a hybrid between the deer and the ox. The general color is a slaty-blue. The face is marked with brown, the long neck is furnished with a bold dark mane, and a long tuft of coarse hair hangs from the throat. The female is smaller than her mate, and hornless. Her coat is generally a reddish-gray, instead of partaking of the

slate-blue tint which colors the form of the male. The hind-legs of this animal are rather shorter than the fore-legs. Its name, Nylghau, is of Persian origin, and signifies "Blue Ox."

It does not seem to be of a social disposition, and is generally found in pairs inhabiting the borders of the jungle. There are, however, many examples of solitary males. It is a shy and wary animal, and the hunter who desires to shoot one of these antelopes is obliged to exert his bush-craft to the utmost in order to attain his purpose. To secure a Nylghau requires a good marksman as well as a good stalker, for the animal is very tenacious of life, and if not struck in the proper spot will carry off a heavy bullet without seeming to be much the worse at the time. The native chiefs are fond of hunting the Nylghau, and employ in the chase a whole army of beaters and trackers, so that the poor animal has no chance of fair play. These hunts are not without their excitement, for the Nylghau's temper is of the shortest, and when it feels itself aggrieved, it suddenly turns upon its opponent, drops on its knees, and leaps forward with such astounding rapidity, that the attack can hardly be avoided, even when the intended victim is aware of the animal's intentions and is prepared for the attack.

Even in domesticated life the Nylghau retains its hasty and capricious temper, and though there may have been several successive generations born into captivity, the young Nylghaus display the same irritable temper as their parents. Its disposition is very uncertain, and not to be depended upon. It takes offence at trifles, and instantly attacks the object of its dislike. The flesh is coarse and insipid, and the animal is of no great value commercially.

The next sub-family, ORYGINÆ, comprises *two* genera, which are distinguished chiefly by the formation of the horns. Both genera are depicted on the oldest monuments of Egypt and Nubia. In the Great Pyramid one of these animals is represented with one horn, and hence it is supposed that the legend of the Unicorn has arisen.

GENUS ORYX.

The *four* species of ORYX belong to the largest and heaviest class of antelopes, but in spite of their stout figure, they give the spectator an impression of majesty. Both sexes have horns which are very long and

thin; quite straight in some species, boldly curved in others. They have no lachrymal sinus.

The PASSAN or CAPE CHAMOIS, *Oryx capensis*, stands about five feet high. The horns, which in the female are thinner and much longer than in the male, exceed a yard in length; they rise straight from the head in a line with the face; the lower portion is marked with thirty or forty rings, the upper part is smooth and pointed. The smooth coat consists of short, stiff hair. The neck, back, and sides are yellowish-white, the head, ears, and the legs from the knee are dazzling white. A streak on the brow, a broad patch on the nose, a line running from the eye to the chin are black, while black lines separate the white and yellowish colors on the rest of the body. The mane-like ridge on the neck and the tuft on the tail are black-brown. The Passan is only found in Southern Africa, and is called by the Boers of the Cape, the Gems-bok. In Gordon Cumming's work on Southern Africa may be found the following notes concerning this animal:

"The Gems-bok was intended by nature to adorn the parched karroos and arid deserts of South Africa, for which description of country it is admirably adapted. It thrives and attains high condition in barren regions where it might be imagined that a locust could not find subsistence; and burning as is the climate, it is perfectly independent of water, which, from my own observation and the repeated reports both of Boers and aborigines, I am convinced it never by any chance tastes. Its flesh is deservedly esteemed, and ranks next to that of the eland. At certain seasons of the year they carry a great quantity of fat, at which time they can more easily be ridden into.

Owing to the even nature of the ground which the Gems-bok frequents, its shy and suspicious disposition, and the extreme distances from water to which it must be followed, it is never stalked or driven to an ambush like the antelopes, but is hunted on horseback, and ridden down by a long, severe, tail-on-end chase. Of several animals in South Africa which are hunted in this manner, the Gems-bok is by far the swiftest and the most enduring."

The long horns are terrible weapons, and the Gems-bok wields these natural bayonets in a manner which makes it a match for most of the Carnivora. It has been known to beat off the lion itself. Even when the lion has overcome the Gems-bok, the battle may sometimes be equally claimed by both sides, for in one instance the dead bodies of a

lion and a Gems-bok were found lying on the plain, the horns of the antelope being driven so firmly into the lion's body, that they could not be extracted by the efforts of a single man. The lion had evidently sprung upon the Gems-bok, which had received its foe upon the points of its horns, and had sacrificed its own life in destroying that of its terrible and redoubtable adversary.

The BEISA, *Oryx beisa*, is the Oryx of the ancients. It is equal to the Passan in size, but its color is lighter, and the white markings are somewhat differently arranged. It inhabits at present the coast of Abyssinia, and southward to the country of the Somali.

The SABRE ANTELOPE, *Oryx leucoryx*, has long horns which are considerably bent, and sweep backward in a noble curve; they are ringed at the base thirty or forty times, and very sharp-pointed. This Antelope, which the Arabs call the "Desert Cow," extends over the northern part of Africa. It is not uncommon in Senaar and Kordofan, as well as in the Soudan.

In habits it resembles the Gems-bok, and can use its cimeter-like horns with equal effect.

GENUS ADDAX.

Like the genus just described, the Addax is represented on the monuments of Egypt. The horns which adorn the heads of kings or priests in ancient Egypt are the horns of this antelope.

The ADDAX, *Addax nasomaculatus*, the *only* species of the genus, is found in many parts of Northern Africa, and is formed by nature for a residence among the vast plains of arid sand which are spread over that portion of the globe.

These animals are not found living together in herds, but in pairs, and their range of locality seems to be rather wide. As they are intended for traversing large sandy regions, the feet are furnished with broad, spreading hoofs, which enable them to obtain a firm foothold upon the dry and yielding sand. The horns of this animal are long, and twisted after a manner that reminds the spectator of the Koodoo, an antelope which has been described and figured. Measured from the tip to the head in a straight line, the horns are about two feet three inches in length; but if the measurement is made to follow the line of the spiral, the length is obviously much greater. The distance between the tips is

about the same as that from the tip to the base. From their roots to within a few inches of their extremities, the horns are covered with strongly marked rings, arranged in an oblique manner, and some of them partially double. The spiral of the horns is as nearly as possible two turns and a half in its whole length.

Upon the forehead there is a bunch or tuft of long hair, and the throat is also covered with a rather heavy mane of long hair, but there is no mane on the back of the neck. The muzzle and nose are rather peculiar, and bear some resemblance to the same parts of a sheep or goat. The general color of the Addax is a milk-white, with the exception of the black patch of hair on the forehead, a brown-black mane, and a reddish shade on the head and shoulders. Both sexes have horns.

The next sub-family, HIPPOTRAGINÆ, comprises only *one* genus, but the animals embraced in it are the stateliest and noblest of the tribe. The name *Hippotragus*, or "Horse-antelope," is derived from the horse-like form which all the *three* species possess.

GENUS HIPPOTRAGUS.

The SABLE ANTELOPE, *Hippotragus niger* (Plate XLVIII), is a magnificent creature, very shy, and therefore seldom seen by the colonists of South Africa. Gordon Cumming gives the following description of it:

"Cantering along through the forest, I came suddenly in full view of one of the loveliest animals which graces this fair creation. This was an old buck of the Sable Antelope, the rarest and most beautiful animal in Africa. It is large and powerful, partaking considerably of the nature of the ibex. Its back and sides are of glossy black, beautifully contrasting with the belly, which is white as driven snow. The horns are upward of three feet in length, and bend strongly back with a bold sweep, reaching nearly to the haunches."

It lives in herds of no very great size, consisting mostly of ten or twelve does led by a single buck. As a general fact, the buck takes matters very easily, and trusts to the does for keeping a good watch and warning him of the approach of an enemy. Owing to the jealous caution of these female sentinels, the hunter finds himself sadly embarrassed when he wishes to enrich his museum with the horns of their leader, and if any of them should happen to take alarm, the whole herd will bound over the roughest ground with such matchless speed that all pursuit is hopeless, and soon abandoned.

In the native dialect, the Sable Antelope is known under the name of Potaquaine. It is very tenacious of life, and will often make good its escape even though pierced entirely through the body with several bullets. It therefore fully tests all the powers of the hunter.

The BLAU-BOK, *Hippotragus leucophoens*, is as large as its sable congener. It was formerly quite common at the Cape of Good Hope, but has within the last sixty years been exterminated in the colony.

It is a gregarious animal, living in little herds not exceeding ten or twelve in number, and preferring hills and slopes to level ground. Like the preceding animal, it exhales a powerful odor, which penetrates throughout its entire body, and which renders its flesh so unpalatable that it is never eaten as long as other food can be obtained. It is a swift and active creature, being remarkable for its speed even among the swift-footed antelopes. There is a variety of this animal, called the DOCOI, which is found by the Gambia, and which is not quite of the same color. The natives assert that the female never produces more than a single young one during her lifetime, for the mother's horns grow so rapidly after the birth of the offspring, that they penetrate into her back and kill her. The Blau-bok is about four feet in height, and the horns are nearly thirty inches in length.



CHAPTER XXVIII.

THE GAZELLES.

THE GAZELLE—ITS BEAUTY AND GRACE—THE ARIEL GAZELLE—THE JAIROU—THE SPRING-BOK—ITS IMMENSE NUMBERS—THE DSEREN—THE SASIN—THE PALLAH—THE SAIGA—THE SUB-FAMILY ANTELOCAPRINÆ—THE PRONG HORN.

THE sub-family GAZELLINÆ—comprising *six* genera—consists of a group of small or moderate-sized animals, remarkable for their graceful forms, their lyre-shaped horns, their long-pointed ears, and small false hoofs. The tear-bag below the eyes is distinct.

GENUS GAZELLA.

The Gazelle, as it ranges the desert, presents a figure so attractive, that the poets of the East have from time immemorial been eloquent in singing its grace, agility, and beauty. The old Egyptians dedicated it to their goddess Iris, the Queen of the gods; it is the "roe or the young hart" to which Solomon compares his spouse, it is the "roe or the hind of the field" by which he conjures the daughter of Jerusalem. The highest expression of beauty which an Eastern bard can utter is the comparison—"she is like a gazelle as it browses beneath the roses." The Arabs find no words to depict it adequately; their oldest poems praise it, the wandering minstrels of to-day still sing its loveliness.

THE GAZELLE.

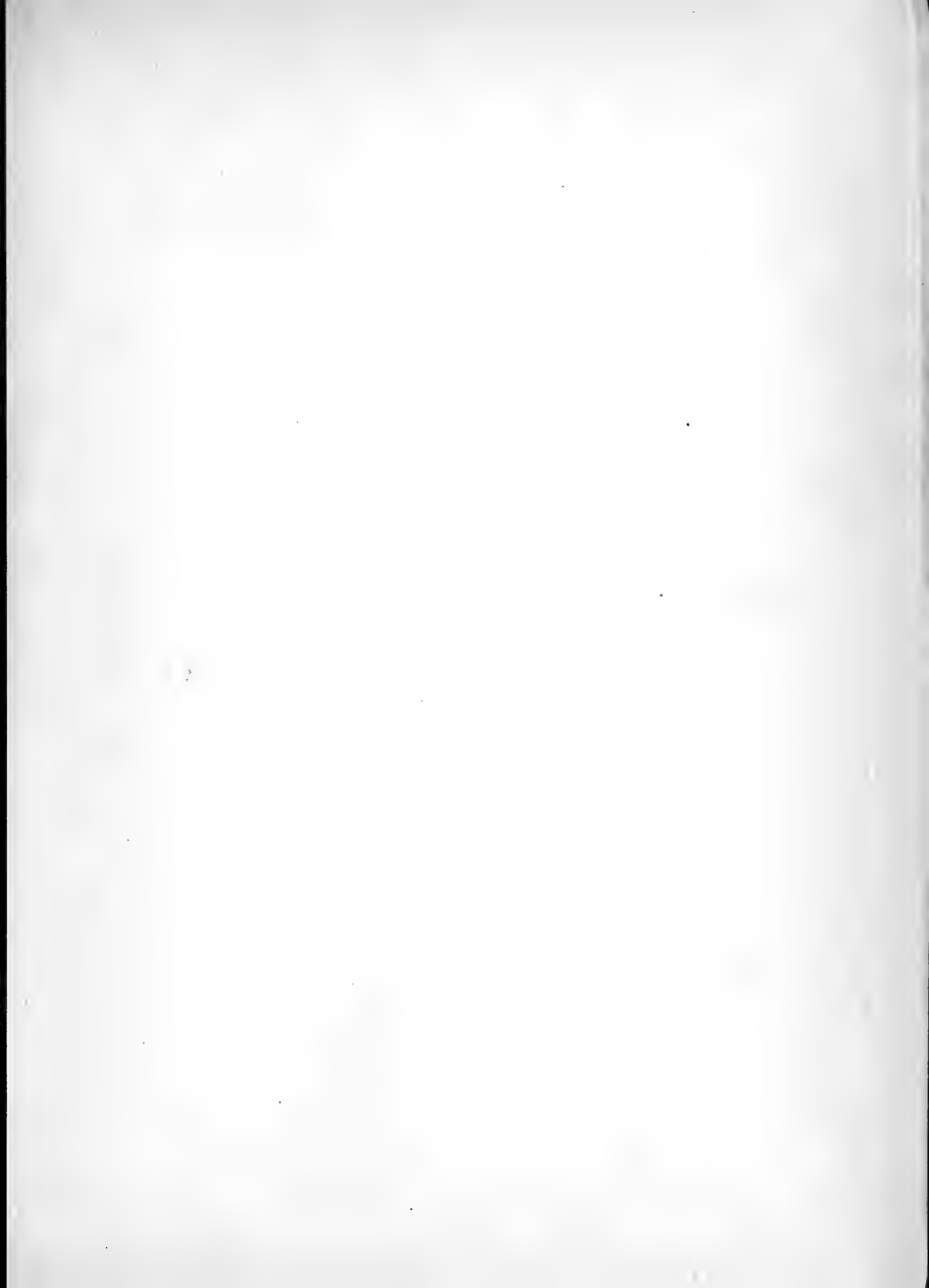
The GAZELLE, *Gazella dorcas* (Plate XLVIII), is not quite as large as the Roe-deer, but is much more finely and slenderly built, and much more prettily marked. A full-grown male stands about a yard high, and measures nearly a yard and a quarter in length. The legs are extremely delicate, and the hoofs small and pretty. Its home is the northeastern

district of Africa. It extends from the Barbary States to the Desert of Arabia, and from the Mediterranean to the plains of Central Africa. Wherever vegetation is found in the desert, the Gazelle is seen in large numbers, but it is rare either in the rich river-bottoms, or in the mountain ranges. A rolling, sandy district, where the mimosas grow thickly, form its favorite haunts. In Kordofan herds of fifty have been observed, but usually the troop consists of less than ten members. But, although they are moving about all day, except during the burning noon-tide hours, the Gazelles are not easily discovered. Their coat resembles closely the color of the soil, and renders it difficult for any but a native of the desert to detect them. At the first sign of danger the herd bounds away as if in sport. Every movement is graceful. They may be seen in play leaping up from one to two yards from the ground over each other's backs, or skipping over stones in their path. All their senses are acute, their scent is remarkable, their sight keen, their intelligence great. Harmless and timid as they are, they are by no means so devoid of courage as is often supposed. Combats take place even in their herds. With all other animals they are willing to be friends; but the leopard and the lion do not reciprocate with good feeling. The Gazelle makes no resistance to such enemies; against weaker ones the herd defends itself by forming a circle with horns pointed out. They are well aware of the advantages of association, and seem to be inspired with feelings of natural attachment to each other.

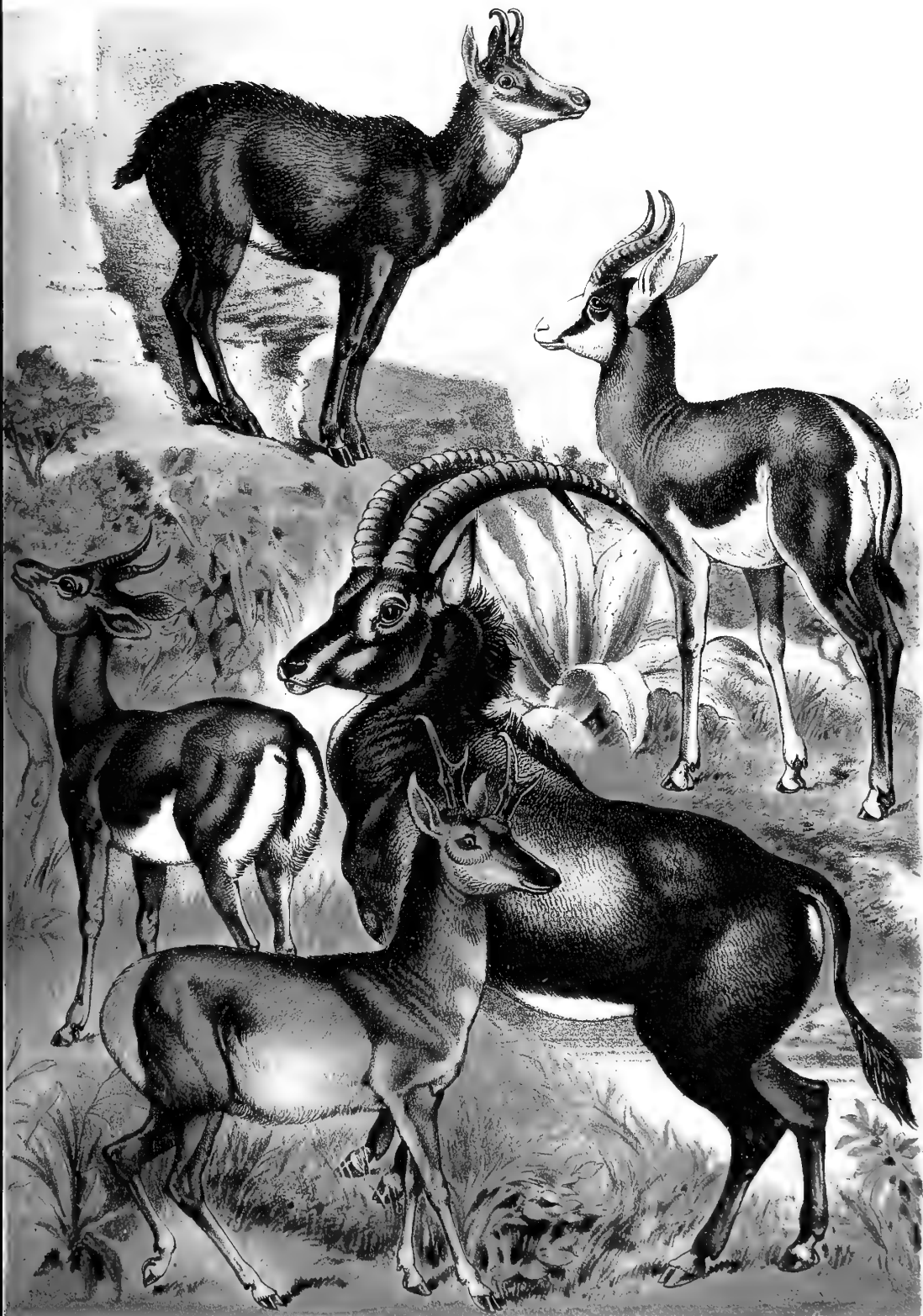
The eye of the Gazelle is large, soft, and lustrous. The color of the coat is a light-fawn, deepening into a dark-brown band on the flanks which forms a line of demarcation between the fawn color of the back and the pure white of the abdomen. The face is marked with a dark-brown and a white streak, running from each horn to the muzzle.

There are *seventeen* species recognized in the genus *Gazella*, and almost as many varieties not entitled to the dignity of species. Among them, the most beautiful is the Ariel Gazelle.

The ARIEL is much darker than the Dorcas Gazelle. It is found in Syria and Arabia, and as it is not only a most graceful and elegant animal in appearance, but is also docile and gentle in temper, it is held in great estimation as a domestic pet, and may be frequently seen running about the houses at its own will. So exquisitely graceful are the movements of the Ariel Gazelle, and with such light activity does it traverse the ground, that it seems almost to set at defiance the laws of







CHAMOIS

SPRINGBOK

GAZELLE

PRONGHORN

SABLE ANTELOPE

PLATE XLVIII UNGULATA

gravitation. When it is alarmed, and runs with its fullest speed, it lays its head back so that the nose projects forward, while the horns lie almost as far back as the shoulders, and then skims over the ground with such marvellous celerity that it seems rather to fly than to run, and cannot be overtaken even by the powerful, long-legged, and long-bodied greyhounds which are employed in the chase by the native hunters.

When the Gazelle is hunted for the sake of the sport, the falcon is called to the aid of the greyhound, for without such assistance no one could catch an Ariel in fair chase. As soon as the falcon is loosed from its jesses, it marks out its intended prey, and overpassing even the swift limbs by its swifter wings, speedily overtakes it, and swoops upon its head. Rising from the attack, it soars into the air for another swoop, and by repeated assaults bewilders the poor animal so completely that it falls an easy prey to the greyhound, which is trained to wait upon the falcon, and watch its flight.

When, however, the Gazelle is hunted merely for the sake of its flesh and skin, a very different mode is pursued. Like all wild animals, the Gazelle is in the habit of marking out some especial stream or fountain, whither it resorts daily for the purpose of quenching its thirst. Near one of these watering-spots the hunters build a very large inclosure, sometimes nearly a mile and a half square, the walls of which are made of loose stones, and are too high even for the active Gazelle to surmount. In several parts of the edifice the wall is only a few feet in height, and each of these gaps opens upon a deep trench or pit. A herd of Gazelles is quietly driven toward the inclosure, one side of which is left open, and being hemmed in by the line of hunters, the animals are forced to enter its fatal precincts. As the pursuers continue to press forward with shouts and all kinds of alarming noises, the Gazelles endeavor to escape by leaping over the walls, but can only do so at the gaps, and fall in consequence into the trenches that yawn to receive them. One after another falls into the pit, and in this manner they perish by hundreds at a time. The flesh of the Ariel Gazelle is highly valued, and is made an article of commerce as well as of immediate consumption by the captors. The hide is manufactured into a variety of useful articles. The Ariel is a small animal, measuring only about twenty-one inches in height.

The JAIROU, or common Gazelle of Asia, which is so celebrated by the Persian and other Oriental poets, is ascertained to be a different species from the Dorcas, and may be distinguished from that animal by

the general dimness of the marking, and the dark brown streak on the haunches. Several other species belong to the genus *Gazella*, among which we may mention the MOHR of Western Africa, the ANDRA of Northern Africa, and the KORIN, or KEVEL, of Senegal.

THE SPRING-BOK.

The SPRING-BOK, *Gazella euchores* (Plate XLVIII), is the representative of the genus in South Africa. It derives its name from its extraordinary agility. It can rise to a height of seven or eight feet without any difficulty, and can reach, on occasions, a height of twelve or thirteen feet. It will never cross a road, if it can avoid doing so; when forced, it clears it at a bound. The color of the Spring-bok is a warm cinnamon-brown above, and pure white on the abdomen; a broad band of reddish-brown parting the two colors.

In the vast plains of Southern Africa, the Spring-bok roams in literally countless herds. "For two hours before the day dawned," Gordon Cumming writes, "I had been lying awake listening to the grunting of the bucks within two hundred yards of me. On rising and looking about me, I beheld the ground to the northward actually covered with a dense living mass of Spring-boks marching slowly and steadily along, extending from an opening in a long range of hills on the west, through which they poured like the flood of some great river, to a ridge about a mile to the east, over which they disappeared. The breadth of the ground they covered might have been somewhere about half a mile. I stood upon the fore-chest of my wagon for nearly two hours, lost in wonder at the novel and beautiful scene which was passing before me, and had some difficulty in convincing myself that it was reality which I beheld, and not the wild and exaggerated picture of a hunter's dream. During this time, their vast legions continued streaming through the neck in the hills, in one unbroken compact phalanx."

The wonderful density of these moving herds may be imagined from the fact, that a flock of sheep have been inextricably entangled among a herd of migrating Spring-boks, and carried along with them without the possibility of resistance or even of escape. Even the lion himself has been thus taken prisoner in the midst of a mass of these animals, and has been forced to move in their midst as if he belonged to their own order. Want of water is said to be the principal cause of these migrations, for

they have been always observed to depart as soon as the district in which they live has been deprived of water, and to return as soon as the genial rains have returned moisture to the earth, and caused the green herbage to make its appearance. Dr. Livingstone, however, doubts whether the Spring-bok is a sufficiently thirsty animal to be driven into these migrations only by want of water, and thinks that there must be other causes also at work.

They are extremely fond of the short tender grass as it springs from the earth, and the Bakalahari Kaffirs, taking advantage of this predilection, are in the habit of burning large patches of dry stubbly herbage for the sake of attracting the Spring-boks, who are sure to find out the locality, and to come and feed upon the short sweet grass that always makes its appearance on the site of burnt vegetation. Spring-boks are very seldom seen in the deep, rank grass that is so plentiful in their native country, for they would not be able to raise their head above the tall blades, and to perceive the lion, leopard, or other enemy that might be crawling toward them under its shelter.

While engaged in these pilgrimages, the Spring-bok suffers sadly from many foes, man included, who thin their numbers along the whole line of march. Various beasts of prey, such as lions, leopards, hyænas, and jackals, hang around the skirts of the herd, and are always ready either to dash boldly among the moving mass and to drag out some unfortunate animal which may happen to take their fancy, or to prowl in a crafty manner about the rear of the troop, in hopes of snapping up the weakly or wounded animals as they fall out of the ranks. The black and white inhabitants of Southern Africa also take advantage of the pilgrimages, and with guns and spears, which may be used almost indiscriminately among such multitudes of animals, without any particular necessity for a careful aim, destroy myriads of the Spring-boks, and load themselves with an ample supply of hides and meat.

There is a curious provision of nature for preserving the herds in proper condition. It is evident that as the animals move in a compact mass, the leaders will eat all the pasture, and those in the rear will find nothing but the bare ground, cut to pieces by the hoofs of their predecessors. The rearward animals would therefore soon perish by starvation, did not matters arrange themselves in a rather remarkable manner. The leading Spring-boks, having the choice of the best pasture, soon become so satiated and overloaded with food, that they are unable to

keep pace with their eager and hungrily active followers, and so are forced to drop into the rear. The hindermost animals in the meantime are anxiously pushing forward in search of food, so that there is a continual interchange going on as the herd moves onward, those in front dropping back to the rear, while those in the rear are constantly pressing forward to take their place in front.

In size the Spring-bok is rather superior to the Dorcas gazelle, but may be immediately distinguished from that animal by means of a curious white patch of long hairs on the croup. Although the animal is so marvelously agile, the body is rather clumsily formed, and seems to be disproportionately large when contrasted with the slight and delicate limbs on which it is supported. While standing at rest, the Spring-bok may be recognized by the peculiar line of the back, which is more elevated at the croup than at the shoulders. The horns of this animal are much larger in the adult male than in the young or the female, and when full grown, are marked with eighteen or twenty narrow complete rings. The lyrate form of the horns is not so perceptible in the young Spring-bok as in the older animal, for until the creature has attained its full growth, the tips of the horns point forward.

GENUS PROCAPRA.

The *two* species of this genus inhabit Mongol-Tartary and the steppes between China and Thibet.

The DSEREN, *Procapra gutturosa*, stand about two feet and a half high, and measures about four feet and a half in length. The body is slender, the head short and thick; the throat of the males has a large protuberance, the tail is short, and its upper part covered with curly hair; the legs are slender and graceful; the horns, which are borne only by the males, are placed close together on the skull, but gradually widen out, curving backward and inward, and marked at the base with about twenty prominent rings. The ears are large and pointed. The color of the coat varies according to the season. In summer the throat and the thighs below the tail are pure white, and the rest of the body is cream-color, with some brownish marks on the brow. The winter coat is uniformly lighter. The hair is very thick, and longer on the hind-quarters than in front.

These animals are usually hunted in the winter season, when they

visit the frozen streams, obtaining water by breaking the ice with their hoofs. If they are surprised on the ice, they can be easily killed, as they cannot keep their feet. A lucky sportsman will kill two hundred head in a favorable winter, for the Dseren keep together in such large herds, that a single ball will often kill two or three of them.

GENUS ANTILOPE.

The SASIN, or INDIAN ANTELOPE, *Antilope bezoartica*,—the only species—is generally found in herds of fifty or sixty together, each herd consisting of one buck and a large harem of does.

It is a wonderfully swift animal, and quite despises such impotent foes as dogs and men, fearing only the falcon, which is trained for the purpose of overtaking and attacking them, as has already been related of the gazelle. At each bound the Sasin will cover twenty-five or thirty feet of ground, and will rise even ten or eleven feet from the earth, so that it can well afford to despise the dogs. As its flesh is hard, dry, and tasteless, the animal is only hunted by the native chiefs for the sake of the sport, and is always chased with the assistance of the hawk or the chetah, the former of which creatures overtakes and delays it by continual attacks, and the other overcomes it by stealthily creeping within a short distance, and knocking over his prey in a few rapid bounds. It is a most wary animal, not only setting sentinels to keep a vigilant watch, as is the case with so many animals, but actually detaching pickets in every direction to a distance of several hundred yards from the main body of the herd.

The young Sasins are very helpless at the time of their entrance into the world, and are not able to stand upon their feet for several days, during which time the mother remains in the covert where her little one was born. As soon as it has attained sufficient strength, she leads it to the herd, where it remains during its life, if it should happen to be a doe, but if it should belong to the male sex, it is driven away from its companions by the leading buck, whose jealousy will permit no rivals in his dominions. Forced thus to live by themselves, these exiles become vigilant and audacious, and endeavor to attract mates for themselves from the families of other bucks.

The horns of this animal are large in proportion to the size of their

owner; their form is spiral, and they diverge considerably at their tips. From the base to the last few inches of the points, the horns are covered with strongly marked rings. In color, the Indian Antelope is grayish-brown or black on the upper parts of the body, and white on the abdomen, the lips, breast, and a circle round the eyes. The outer sides of the limbs, together with the front of the feet and the end of the tail, are nearly black. Some of the oldest and most powerful males are so deeply colored that their coats are tinted with the two contrasting hues of black and white, the fawn tint being altogether wanting. The height of this animal is about two feet six inches at the shoulder.

GENUS *ÆPYCERUS*.

The PALLAH, *Æpycerus melampus*, is the *only* species of the genus. It is found in enormous herds in South Africa. It is a remarkably fine animal, three feet in height at the shoulder, and possesses elegantly shaped horns, and a beautifully tinted coat. The predominant color is bay, fading into white on the abdomen, and the peculiar patch of lighter colored hair which surrounds the root of the tail. A black semi-lunar mark on the croup serves as a visible distinction from the other antelopes; and the hoofs are black. It is less timid than the Spring-bok. When alarmed, it walks away in the quietest and most silent manner imaginable, lifting its feet high from the ground. When on a journey, they walk in Indian file, and when they have once settled the direction in which they intend to go, they cannot be turned aside even by the presence of a human being.

The name *Æpycerus* or "High-horned," indicates the characteristic of the genus. The horns are nearly two feet long, slender, and lyre-formed, and marked by rough rings at the base. The females are hornless.

GENUS SAIGA.

The SAIGA, *Saiga tartarica*, a *solitary* species, in form and habits reminds one of the sheep. The body is thick, the legs slender and short, the hair remarkably long and thick. The nose is arched and broad, and terminates in a snout. This snout is very peculiar, it projects over the jaw, is mobile, and has in the center two naked nostrils, so that

it resembles a real proboscis. The horns are lyrate, thin, and transparent; the ears are short, and almost hidden in its rough coat. In summer the color is a grayish-yellow; in winter the color becomes lighter and the hairs are nearly three inches in length.

The Saiga inhabits the steppes of Eastern Europe and Siberia, from the frontiers of Poland to the Altai. It lives in herds, forming in autumn bands of several thousands, which perform regular migrations. They are very watchful, and never all repose at once, and Pallas observed that the sentinels were regularly relieved. They are very fleet, so that not even a greyhound can take them; they leap well, but without the grace of the antelope. For food, they prefer the herbage that grows on the dry steppe near salt-springs. They walk backward when feeding, as the projecting snout is, otherwise, in their way. The flesh, owing to the nature of the herbage on which the Saiga feeds, has a sharp, balsamic odor; but in spite of this, the natives are eager hunters. In addition to the usual methods of the chase, the Black Eagle is employed.

THE PRONG HORN.

The sixth of our sub-families of the BOVIDÆ is constituted by the ANTILOCAPRINÆ, consisting of only *one* species of a single genus. It inhabits both sides of the Rocky Mountains, extending north to the Saskatchewan and the Columbia rivers, west to the coast-range of California, and east to the Missouri. It seems to represent a transition between the families which have solid and deciduous horns, and those possessing hollow and permanent ones, for the horns, although hollow, like those of the antelope, are shed annually, like those of the deer.

GENUS ANTILOCAPRA.

The PRONG HORN, *Antilocapra Americana* (Plate XLVIII), derives its name from the character of its horns. They are from eight to fourteen inches in length, and at about two-thirds of their height become palmated, and give out a short prong. The tips are bent inward. They are shed every year, in a peculiar manner. They do not fall off entirely like the horns of the elk; the pith remains, and the hard horny shell comes off the pith like the shell from a crab. This shell becomes

loose in May, and the Prong-horn retires into seclusion. When it has dropped off, it leaves a spongy, white fleshy substance, sparsely covered with short black bristles pointing upward. This pith grows rapidly, and becomes larger than the old horn. The outside, in the short time of two or three days, hardens again into horn.

The hair is very thick, brittle, and nearly two inches long. The color on the back is reddish, turning to yellow on the sides and white on the belly. Around the tail the hair is dazzlingly white, long, and capable of being erected like a fan when the animal is alarmed. The Prong-horn is chiefly found in the treeless plains. Its run is even and regular, and it is the fleetest of all the animals on the plains. General Dodge says that they often display a strange combination of curiosity and terror. "They become beside themselves at the appearance of any unusual object. A wagon train will attract every herd within the range of vision. They rush at it with every indication of extreme terror, and passing within a few yards, will make a complete circuit, and go off in the direction from which they came." When the leader goes, the rest follow like sheep; if the leader leaps up in the air, all the herd leap in the like manner. As a rule, except during the month of April, these antelopes are in herds. The does are very motherly, and will give suck to other young beside their own; thus the orphan-fawns whose dams have been killed seldom die.

Their food is the short succulent grass of the prairies, and they love saltish water or pure salt, and remain at the salt licks till hunger drives them away. They are good swimmers, and easily pass broad streams. They are hunted alike by Indians and white men.



CHAPTER XXIX.

THE LESSER ANTELOPES.

THE OUREBI—THE KLIPSPRINGER—THE WATER BUCK—THE BLUE-BUCK—THE MUSK ANTELOPE—
THE DUYKER BOK—THE RHOODE BOK—THE CHICKARA—THE HARTEBEEST—THE SASSABY—
THE GNU—THE CHAMOIS—THE GORAL—THE MOUNTAIN GOAT OF THE ROCKY MOUNTAINS.

THE sub-family CERVICAPRINÆ contains *five* genera. They are all confined to the Southern and Tropical regions of the African continent.

GENUS CERVICAPRA.

The OUREBI, *Cervicapra urebi*, the first of the *four* genera, is thus described by Captain Drayson:

“While many animals of the Antelope kind fly from the presence of man, and do not approach within a distance of many hundred miles of his residence, there are some few which do not appear to have this great dread of him, but which adhere to particular localities as long as their position is tenable, or until they fall victims to their temerity. It also appears as if some spots were so inviting, that as soon as they become vacant by the death of one occupant, another individual of the same species will come from some unknown locality, and reoccupy the ground. Thus it is with the Ourebi, which will stop in the immediate vicinity of villages, and on hills and in valleys, where it is daily making hair-breadth escapes from its persevering enemy—man.

“When, day after day, a sportsman has scoured the country, and apparently slain every Ourebi within a radius of ten miles, he has but to wait for a few days, and upon again taking the field he will find fresh specimens of this graceful little antelope bounding over the hills around him. It is generally found in pairs, inhabiting the plains, and when pur-

sued, trusts to its speed, seeking no shelter either in the bush or the forest. Its general habitation is among the long grass which remains after a plain has been burned, or on the sheltered side of a hill, among rocks and stones."

Its mode of progression, when alarmed or disturbed, is very beautiful. It gallops away with great rapidity for a few yards, and then bounds several feet in the air, gallops on, and bounds again. These leaps are made for the purpose of examining the surrounding country, which it is enabled to do from its elevated position in the air. Sometimes, and especially when any suspicious object is only indistinctly observed in the first bound, the Ourebi will make several successive leaps, and it then looks almost like a creature possessed of wings, and having the power of sustaining itself in the air. If, for instance, a dog pursues one of these antelopes, and follows it through long grass, the Ourebi will make repeated leaps, and by observing the direction in which its pursuer is advancing, will suddenly change its own course, and thus escape from view. In descending from these leaps the Ourebi comes to the ground on its hind feet.

The Ourebi stands about two feet high, and is four feet in length. The horns of the males are about five inches long, straight, pointed, and ringed at the base. The female is hornless. The color of the animal is pale-tawny above, white below.

The KLIPPSPRINGER, *Cervicapra saltatrix*, is called by Gordon Cumming a darling little antelope. It is peculiarly formed for rocky ground, its hoofs being small, hard, and sharply pointed. It stands like the chamois, with its feet drawn close together. When alarmed, it bounds up the most precipitous rocks with such rapidity that it is soon beyond all danger. Its color is dark brown, sprinkled with yellow. Each hair is yellow at the tip, then brown, then gray to the base. It measures about twenty-one inches in height when fully grown. The female is like the female Ourebi, destitute of horns.

GENUS KOBUS.

The WATER BUCK, *Kobus ellipsoprymnus*, is the most striking of the six species of this genus.

It is a peculiarly timid animal, and when alarmed rushes at once toward the nearest river, into which it plunges without hesitation, and

which it will cross successfully even when the stream is deep, strong, and rapid. The animals are probably induced to take to the water by their instinctive dread of the lion and leopard, which will never voluntarily enter the water, except under peculiar circumstances. The Water Bucks are generally found in small herds, which never wander far from the banks of some large river. The horns of this species are remarkable for their formation, being somewhat lyrate, bent back, and thrown forward at their extremities. The tail is rather long, and is covered with long hairs toward its termination. The flesh of this animal is very powerfully scented, and is of so bad a flavor that none but a hungry Kaffir will eat it, and even he will not do so until forced by dire hunger. This peculiar scent is probably variable in potency according to the season of the year, as is the case with all perfumed animals. Captain Harris says that those which he has killed have been totally uneatable, not even the native palate being proof against the rank flavor. The scent extends to the skin, which exhales so powerful an odor that when Captain Harris was engaged in cutting off the head of one, he was compelled to desist. The calves, however, according to Schweinfurth, are very good eating.

GENUS NEOTRAGUS.

The MUSK ANTELOPE, *Neotragus moschatus*,—the *only* species—is a native of Abyssinia and Eastern Africa, where it bears the name of *Beni-Israel*, or “Children of Israel.” It is one of the tiniest of antelopes, being hardly fourteen inches in height at the shoulder, and is so slightly made that it appears too fragile to live. Its legs are long, and not thicker than a lady’s finger, the body is covered with fine long hairs, which are gray at the base, but a warm red at the top. A broad white stripe runs above and below the eyes. The hoofs and tear-bag are black. The male has a little pair of horns with ten to twelve rings, and pointed tips bent forward, and almost lost in the thick shock of hair in which they grow. Like some of its kindred, it lives in pairs, or in families consisting of the parents and their offspring.

It is found in the mountains as high as six thousand feet above the sea. It lives in the densest thickets, where the larger antelopes cannot enter, and it can pass through the narrowest clefts of the rock.

GENUS NANOTRAGUS.

The *nine* species of this genus comprise the smallest members of the family. They are all very much alike. The males have small, thin, upright horns, with a few rings or half-rings at the base. The head is round, the nose pointed, and the muzzle small.

The BLUE-BUCK, *Nanotragus Hemprichii*, is one of the most graceful of Ruminants. "The most practised eyes," writes Drayson, "are required to discover this buck in the bush, as its color is so similar to the gloom of the underwood, that if it did not shake the branches in its progress, it would be scarcely possible to see it. Long after the sportsman has become sufficiently acquainted with bush-craft to secure with certainty one or two red bucks during a day's stalking, he would still be unable to bag the little Blue-buck. Several times when I was with a Kaffir, who possessed eyes like those of an eagle, he would point, and with great excitement say, 'There goes a Blue-buck! there he is! there, there!' but it was of no use to me, I would strain my eyes and look to the spots pointed out, but could see no buck; and it was a considerable time before my sight became sufficiently quick to enable me to drop this little antelope with any certainty."

It is scarcely more than a foot in height, and about two feet long; and its color is a dark-blue, or mouse tint. It is found in Africa, south of the Sahara.

The sub-family CEPHALOPHINÆ contains *two* genera, one of which inhabits Africa, and the other the hilly parts of India.

GENUS CEPHALOPHUS.

The DUYKER-BOK, *Cephalophus mergens*, may be taken as the most typical of the *twenty-two* species. It derives its name of Duyker or Diver from the way in which it plunges into the bush. Drayson describes it as follows:

"On the borders of the bush, the antelope which is most commonly met is the Duyker, a solitary and very cunning animal. If the sportsman should happen to overtake this buck, it will lie still, watching him attentively, and will not move until it is aware that it is observed. It will then jump up and start off, making a series of sharp turns and dives,

sometimes over bushes, and at others through them. When it perceives that it is observed, it will crouch in the long grass or behind a bush, as though it were going to lie down. This conduct is, however, nothing but a ruse for the purpose of concealing its retreat, as it will then crawl along under the foliage for several yards, and when it has gone to some distance in this sly manner, will again bound away. It is therefore very difficult to follow the course of a Duyker, as it makes so many sharp turns and leaps, that both 'spoorer' and dogs are frequently baffled.

"If the course of the buck can be watched, and the place discovered where it lies down after its erratic manœuvrings, it can be easily stalked by approaching it from the leeward side. One must, however, be a good shot to secure a Duyker with certainty, for the little creature is so tenacious of life that it will carry off a large charge of buckshot without any difficulty, and the irregular course which it then pursues requires great perfection and quickness in shooting with a single ball.

"The height of the Duyker-bok is about twenty-one inches at the shoulder, but the animal is somewhat higher at the croup, where it measures nearly twenty-three inches. It may be distinguished from the other species belonging to the large genus in which it is placed, by a ridge upon the front surface of the horns, which runs through the four or five central rings with which the horns are marked, but does not reach either to the tip or to the base. The general color of this animal is brown-yellow, fading into white on the abdomen and all the under parts, including the tail. The upper part of the tail is black, and there is a black streak running up the legs, and another on the nose."

The RHOODE-BOK, *Cephalophus natalensis*, is common in Natal. Its color is a deep reddish-brown; it stands above two feet high, and the horns are about three inches long, straight and pointed.

GENUS TETRACEROS.

The CHICKARA, *Tetraceros quadricornis*, is the best known of the two species of the genus.

In the scientific title of this very curious species of Antelope both words bear the same signification, namely, "four-horned." These singular animals are natives of India, where they are known also under the titles of CHOUSINGHA, or CHOUKA, the last word being derived from the

native term *chouk*, a leap, which has been given to the animal in allusion to its habit of making lofty bounds.

The front pair of horns are very short, and are placed just above the eyes, the hinder pair being much longer, and occupying the usual position on the head. The females are hornless. The color of the Chousingha is a bright bay above, and gray-white below, a few sandy hairs being intermixed with the white. The length of the hinder pair of horns is rather more than three inches, while the front, or spurious horns as they are sometimes termed, are only three-quarters of an inch long. The height of the adult animal is about twenty inches.

The ALCEPHALINÆ form a sub-family divided into *two* genera, both inhabiting Africa, and Northeast to Syria.

GENUS ALCEPHALUS.

Of the *nine* species of this genus we will mention only the most important and typical, for all these antelopes are very much alike in habits and mode of life.

The HARTEBEEST, *Alcephalus caama*, may be easily known by the peculiar shape of the horns, which are lyrate at their commencement, thick and heavily knotted at the base, and then curve off suddenly nearly at a right angle. Its general color is a grayish-brown, diversified by a large, nearly triangular white spot on the haunches, a black streak on the face, another along the back, and a black-brown patch on the outer side of the limbs. It is a large animal, being about five feet high at the shoulder. Being of gregarious habits, it is found in little herds of ten or twelve in number, each herd being headed by an old male who has expelled all adult members of his own sex.

Not being very swift or agile, its movements are more clumsy than is generally the case with Antelopes. It is, however, very capable of running for considerable distances, and if brought to bay, becomes a very redoubtable foe, dropping on its knees, and charging forward with lightning rapidity. The Hartebeest is spread over a very large range of country, being found in the whole of the flat and wooded district between the Cape and the Tropic of Capricorn.

The SASSABY, *Alcephalus lunatus*, is reddish-brown, with a blackish-brown stripe down the middle of the face. It lives in herds of six or ten

in the flat districts near the Tropic of Capricorn. It is a thirsty animal, and the hunter when he sees one of them knows that water is at no great distance from the spot where the gamè is.

GENUS CATOBLEPAS.

The *two* species of this genus are most remarkable animals. They seem a compound of horse, ox, and antelope. They have the head of an ox, the body and neck of a horse, and the cloven hoof of the antelope. Both sexes have horns.

The GNU, *Catoblepas gnu* (Plate XLVII), has a fine head, and peculiarly shaped horns which are bent downward, then upward, with a sharp curve. They live in large herds, and are curious in disposition, as well as very irritable in temper.

"They commence whisking their long white tails," says Cumming, "in a most eccentric manner; then, springing suddenly into the air, they begin pawing and capering, and pursue each other in circles at their utmost speed. Suddenly they all pull up together to overhaul the intruder, when some of the bulls will often commence fighting in the most violent manner, dropping on their knees at every shock; then, quickly wheeling about, they kick up their heels, whirl their tails with a fantastic flourish, and scour across the plain, enveloped in a cloud of dust." On account of these extraordinary manœuvres, the Gnu is called Wildebeest by the Dutch settlers.

The sub-family RUPRICAPRINÆ contains only *two* species, inhabiting the European Alps from the Pyrenees to the Caucasus. In appearance and habits they strongly resemble the goats. They are, however, true Antelopes, and may be distinguished by the shape of the horns, which rise straight from the top of the head for some inches, and then suddenly curve backward.

GENUS RUPRICAPRA.

The CHAMOIS, *Rupricapra tragus* (Plate XLVIII), is really a forest antelope, and wherever man spares them, they prefer the woods to the higher peaks of the mountains. At present they are most abundant in the Tyrol, where the chase of the Chamois is the favorite amusement of the

Emperor of Austria, and the princes of his house. It moves very swiftly over level ground, and is unsurpassed in traversing the Alpine rocks; the false hoofs of its hinder feet aid it greatly in descending the rocks. It is very wary, and possesses a keen scent; even an old footmark in the snow will startle it. It lives in small herds, which send out sentinels to watch while the rest are feeding, and give warning of a coming foe.

As the hind legs exceed the fore limbs in length, the Chamois is better fitted for the ascent of steep ground than for descending, and never exhibits its wonderful powers with such success as when it is leaping lightly and rapidly up the face of an apparently inaccessible rock, and taking advantage of every little projection to add impetus to its progress. Even when standing still, it is able to mount to a higher spot without leaping. It stands erect on its hind legs, places its fore-feet on some narrow shelf of rock, and by a sudden exertion, draws its whole body upon the ledge, where it stands secure.

The food of the Chamois consists of the various herbs which grow upon the mountains, and in the winter season it finds its nourishment on the buds of sundry trees, mostly of an aromatic nature, such as the fir, pine, and juniper. In consequence of this diet, the flesh assumes a rather powerful odor, which is decidedly repulsive to the palates of some persons, while others seem to appreciate the peculiar flavor, and to value it as highly as the modern gourmand appreciates the "gamey" flavor of long kept venison. The skin is largely employed in the manufacture of a certain leather, which is widely famous for its soft, though tough character. The color of the Chamois is yellowish-brown upon the greater portion of the body, the spinal line being marked with a black streak. In the winter months, the fur darkens and becomes blackish-brown. The face, cheeks, and throat are of a yellowish-white hue, diversified by a dark brownish-black band which passes from the corner of the mouth to the eyes, when it suddenly dilates and forms a nearly perfect ring round the eyes. The horns are jetty-black and highly polished, especially toward the tips, which are extremely sharp. There are several obscure rings on the basal portions, and their entire surface is marked with longitudinal lines.

Several varieties of the Chamois are recorded, but the distinctions between them lie only in the comparative length of the horns, and the hue of the coat. The full-grown Chamois is rather more than two feet in height, and the horns are from six to eight inches long.

The sub-family BUDORCINÆ comprises *one* genus of *two* species, which are found in Nepal and Eastern Thibet. The sub-family NEMORHEDINÆ embraces *two* genera of goat-like antelopes.

GENUS NEMORHEDUS.

The *nine* species of this genus range from the Eastern Himalayas to Northern China and Japan, and southward to Formosa and Sumatra. We mention only one species.

The GORAL, *Nemorhedus goral*, is the size of a goat; its horns are two feet long, thin and round, and placed close together; its ears are long and narrow; its coat is short, thick, of a gray or reddish-brown color, and is sprinkled on the sides with black or red. A white streak runs under the throat, and a ridge of hair on the spine is black. Both sexes have horns. It is as agile as the chamois, and possesses the same quick senses to descry danger. It seldom seeks the shades of the forest, but loves the rocks and rocky precipices.

GENUS APLOCERUS.

The *solitary* species of APLOCERUS lives in the Rocky Mountains and the Northern part of California. It is regarded by Brehm and other naturalists as a goat, rather than an antelope.

The MOUNTAIN GOAT, *Aplocerus Americanus*, is often confounded with the "Mountain Sheep." It stands two feet and a quarter high at the shoulder, and is about four feet in length. The horns are about eight inches in length; round at the root, and rising in a gentle curve upward, backward, and outward. The coat covering the whole body is of a uniform white color, and consists of long stiff hairs, with a fine, close under-wool. This thick coat makes the animal look much larger and more powerful than it really is. The hair forms a thick bush on the back of the head, and a mane on the neck, while the chin supports a long, abundant beard divided into regular locks; a collar of long hair goes round the neck, and extends itself over the shoulders and fore-arms.

According to Professor Baird, the Mountain Goat is most abundant in the mountains of Washington Territory. It lives in very high districts, and feeds on Alpine plants, the boughs of *pinus contorta*, and the

like. During the summer it ascends to a height of fifteen thousand feet above the sea, and prefers to stay near the lower edge of the melting snow-fields; in winter it descends lower, but never leaves the mountain-peaks. In these deserts, where the human foot seldom treads, it moves, with the sure-footedness of its race, from rock to rock, or clammers up precipices which seem inaccessible. When alarmed, the troop, led by the males, rushes at full gallop to the edge of the most terrible precipices and plunges down, or leaps a chasm, one after another, treading exactly on the same spot, with the lightness of a winged creature, rather than like a quadruped. Endowed with keen powers of smelling and hearing, the Mountain Goat baffles in most cases the attempts of the hunter. The Indians occasionally hunt this animal, but without any eagerness. The flesh is of little value, as it is both very tough and has an odor which sickens even the Redskins. The pelt is valuable, and is carried in to the Hudson Bay Company's factories. Like other furs, its value varies with the fashion of the day. When monkey-skin muffs and collars were in vogue, the fleece of this antelope supplied material for an imitation.



CHAPTER XXX.

GOATS AND IBEXES.

THE GENUS CAPRA—THE GOATS—THE BEZOAR GOAT OR PASENG—THE CASHMERE GOAT—THE ANGORA GOAT—THE MAMBER GOAT—THE MARKHOR AND TAHIR—THE EGYPTIAN GOAT—THE IBEXES—THE ALPINE IBEX—THE PYRENEAN IBEX—THE ARABIAN IBEX.

THE last sub-family of the BOVIDÆ is that named CAPRINÆ. It contains *two* genera, CAPRA and OVIBOS. The former very extensive genus has been often divided into numerous sub-genera, but it is more convenient to form only two divisions, "the Goats and Ibexes," and the "Sheep."

GENUS CAPRA.

The *twenty-two* species of *Capra* are equally divided between the Goats and the Sheep. The line of demarcation between the groups is by no means clearly drawn; the relationship between them is close, and no decisive characteristics can be described. In general, we may say that the Goats have erect horns, decidedly compressed, curved backward and outward, with a keel or ridge of horny substance in front. The males have a thick beard, and are notable for a very rank odor, which is not present in the male sheep.

THE GOATS.

The DOMESTIC GOAT (Plate XLIX) has shared the fate of our other domesticated animals—we cannot tell from what wild species it is derived. The Paseng, perhaps, has the best claim to be considered its ancestor. The goat was very early reduced to the service of man. During the Stone Age, judging by the Swiss-lake dwellings, it was more common than the sheep. In the oldest Egyptian monuments the goat

appears, and herds of goats, as well as their milk and flesh, are repeatedly mentioned, together with the fact that the most ancient documents were written on goat-skin. In the Bible, the goat is frequently spoken of as supplying both flesh and milk, and its hair as furnishing raiment. One of the principal uses to which the skin of the animal was applied was the manufacture of leather, especially of leathern bottles for carrying water; or sacks, such as Joseph's brethren had, for conveying grain. In sacrifices the goat was in great requisition, and on the Great Day of Atonement it was the only animal that could be offered. Two were selected by lot, one for the Lord, the other for Azazel; the former was slain, and its blood sprinkled on the altar; the latter, the scapegoat, was driven into the wilderness.

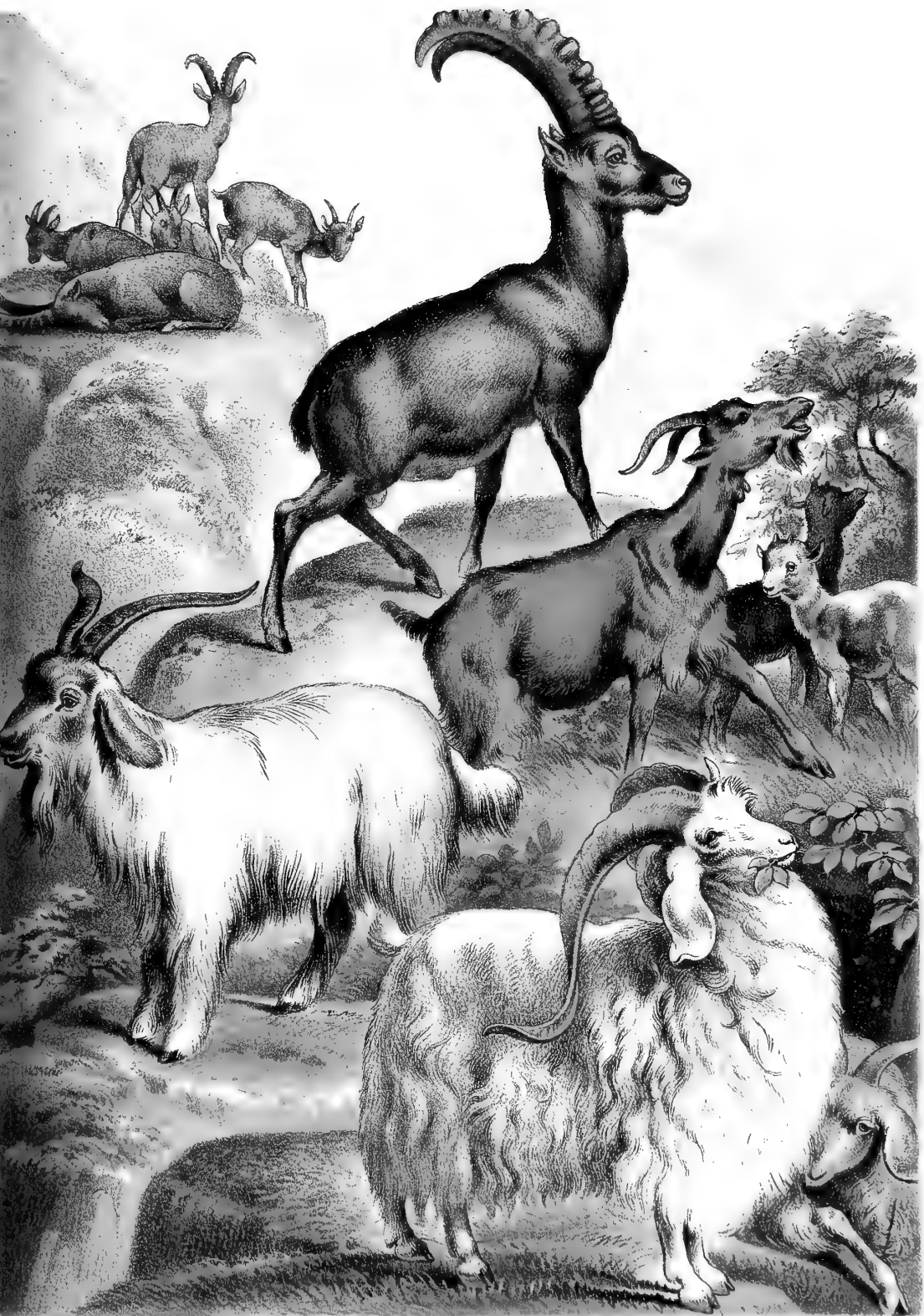
Friendly as goats and sheep are, the flocks never mingle, not even when folded in the same enclosure. This instinctive separation of the animals led naturally to the simile, so frequently repeated of the just and the unjust, of the sheep and the goats. The goat, no doubt, gives much more trouble to the goatherd, than the sheep to the shepherd. The former is an erratic creature, climbing up the sides of the valleys, skipping and jumping, and venturing into places where man cannot set his foot. It is, too, more destructive than the sheep, and in Palestine has, by browsing on the young shoots, quite extirpated many species of trees.

In Palestine, at present, the most valuable herds are those of the Mohair or Angora Goat, or of the Syrian or Mamber Goat. From the coat of the former the costly coverings for the Tabernacle were made. Allusion to the long ears of the other variety is found in the Prophet Amos, ch. iii. ver. 12. The wild goat of Scripture was most probably a variety of the Ibex.

Goats, at present, are found everywhere. In some countries they are turned out to pasture in herds, and are watched by goatherds; in others, a few stray about near the houses of their owners. In all places they show by their habits that they are mountain-animals. They delight in clambering over rocks, stone walls, or anything that reminds them of their original home. They are very intelligent, and can easily be taught many tricks. In Spain they are employed as leaders to the flocks of sheep. In many countries of Europe a goat is kept in large stables to lead the horses from the stalls in case of fire, for nothing but the example of another animal will induce the horse to face the flame. In America, the Goat is an introduction by Europeans, and is abundant in







CASHMERE GOAT

IBEX

DOMESTIC GOAT
ANGORA GOAT

PLATE XLIX. UNGULATA.

all parts, both north and south. Its maintenance costs little or nothing, and its milk is abundant, and can be made into a peculiarly-flavored cheese. The flesh of the young kid is delicate; its skin furnishes the best kind of leather, and its hair is fashioned into brushes or woven into cloth.

THE BEZOAR GOAT.

The BEZOAR GOAT or PASENG, *Capra ægagrus*, is rather larger than the Domestic Goat. It has very strong, large, curving horns, often nearly three feet in length, which have in front several protuberances. Both sexes have beards, and the coat consists of long, stiff, smooth hair, covering a short, fine wool. The color is a reddish-gray, passing into white on the abdomen.

The Paseng is found in Western and Central Asia, and extends to the islands of the Grecian Archipelago, abounding especially in Crete, where it frequents the loftier peaks. The herds usually consist of forty or fifty, and are dangerous, as they will attack a hunter, and, unless he is cautious, hurl him down the precipices. In the Caucasus they ascend up to the snow-line. In its mode of life it does not differ much from the chamois, climbing and leaping from cliff to cliff with equal agility and skill. The lynx and panther are its deadly foes in the Taurus range, but in all Western Asia it is eagerly hunted to obtain the Bezoar-stones. The Bezoars are balls which form in the intestines of many ruminants. The animal being partial to saline matters, gratifies its taste by licking pieces of rock containing saltpetre. Thus a variety of earthy and silicious particles are swallowed, which become agglutinated by the action of the stomach, and form curious pebble-like accretions. These are regarded as endowed with wonderful power as medicines, especially as safeguards against poison.

THE CASHMERE GOAT.

The CASHMERE GOAT *Capra laniger* (Plate XLIX), is remarkable for its soft, silky hair, from which the highly-prized shawls are manufactured.

This animal is a native of Thibet and the neighboring localities, but the Cashmere shawls are not manufactured in the same land which supplies the material. The fur of the Cashmere Goat is of two sorts—a soft,

woolly under-coat of grayish hair, and a covering of long, silken hairs, that seem to defend the interior coat from the effects of winter. The woolly under-coat is the substance from which the Cashmere shawls are woven, and in order to make a single shawl, a yard-and-a-half square, at least ten goats are robbed of their natural covering. Beautiful as are these fabrics, they would be sold at a very much lower price but for the heavy and numerous taxes which are laid upon the material in all the stages of its manufacture, and after its completion upon the finished article. Indeed, the buyer of a Cashmere shawl is forced to pay at least a thousand per cent on the cost of his purchase.

Attempts have been made to domesticate this valuable animal in Europe, but without real success. It will unite with the Angora Goat and produce a mixed breed, from which may be procured very soft and fine wool, that is even longer and more plentiful than that of the pure Cashmere Goat. As a commercial speculation, however, the plan does not seem to have met with much success.

THE ANGORA GOAT.

The ANGORA GOAT, *Capra angorensis* (Plate XLIX), is the noblest of all the group. It is a large animal, with long peculiar horns, and magnificent hair. The horns in the male are compressed, not rounded, but with a sharp ridge; they slope almost horizontally backward, and make a wide double turn with the tips outward; in the female they are shorter, weaker, and round, and form only one curve. The face, ears, and lower joints of the legs are covered with short, smooth hair, the rest of the body is hidden with a thick long fleece, fine, soft, brilliant and silky, which curls in locks, and is chiefly composed of wool, with a few sparse hairs only appearing. The predominant color is a uniform dazzling white, although specimens with dark marks have been seen. This fleece falls off in handfuls in summer, but grows again very rapidly.

This goat derives its name from the town of Angora or Angora, in Asia Minor, where it was first seen by Europeans. The region they inhabit is dry and hot in summer, and very cold in winter, and a pure dry atmosphere is necessary for them. The animal is carefully washed and combed every month during the summer. The fleece is clipped in April, and packed for the market. Angora alone sends out 2,200,000 pounds, mostly shipped to England. The fineness of the wool decreases

as the animal's age increases; hence the fleece of a one-year-old goat is the most precious; after their sixth year, the wool is unmerchantable. Angora goats have been introduced into various kingdoms of Europe, and preserve there all the fineness of their wool.

THE MAMBER GOAT.

The MAMBER GOAT, *Capra mambrica*, has long hair, but is distinguished from the previous goats by very long pendulous ears, which often exceed a foot in length. It is a large, high animal, with strong horns that describe a semicircle. The fleece is abundant, thick, and silky. This species is found in considerable numbers near Aleppo and Damascus, and thence has spread through a great part of Asia. The Kirghish Tartars dock the ears as they get in the way, when the creature is feeding.

THE MARKHOR AND TAHIR.

The MARKHOR, *Capra megaceros*, is found in Afghanistan, Thibet, Cashmere, and the Himalaya Mountains. As the specific title *mega-ceros* or "big-horn" indicates, its horns are of remarkable size. They grow, usually, to a length of forty inches, and have a semi-oval section with a prominent ridge at both sides: they stand close together, rise up straight, and make one and a half, or two spiral twists. In some bucks they perfectly resemble corkscrews. The coat is long on the shoulders and along the spine, giving the animal a kind of mane, and is more strikingly developed on the throat, chest, and chin, reaching often to the knee-joints. A grayish-brown is its prevailing color.

The TAHIR, or JEMPLACK, *Capra femlaica*, is regarded by some as the representative of a sub-genus, *Hemitragus*. It is a handsome animal, inhabiting the loftiest mountains of India. It lives in herds, passes the day in the woods, and sallies out to feed in the evening.

THE EGYPTIAN GOAT.

The EGYPTIAN GOAT, *Capra Ægyptiaca*, is smaller than our common goat, and has thin, merely rudimentary horns, when horns are present. Usually, neither sex has these appendages. The color is reddish-brown. This animal is found everywhere domesticated in Lower Egypt and Nubia.

The DWARF GOAT, *Capra reversa*, stands about twenty inches high. It has short horns, curving slightly backward. The short, thick coat is dark, black and reddish-brown mixed together being the prevailing color, but it is sometimes marked with white patches. It is found in the countries between the White Nile and the Niger rivers in Africa, and probably extends into the heart of the continent.

THE IBEXES.

The IBEX inhabits the mountains of the Old World, and dwells on heights inaccessible to other large animals. Each species has only a narrow distribution. Europe contains at least three species, and the others are found in regions so widely separated as Siberia, Rocky Arabia, Abyssinia, and the Himalayas. The specific differences lie in the form of the horns.

THE ALPINE IBEX.

The IBEX, *Capra ibex* (Plate XLIX), is a stately creature nearly five feet in length and three feet in height. The body is compact, the head small but strongly arched at the brow, the legs powerful, the horns, which are common to both sexes, are large and strong, and curve in a semicircle backward. At the roots, where they are thickest, they stand close together, but gradually diverge and taper. Their section is nearly rectangular. The rings, which indicate the animal's age, form on the front of the horn strongly marked transverse ridges, being most clearly defined and most closely placed in the middle of the horn. The length of these horns is often upwards of a yard, and their weight nearly thirty pounds. The horns of the female are smaller than in the male, and round.

The Ibex was nearly exterminated some centuries ago, but for the last century has been carefully preserved in the Italian Alps. It no longer exists in the Tyrol or Switzerland, and for its preservation in the mountains between Piedmont and Savoy we must thank the late king of Italy, Victor Emmanuel, who took energetic measures to stop its destruction. At present, it is supposed, five hundred Ibexes exist in the hunting-grounds he possessed in the chain of Mont Blanc, in the communes of Cogne, Campiglia, Ceresole, and Savaranche. Notices are put

up, warning travelers not to shoot them, and the royal gamekeepers are ever on the alert. The Emperor of Austria has lately imported some to the Salzkammergut, where they are said to be increasing.

To hunt the Ibex successfully is as hard a matter as hunting the chamois, for the Ibex is to the full as wary and active an animal, and is sometimes apt to turn the tables on its pursuer, and assume an offensive deportment. Should the hunter approach too near the Ibex, the animal will, as if suddenly urged by the reckless courage of despair, dash boldly forward at its foe, and strike him from the precipitous rock over which he is forced to pass. The difficulty of the chase is further increased by the fact that the Ibex is a remarkably enduring animal, and is capable of abstaining from food or water for a considerable time.

It lives in little bands of five or ten in number, each troop being under the command of an old male, and preserving admirable order among themselves. Their sentinel is ever on the watch, and at the slightest suspicious sound, scent, or object, the warning whistle is blown, and the whole troop make instantly for the highest attainable point. Their instinct always leads them upward, an inborn "excelsior" being woven into their very natures, and as soon as they perceive danger, they invariably begin to mount toward the line of perpetual snow. The young of this animal are produced in April, and in a few hours after their birth they are strong enough to follow their parent.

The color of the Ibex is a reddish-brown in summer, and gray-brown in winter; a dark stripe passes along the spine and over the face, and the abdomen and interior faces of the limbs are washed with whitish gray. The Ibex is also known under the name of BOUQUETIN.

THE PYRENEAN IBEX.

The CABRAMONTES, *Capra Pyrenaica*, is found in the Sierra Nevada, Sierra Moreno, the Mountains of Toledo, the Pyrenees, and is especially abundant in the Sierra de Grados, which separates Old and New Castile. It is quite as large as the Alpine Ibex, but differs from it in the conformation of its horns. These, in the buck, stand very closely together—in fact, almost touching; they rise at first straight up for one-third of their length; they then spread out in a lyrate form, while the tips turn upward and toward each other; they are round in front, but form a short keel behind. The rings indicative of age are clearly visible, but do not

form ridges, as in the Ibex. The horns of a buck eleven years old, were found to measure over two feet and a half in length. The color of the animal varies not only with age and season, but according to locality. The hair, beginning from the horns, and going down to the shoulder, forms a kind of mane nearly four inches long; the tail has a still longer tuft. In the Sierra de Grados, a dark-brown mixed with black is the prevailing color in summer; in winter, a brownish-black and gray hue predominate. In the Sierra Nevada the color is lighter, and the black less pronounced.

The Cabramontes usually lives in herds, divided according to the sex, often exceeding one hundred in number. The bucks, heedless of snow and cold, live in the highest part of the mountains, while the ewes seek the southern slopes. The herd is led by the oldest and strongest member. The leader advances ten or twelve yards, stops till the herd comes up, and then again advances in like manner. A herd, feeding, always appoints sentinels to give the alarm. A piping bleat gives the signal. The herd rushes away. Precipices, where man can see no possible foothold for any living creature, are scaled with easy rapidity and safety, not only by the old ones, but the youngest kids. The bucks are more watchful than the ewes, and take the additional precaution of having a rearguard; nor are they so timid, for, when disturbed, they do not at once take to flight, but leap on some rock and examine the intruder. The Spanish hunter has a hard task to bring down his game. He climbs by the wildest paths to the mountain ridge, then creeps on hands and knees to the edge of some precipice, where, after removing his hat, he lies flat down to look into the chasm below. If he sees a herd, he imitates their piping bleat, and by this device often attracts the bucks nearer to him. The flesh is highly prized, and the hide and horns have also their value.

Old writers used to relate that the horns of the Ibexes were of great service to the animal, for, when it leaped down a precipice, it alighted on its horns, and thus saved its skull. Of course this is mere fable.

THE ARABIAN IBEX.

The *BEDEN*, *Capra Syriaca*, is closely allied to the Ibex of the Alps. The differences between them lie in the horns, which have three angles

instead of four. Its usual color is gray, becoming brownish in winter. The male has a black beard.

The Beden, or Wild Goat of Scripture, is still found in Palestine, in small herds of eight or ten. Its agility is extraordinary, and it flings itself with reckless accuracy from one craggy peak to another. Like the Ibex it is very wary, has very keen eyes and keen scent, and, like all gregarious animals, posts sentries to guard the herd. The flesh is excellent, and perhaps the reason why King David took up his abode at Engedi was the necessity of obtaining food for his followers, as it may be safely assumed that the Beden, which is still seen there, was more abundant in old days, before firearms rendered all wild animals afraid of the neighborhood of man. It is probable, too, that it was the Beden which Esau hunted with his quiver and his bow when he sought the savory meat his father loved.



CHAPTER XXXI.

THE SHEEP AND THE MUSK-OX.

THE AOUDAD—THE MOUFFLON—THE ARGALI—THE KATSHKAR—THE BIG HORN—ITS HABITS—
FAT-TAILED SHEEP—THE CRETAN SHEEP—THE SOUTHDOWN—THE LEICESTER—THE MERINO—
THE HIGHLAND SHEEP—THE GENUS OVIBOS—THE MUSK-OX OF NORTH AMERICA.

THE Sheep are distinguished from the Goats by the possession— as a rule—of the tear-bag, by the flat forehead, and the angular twisted horns, and by the absence of a beard. All wild sheep inhabit mountains of the Northern Hemisphere. Their proper home is Asia, but they extend as far as Africa and the Northern part of America. Every mountain-group in Asia has varieties peculiar to itself, while in Europe, Africa, and America, each have only one species. Many species and varieties are very close to each other, and are distinguished merely by the conformation of the horns. Sheep are like goats, children of the mountain, and live at heights where no other animal except the goat is found. The tame sheep is only a shadow of the wild one, and, unlike the goat, retains hardly a trace of its original qualities.

THE AOUDAD.

The AOUDAD, *Capra tragelaphus*, is a native of Northern Africa, where it is found only in the highest and almost inaccessible ridges of the Atlas range. It is a powerful and active animal, standing rather more than three feet at the shoulder. The horns are about two feet in length, and curve boldly backward. Its fleece consists of strong, hard, rough hair, and fine curling wool. The former forms on the back of the neck into a short mane, and is developed on the throat, breast, and fore-legs into a thick, long, bushy mass. The flesh of this wild sheep is highly prized by the Arabs, and resembles very much that of the deer. It lives a solitary life, and is never seen in herds.

The MOUFFLON, *Capra musimon*, is the only wild sheep found in Europe. It inhabits Sardinia and Corsica, frequenting the lofty peaks of those islands, but it is an error to confound with it the varieties found in the Balearic Islands and Spain, or in Greece. In olden days this variety of wild sheep was very abundant, as many as five hundred having been slain in a single chase; but at present, twenty or thirty head are the highest numbers killed, even when the sportsmen have all the needful appliances.

The Moufflon is one of the smallest of wild sheep, standing a little over two feet in height; the horns attain a length of two feet, the coat is pretty short and smooth, but in winter becomes very thick, and forms a kind of mane. Unlike the Aoudad, the Moufflon is found in tribes of fifty to a hundred, led by an old sturdy ram. Such a troop chooses for its dwelling some inaccessible height, and, like other social ruminants, throws out sentinels to give alarm. The movements of the Moufflon are lively, quick, and safe, but are deficient in endurance.

Tame Moufflons may be often seen in Corsica and Sardinia, but they are troublesome; the bucks, especially, losing all fear of man, and attacking him out of mere wantonness.

THE ARGALI.

The BEARDED ARGALI, *Capra argali* (Plate L), is the giant of the Sheep group, being nearly as large as a moderate sized ox. The horns of an adult male are nearly four feet in length, and measure nineteen inches in circumference at the base: they curve boldly downward till beneath the chin, then recurve and come to a point. The surface of these horns is covered with a set of deep grooves set closely together, and extending to the tips. Firmly set as these horns are, they are not unfrequently knocked off in the annual duels.

It is a mountain-loving animal, being found on the highest grounds of Southern Siberia and the mountains of Central Asia, and not fond of descending to the level ground.

Its power of limb and sureness of foot are truly marvelous, when the great size of the animal is taken into consideration. If disturbed while feeding in the valley, it makes at once for the rocks, and flies up their craggy surfaces with wonderful ease and rapidity. Living in such localities, it is liable to suffer great changes of temperature, and is sometimes

wholly enveloped in the deep snow-drifts that are so common upon mountainous regions. In such cases they lie quietly under the snow, and continue respiration by means of a small breathing-hole through the snow. For these imprisoned Argalis the hunters eagerly search, as the animal is deprived of its fleet and powerful limbs, and is forced ignominiously to succumb to the foe, who impales him by driving his spear through the snow into the creature's body. Like others of the same group, it is gregarious, and lives in small flocks.

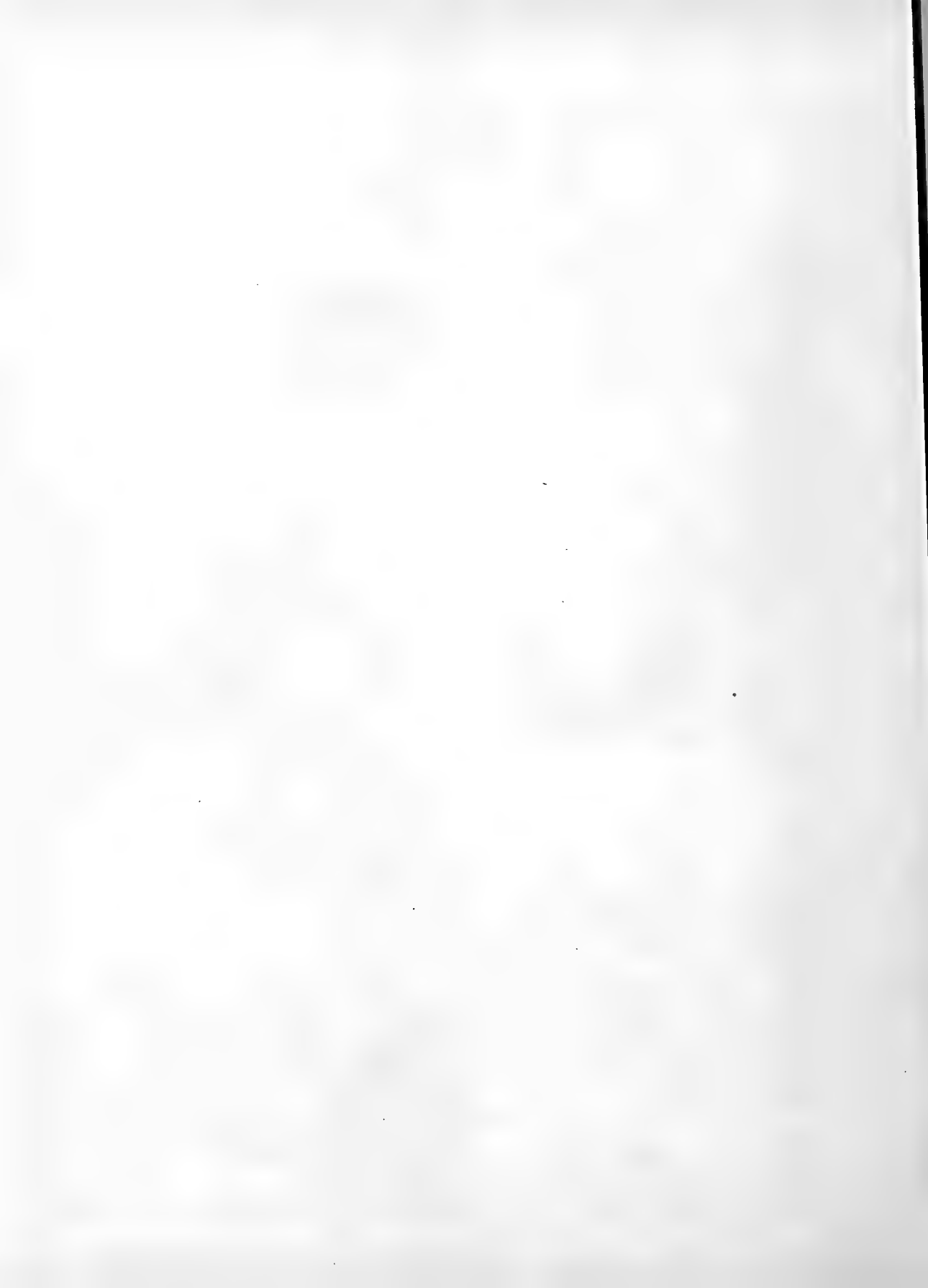
THE KATSHKAR.

The KATSHKAR, *Capra polii*, is described by the old traveler, Marco Polo, as abundant in the elevated plateau of Pamere. It is as large as the Argali, measuring six feet in length, and four feet in height. The horns curve downward in a complete circle, and attain a length of nearly five feet. This sheep seems to be found in all the mountain table-lands of Asia, in the plateaux of Thian-Shan and North Thibet, and of the Aksai, where it ascends above the "timber-line." The herds consist of ten to fifteen, led by a buck whose snowy breast, long curved horns, and proud gait make him a noble object. This animal is hunted in a peculiar manner. The Cossacks and Kirghises go out in pairs to the chase. They are armed with long heavy muskets, which are fired from a rest. If the creature is not killed at the first fire, then the chase begins; one sportsman presses the animal closely, the other cuts off corners, and tries to conceal himself in places where the game must pass.

THE BIG HORN.

The BIG HORN, *Capra montana* (Plate L), ranks next in size to the elk among the horned beasts of the Great West. It is a curious combination of the body of a deer and the head of a sheep; the horns are, as its common name indicates, of enormous size, and make a curve that is more than a complete circle. The head and horns often weigh sixty pounds. Its coat is thick with short grayish hair, changing in the fall into dun, and the hair becoming more than an inch long, and rather wiry. In winter the coat is increased by a layer of exceedingly fine wool which, though sometimes three inches long, never shows outside the hair, but lies curled up close to the skin.







ROCKY MOUNTAIN SHEEP
 CRETAN SHEEP
 DOMESTIC SHEEP

BEARDED ARGALI
 HIGHLAND SHEEP

MERINO SHEEP

PLATE I UNGULATA



The Big-horn is found in troops of twenty or thirty in number; they never quit the craggiest regions, but find their food upon the little knolls of green herbage that are sprinkled among the precipices, without being tempted by the verdure of the plains. They come down, however, from their rocky fastnesses to obtain water from the low-lying springs. They are very shy and suspicious, and, at the first appearance of a man, take flight. "What becomes of the Mountain Sheep," writes General Dodge, "when man invades his stronghold, it is impossible to say. Hundreds may be in a locality; man appears; a few, perhaps ten, are killed; the others disappear and leave no sign.

The Big-horn is an admirable climber, and runs up or down the faces of precipices where apparently no foothold exists. Their habits are those of other sheep. The lambs begin to be seen in June, when they are placed on some shelf of rock inaccessible to man or any beast of prey. The ewes and lambs, according to Richardson, form herds apart from the males. From the middle of August till November, the flesh of the Big-horn is in prime condition. According to General Dodge "it is impossible to describe it, but if one can imagine a saddle of most delicious 'Southdown' flavored with the richest and most gamey juices of the black-tail deer, he will form some idea of a feast of mountain-sheep in season, and properly cooked. Except in season, the mountain sheep is thin, tough, and the poorest food that the plains furnish to man."

THE FAT-TAILED SHEEP.

In several foreign breeds of the domestic sheep there is a curious tendency to the deposition of fat upon the hinder quarters. This propensity is not valued in our own country, where the sheep are almost invariably deprived of the greater portion of their tails by the hand of the shepherd, which in consequence are never developed. In some varieties, however, such as the steatopygous sheep of Tartary, the fat accumulates upon the hinder quarters in such enormous masses that the shape of the animal is completely altered. The fat of this portion of the body will sometimes weigh between thirty and forty pounds, and when melted down, will yield from twenty to thirty pounds of pure tallow. So inordinate is the growth of the fat, that the tail becomes almost obliterated, and is only perceptible externally as a little round fleshy button.

Some varieties present a different mode of producing fat, and deposit a large amount of fatty matter in the tail. Fat-tailed Sheep are found in many parts of the world, and are much valued on account of the peculiarity from which they derive their name. The Syrian variety is remarkable for the enormous dimensions of the tail, which in highly fattened and carefully tended specimens will weigh from seventy to eighty pounds. So large, indeed, are the tails, and so weighty are they, that the shepherds are forced to protect them from the ground by tying flat pieces of board to their under surface. Sometimes they add a pair of little wheels to the end which drags on the ground, in order to save the animal the trouble of drawing the bare board over the rough earth. The fat which is procured from the tail is highly valued, and is used in lieu of butter, as well as to "lard" meat that would otherwise be unpleasantly dry and tasteless. It is also melted down and poured into jars of preserved meat, for the purpose of excluding the air. These sheep are most carefully watched, and are generally fed by hand.

The Afghan Fat-tail has very fine silky wool, the Persian is remarkable for its contrasts of color, the body being white, the head a deep black. In all Northern and Central Africa, as well as in Arabia, these Fat-tailed Sheep are common.

THE CRETAN, OR WALLACHIAN SHEEP.

The CRETAN SHEEP (Plate L) is a native of Western Asia and the adjacent portions of Europe, and is very common in Crete, Wallachia, and Hungary. The horns of the Wallachian Sheep are strikingly like those of the Koodoo, or the Addax, their dimensions being proportionately large, and their form very similar. The first spiral turn is always the largest, and the horns are not precisely the same in every specimen. As a general rule, they rise boldly upward from the skull, being set almost perpendicularly upon the head; but in others, there is considerable variety in the formation of the spirals and the direction of the tips. In one specimen which was preserved in the gardens of the Zoological Society, the first spiral of the horns was curved downward, and their tips were directed toward the ground.

The fleece of this animal is composed of a soft woolly undercoat, covered with and protected by long drooping hairs. This wool is

extremely fine in quality, and is employed in the manufacture of warm cloaks, which are largely used by the peasantry.

THE SOUTHDOWN.

The SOUTHDOWN (Plate L) is one of the short-wooled breeds, and is valuable, not only for its wool, but for the delicacy of its flesh. It has no horns. It derives its name from the South Downs, a range of chalk-hills in Sussex, Surrey, and Kent, which are covered with a short, sweet grass; but it is not confined to this region, but has been introduced wherever the soil and grass are suitable.

THE LEICESTER.

The Leicester and its varieties are long-wooled animals, which prefer low-lying pasturages to breezy downs.

The most celebrated breed of Leicester Sheep is that which is known as the Dishley breed, and which was developed by the persevering energies of a single individual against every possible discouragement. Mr. Bakewell, seeing that the whole practice of sheep-breeding was based on erroneous principles, struck out an entirely new plan, and followed it with admirable perseverance. The usual plan in breeding the old Leicester Sheep was to obtain a large body and a heavy fleece. Mr. Bakewell, however, thought that these overgrown animals could not be nearly so profitable to the farmer as a smaller and better proportioned breed; for the amount of wool and flesh which was gained by the larger animals would not compensate for the greater amount of food required to fatten them, and the additional year or eighteen months during which they had to be maintained.

His idea was, that three extra pounds of wool are not so valuable as ten or twelve pounds of meat, and that when the expense of keeping and feeding a sheep for eighteen months is taken into consideration, the balance is certainly on the wrong side. He therefore set himself to improve the flesh, letting the wool take care of itself at first, and then turned his attention to the fleece. It was found by experience that sheep with a heavy fleece fatten more slowly than those whose coat is moderately thick.

THE MERINO.

Originally, this animal is a native of Spain, a country which has been for many centuries celebrated for the quantity and quality of its wool.

The MERINO SHEEP (Plate L), from which the fine Spanish wool is obtained, were greatly improved by an admixture with the Cotswold Sheep of England, some of which were sent to Spain in 1464, and the fleece was so improved by the crossing, that the famous English wool was surpassed by that which was supplied by Spain.

The Merino Sheep is but of little use except for its wool, as, although its mutton is sufficiently good when fattened, it consumes too much food, and occupies so much time in the process of ripening, that it is by no means a profitable animal. The Merino is larger in the limbs than the ordinary English Sheep, and the male is furnished with large spiral horns. The female is generally hornless, but sometimes possesses these appendages on a very small scale. It is liable to bear a black fleece, the sable hue continually making its appearance, even after long and careful crossing. By good management the black tint has been confined to the face and legs, but is ever liable to come out in spots or dashes in the wool. There is always a peculiar hue about the face of a Merino Sheep, not easy to describe, but readily to be recognized whenever seen.

In Spain, the Merinos are kept in vast flocks, and divided into two general heads, the Stationary and the Migratory. The former animals remain in the same locality during the whole of their lives, but the latter are accustomed to undertake regular annual migrations. The summer months they spend in the cool mountainous districts, but as soon as the weather begins to grow cold, the flocks pass into the warmer regions of Andalusia, where they remain until April. The flocks are sometimes ten thousand in number, and the organization by which they are managed is very complex and perfect. Over each great flock is set one experienced shepherd, who is called the "mayoral," and who exercises despotic sway over his subordinates. Fifty shepherds are placed under his orders, and are supplied with boys and intelligent dogs.

Under the guardianship of their shepherds, the Merino Sheep, which have spent the summer in the mountains, begin their downward journey

about the month of September; and after a long and leisurely march, they arrive at the pasture-grounds, which are recognized instinctively by the sheep. In these pasturages the winter folds are prepared, and here are born the young Merinos, which generally enter the world in March, or the beginning of April. Toward the end of that month the sheep begin to be restless, and unless they are at once removed, will often decamp of their own accord. Sometimes a whole flock will thus escape, and, guided by some marvelous instinct, will make their way to their old quarters unharmed, except perchance by some prowling wolf, who takes advantage of the shepherd's absence.

THE HIGHLAND SHEEP.

The HIGHLAND SHEEP (Plate L) partakes in a great degree of the character of the wild animal. Pasturing together in enormous herds, and living upon vast ranges of bleak, hilly country, the light and active HIGHLAND SHEEP is a very intelligent and independent creature, quite distinct in character from the large, woolly, unintellectual animal that lives only in the fold, and is regularly supplied with its food by the careful hand of its guardian. It is very sensitive to atmospheric influences, and is so ready in obeying the directions of its own instinct, that a good shepherd when he first rises in the morning can generally tell where to find his sheep, merely by noticing the temperature, the direction of the wind, and the amount of moisture in the air and on the ground. As the Highland Sheep is liable to wander to considerable distances from its proper home, the shepherd is aided in his laborious task by several of those wonderful dogs whose virtues and powers have already been recorded in the course of this work.

GENUS OVIBOS.

The MUSK OX, *Ovibos moschatus* (Plate XLVI), the *only* species, is found in the Hudson Bay Territory, West Greenland, and other districts of Arctic America. It is a remarkable blending of the types of the ox and the sheep. Anatomy shows that it is more nearly allied to the latter. Richardson writes concerning it: "Notwithstanding the shortness of its legs, the Musk Ox runs fast, and climbs hills and rocks with great ease.

Its footmarks are very similar to those of the Caribou, but are rather longer and narrower. These animals assemble in herds of from twenty to thirty in August, and bring forth a calf about the latter end of May. If the hunters keep themselves concealed when they fire upon a herd, the poor creatures mistake the noise for thunder, and crowd together." The Musk Ox has a long-haired, woolly hide; the horns are remarkably broad at the base, where they approximate very closely; the first half of the horns is rough and light-colored, the tip smooth and black, and, after covering with a kind of long helmet the summit of the forehead, they turn down boldly behind the eye, and are again hooked upward at the tip.

The Musk Ox supplies the Esquimaux with a favorite article of food. Its flesh, as the name indicates, is marked by a strong musky odor, but except for a few weeks in the year, it is perfectly fit for food, and is fat and well-flavored.



ORDER VIII.

PROBOSCIDEA.

53. ELEPHANTIDÆ - - - - - ELEPHANTS.

PROBOSCIDEA

CHAPTER I.

ELEPHANTS IN GENERAL.

THE ORDER PROBOSCIDEA—DERIVATION OF NAME—THE FAMILY ELEPHANTIDÆ—FOSSIL ELEPHANTS
—THE MAMMOTH—THE MASTODON—THE ELEPHANT—ITS TRUNK—ITS TUSKS—THE ELEPHANT
IN HISTORY—IN THE EAST—IN ROME—IN MODERN TIMES—THE TWO SPECIES.

THE order PROBOSCIDEA contains the largest of terrestrial animals. The name is derived from the Greek word *proboscis*, “a trunk,” and expresses the most conspicuous feature of the animals contained in it. It comprises only *one* family, the ELEPHANTIDÆ, or Elephants, those strange creatures which excite awe by their strength, and astonishment by their sagacity, and which form a clearly marked link between the creatures of the world we live in, and those which roamed over the surface of the globe in ages long before it assumed its present conditions of climate. A few words on the fossil remains of the extinct varieties of the elephant will form a fit prelude to our sketch of the survivors.

THE MAMMOTH.

The MAMMOTH, *Elephas primigenius*, has left its bones in abundance on the Arctic coasts of the continent of Asia and on the islands of New Siberia. In the latter, indeed, the soil seems formed of bones and tusks cemented together into a solid mass by sand and ice. When the thaws of summer loosen the sandy tundras near the rivers Obi, Yenisei, and Lena, heaps of huge tusks are revealed. Often the teeth are still fixed in the jaws, and huge ribs and thigh-bones have been found still covered with hide, and hair, and flesh, and still bloody. An old traveler, Ides, who in 1692 went through Siberia to China, writes in his account of his journey: “The natives call the beast that has left these remains the

Mammoth, and say it is enormously large, four or five yards high; that it has a long broad head and feet like a bear, that it lives and dwells under the earth, digging out a passage with its tusks. It seeks its food in the swamps, but dies when it touches sandy ground, perishing when it ascends into the outer air." The Russian explorer, Pallas, describes the heaps of bones he saw in his travels. In 1799, an entire carcass of a Mammoth was found in Siberia, near the mouth of the Lena. Unfortunately it was not till 1806 that it was scientifically examined by Professor Adams of Moscow. The Siberians had cut it up, and used its flesh as food for their dogs. The bears and other carnivorous animals had also consumed a great part of it, but a portion of the skin and one ear remained still untouched. He was able to distinguish the pupil of the eye, and the brain was also to be recognized. The skeleton was still entire, with the exception of one fore-foot. The neck was still clothed with a thick mane; and the skin was covered with blackish hairs and a sort of reddish wool in such abundance that what remained of it could only be carried with difficulty by ten men. Besides this, they collected more than thirty pounds weight of long and short hair that the White Bears had buried in the damp ground after they had devoured its flesh. The remains of this animal, which came to light when buried in the ice for probably many thousand years, are preserved in the Museum of the Academy of St. Petersburg.

This discovery excited considerable discussion among naturalists. The creatures had evidently lived in Siberia when the climate was less arctic. Whether their destruction was caused by a sudden change in the inclination of the earth's axis producing an arctic climate, or whether it arose from some vast deluge, may be still disputed.

THE MASTODON.

The MASTODON, *Elephas mastodon*, lived about the same time as the Mammoth. Ten or twelve species have been discovered in Europe, North and South America, and India. The United States are peculiarly rich in its remains; one species, the Gigantic Mastodon discovered in Ohio, has been, indeed, reconstructed. Barton relates that in 1761 the Indians had found five mammoth skeletons, near the heads of which, the finders declared, were "long noses with a mouth below them." Kalen

also mentions a skeleton where the trunk could be distinguished. All the varieties resemble our present elephant. Some were larger, others smaller. Indian traditions called them the "Fathers of the Buffaloes," and relate that they lived at the same time as men of huge size, and were both destroyed by the thunderbolts of the Great Spirit. The Powhatan tribe in Virginia stated that the "Great Man" with his lightnings once smote the whole herd of these monsters because they were destroying the deer, bison, and other animals destined for the use of man. One large bull, however, caught the thunderbolts on his head and turned them aside, till at last he was struck in the flank. He fled, wounded, into the Great Lake, where he will live for ever.

European traditions, speaking of the bones of giants, refer to the remains of either the Mastodon or the Mammoth. The Spartans saw the bones of the hero Orestes in some bones twelve feet long, found in Thrace. A gigantic kneepan found near Salamis was attributed to Ajax, and other huge bones discovered in Sicily were confidently assigned to the one-eyed giant, Polyphemus.

THE ELEPHANT.

The most remarkable characteristic of the Elephant is its trunk. This organ, which is an organ at once of smell and touch, is an elongation of the nose, very remarkable for its mobility and sensibility. It contains an immense number of circular and longitudinal muscles, which enable it to turn in every direction, and to contract and elongate. It ends in a finger-like projection about five inches long, and in the ordinary actions of life is an instrument that performs all the functions of a hand. It seizes and picks up the smallest objects; it can uncork a bottle, or fire off a pistol. In the natural state, the Elephant makes use of it for conveying food to its mouth; for lifting heavy weights, and putting them on its back; for drinking, by filling it with water, and then letting the water pour down its throat. With this instrument it defends itself, and attacks others; it seizes its enemies, entwines them in its folds, squeezes them, crushes them, and tosses them into the air, or hurls them to the ground, afterwards to be trampled under its broad feet. The trunk is a conical tube, of an irregular form, very elongated, truncated and funnel-shaped at the end. The upper side is convex, and fluted along its breadth; the underside is flat, and furnished with two lon-

gitudinal rows of little eminences, which resemble the feet of silkworms.

The tusks are two enormously developed canine teeth projecting downward from the upper jaw, and they grow to an immense length and weight. The Elephant has one molar tooth on each side of the tusk-bearing jaw, composed of a number of bony plates covered with enamel. The section of the tusks shows a set of streaks radiating in curves from the centre to the circumference and forming lozenges where they intersect. The tusks are only renewed once, the molars repeatedly, the old ones being pushed forward by new ones coming from behind.

In order to support the enormous weight of the teeth, tusks, and proboscis, the head is required to be of very large dimensions, so as to afford support for the powerful muscles and tendons which are requisite for such a task. It is also needful that lightness should be combined with magnitude, and this double condition is very beautifully fulfilled. The skull of the Elephant, instead of being a mere bony shell round the brain, is enormously enlarged by the separation of its bony plates, the intervening space being filled with a vast number of honeycomb-like bony cells, their walls being hardly thicker than strong paper, and their hollows filled during the life of the animal with a kind of semi-liquid fat or oil. The brain lies in a comparatively small cavity within this cellular structure, and is therefore defended from the severe concussions which it would otherwise experience from the frequency with which the animal employs its head as a battering-ram.

In order to support the enormous weight which rests upon them, the legs are very stout, and are set perpendicularly, without that bend in the hinder leg which is found in most animals. It may seem strange, but it is nevertheless true, that localities which would be inaccessible to a horse are traversed by the Elephant with ease. In descending from a height, the animal performs a very curious series of manœuvres. Kneeling down, with its fore-feet stretched out in front and its hinder legs bent backward, as is their wont, the Elephant hitches one of its fore-feet upon some projection or in some crevice, and bearing firmly upon this support, lowers itself for a short distance. It then advances the other foot, secures it in like manner, and slides still farther, never losing its hold of one place of vantage until another is gained. Should no suitable projection be found, the Elephant scrapes a hole in the ground with its advanced foot, and makes use of this artificial depression in its descent.

If the declivity be very steep, the animal will not descend in a direct line, but makes an oblique track along the face of the hill. Although the description of this process occupies some time, the feat is performed with extreme rapidity.

THE ELEPHANT IN HISTORY.

The ancient Egyptians had seen both the African and Asiatic Elephant, having made the acquaintance of the latter during their campaigns in Assyria. On coins, the Greeks, who had encountered the Persians, always represented the Asiatic species, while the coins of the Romans represented the African species.

In India, the Elephant is called *Hathi*, "the beast with the hand," and the grandeur and state pomp of the mightiest Oriental kings, the enormity of whose magnificence sometimes reads like a fabulous wonder, seems almost inseparable from the early history of elephants. On all great occasions, and the assemblage of multitudes, the lofty and sagacious double forehead, with the quiet small eyes, enormous flaps of ears, and ever-varying attitude of "proboscis lithe," constitutes one of the most imposing figures of the majestic scene and its countless concourse. In the most ancient Sanscrit poems there are records of tame elephants in processions, a thousand years before the Christian era. We do not allude only to great state occasions, or to warlike processions, but even to religious ceremonies, since the elephant is found to occupy a post of extraordinary honor in the remotest records of the mythology of India. One of their most alarming deities rides upon his back; while the idol which is their symbol for wisdom and science, bears the form of a man with the head of an elephant. A few miles from the modern city of Kermanshah, the excavations of the rock display many finely carved figures, and the sides of some of the caves are covered with sculpture representing the hunting of wild boars along the banks of a river by men mounted on elephants, while others, in boats, are ready to attack the game when it takes to the water. The ancient Chinese represented the earth as borne upon the backs of eight elephants, whose heads were turned to the principal points of the compass. The same animal is a favorite figure of speech in their poetry. In Eastern architecture the elephant is likewise a very important personage at the gates of temples, on the walls of palaces, on the sides of tombs and pagodas, and in subterranean temples

like those of Ellora. Even to the present time the Hindoos, on great occasions, select these creatures to bear the images of their gods, and we find them loaded with the most valuable ornaments in the mystic processions of Brahma and Vishnoo. The use of elephants is absolutely prohibited in the modern capital of Siam, excepting to personages of very high rank; and, in a portion of the Celestial Empire, the chief minister for the foreign department is expressly designated as "the Mandarin of Elephants."

The earliest account, which may be considered worthy to be regarded as history, of the employment of elephants as part of an army, is that which is given of the battle of Arbela (331 B.C.), when Darius ranged fifteen of them in front of the centre of his grand line. They fell into the hands of the conqueror, Alexander; to whom a present was made of twelve more; but this great general was too wise to make use of them in his battle against Porus, as he had already perceived that they might prove very dangerous allies, if driven back mad with wounds and terror among the "serried ranks." Very soon, however, they were put to use, systematically; and gradually, by regular training, became very formidable. There were few wars in which the Romans were engaged, during the three hundred years that intervened between the time of Alexander the Great and Cæsar, in which these animals were not employed. Notwithstanding their military education, however, it must be admitted that the best fighting elephants not unfrequently caused their masters to lose the day by their insubordinate and disorderly conduct.

Of the tower which was fixed upon the back of the elephant, and filled with armed men, our impressions are chiefly derived from ancient medals and coins, pictures, bas-reliefs, and the writings of poets. In the Book of Maccabees it is said—"And upon the beasts there were strong towers of wood, which covered every one of them, and were girt fast unto them with devices; there were also upon every one, two-and-thirty strong men, that fought upon them, beside the Indian that ruled him." This number is an exaggerated one. The usual number of men was four, beside the conductor.

The ancient armor of an elephant, in other respects, is highly interesting—a strange mixture of the terrible and grotesque. He was often half-cased with plates of metal, and wore a large breastplate, which was furnished with long sharp spikes, to render his charge into the ranks of the enemy more devastating; his tusks were fitted—in fact, elongated—with

strong points of steel. Plumes of feathers, small flags, and bells, were also affixed to them. It is said that some of the most sagacious and skilful of the fighting elephants were taught the use of the sword, and, the handles being made suitable to the grasp of the trunk, they wielded enormous cimeters with extraordinary address. The Sultan Akbar had many of these sword-bearing elephants in his army.

According to Pliny, elephants were trained in Rome for the stage. He gives an account of a scene enacted by them, in which four of them carried a fifth in a litter, the latter representing an invalid. Others ranged themselves in a seated posture at a great banquet-table, and eat their food from large plates of gold and silver, with portentous gravity, that excessively delighted the spectators. Moreover, he and Suetonius both assure us that an elephant danced on the tight-rope! He walked up a slanting tight-rope from the bottom of the arena to the top of the amphitheatre; and on one great occasion a man was found daring enough, and confident enough in the performer's skill, to sit upon his back while he made the perilous ascent. There is no exaggeration in this statement. There was in Paris, in 1867, an elephant performing at the circus of the Boulevard du Prince-Eugène, which was called *L'Elphant ascensioniste*; it had learned to balance its heavy mass on a tight-rope, like Blondin.

The Romans justly considered the Asiatic Elephant more intelligent and courageous than the African one. They introduced both in large numbers to their combats in the circus, and Pliny tells a touching story of the pathetic appeals which the poor creatures made to the spectators against the cruelty of their foes. After the fall of the Roman Empire, the first of these animals which was seen in Europe was sent to Charles the Great by the Caliph Haroun al Raschid. Pope Leo X received one as a present from the Sultan. It excited great curiosity, but soon died. At present both species are common in Zoological Gardens. But, naturally, the performing elephants we see are natives of Asia.

GENERAL HABITS.

Elephants of both kinds live in large forests, preferring those where water is most abundant. They are sometimes, however, found in Ceylon, at a height of six thousand feet above the sea. They are more nocturnal than diurnal animals. They live in herds, and the traveler who comes upon a herd without disturbing it, sees them

feeding in the greatest peace and harmony. When they travel, no obstacles deter them. They climb steep hills, they swim lakes and streams, they easily force themselves through the thickest jungle, and form regular tracks as they march in Indian file. The old superstition that they could not lie down is unfounded; but may have arisen from the fact that they often sleep standing. The sight of the elephant is not highly developed, but its other senses are delicate, especially that of hearing. Every sportsman has learned that the snapping of a twig will start a whole herd. The intellectual faculties of the elephant resemble those of the higher mammals; he reflects before acting, he learns by experience, he is very susceptible of teaching, and remembers what he learns. They have the sense to avoid the neighborhood of trees during a thunder-storm; a fact which proves a considerable reasoning power. Still, in his wild life the elephant is cunning rather than sagacious. The herds consist of various numbers, from ten up to hundreds. Kirk saw eight hundred together on the Zambesi river. Each herd consists of a single family, under the rule of a patriarch, who leads and guards the others, providing in every way for their safety. The elephant grows till it is about twenty, and probably lives till it is a hundred and twenty.

The Elephant is found in a wild state in Asia and in Africa. In the former continent it inhabits India, Burmah, and Siam, as well as the islands of Ceylon, Borneo, and Sumatra. In the latter it is a native of all the Interior whenever it is clothed with forests or with grass. Probably it never extended to the range of Mount Atlas. It was exterminated in the Cape of Good Hope at the end of the last century. In North as well as in South Africa it is receding before the advance of civilization.



CHAPTER II.

THE ASIATIC ELEPHANT.

THE ASIATIC ELEPHANT—ITS USE—MODE OF CAPTURE IN CEYLON—POINTS OF A GOOD ELEPHANT
—WHITE ELEPHANTS—FUNERAL OF A WHITE ELEPHANT—THE DWARF ELEPHANT.

THE ASIATIC ELEPHANT, *Elephas Indicus* (Plate LI), is a powerful animal with a broad forehead, short neck, strong body, and pillar-like limbs. The head, more particularly, gives the overpowering impression which this great beast exercises on the spectator. It is high, short, and broad; the facial line is vertical, the cranium crowned by two elevated lateral bumps. Near the ears are two glands which, at certain times, secrete a most offensive fluid. The ears are of moderate size, four-sided, and ending in a point. The small, twinkling, but unpleasant eye is deep-set, and the eyelids are lined with thick, strong, black eyelashes. The centre of the eye is very small and round, the iris coffee-colored. The under lip is pointed, and usually hangs down. Between the eyes is the origin of the trunk, which gradually tapers to its extremity. The powerful tusks project from the upper jaw. The neck is short, the line of the spine is highest just behind the head, and slopes downward to the tail. The tail is placed high, and hangs down straight to the joint of the hind leg. The skin is covered with folds and wrinkles, and is almost destitute of hair. The few hairs on the back are of a dark-gray color. The size of the elephant is usually exaggerated. A very large male will measure from the end of the trunk to the end of the tail eight yards, and will stand about four yards high.

If it had not been for the presence of man upon the earth, the elephant would have been the lord of creation. But man has succeeded in reducing this monarch of the animal kingdom to his service. In India or Siam, when a troop of elephants has been discovered, the natives assemble and surround them, and drive them into a corral. At other times, a solitary male elephant which has been exiled from some troop

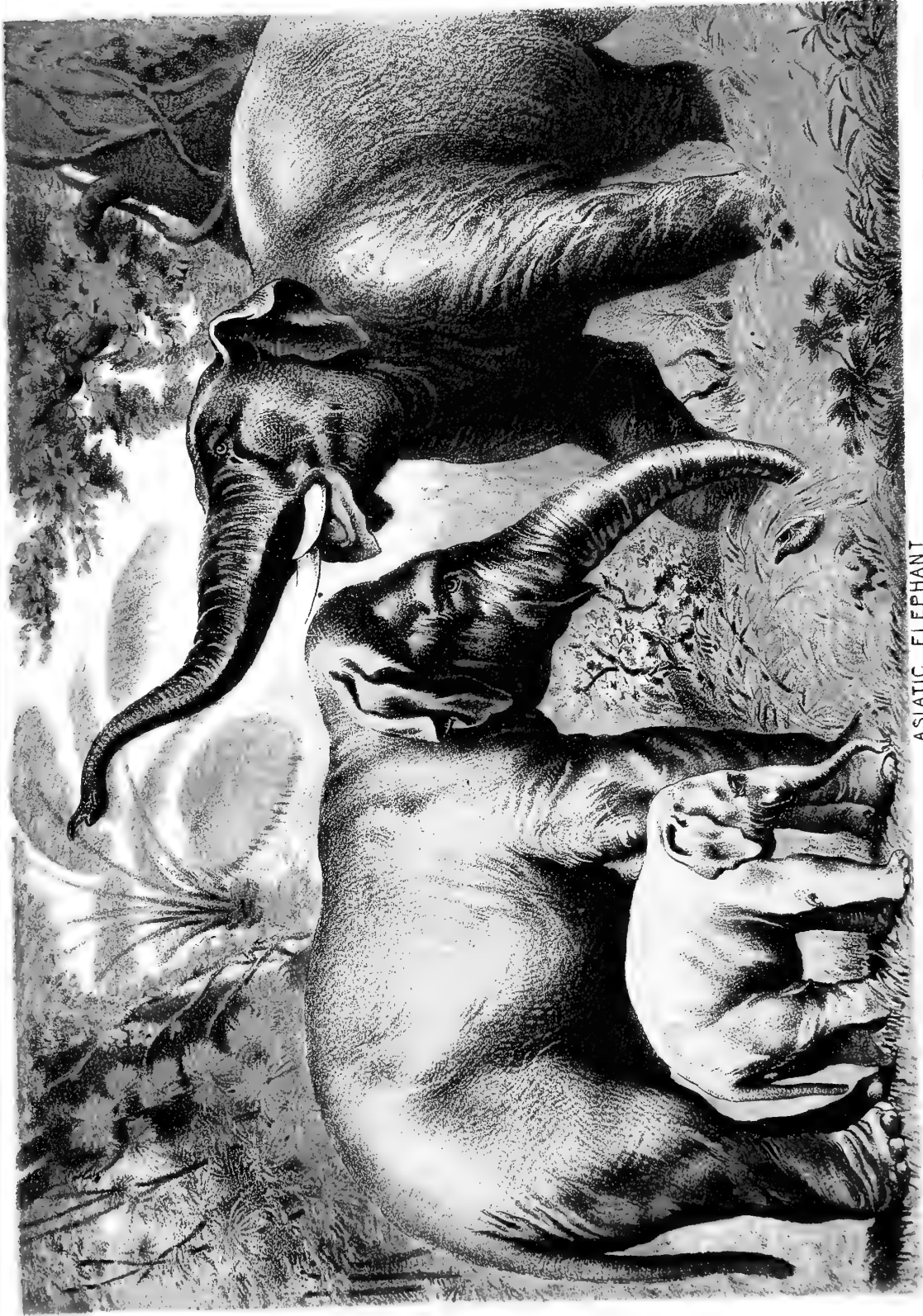
is beguiled by a couple of tame females who caress him with their trunks while the men who had accompanied them are passing cords around his limbs. A well-trained elephant is of very great value in the Southeastern regions of Asia. Its strength is about five times that of the camel. In its wild state, the Indian Elephant is believed to attain to the age of two hundred years; but it rarely is so long-lived in a state of captivity. In war they are employed for carrying the sick, and camp equipage. The English in India harness them in their artillery trains. Moreover, the proprietors of large cultivated plains, in certain parts of India, have succeeded in making them draw plows. Never did a more monstrous beast of draught turn up the earth with a plowshare. A plowing elephant does the work of thirty oxen.

Without the presence of numerous elephants to grace it, no public *fête* in most parts of India is considered complete. It always figures in the suite of princes, and state processions.

It is especially useful for carrying sportsmen on its back in tiger hunting, and, if need be, for defending them against it, when this terrible animal turns to bay. The elephants which are used by the English army are usually captured by government officials in the island of Ceylon, where they are very numerous. The hunts are on a large scale, as well to rid the neighborhood of such dangerous visitors, as for supplying themselves with such docile workers. A large open space in the jungle is fenced round with strong bamboos, and a narrow entrance at one end is left open. Into this kraal or corral a large party of men drive the herd of wild elephants which are led by tame decoy elephants into the roads leading to the enclosure. When the herd is safely inside, the exit is barred, and the imprisoned animals make furious attempts to escape, charging the fence with desperate determination. When they are wearied out with their fruitless efforts, the best of the herd are selected for taming. Men, lasso in hand, creep quickly into the kraal. Each of them selects one of the largest and strongest of the group, and, having arranged the "lasso" for action, they apply a finger gently to the right heel of their beast, who, feeling the touch as though that of some insect, slowly raises the leg. The men, as the legs are lifted, place the running nooses beneath them, so that the elephants are quietly trapped, unknown to themselves, and with the utmost ease. The men now steal rapidly away with the ends of the ropes, and immediately make them fast to the ends of the nearest trees.







MALE

ASIATIC ELEPHANT

FEMALE AND YOUNG

PLATE LI. PROBOSCIDEA.



But the work is not complete. It is necessary to secure the wild creatures more securely. Two tame elephants are now placed on active service. Walking slowly up to the nearest of the captured animals, they begin to urge him toward the tree to which he was fastened. At first the creature is stubborn; but a few taps on his great skull, and a mighty push on his carcass, send him a yard or two nearer his destination. As he proceeds, the man in charge of the rope gathers in the slack of it; and so matters go on between this party—a tap, a push, and a pull—until at length the three elephants are close to the trees. Two other villagers then come forward with a stout iron chain. The tame animals place themselves one on each side of their prisoner, pressing him between them so tightly as to prevent the possibility of his moving. In a minute or two the great chain is passed several times round the hind legs and the tree; and in this way the captive is left, helpless, and faint with struggling against his bonds.

The process of taming is soon accomplished. At the end of two or three months, the wild and unruly destroying monster of the jungle might be seen quietly and submissively piling logs of ebony in the government timber-yards, with a purpose-like intelligence little short of that of man.

A traveler writes: "These huge animals were generally employed in the commissariat timber-yard, or the civil engineer's department, either in removing and stowing logs and planks, or in rolling about heavy masses of stone for building purposes. I could not but admire the precision with which they performed their allotted task, unaided save by their own sagacity. They were one morning hard at work, though slowly, piling up a quantity of heavy pieces of ebony; the lower row of the pile had been already laid down, with mathematical precision, six logs side by side. These they had first rolled in from the adjoining wharf; and, when I rode up, they were engaged in bringing forward the next six for the second row in the pile. It was curious to observe those uncouth animals seize one of the heavy logs at each end; and, by means of their trunks, lift it up on the logs already placed, and then arrange it crosswise upon them with the most perfect skill. I waited while they thus placed the third row; feeling a curiosity to know how they would proceed when the timber had to be lifted to greater height. Some of the logs weighed nearly twenty hundred-weight. There was a short pause before the fourth row was touched; but the difficulty was no

sooner perceived than it was overcome. The sagacious animals selected two straight pieces of timber, placed one end of each piece on the ground, with the other resting on the top of the pile, so as to form a sliding-way for the next logs; and, having seen that they were perfectly steady and in a straight line, the four-legged laborers rolled up the slope they had thus formed the six pieces of ebony for the fourth layer on the pile. Not the least amusing part of the performance was, the careful survey of the pile, made by one of the elephants, after placing each log, to ascertain if it were laid perfectly square with the rest."

A still more striking proof of sagacity exhibited by one of these commissariat elephants is told: "One evening, while riding in the vicinity of Kandy, my horse evinced some excitement at a noise which approached us in the thick jungle, and which consisted of a repetition of the ejaculation, *Urmph! urmph!* in a hoarse and dissatisfied tone. A turn in the forest explained the mystery, by bringing me face to face with a tame elephant, unaccompanied by any attendant. He was laboring painfully to carry a heavy beam of timber, which he balanced across his tusks, but the pathway being narrow, he was forced to bend his head to one side to permit it to pass endways; and the exertion and inconvenience combined, led him to utter the dissatisfied sounds which disturbed the composure of my horse.

"On seeing us halt, the elephant raised his head, reconnoitred us for a moment, then flung down the timber, and forced himself backward among the brushwood, so as to leave a passage, of which he expected us to avail ourselves. My horse still hesitated: the elephant observed, and impatiently thrust himself still deeper into the jungle, repeating his cry of *urmph!* but in a voice evidently meant to encourage us to come on. Still the horse trembled; and, anxious to observe the instinct of the two sagacious creatures, I forbore any interference: again the elephant wedged himself farther in among the trees, and waited impatiently for us to pass him, and after the horse had done so, tremblingly and timidly, I saw the wise creature stoop and take up his heavy burden, turn and balance it on his tusks, and resume his route, hoarsely snorting, as before, his discontented remonstrance."

The working elephant is not so valuable for certain kinds of work as has been supposed. In the unopened districts they are useful for carrying stores, and constructing bridges. But in more civilized districts, where the roads permit the use of horses and oxen, their services may

be dispensed with. In Ceylon, an elephant costs six to seven shillings a day to feed, and he can work only four days a week. A stout horse, that works for five days, costs only two shillings and sixpence.

When the natives hunt the elephant merely for the sake of his ivory or his flesh, and do not care to take him alive, they achieve their object by stealing cautiously upon him as he dozes, and by gently tickling one of his hind-feet with a slight twig, they induce him to lift his foot from the ground. As soon as he does so, the hunters, who are furnished with a mallet and a sharp wooden spike about eight inches in length, drive the spike into his foot, and effectually lame him with a single blow. He is then quite at their disposal, and is easily dispatched. The flesh of the elephant is thought to be very poor indeed; but the heart, the tongue, the trunk, and the foot, are considered to be good eating.

The "points" of a good elephant are as important in India and Ceylon as those of a horse in Europe. In a native work upon the elephant, quoted by Sir E. Tennent, the points are given as follows: "The softness of the skin, the red color of the mouth and tongue, the forehead expanded and full, the ears large and rectangular, the trunk broad at the root, and blotched with pink in front, the eyes light and kindly, the cheeks large, the neck full, the back level, the chest square, the fore-legs short and convex in front, the hind quarters plump, five nails in each foot; all smooth, elastic, and round. An elephant with all these perfections will impart glory and magnificence to the king."

The herds in which the Indian elephants congregate are not of very great size, containing only from ten to twenty or thirty individuals, and consisting, as is generally thought by men of practical experience, of members of the same family. This opinion is strengthened by the fact that certain physical peculiarities, such as the shape of the trunk or the head, have been found in every member of the same herd. Sometimes these herds will associate with each other for a time, but at the smallest alarm each little flock assembles together independently of the others. It is remarkable that a whole herd has never been known to charge a foe simultaneously. The leader generally faces the enemy, while the remainder of the herd manœuvre in his rear; but that the entire herd should unite in a charge, is a circumstance never yet known to occur. The Asiatic elephant will permit the temporary society of other animals, and may be seen at a fountain, or feeding on an open space in close proximity to deer and wild buffaloes, neither animal displaying any

aversion to, or fear of the other. In its general habits the elephant is restless and irritable, or rather "fidgety," never remaining quite still, but always in motion in some way or other.

The elephant is always guided by a mahoot, who sits astride its neck and directs its movements by his voice and a spiked hook. The persons who are carried on the elephant either sit in a howdah—a kind of carriage without wheels strapped on its back—or they sit upon a cushion. The latter mode is preferable, as the traveler can readily change his position. The motion is sometimes pleasant, sometimes fatiguing. At times the pace is so rapid that a man on horseback can with difficulty keep up. But this pace does not last long, and the animal usually travels about twenty-four miles a day.

Sometimes Albino elephants are discovered. The white color is really the result of hereditary disease. These specimens are highly prized in Siam; the whole country, indeed, has been called the land of the White Elephant.

The King of Siam once had no less than six of these wonders of the earth. They had apartments near the Palace, each having ten servants. Their food was fresh grass and sugar-cane, and bananas wreathed with flowers. Their dinner was set on a white table-cloth in a shady court near a marble fountain. Their tusks were ornamented with gold rings, their heads covered with a network of gold, and their backs supported a small embroidered cushion. The White Elephant is called "The Pure King," and "The Wonderful King." Whoever discovers a white elephant is rewarded by the Siamese kings, a grant of land is made to him, and his family, to the third generation, is exempt from taxes.

A white elephant died in his temple at Bangkok in Siam, in November, 1878, which was said to have been born in 1770. Each white elephant possesses its palace, a vessel of gold, and richly jewelled harness; several mandarins are attached to its service, and feed it with cakes and sugar-cane. The king is the only person to whom it bows the knee, and a similar salutation is returned by the prince. The one above mentioned had a magnificent funeral. A hundred priests officiated, the three surviving white elephants, preceded by trumpets, and followed by an immense concourse of people, accompanied the remains to the banks of the river, where the king and his nobles received them. A procession of thirty vessels formed the cortege to convoy the funeral car to the other bank for interment.

THE DWARF ELEPHANT.

There were lately landed in New York, by the ship Oxfordshire from Singapore, two strange creatures said to be captured about eight hundred miles from Singapore. They were described as being two dwarf elephants from the mountains of the Malay peninsula. They are the first elephants of their species ever brought to this country, and a gentleman who had visited all of the great Zoological Exhibitions in Europe declared that he had not seen anything like them. They are males, and their names are Prince and Sidney. Prince, the larger, is thirty-six inches tall. Sidney is only twenty-eight inches in height. They are supposed to be about five and seven years old, respectively. They are covered with a thick coat of bristly hair. Mr. Reiche calls it wool, and says that he shall style them the woolly elephants. He accounts for this growth by the fact that the elephants lived far up the mountains, where the climate is cold.



CHAPTER III.

THE AFRICAN ELEPHANT.

THE AFRICAN ELEPHANT—DIFFERENCE FROM THE INDIAN ELEPHANT—HUNTING THE ELEPHANT—
DELEGORGUE—GORDON CUMMING—THE ABYSSINIAN “HOCK-CUTTERS”—CAPTIVE ELEPHANTS
—BABY ELEPHANTS—ANECDOTES OF ELEPHANTS.

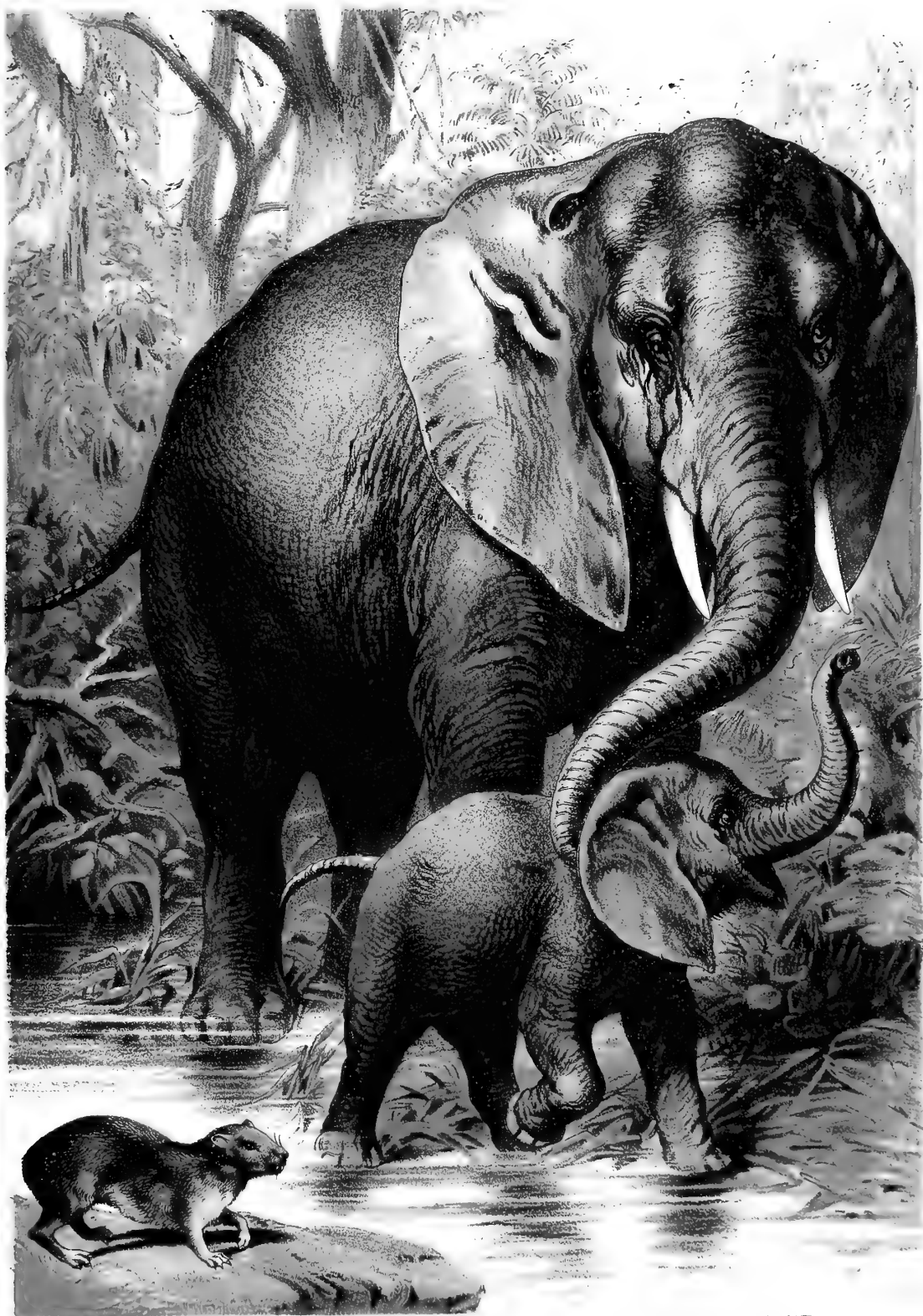
THE Elephant which is found in Africa differs considerably in appearance from the one just described. The head is rounder and narrower, the ears are enormous, the rims nearly meeting on the back of the head, and the tusk is much stronger.

The AFRICAN ELEPHANT, *Elephas Africanus* (Plate LII), is called by the Arabs *Fihl*. It is met with from the Cape of Good Hope as far north as Nubia and Cape Verd. It consequently exists in Mozambique, in Abyssinia, in Guinea, and in Senegal.

African Elephants live, like those of India, in troops more or less numerous. They are sometimes found alone: the Dutch call these *rodours*, rovers or prowlers. They were formerly much more common in the environs of the Cape of Good Hope than they are at present. Thunberg relates that a hunter told him that he had killed in these regions four or five a day, and that regularly. He added that the number of his victims had many a time amounted to twelve or thirteen, and even to twenty-two in one day. This may, perhaps, have been but a braggart's idle boast. Still they abound in the vast interior of Africa. In the present day they are not used by man for any warlike or domestic purpose, but are hunted for the sake of their ivory.

Delegorgue, a French traveler, has published, more recently, some curious accounts of their habits. Among these animals, gathered together in troops, there prevails a spirit of imitation which sometimes makes them all do exactly what the first has done. Delegorgue relates on this subject the following episode of one of his hunting excursions. A band of elephants was coming toward him and his two hunting com-

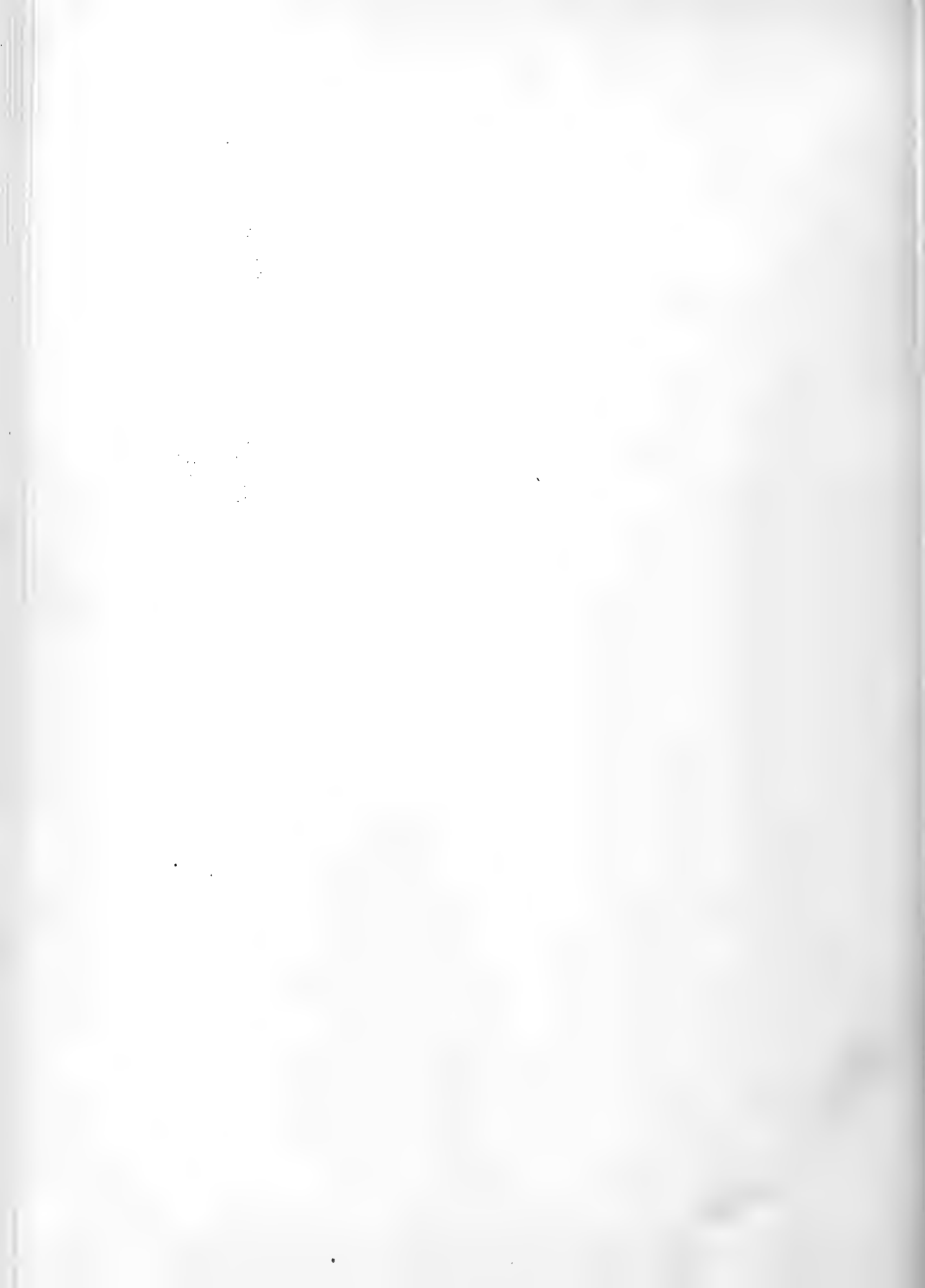




HYRAX

AFRICAN ELEPHANT

PLATE LII PROBOSCIDEA AND HYRACOIDEA



panions. He shot at the first of the troop; the elephant fell, sinking on its knees. A second elephant was then killed, and fell on its knees over the first. Another of the sportsmen then shot in his turn, and the elephant aimed at fell in the same manner over the two others. All the elephants fell thus on their knees, even to the very last of them, eleven in all, under the fire of the sportsmen.

Gordon Cumming gives thrilling accounts of his adventures with elephants. He sighted a herd, and selected two huge females. "They walked slowly past at about sixty yards, and the one I picked out was quietly feeding with two others on a thorny tree before me. My hand was now as steady as the rock on which it rested, so, taking a deliberate aim, I let fly at her head, a little behind the eye. She got it hard and sharp, just where I aimed, but it did not seem to affect her much. Uttering a loud cry, she wheeled about, when I gave her the second ball, close behind the shoulder. All the elephants uttered a strange rumbling noise, and made off in a line to the northward at a brisk ambling pace, their huge fan-like ears flapping in the ratio of their speed. I did not wait to load, but ran back to the hillock to obtain a view. Presently my men hove in sight, bringing the dogs; and when these came up, I waited some time before commencing the attack, that the dogs and horses might recover their wind. We then rode slowly toward the elephants, and had advanced within two hundred yards of them, when, the ground being open, they observed us, and made off in an easterly direction; but the wounded one immediately dropped astern, and next moment she was surrounded by the dogs, which, barking angrily, seemed to engross her attention. Having placed myself between her and the retreating troop, I dismounted, to fire within forty yards of her, in open ground. Colesberg, my horse, was extremely afraid of them, and gave me much trouble, jerking my arm when I tried to fire. At length I let fly; but, on endeavoring to regain my saddle, Colesberg declined to allow me to mount; and when I tried to lead him, and run for it, he only backed toward the wounded elephant. At this moment I heard another elephant close behind; and on looking about I beheld one of its friends with uplifted trunk, charging down upon me at top speed, shrilly trumpeting, and following an old black pointer named Schwart, that was perfectly deaf, and trotted along before the enraged elephant quite unaware of what was behind him. I felt certain that she would have either me or my horse. I, however, determined not to relinquish

my steed, but to hold on by the bridle. Fortunately, however, the dogs took off the attention of the elephants; and just as they were upon me I managed to spring into the saddle, where I was safe. As I turned my back to mount, the elephants were so very near, that I really expected to feel one of their trunks lay hold of me. Returning to the charge, I was soon once more alongside, and, firing from the saddle, I sent another brace of bullets into the wounded elephant. Colesberg was extremely unsteady, and destroyed the correctness of my aim. The 'friend' now seemed resolved to do some mischief, and charged me furiously, pursuing me to a distance of several hundred yards. I therefore deemed it proper to give her a gentle hint to act less officiously, and accordingly, having loaded, I approached within thirty yards, and gave it her sharp, right and left, behind the shoulder; upon which she at once made off with drooping trunk, evidently with a mortal wound. Two more shots finished her: on receiving them she tossed her trunk up and down two or three times, and falling on her broadside against a thorny tree, which yielded like grass before her enormous weight, she uttered a deep hoarse cry and expired." For all elephant-shooting, leaden bullets are not to be relied on. Cumming used a two-ounce ball hardened with one-eighth lead. Shell-bullets also have been used with terrible effect.

Sir Samuel Baker describes the method of hunting pursued by the Aggageers or hock-cutters in Abyssinia. A party of seven, of which he was one, had started a fine bull elephant. It at once retreated, but when the hunters again drew near, it halted and faced them.

"'Be ready, and take care of the rocks!' said Taher Sherrif, as I rode forward by his side. Hardly had he uttered these words of caution, when the bull gave a vicious jerk with its head, and with a shrill scream charged down upon us with the greatest fury. Away we all went, helter-skelter, through the dry grass which whistled in my ears, over the hidden rocks, at full gallop, with the elephant tearing after us for about a hundred and eighty yards at a tremendous pace. I was not sorry when it gave up the hunt. We now quickly united and again followed the elephant, that had once more retreated. Then came the tug of war. Taher Sherrif came close to me and said, 'You had better shoot the elephant, as we shall have great difficulty in this rocky ground.' This I declined, as I wished to end the fight as it had been commenced, with the sword; and I proposed that he should endeavor to drive the animal

to more favorable ground. 'Never mind,' replied Taher; 'Inshallah (please God), he shall not beat us.' He now advised me to keep as close to him as possible, and to look sharp for a charge.

"The elephant stood facing us like a statue; it did not move a muscle beyond a quick and restless action of the eyes that were watching all sides. Taher Sherrif and his brother now separated, and, passing at opposite sides of the elephant, joined each other about twenty yards behind it. In front were two of the hock-cutters; one of them, named Roder Sherrif, rode an experienced bay mare. She advanced close up to her antagonist until within eight or nine yards of his head. For an instant not a word was spoken. Then I saw the white of one of its eyes gleam. 'Look out, Roder! he's coming,' I exclaimed. With a shrill scream the elephant dashed upon him like an avalanche. Round went the mare as though upon a pivot, and away over rocks and stones, flying like a gazelle, with the monkey-like form of little Roder Sherrif leaning forward and looking over his left shoulder as the elephant rushed after him. For a moment I thought he must be caught. Had the mare stumbled, all were lost; but she gained in the race after a few quick, bounding strides, and Roder, still looking behind him, kept his distance so close to the elephant that its outstretched trunk was within a few feet of the mare's tail.

"Taher Sherrif and his brother Ibrahim swept down like falcons in the rear. In full speed, they dexterously avoided the trees until they arrived upon open ground, when they dashed up close to the hind-quarters of the furious elephant, which, maddened with the excitement, heeded nothing but Roder and his mare, now almost within its grasp. When close to the tail of the elephant, Taher Sheriff's sword flashed from its sheath, as, grasping his trusty blade, he leaped nimbly to the ground, while Ibrahim caught the reins of his horse.

"Two or three bounds on foot, with the sword clutched in both hands, and he was close behind the elephant. A bright glance shone like lightning as the sun struck upon the descending steel. This was followed by a dull crack, as the sword cut through skin and sinews, and settled deep in the bone about twelve inches above the foot. At the next stride the elephant halted dead short in the midst of its charge.

"Taher had jumped quickly on one side, and had vaulted into the saddle with his naked sword in hand. At the same moment Roder, who had led the chase, turned sharp round, and again faced the elephant as

before. Stooping quickly from the saddle, he picked up from the ground a handful of dirt, which he threw into the face of the vicious-looking animal that once more attempted to rush upon him. It was impossible; the foot was dislocated, and turned up in front like an old shoe. In an instant Taher was once more on foot, and again the sharp sword slashed the remaining leg. The great bull elephant could not move! The first cut with the sword had utterly disabled it; the second was its death-blow."

ELEPHANTS IN CAPTIVITY.

It was a very long time believed that elephants would not breed except in a wild state. It is indisputable that the domesticated elephants in India have never produced any young. The first baby elephant seen in Europe arrived in England in 1851. The mother was a wild one, caught near Cawnpore, who gave birth to a female a few months after her capture. Two wild elephants just captured were put together by Corsa. Twenty-one months afterward a young one was born. It began to suck at once, turning back its trunk and taking the teat in its mouth. It grew rapidly, and at one year old measured nearly four feet in height. The suckling period lasts for two years. But in our own country a proof has been given of the unfounded character of the old supposition. A female elephant which had for years been traveling in one of our circuses, became the mother of the Baby Elephant which most of our readers have doubtless seen.

The BABY ELEPHANT (Plate LII), born while its mother was in close quarters in Philadelphia, in the winter of 1879, disposed forever of the assumption. We saw the little creature in Brooklyn at the opening of the present season, and found it to be as playful as a kitten. Its mother, however, did not exhibit any particular affection for it. She endured her offspring, nothing more. On one occasion she struck it with her trunk so violently that it was thrown a distance of quite twenty feet. It fell heavily on the ground, which, fortunately for its limbs and ribs, was soft, and covered with tan bark and straw. When the "baby" desired to feed, the mother would lie down with a sullen grunt, and permit it to take into its mouth one of her dugs. The milk is very rich, containing a high proportion of butter and sugar. It is said that the mother-elephant cares very little for her offspring, and if kept from it for forty or fifty hours, will never after recognize it.

The English novelist, Mr. Charles Reade, holds the opinion of all American showmen, that the elephant is only to be mastered by fear. He writes: "There is a fixed opinion among men that an elephant is a good, kind creature. The opinion is fed by the proprietors of elephants, who must nurse the notion or lose their customers, and so a set tale is always ready to clear the guilty and criminate the sufferer; and this tale is greedily swallowed by the public. You will hear and read many such tales in the papers before you die. Every such tale is a lie."

He then narrates the performances of a famous performing elephant, Mademoiselle Djek. She killed several of her keepers, but seemed to be devotedly attached to the most drunken and brutal of the lot. A comrade detected this keeper walking into her with a pitchfork, her trembling like a school-boy, with her head in a corner, and the blood streaming from her sides. The spectator next took an opportunity of trying the efficacy of this mode of treatment. "I took the steel rod, and introduced myself by driving it into Djek's ribs; she took it as a matter of course, and walked like a lamb. We marched on, the best of friends. About a mile out of the town she put out her trunk, and tried to curl it round me in a caressing way. I met this overture by driving the steel into her till the blood squirted out of her. If I had not, the siren would have killed me in the course of the next five minutes.

"Whenever she relaxed her speed I drove the steel into her. When the afternoon sun smiled gloriously on us, and the poor thing felt nature stir in her heart, and began to frisk in her awful, clumsy way, pounding the great globe, I drove the steel into her. If I had not, I should not be here to relate this narrative."

The fact that a creature can be cowed by cruelty is no proof that it is not amenable to kindness. Casanova, the great dealer in wild animals, bore witness how grateful the elephants he brought from Africa were to the European keepers who treated them kindly, while they could not bear the cruel natives.

Buffon relates the following trait: "A painter wished to make a drawing of the elephant of the menagerie of Versailles in an extraordinary attitude, which was with its trunk elevated in the air, and its mouth wide open. The painter's servant, to make it remain in this attitude, kept throwing fruit into its mouth, but oftener, by pretending to do so. The elephant, as if it knew that the painter's desire of making a drawing of it was the cause of its being thus annoyed, instead of

revenging itself on the servant, addressed itself to the master, and discharged at him, through his trunk, a quantity of water, with which it spoiled the paper on which he was drawing."

In the London Zoological Garden the largest African elephant broke off his tusks. The stumps grew into the cheeks, causing intense pain. The intrepid superintendent undertook to perform a surgical operation and relieve the poor beast. Having prepared a gigantic hook-shaped lancet, he bandaged the creature's eyes, and proceeded to his task. It was an anxious moment, for there was absolutely nothing to prevent the animal killing his medical attendants upon the spot, and to rely upon the common sense and good nature of a creature weighing many tons and suffering from facial abscesses and neuralgia, argues, to say the least of it, the possession of considerable nerve. But Mr. Bartlett did not hesitate, and climbing up within reach of his patient, he lanced the swollen cheek. His courage was rewarded, for the beast at once perceived that the proceedings were for his good, and submitted quietly. The next morning, when they came to operate upon the other side, the elephant turned his cheek without being bidden, and endured the second incision without a groan.

Some elephants possess a taste for music. In 1813, the musicians of Paris met together and gave a concert to the male elephant, which was then in the Jardin des Plantes. The animal showed great pleasure at hearing sung *O ma tendre Musette!* But the air of *La charmante Gabrielle* pleased it so much that it beat time by making its trunk oscillate from right to left, and by rocking its enormous body from side to side. It even uttered a few sounds more or less in harmony with those produced by the orchestra.

An elephant was used in a spectacular play in Philadelphia. He was kept in a stable several blocks away, and taken to the theatre every evening at the proper point in the piece. One afternoon he took it into his head that the time had come to perform. Throwing his keeper aside, he burst into the street, overturned a wagon and several street-stands on his way to the theatre, smashed a door, and took his usual place on the stage. The absence of lights and audience seemed to convince him that he had made a mistake, and he suffered himself to be led back to the stable.



ORDER IX.

HYRACOIDEA.

54. HYRACIDÆ - - - - - ROCK RABBITS.

HYRACOIDEA

THE ROCK RABBITS.

THE ORDER HYRACOIDEA—THE GENUS HYRAX—ITS CHARACTERISTICS.

THE order HYRACOIDEA consists of only *one* family, HYRACIDÆ, which comprises only *one* genus. Naturalists are by no means agreed as to the classification of the animals comprised in this one order, family, or genus. Pallas regarded them as Rodents. Oken considered them nearest akin to the Marsupials. Huxley, however, who is followed by Wallace, raised them to the dignity of an independent order.

In the stony mountain ranges of Africa and Western Asia, the traveler sees in many spots a lively rabbit-like creature basking on a narrow ledge of rock. As he approaches, the animal takes fright, swiftly clambers up the precipice, vanishes in one of the numerous clefts, and then, safe and curious, turns and looks down with wondering eyes on the intruder. It is one of the Rock Rabbits.

GENUS HYRAX.

The Genus HYRAX contains *ten* species. The generic characteristics are the following. The body is long, the head large, the upper-lip cleft, the eyes small, the ear short, broad, and round, and almost hidden in fur, the neck short, the tail a mere rudiment, the legs moderately high and weak, the fore-feet divided into four, the hind-feet into three toes. A soft, thick coat covers the body and limbs.

The Rock Rabbits or Damans have been known from olden times. They are the "conies" of the Bible, "a weak people which had their

houses in the rocks." Moses regarded them as unclean animals. At present, in Abyssinia neither Christian nor Mussulman will taste their flesh. In Arabia, however, the Bedouins eat it readily. The Hyrax, in its movements, seems to be a link between the clumsy ruminants and the lively rodents. When running on level ground they move their limbs deliberately and regularly. When alarmed, they fly to the rocks, and there display their wonderful agility. In disposition they display gentleness and incredible timidity. They love society, and are never seen alone. They are constant to the dwelling they have once selected, and are very voracious, the plants of their alpine homes supplying them with ample food. They bite off the grass with their teeth, and then move their jaws like animals chewing the cud. It is doubtful whether they actually ruminate, as the proper ruminants do.

THE ASHKOKO.

The ASHKOKO, *Hyrax Abyssinicus*, is from nine to twelve inches long. The coat consists of smooth fine hairs, and is of a dappled fawn-gray color. It is the characteristic animal of the stony mountain ranges, where troops may be seen lying on the rocks. They often are seen near the villages, where they have learned by experience that no one attempts to hurt them. But the sight of a European or the approach of a dog sets them off in full flight. A passing crow, or a swallow skimming the air near them, has the same effect. Yet they live in harmony with much more blood-thirsty animals, as, for instance, the ichneumon. They seldom leave their craggy homes. When the grass which grows in the ledges is eaten, they descend into the valleys, but a sentinel is then always posted on some prominent cliff, and a warning voice from him produces a speedy retreat. The power these creatures possess of running up smooth and perpendicular walls of rock is wonderful. Schweinfurth asserts that they can contract their feet so as to form a cavity in the centre of the sole, and thus adhere to the flat surface by atmospheric pressure alone.

The celebrated traveler Bruce was the first to give a detailed account of the Ashkoko. "It is found," he writes, "in Ethiopia in the caverns of the rocks, or under the great stones in the Mountain of the Sun behind the Queen's Palace at Koscam. It does not burrow or make holes like the rat or rabbit, for its feet are by no means adapted for

digging. Several dozens of them may be seen sitting on the great stones at the mouth of caves, warming themselves in the sun, or enjoying the freshness of the summer evening. They do not stand upright upon their feet, but steal along as in fear, their belly being very close to the ground, advancing a few steps at a time, and then pausing."

This species is found plentifully on Mount Lebanon, and is sometimes called the Syrian Hyrax. The Arabs style it "Israel's Sheep," probably from its frequenting the rocks of Horeb and Mount Sinai, where the children of Israel made their forty years' wandering. It is known in Hebrew by the name Saphan, and is the animal erroneously called in the English version of the Bible the "coney."

There is no foundation for the species *Hyrax Hudsonicus* which was described by Pennant from a specimen in a museum.

THE KLIPDAS.

The KLIPDAS, *Hyrax capensis* (Plate LII) is sometimes called the Rock Badger. Kolbe, its first discoverer, and Buffon mention it as a Marmot. Blumenbach left it with the Rodentia. It is not much larger than a hare; the make is clumsy, rather long, low on the legs, with a thick head terminated by an obtuse muzzle. The fur is uniformly grayish-brown, with the inside of the ears white, and sometimes a blackish band is found on the back. In captivity these creatures soon become tamed, and are easily attached to their keeper. They are active and cleanly, and feed exclusively on vegetable substances, and are said to prepare a kind of nest or bed of dried leaves, grasses, and the like, in the cavities in which they reside.

THE TREE DAMAN.

The TREE DAMAN, *Hyrax arboreus*, is found in many of the forests of South Africa, and dwells in the hollows of decayed trees. It rather exceeds the size of the Klipdas, but resembles it in form, and in its manner of moving and sitting. In color it is a tawny-red, mottled with black upon the back, but the fur beneath is of a uniform dull white. The reddish color arises from the tips of most of the hairs being of that hue; the black variegations depend on a scanty intermixture of long

hairs which are entirely of that color. The crown of the head has a predominance of black, the sides of the head are somewhat grayish. The ears are short and roundish, and beset outside with long, dusty-whitish hair. The teeth of this species differ a little from those of the Cape *Hyrax*, more particularly the incisors. The upper ones are more pointed, and the lower ones stand in pairs. "Little is known of its manners," writes Major Smith. "Almost the only observation that can be elicited from the farmers and inhabitants of the parts of the country in which it resides is, that it makes a great noise previous to the fall of rain."

The *Hyrax* or Daman, as the whole genus is sometimes called, is one of those links in the chain of nature's works which puzzle classifiers. Cuvier, the founder of modern scientific Zoology, placed these animals with the horse and the rhinoceros in the order Pachydermata. It is certain, indeed, that they resemble in their teeth and skeleton the huge and unwieldy rhinoceros.

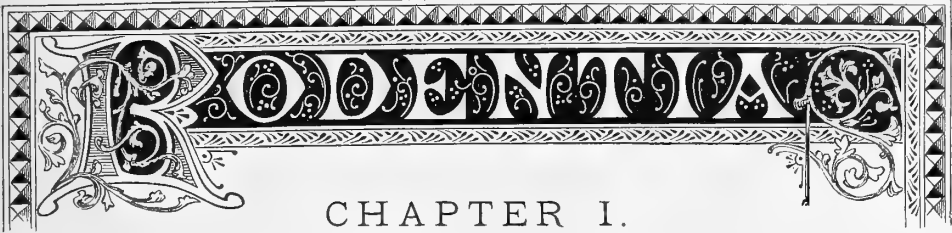


ORDER X.

RODENTIA.

FAMILIES.

55. MURIDÆ - - - - - RATS.
56. SPALACIDÆ - - - - - MOLE RATS.
57. DIPODIDÆ - - - - - JERBOAS.
58. MYOXIDÆ - - - - - DORMICE.
59. SACCOMYIDÆ - - - - - POUCHED RATS.
60. CASTORIDÆ - - - - - BEAVERS.
61. SCIURIDÆ - - - - - SQUIRRELS.
62. HAPLOODONTIDÆ - - - - - SEWELLALS.
63. CHINCHILLIDÆ - - - - - CHINCHILLAS.
64. OCTODONTIDÆ - - - - - OCTODONS.
65. ECHIMYIDÆ - - - - - SPRING RATS.
66. CERCOLABIDÆ - - - - - TREE PORCUPINES.
67. HYSTRICIDÆ - - - - - PORCUPINES.
68. CAVIIDÆ - - - - - CAVIES.
69. LAGOMYIDÆ - - - - - PIKAS.
70. LEPORIDÆ - - - - - HARES.



CHAPTER I.

RATS AND MICE.

THE ORDER RODENTIA—THE FAMILY MURIDÆ—RATS AND MICE—THE BLACK RAT—THE BROWN RAT—THE MOUSE—THE HARVEST MOUSE—THE BARBARY MOUSE—THE HAMSTER—THE MUSK RAT—THE WATER RAT—THE FIELD MOUSE—WILSON'S MEADOW MOUSE—LE CONTE'S MOUSE—THE COTTON RAT—THE LEMMING.

THE RODENTIA or Gnawers (from the Latin *rodere* "to gnaw"), constitute a well-defined order characterized by the possession of two long, curved, sharp-edged, rootless incisors in each jaw. The order contains a very considerable number of subdivisions, namely, *sixteen* families, some of which comprise over two hundred species. It may be inferred from this fact that the animals of the order differ very widely in all other respects than that which has given them their name. The gnawing teeth are necessarily placed in strong heavy jaws which are large in proportion to the head, for they not only require a stout support, but room for continual development. These teeth are worn continually by the friction they undergo, and necessitate a provision for their continual renewal; the base passes deeply into the jawbone, where a pulpy core supplies the material for constant growth. As those of the upper jaw meet those of the lower jaw at the tips, they are perpetually worn away by their action upon each other, and upon the hard food which they are formed for nibbling. The growth at the base and the wearing away of the tips thus balance each other. If one of the incisors is lost, the opposing one in the other jaw being no longer worn, grows till it projects like the tusk of an elephant. These incisors are chisel-shaped, and are provided in front with a layer of enamel hard as the hardest steel, while behind they are composed of a much softer material

called ivory. This latter portion wears away much more rapidly than the front, and thus a sharp-cutting edge is preserved.

The RODENTIA are widely spread over the globe, and comprise nearly one-half of the mammalia. From the equator to the coldest latitudes they tenant rocks and mountains, plains and woods, and often devastate the cultivated domains of man.

RATS AND MICE.

The family MURIDÆ contains no less than *thirty-seven* genera, and *three hundred and thirty* species. The characteristics of the family may be summed up as follows: a pointed muzzle, a cleft upper-lip, round, deep-black eyes, and a long, naked tail covered with square scales, and bearing only a few stiff hairs. The fore-feet have four toes, the hinder ones five toes. The family is divided in common parlance into Rats and Mice. The former are stout and repulsive in appearance, the latter slender and graceful. The former are recent immigrants into Europe, the latter have, from the earliest periods, haunted the house.

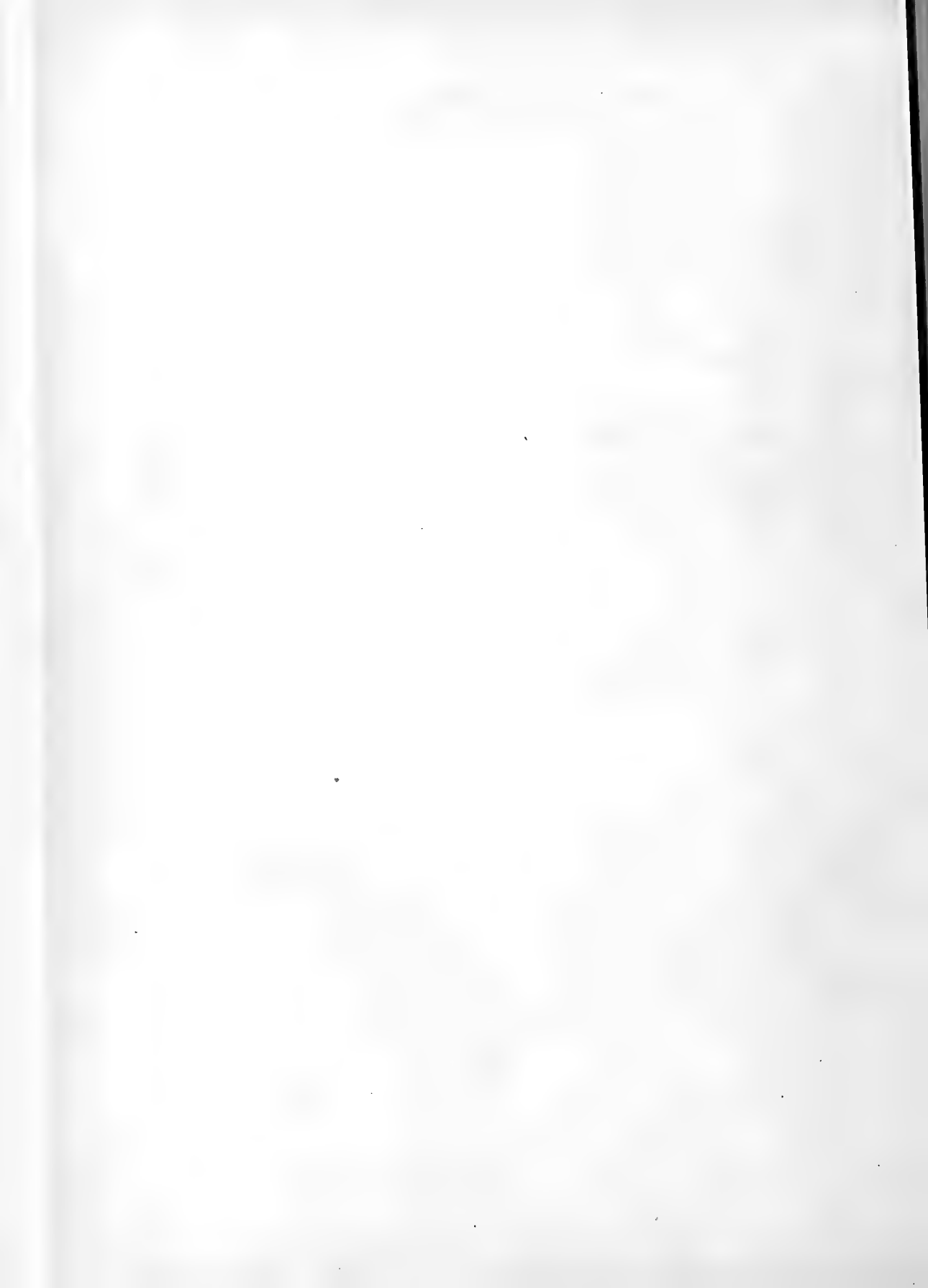
GENUS MUS.

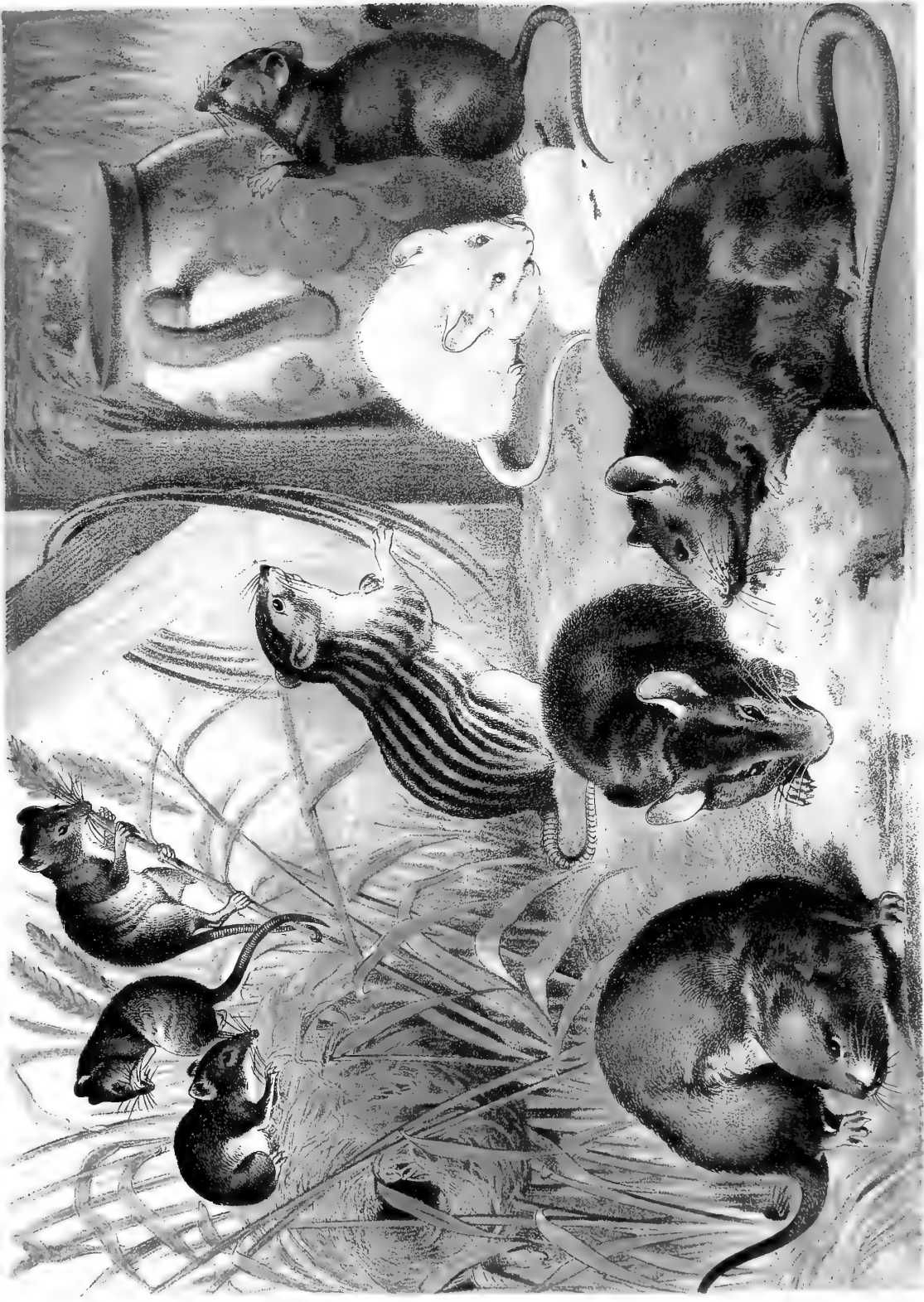
This genus is divided by some naturalists into *one hundred*, by others into *one hundred and twenty* species. We can find space to mention only the most marked, or the best known forms. Not a single indigenous species of the genus is found in either North or South America.

The BLACK RAT, *Mus rattus* (Plate LIII), is the Rat of fable. It was the Black Rat which, according to tradition, devoured the wicked Bishop Hatto, in his tower in the Rhine, which is still called the Mouse-tower, and which wrought such havoc in Hamelin till the charm of the Pied-piper freed the city.

In all probability the Black Rat came from Persia, where they still abound. In Europe, however, since the beginning of the last century, it has been nearly exterminated by the Brown Rat.

The BROWN RAT, *Mus decumanus* (Plate LIII), is larger than the Black Rat, and is of a brownish-gray color. It seems to have come from Central Asia. Pallas, in 1727, describes it as migrating from the vicinity of the Caspian, in consequence of an earthquake. It crossed the Volga in swarms, and proceeded steadily westward. In 1732 the same rat was brought by ship from the East Indies to England. It appeared in East





COMMON MICE

BARBARY MOUSE
COMMON RATS

HARVEST MICE
WATER RAT

PLATE LIII RODENTIA



Prussia in 1750; in Paris in 1753; but did not reach Denmark and Switzerland till 1809. In 1760, it is said that the town of Jaik in Siberia was taken by storm by an innumerable army of rats. In 1755 the Brown Rat arrived in North America.

The Brown Rat is a fierce animal, and possesses great power of combination. A number of them have been known to kill a cat, and a large body would make short work of a man. It is exceedingly voracious, and has no scruple about devouring its companions if they are sick or wounded. They will enter a stable and nibble the horn of the horses' hoofs; they will creep among sleeping dogs and gnaw their feet. They have been known to attack children in the cradle. Yet they are not without their uses; they act as scavengers, and consume an immense quantity of refuse which otherwise would breed disease. They are cleanly in their personal habits, and spend much time in washing themselves. They have repeatedly been tamed by prisoners who have made their acquaintance in solitary confinement. They are subject to a very peculiar disease. The tails of several rats grow together and form what is called in Germany a "King-rat." In 1822, at Döllstedt, two miles from Gotha, two King-rats were captured; one of these groups consisted of twenty-eight, the other of fourteen rats; they were over a year old, and seemed in good health, but very hungry, as of course they had to live on the alms of other rats.

The MOUSE, *Mus musculus* (Plate LIII) is a pretty little creature with black bead-like eyes, velvety fur, and squirrel-like paws. Its back is a brownish-gray, its throat and abdomen a light-gray color. They are odd little creatures, full of curiosity, and easily tamed. White Mice (Plate LIII) are not uncommon; they are true albinos, and have red eyes. The common mouse is much more docile than the white variety. Mice make their nests in any quiet spot, and from any soft substance, and, like the rats, multiply rapidly.

The HARVEST MOUSE, *Mus minutus* (Plate LIII), is about five inches in length, including the tail. The abdomen is white, the back reddish-brown. It builds a pretty nest, which is thus described: "It was built upon a scaffolding of four of the rank grass-stems that are generally found on the sides of ditches, and was situated at some ten or eleven inches from the ground. In form it was globular, rather larger than a cricket-ball, and was quite empty, having probably been hardly completed when the remorseless scythe struck down the scaffolding and

wasted all the elaborate labor of the poor little architect. The material of which it was composed was thin dry grass of nearly uniform substance, and its texture was remarkably loose, so that any object contained in it could be seen through the interstices as easily as if it had been placed in a lady's open-worked knitting basket. There was no vestige of aperture in any part of it, so that the method by which it was constructed seems quite enigmatical." This tiny creature is insectivorous to no small degree, and has a prehensile tail.

The BARBARY MOUSE, *Mus Barbarus* (Plate LIII), has a fur decorated with bold and elegant markings. It is larger than the common mouse, and lives in North and Central Africa. It is frequent in the Atlas range, and on the whole coast of Algeria. It burrows in the earth, and stores up provisions for the cold or wet season.

GENUS CRICETUS.

The *nine* species of this genus are found in Northern Asia and Europe, and in Egypt. They have thick bodies, short tails and legs. They build subterranean dwellings, where they accumulate food, and live.

The HAMSTER, *Cricetus frumentarius* (Plate LIV), is the best known member of the genus. It is of a grayish-fawn color on the back, deepening into black on the abdomen, and softening to yellow on the head. It has two large cheek pouches in which it carries off its plunder. It makes a very complicated burrow with two entrances, one perpendicular, the other sloping. It is torpid during a portion of the winter. It is an exceedingly destructive animal; a single one has been found with sixty pounds of corn in its burrow, and another with a hundred-weight of beans. It is also very prolific, the female having several broods each year, with about ten in each brood. As soon as the young Hamsters are able to shift for themselves, an event which occurs in a wonderfully short time, they leave the maternal home, and dig separate burrows.

GENUS NEOTOMA.

The distinguishing marks by which this genus is separated from the *Arvicola* consist in the enamel of the teeth, which is so developed that a worn-down tooth of an old specimen exhibits insulated circles of enamel on the grinding surface. Of the *six* species, we describe two only.

The FLORIDA RAT, *Neotoma Floridiana*, has a light and agile form, bearing some resemblance to that of the squirrel; the eyes are large, the ears thin and prominent; the legs robust. The body and head are lead color, intermixed with yellowish black hair. The border of the abdomen is buff, the under surface of the body white. An adult specimen measures eight inches from nose to root of tail.

The Rat is found in all the States, but exhibits different habits in different circumstances. In Florida it burrows under stones and in rivers, in Georgia it prefers the woods. Sometimes it makes its nest in the fork of a tree; sometimes among vines near a sluggish stream. It forms, by piling up dry sticks, grasses, mud, and leaves, a structure impervious to rain, and inaccessible to the wild cat or racoon. The nests they build in trees are often of enormous size. Audubon saw some in Georgia ten to twenty feet from the ground which appeared larger than a cart-wheel, and contained a mass of leaves and sticks that would have more than filled a barrel. On the Missouri River, this rat lives in hollow trees; in the Rocky Mountains it nestles in clefts of the rock. In fact, it makes itself at home everywhere.

The ROCKY MOUNTAIN RAT, *Neotoma Drummondii*, is larger than the Florida Rat, and much more destructive. It gnaws everything left in its way, and is hated by the fur-traders, for it will cut their blankets to pieces while they are asleep, and gnaw through whole packs of furs in a single night.

It is very common near the Columbia River, in Oregon, and along the sides of the Rocky Mountains.

GENUS REITHRODON.

LE CONTE'S MOUSE, *Reithrodon Le Contes*, is about half the size of a full-grown mouse. The upper fore-teeth are deeply grooved, and yellow in color. The ears round, moderate in size, and nearly naked. The nails on the feet are long, but slightly hooked, and adapted to digging. The specimen described by Audubon came from the State of Georgia.

GENUS SIGMODON.

This genus was formed by Messrs. Say and Ord, and comprises *two* species which were previously placed among the *Arvicolæ*. The name of the genus is significative of its generic characteristic, namely, that the molar of the upper jaw has the form of the Greek letter S or Σ.

The COTTON RAT, *Sigmodon Hispidum*, is the most common wood-rat in the Southern States. It occasions, however, very little injury, as it prefers deserted old fields to cultivated grounds. It feeds on coarse grasses, and devours a considerable quantity of animal food, for it is decidedly carnivorous. Robins, partridges, or other birds that are wounded and drop among the long grass, are speedily devoured by them. They have been seen running about with crayfish in their mouths, and are especially fond of "fiddlers." They fight fiercely, so that it is almost impossible to keep more than one in a cage, for the strongest usually eats all the others. This species delights in sucking eggs. They come out at night from their holes which often run a distance of twenty or thirty yards under-ground, but so near the surface that they can be traced by the ridge in the ground. Each burrow contains only one family, but the various galleries often intersect. The Cotton Rat has obtained its name from the supposition that it makes its nest of cotton.

GENUS FIBER.

The *two* species of this genus inhabit the North American continent as far south as Mexico. They form a link between the Beavers and the Water Rats.

The MUSK RAT, *Fiber zibeticus*, may be described as a large water-rat with a short snout and a long tail. Near the tail is a gland which secretes a white oily fluid of a strong civet odor. The hind-feet are webbed: the incisor teeth are yellow, but the nails white. Audubon gives a very good account of its habits, which we quote:

"Musk Rats are very lively, playful animals when in their proper element, the water; and many of them may be occasionally seen disporting themselves on a calm night in some mill-pond or deep sequestered pool, crossing and recrossing in every direction, leaving long ripples in the water behind them, while others stand for a few moments on little hurdles or tufts of grass, or on stones or logs, on which they can get a footing above the water, or on the banks of the pond, and then plunge one after the other into the water. At times one is seen lying perfectly still on the surface of the pond or stream, with its body widely spread out, and as flat as can be. Suddenly it gives the water a smart slap with its tail, somewhat in the manner of the beaver, and disappears beneath the surface instantaneously, going down head foremost, and reminding

one of the quickness and ease with which some species of ducks and grebes dive when shot at.

“At the distance of ten or twenty yards, the Musk Rat comes to the surface again, and perhaps joins its companions in their sports; at the same time others are feeding on the grassy banks, dragging off the roots of various kinds of plants, or digging underneath the edge of the bank. These animals seem to form a little community of social, playful creatures, who only require to be unmolested in order to be happy.”

GENUS HESPEROMYS.

This genus, with its *ninety* species, replaces on the American continent the genus *Mus*.

The NEW JERSEY FIELD MOUSE, *Hesperomys campestris*, measures a little more than three inches in length. The fur is a leaden black, the head is large, the ears large, oval, blunt, and thinly covered with closely adpressed hair. The legs and feet are brown. The tail well covered with long hair.

The SONORA FIELD MOUSE, *Hesperomys Sonoriensis*, is slightly larger than the New Jersey species. The hair is slate color, mixed with brownish-gray; beneath, whitish, except on the throat. The head is elongated, the ears large, oval, and hairy. The feet are covered with short, whitish-brown hair. The tail of moderate length.

The TEXAN FIELD MOUSE, *Hesperomys Texana*, is smaller than the above described species, only measuring two inches in length. The head is large and blunt, the eyes prominent and dark-brown; ears large, erect, roundish, oval, blunt, sparsely covered outwardly with short, close-lying brown hairs, inwardly with gray. The hind-feet are furred, with the exception of the sole. The whiskers are long. The fur has rather a mottled appearance; beneath white, inclining to yellowish. The two colors are distinctly separated in a straight line. The feet are white, the hairs projecting over the nails. Its habitat is Western Texas.

GENUS ARVICOLA.

The *fifty* species of Arvicola are distributed over Europe, Northern Asia, and temperate North America.

The WATER RAT, *Arvicola amphibius* (Plate LIII), is found from the Atlantic to the Sea of Ochotsk, and from the White to the Mediterranean Sea, in plains, as well as in mountains.

The color of the Water Rat is a chestnut-brown, dashed with gray on the upper parts, and fading to gray below. The ears are so short that they are hardly perceptible above the fur. The incisor teeth are of a light yellow, and are very thick and strong. The tail is shorter than that of the common rat, hardly exceeding half the length of the head and body. The average length of a full-grown specimen is thirteen inches, the tail being about four inches and three-quarters long. It is not so prolific an animal as the Brown Rat, breeding only twice in the year, and producing from five to six young at a birth.

It is falsely accused of destroying fish; but it does immense harm by the tunnels it forms in embankments. Its food is entirely aquatic plants and roots.

The CAMPAGNOL, *Arvicola arvalis*, or Common Field Mouse of Europe, is a great foe to the European farmer. It eats his seed-corn, it plunders the ripening corn, it devours the contents of his ricks and barns. Its color is a ruddy brown, with gray on the chest. The tail is only one-third the length of the body.

WILSON'S MEADOW MOUSE, *Arvicola Pennsylvanica*, is the common Meadow Mouse of the Northern and Eastern States. In every meadow you may trace its small tortuous paths cut through the grass, leading to the root of a stump, or the borders of a ditch. If you dig up the nest, you find a family of five or ten. Their galleries do not run underground, but extend along the surface. The food of this species consists principally of roots and grasses; it will eat also bulbs, such as meadow-garlic, and red-lily. In very severe winters, when the ground is frozen, it sometimes attacks the bark of shrubs and fruit-trees, peeling it off, and destroying the tree. But Audubon thinks it does little harm to the farmer. It swims and dives well, but never visits outhouses or dwellings.

It is found in all the New England States, and is abundant in New York. It is common near Philadelphia, and has been traced southward to the northern boundary of North Carolina, and northward to Hudson's Bay.

GENUS MYODES.

The *four* species of the genus are compactly built, short-tailed animals. The head is large, the under lip deeply cleft, the ear small, and all the feet have five toes.

The LEMMING, *Myodes lemmus* (Plate LIV), is the most mysterious animal in all Scandinavia.

At uncertain and distant intervals of time, many of the northern parts of Europe, such as Lapland, Norway, and Sweden, are subjected to a strange invasion. Hundreds of little, dark, mouse-like animals sweep over the land, like clouds of locusts suddenly changed into quadrupeds, coming from some unknown home, and going no one knows whither. These creatures are the LEMMINGS, and their sudden appearances are so entirely mysterious, that the Norwegians look upon them as having been rained from the clouds upon the earth.

The Lemming feeds upon various vegetable substances, such as grass, reeds, and lichens, being often forced to seek the last-named plant beneath the snow, and to make occasional air-shafts to the surface. Even when engaged in their ordinary pursuits, and not excited by the migratorial instinct, they are obstinately savage creatures. Mr. Metcalfe describes them as swarming in the forest, sitting two or three on every stump, and biting the dogs' noses as they came to investigate the character of the irritable little animals. If they happened to be in a pathway, they would not turn aside to permit a passenger to move by them, but boldly disputed the right of way, and uttered defiance in little sharp, squeaking barks.

The color of the Lemming is dark brownish-black, mixed irregularly with a tawny hue upon the back, and fading into yellowish-white upon the abdomen. Its length is not quite six inches, the tail being only half an inch long.



CHAPTER II.

MOLE RATS, POUCHED RATS, AND BEAVERS.

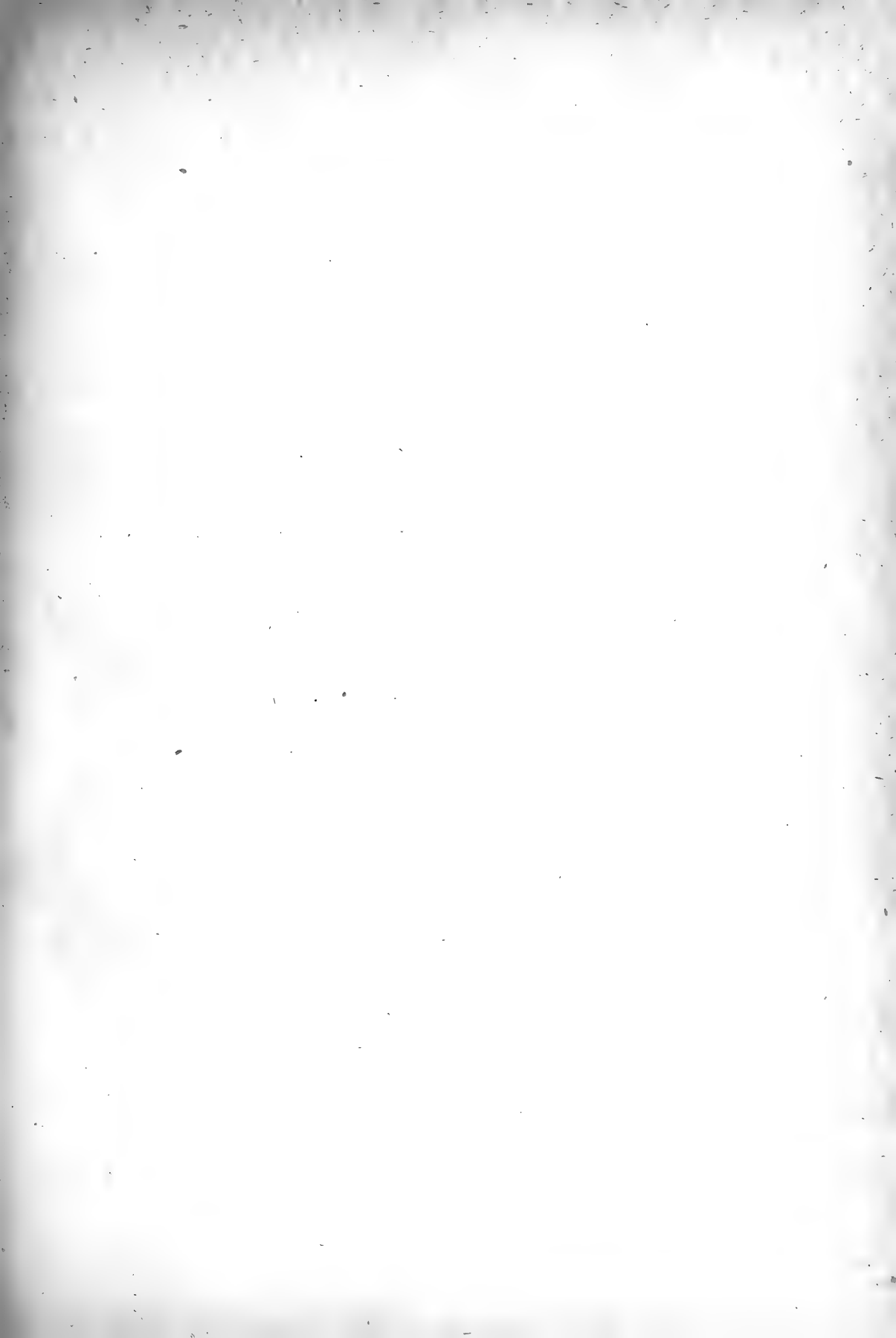
THE MOLE RAT—THE JERBOA—THE ALACTAGA—THE CAPE LEAPING HARE—THE HUDSON BAY JUMPING MOUSE—THE FAT DORMOUSE—THE COMMON DORMOUSE—THE POUCHED RATS—THE BEAVERS—THE AMERICAN BEAVER—THE EUROPEAN BEAVER.

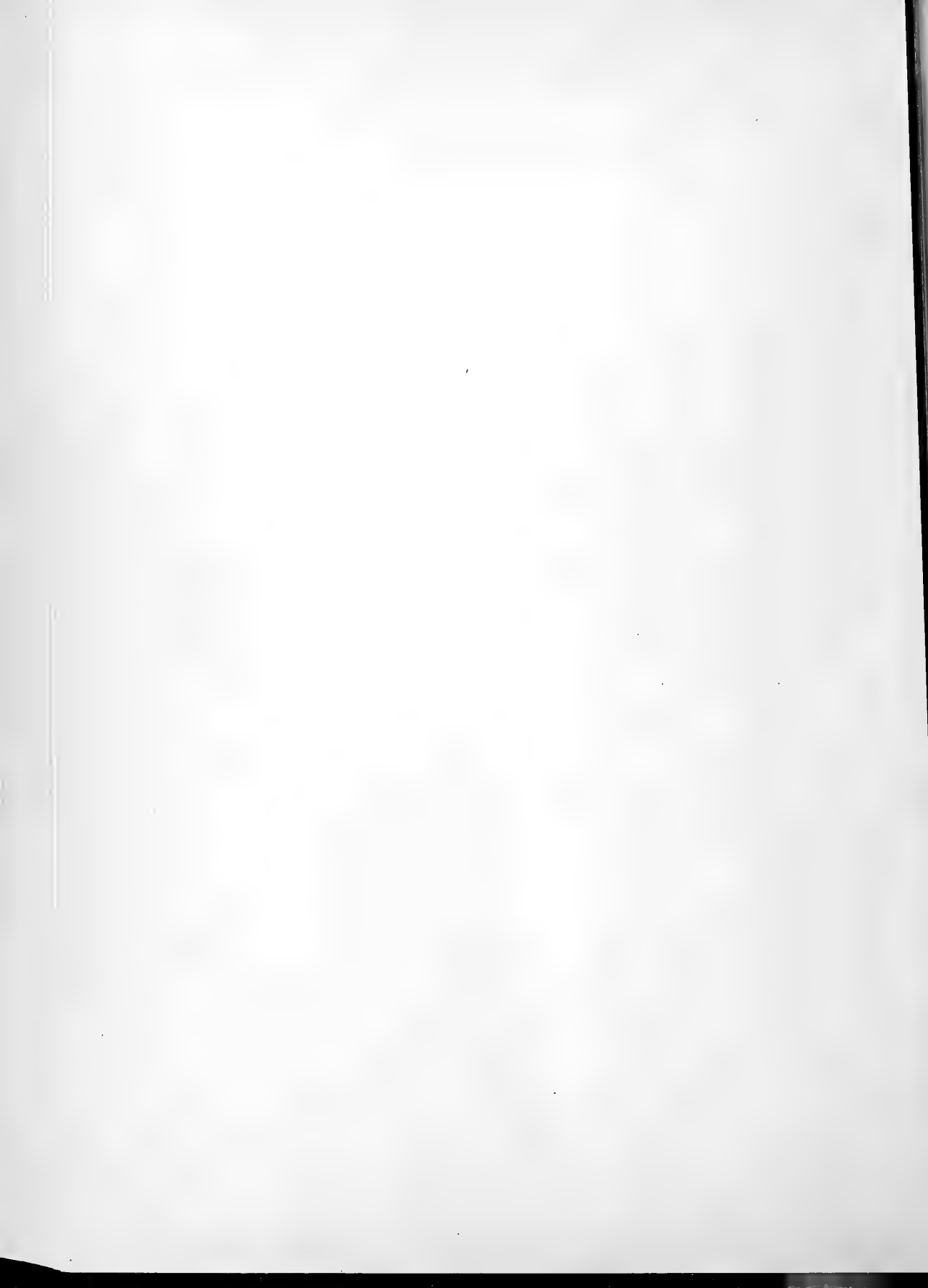
THE family SPALACIDÆ or Mole Rats have a straggling distribution over the continents of the Old World. They are misshaped, subterranean rodents, with all the unpleasant characteristics of the mole. They inhabit dry sandy plains, and make burrows which run for long distances. They do not form societies, but live solitary in their dens; they avoid the light, and seldom come above-ground; they dig with great rapidity, often in a perpendicular direction. The family comprises *seven* genera.

GENUS SPALAX.

The MOLE RAT, *Spalax typhlus* (Plate LIV), the *only* species, is known also by its Russian name, Slapush. The head is pointed and large, the neck short, immovable, and as thick as the tailless body; the legs are short, with large paws armed with strong claws. The eyes are two small, round black specks, which lie under the fur-covered skin; so that even if they were susceptible to light, the brightest rays of the sun could not reach them. The ears are very large, and the animal's powers of hearing are very acute. The fur is thick, close, and smooth, but some stiff bristles grow on the cheeks. The color is generally a yellowish-brown, the chin and paws being, however, of a dirty-white hue. The total length is about ten inches.

The Mole Rat abounds in the country adjacent to the Don and the Volga, and is especially numerous in the Ukraine. It frequents cultivated and fertile districts, where countless heaps mark its subterranean







JERBOA

DORMOUSE

HAMSTER
MOLE RAT

LEMMING
FUR COUNTRY POUCHED RAT

PLATE LIV RODENTIA



chambers and passages. The tunnels formed by this burrower are very complicated, and can be traced through moist and sloppy marshes, as well as on the steep hill-sides. The peasants have a notion that if any one will seize a Slapush in his bare hands, permit the animal to bite him, and then squeeze it to death, he will have the power of curing goitre by touch.

The family DIPODIDÆ, containing *three* genera, consists of the Jumping Mice or JERBOAS. They are found in Arabia, Egypt, and Abyssinia, but extend to the Caspian Sea and eastward to India, as well as over a large part of Africa. Isolated forms occur in North America.

GENUS DIPUS.

The JERBOA, *Dipus Ægyptus* (Plate LIV), is hardly larger than an ordinary rat. The color of its fur is a light dun, washed with yellow, the abdomen being nearly white. The tail is of very great length, is cylindrical in shape, and tufted at its extremity with stiff black hairs. It is abundant in North Africa, and lives in society, forming large warrens in the regions it inhabits. The Jerboa is admirably adapted for digging in hard and burning ground, as its feet are guarded by a thick covering of stiff, bristly hair. The body is about six, the tail eight inches in length.

The ALACTAGA, *Dipus alactaga*, or the Jumping Rabbit of Siberia, has a body about seven inches, and a tail ten inches in length. The head is pretty, with lively, prominent eyes, long narrow ears—as long as the head itself, and eight rows of long black hairs on each upper lip. The color of the fur is reddish yellow. On the approach of cold weather, it falls asleep, after having carefully stopped up the entrances to its burrow, and remains torpid from September to the end of April.

GENUS PEDETES.

The CAPE LEAPING HARE, *Pedetes capensis*, is a solitary and isolated species found in South Africa from the Cape of Good Hope to Mozambique and Angola. The Dutch Boers have named it the SPRING HAAS.

With the exception of shorter ears, and the elongated hinder limbs, the Spring Haas is not unlike our common hare. The fur is of a dark fawn, or reddish-brown, perceptibly tinged with yellow on the upper

parts, and fading into grayish-white beneath. In texture it is very similar to that of the hare. The tail is about as long as the body, and is heavily covered with rather stiff hairs, which at the extremity are of a deep black hue.

GENUS JACULUS.

The *single* species is found from Nova Scotia and Canada, southward to Pennsylvania, and westward to California and British Columbia.

The JUMPING MOUSE, *Jaculus Hudsonius*, has the general form of its Old World kindred, but its tail is more mouse-like. This tail is thin, round, and very long, tapering down to a fine point, and sparsely sprinkled with short hairs. The fur is a dark liver color, with a blackish tinge on the flanks. The body measures about three inches, the tail about five inches in length. It lives near the forests, remains concealed by day, but comes out in bands by night. Its burrows are about twenty inches below the surface, but in cold weather they are sunk still lower. At the beginning of winter the creature forms a hollow ball of clay, rolls itself up in it, and lies in complete torpidity till spring returns. In summer it is very active, and hops around on its hind legs. Audubon thinks that there is no animal so agile. He had two young ones in captivity, and placed a foot deep of earth in the cage; the mice made a burrow in it, and kept themselves closely hidden as long as it was light, and concealed by night whatever was placed in the cage.

The family MYOXIDÆ is a small one containing only a *single* genus of *twelve* species. In form and habit the Dormice approximate to the squirrels; the head is narrow, the eyes pretty large, the ears large and bare; the fur is rich and soft, the tail is bushy, and the hairs on it grow in a double row. These small rodents are found over all the Northern regions of the Old World, and over most parts of Africa.

GENUS MYOXUS.

The FAT DORMOUSE, *Myoxus glis*, is found in Southern and Eastern Europe. They live in the forests, concealing themselves by day in hollow trees, or even in the deserted burrows of the hamster, but coming out at nightfall to feed. When autumn approaches, they store up their winter supplies; they make in some deep hole a nest of soft moss, roll

themselves up with several of their companions, and long before the cold weather comes, fall asleep.

The Fat Dormouse is six inches long in the body, with a tail five inches long. Its soft, thick fur is of a uniform ashy-gray, the tail is bushy, the hairs falling in two rows, of a brownish-gray color, with a white stripe on its under surface. It is the smallest of all hibernating animals.

The COMMON DORMOUSE, *Myoxus avellanus*, or *Muscardinus avellaniarius* (Plate LIV), is found all through Central Europe from Sweden and England to the borders of Turkey.

The total length of this pretty little animal is rather more than five inches, the tail being two inches and a half long. The color of its fur is a light reddish-brown upon the back, yellowish-white upon the abdomen, and white on the throat. The tail is thickly covered with hair, which is arranged in a double row throughout its length, and forms a slight tuft at the extremity. The head is rather large in proportion to the body, the ears are large and broad, and the eye full, black, and slightly prominent.

Like the rest of its tribe, it lays in a stock of provisions in the fall, and becomes exceedingly fat toward the end of autumn. This hoard is not gathered into the nest, but is hidden away close to the spot where the nest is placed. Comparatively little of the store is eaten during the winter, but it is of very great service in the earlier part of the spring, when the Dormouse is awake and lively, and there are as yet no fresh fruits on which it could feed.

THE POUCHED RATS.

The family SACCOMYIDÆ or Pouched Rats, are almost wholly confined to the Rocky Mountains and the elevated plains of Central North America. It is divided into *eight* genera and *thirty-three* species. They are remarkable for the possession of long and deep cheek-pouches opening from without, and lined with short hair. The mouth is, as it were, double, the outer portion being very wide and hairy, behind which is the small inner mouth.

GENUS DIPODOMYS.

The *five* species of this genus are found in Mexico, California, up to the Columbia River, with *one* specimen in South Carolina. They have slender bodies, long hind-legs, and a long tail with a brush at the extremity.

The POUCHED JERBOA, *Dipodomys Philippi*, is a native of California, where it lives in the most desert-like districts. It is probable that it can live without water for a long time, or is satisfied with the dewdrops which form on some plants. Audubon writes that in Western Mexico and California they were so tame that they could have been caught by the hand without difficulty. "This species hops about kangaroo-fashion, and jumps pretty far at a leap. Where the men encamped they came smelling about the legs of the mules, as if they were old friends. These animals appear to prefer the sides of stony hills, which afford them secure places to hide in, and they can easily convey their food in their cheek-pouches to their nests."

GENUS GEOMYS.

The FUR COUNTRY POUCHED RAT or MULO, *Geomys bursarius* (Plate LIV), is the most remarkable of the *five* species of the genus.

It is of a pale-gray color, but the exterior of the pouches, the abdomen, and the tail are covered with white hair. The teeth are yellow, and are marked with deep longitudinal grooves. The central claw of the fore feet is very strong, and measures nearly half an inch in length.

It is rather gregarious in its habits, associating together in moderately large bands, and undermining the ground in all directions. Its burrow is not very deep, but runs for a considerable distance in a horizontal direction, and along its course occasional hillocks are thrown up, by means of which it may be traced from the surface. A more detailed account is found in the following extract from Audubon:

"Having observed some freshly thrown up mounds in M. Chocteau's garden, several servants were called and set to work to dig out the animals, if practicable, alive; and we soon dug up several galleries worked by the Muloes, in different directions.

"One of the main galleries was about a foot beneath the surface of the ground, except when it passed under the walks, in which places it was sunk rather lower. We turned up this entire gallery, which led across a large garden-bed and two walks into another bed, where we discovered that several fine plants had been killed by these animals eating off their roots just beneath the surface of the ground. The burrow ended near these plants under a large rose-bush. We then dug out another principal burrow, but its terminus was among the roots of a

large peach-tree, some of the bark of which had been eaten off by these animals. We could not capture any of them at the time, owing to the ramification of their galleries having escaped our notice while following the main burrows. On carefully examining the ground, we discovered that several galleries existed that appeared to run entirely out of the garden into the open fields and woods beyond, so that we were obliged to give up the chase."

The SALAMANDER, *Geomys pinetus*, is also called the Southern Goffer or Georgian Hamster. It does not remain underground during the winter, but continues its digging throughout the year. It frequents the high pine barren regions from the middle of Georgia and Alabama to the south point of Florida.

We have refrained from using the term "Goffer" in describing these pouched rats. Goffer in the Southern States is often applied to a land tortoise, and even in the North is used with great laxity for describing various kinds of both rats and squirrels.

THE BEAVERS.

The family CASTORIDÆ consists of only *one* genus—CASTOR. The animals embraced in the genus have from the earliest times attracted the attention of observers. Aristotle classes them with the Sea-otters. Pliny speaks of the tenacity of the Beaver's bite, of its felling trees, and of its possessing a fish-like tail. Solinus affirms that Beavers are found only in the waters of the Black Sea. Olaus Magnus adds that they are found in the Rhine, the Danube, and many rivers of Scandinavia. It seems, from these accounts, that the Beaver was once widely diffused, but has been ruthlessly exterminated in most parts of the Old World. Yet it exists in considerable numbers in Central and Northern Siberia, and in spite of continuous persecution still is found in the northern districts of America.

GENUS CASTOR.

The genus CASTOR comprises *two* species: the American, ranging over the whole of North America from Labrador to New Mexico, and the European, which appears to be confined to the temperate regions of Europe and Asia from France to the Amoor, over which extensive region it doubtless ranged in prehistoric times.

THE AMERICAN BEAVER.

The AMERICAN BEAVER, *Castor Canadensis* (Plate LV), is distinguished from its European congener by its more arched profile, its narrower head, and its darker coat. It is a social animal, and displays a singular mixture of reason and instinct. The societies in which it lives vary considerably in numbers; they dwell near small clear rivers and creeks, or close to large springs, rarely taking up their abode on the banks of lakes. In such situations it executes works which would do credit to any engineer. The object of these works is to keep the water always above the level of the entrance-tunnel which leads to its house. The dams constructed for this purpose are formed of tree-branches, mud, and stones; they are ten or twelve feet thick at the bottom, and about two feet at the top; in length they vary, some attaining the dimensions of two or three hundred feet. When the stream to be stopped is gentle, the dam is carried straight from bank to bank; when it is impetuous, the dam is curved upward against the stream. The logs forming the dam are laid horizontally, and kept down by stones; they are about three feet in length, and vary extremely in thickness. Generally, they are about six or seven inches in diameter, but they have been known to measure no less than eighteen inches in diameter. An almost incredible number of these logs are required for the completion of one dam, as may be supposed from the fact that a single dam will sometimes be three hundred yards in length, ten or twelve feet thick at the bottom, and of a height varying according to the depth of water. Before employing the logs in this structure, the Beavers take care to separate the bark, which they carry away, and lay up for a winter store of food.

Near the dams are built the Beaver-houses, or "lodges," as they are termed; edifices as remarkable in their way as that which has just been mentioned. They are entirely composed of branches, moss, and mud, and will accommodate five or six Beavers together. The form of an ordinarily sized Beaver's lodge is circular, and its cavity is about seven feet in diameter by three feet in height. The walls of this structure are extremely thick, so that the external measurement of the same lodges will be fifteen or twenty feet in diameter, and seven or eight feet in height. The roofs are all finished off with a thin layer of mud, laid on with marvelous smoothness, and carefully renewed every year. As this compost of mud, moss, and branches is congealed into a solid mass by

the severe frost of a North American winter, it forms a very sufficient defence against the attacks of the Beaver's great enemy, the wolverene, and cannot readily be broken through, even with the help of iron tools. The precise manner in which the Beavers perform their various tasks is not easy to discern, as the animals work only in the dark. The females, however, it is known, are the architects and builders, the males merely carriers and laborers.

Around the lodges the Beavers excavate a rather large ditch, too deep to be entirely frozen, and into this ditch the various lodges open, so that the inhabitants can pass in or out without hindrance. This precaution is the more necessary, as they are poor pedestrians, and never travel by land as long as they can swim by water. Each lodge is inhabited by a small number of Beavers, whose beds are arranged against the wall, each bed being separate, and the centre of the chamber being left unoccupied.

In order to secure a store of winter food, the Beavers take a vast number of small logs, and carefully fasten them under water in the close vicinity of their lodges. When a Beaver feels hungry, he dives to the store-heap, drags out a suitable log, carries it to a sheltered and dry spot, nibbles the bark away, and then either permits the stripped log to float down the stream, or applies it to the dam.

The Beaver does not possess a pleasing appearance. Its thickset shape, its large head, small eyes, cloven upper lip, which shows its powerful incisors, its long and wide tail, flattened like a spatula and covered with scales, combine to give it an awkward appearance. Its hind feet are larger than the fore, and are fully webbed. Owing to the deep separation of the fingers, and the existence of certain fleshy tubercles placed on the lower face of the extremities, they fulfil to some extent the functions of thumbs, those in front more especially. The muzzle is prolonged a little way beyond the jaws, and the nostrils are remarkably mobile. The ears are also movable; they do not show much, and the animal has the faculty of placing them close to its head when it dives, so as to prevent water entering the auditory passage. Its coat is well adapted to the requirements of an aquatic life, and is composed of a fine thick woolly substance, which lies close upon the skin, and is impervious to water.

The color of the long shining hairs which cover the back of the Beaver is a light chestnut, and the fine wool that lies next to the skin is

a soft grayish-brown. The total length of the animal is about three feet and a half; the flat, paddle-shaped, scale-covered tail being about one foot in length. The flesh of the Beaver is eaten by the trappers, who compare it to flabby pork. The tail is something like beef marrow, when properly cooked, but it is too rich and oily to suit the taste of most persons. The female Beaver produces about three or four young at a litter, and the little creatures are born with open eyes.

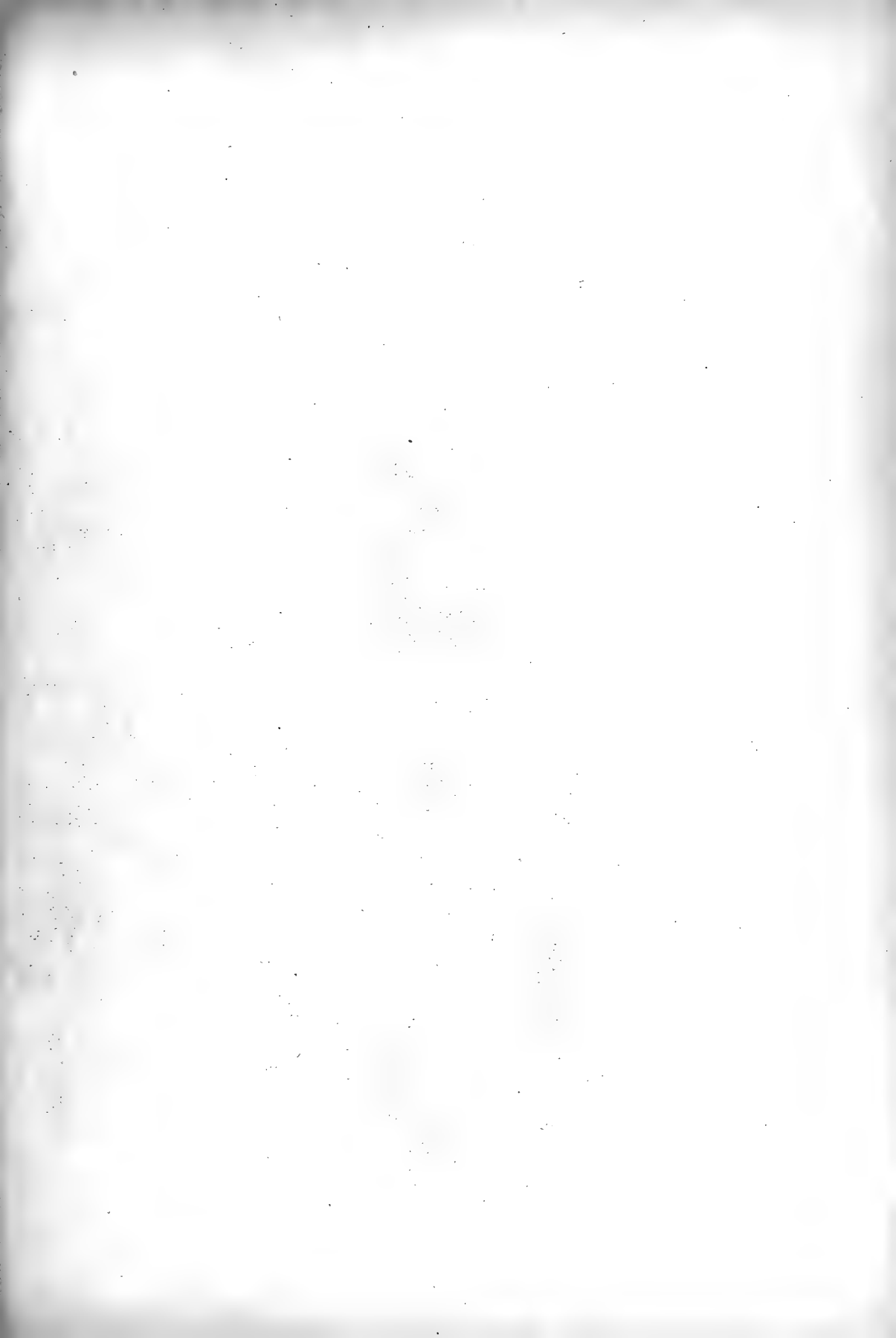
The Beaver secretes a curious odoriferous substance called *castoreum* or "barkstone." According to Audubon, "If two Beaver lodges are tolerably near each other, the inhabitants of the one lodge, which we will call lodge A, go to a little distance for the purpose of ridding themselves of the superabundant castoreum. The Beavers of lodge B, smelling the castoreum, go to the same spot, and cover the odoriferous substance with a thick layer of earth and leaves. They then place their own castoreum upon the heap, and return home. The inhabitants of lodge A then go through precisely the same process, until they have raised a mound some four or five feet in height."

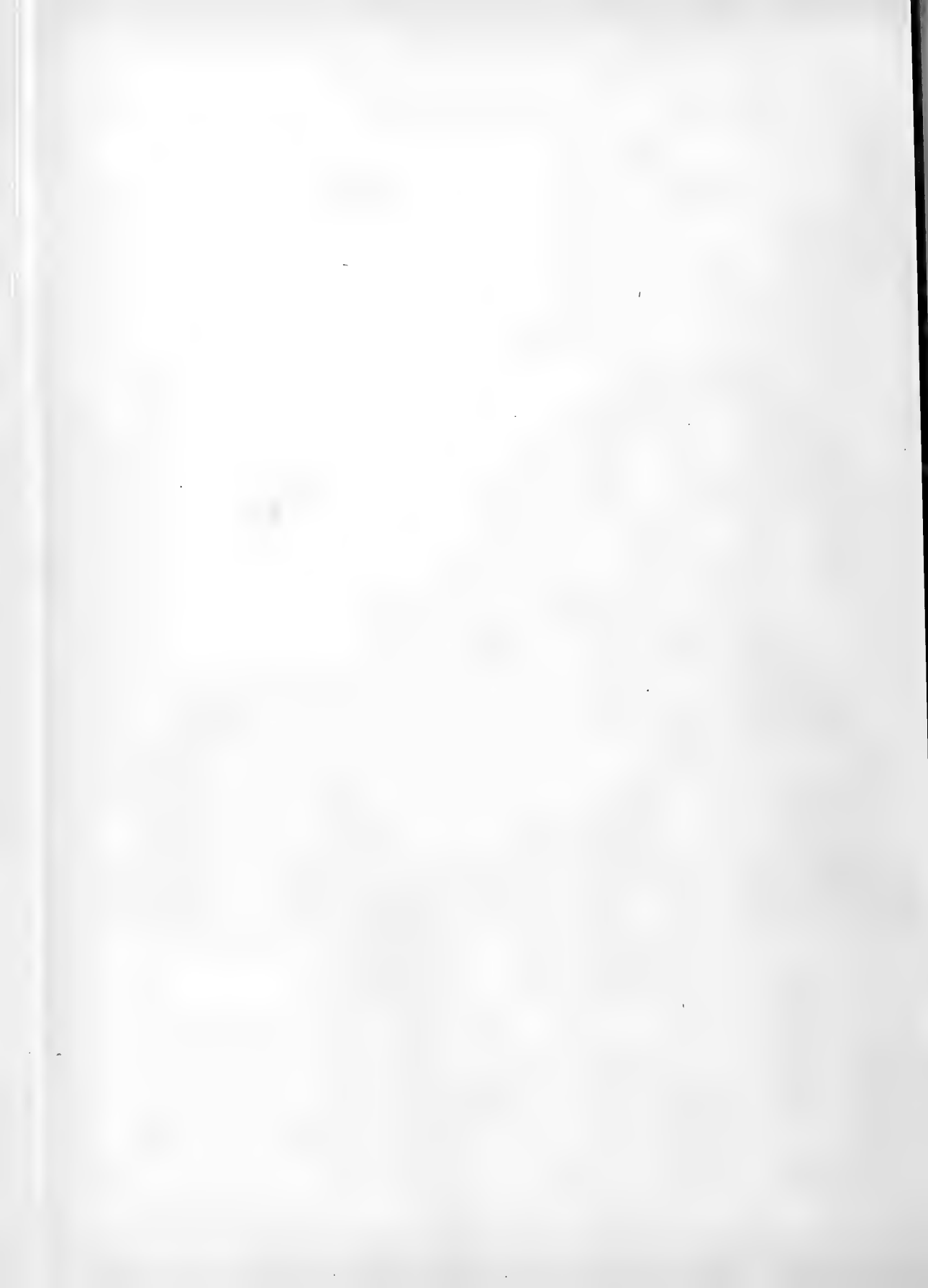
THE EUROPEAN BEAVER.

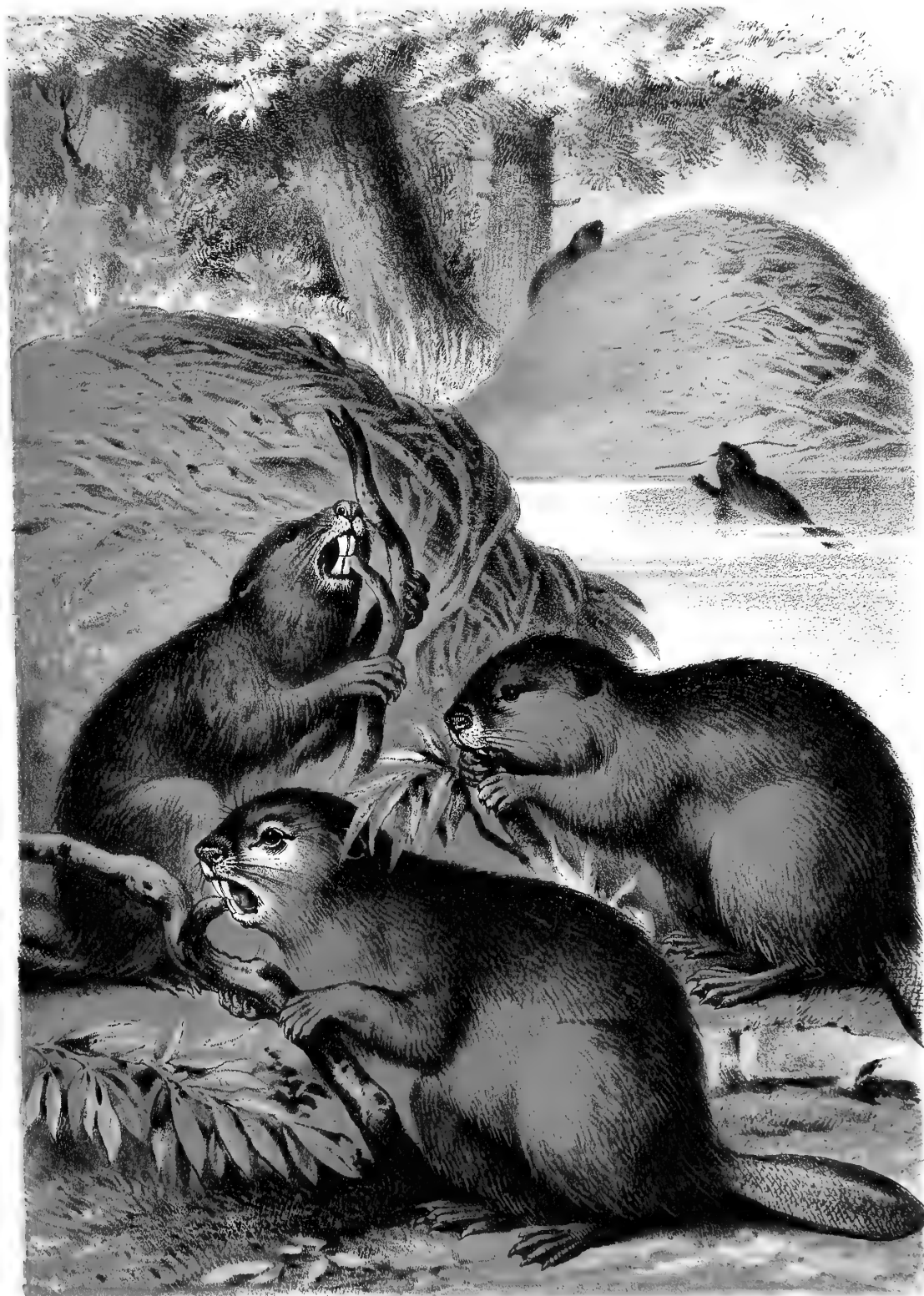
The EUROPEAN BEAVER, *Castor fiber*, lives usually under conditions which do not require it to build a house. Hence in France it has abandoned a communal life, and takes refuge in the rocky crevices that overhang streams. In place of being a builder, it has become a miner. On the Rhine the Beavers frequent uninhabited islands; their burrows communicate with the water by a long gallery opening beneath the surface. These excavations are sometimes of considerable size, one having been seen that measured fifty feet in length, and was divided into several compartments.

Colonies of Constructive Beavers are yet to be found in Europe. This fact was noted in 1787 by a German observer, not far from Magdeburg, on one of the affluents of the Elbe. A number had collected in this place, and had built huts in every respect similar to those of American Beavers. Such colonies are, as may be imagined, excessively rare, and excite the greatest amount of curiosity.

An attempt to rear the Beaver in a domestic state was undertaken by Exinger, of Vienna, on the banks of a large pond situated in the vicinity of Modin, Poland. The Beavers belonged to those which burrow in the







BEAVERS

PLATE LV RODENTIA



ground. This observer was able to study them for six years. They were very timid, and scarcely ever left their retreat until nightfall. At the approach of winter, Exinger had the willow and poplar trees cut down, and laid them on the bank of the pond, the trunks in the water. In the first cold days the Beavers dragged these trees to the bottom of the pond, and ranged them side by side, weaving them in such a manner as to form a solid and resisting mass. When the winter was prolonged, Exinger broke the ice and introduced some fresh trunks of trees, so as to furnish an additional supply of provisions for the prisoners.

Dr. Sace, in alluding to this example, remarks that there is here an excellent means of utilizing the immense marshes of the East and North of Europe, in favoring the settlement and multiplication of Beavers. In America the Beaver, in settled districts, is looked on as a nuisance, by backing the water till it overflowed arable land.

In 1868 some American Beavers were sent to the Jardin des Plantes in Paris. They were placed in a large wooden box, with a door opening upon a pond. They at once set to work to improve their home, and protect themselves from the weather. For this purpose they turned up the turf of their little yard and carried it on to the roof of their hut. In a word, they executed a special work which was not in accordance with their habits. They took great pains to keep the floor of their house scrupulously clean.

A Beaver was brought to England in the year 1825, very young, very small, and very woolly. The building instinct showed itself early. Before it had been a week in its new quarters, as soon as it was let out of its cage, and materials placed in its way, it went to work. It had soon learned to know its name, and when called by it—"Binny"—it answered with a low plaintive cry, and came to its owner. Its strength, when it was half grown, was great. It would drag along a large sweeping-brush, or a warming-pan, grasping the handle with its teeth, so that it came over its shoulders, and advancing with the load in an oblique direction till it arrived at the point where it wished to place it.

The long and large materials were always taken first, and two of the longest were generally laid crosswise, with one of the ends of each touching the wall, and the other ends projecting out into the room. The area formed by the crossed brushes and the wall he would fill up with hand-brushes, rush-baskets, books, boots, sticks, clothes, dried turf, or anything portable. As the work grew high, he supported himself on his

tail, which propped him up admirably ; and he would often, after laying on one of his building materials, sit up over against it, appearing to consider his work, or, as the country-people say, "judge it." After this pause he would sometimes change the position of the material "judged," and sometimes he would leave it in its place.

After he had piled up his materials in one part of the room (for he generally chose the same place), he proceeded to wall up the space between the feet of a chest of drawers which stood at a little distance from it, high enough on its legs to make the bottom a roof for him ; using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or anything he could pick up. This last place he seemed to appropriate for his dwelling ; the former work seemed to be intended for a dam. When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, clothes, hay, cotton-wool, etc., and to make a nest. When he had done this to his satisfaction, he would sit up under the drawers and comb himself with the nails of his hind feet.

Binny generally carried small and light articles between his right fore-leg and his chin, walking on the other three legs ; and huge masses, which he could not grasp readily with his teeth, he pushed forward, leaning against them with his right fore-paw and his chin. He never carried anything on his tail, which he liked to dip in water, but he was not fond of plunging in the whole of his body. If his tail was kept moist, he never cared to drink ; but if it was kept dry it became hot, and the animal appeared distressed, and would drink a great deal.

Binny must have been captured too young to have seen any of the building operations of his parents, or their co-mates ; but his instinct impelled him to go to work under the most unfavorable circumstances, and he busied himself as earnestly in constructing a dam, in a room up three pair of stairs in London, as if he had been laying his foundation in a stream or lake in Upper Canada.



CHAPTER III.

THE SQUIRRELS AND MARMOTS.

THE FAMILY SCIURIDÆ—THE EUROPEAN SQUIRREL—THE JAVANESE SQUIRREL—THE HARE SQUIRREL—THE BLACK SQUIRREL—THE GRAY SQUIRREL—THE NORTHERN GRAY SQUIRREL—THE RED SQUIRREL—THE LONG-HAIRED SQUIRREL—THE FLYING SQUIRREL—THE AMERICAN FLYING SQUIRREL—THE TAGUAN—THE CHIPMUCK—THE LEOPARD MARMOT—THE MARMOT—THE BABAC—THE WOODCHUCK—THE PRAIRIE DOG.

THE family SCIURIDÆ comprehends the Squirrels, the Marmots, and the Prairie Dogs. It is very widely spread over the earth, being especially abundant in the North Temperate Zone, but having no representatives in the West Indian Islands, Madagascar, or Australia. It contains *eight* genera.

GENUS SCIURUS.

The *one hundred* species of this genus occupy the area of the whole family wherever woods and forests occur. They are pretty little animals, elegant in form, and rapid in movement. They are readily recognized by their long tails, raised like a plume above their heads, and by their abundant, clean, and glossy fur. The woods are their natural home, and we see them passing incessantly from branch to branch, from tree to tree, with wonderful agility, and untiring restlessness. Their usual food consists of nuts, but at times they suck birds' eggs.

THE SQUIRRELS.

The EUROPEAN SQUIRREL, *Sciurus Europæus*, is usually of a ruddy-brown upon the back, and a grayish-white on the under portions of the body. It is, however, very variable in its color. It has a summer and winter coat, the latter being always much lighter in its hue. In Siberia

it becomes of a fine grayish-slate color. These graceful, fascinating Rodents live in couples.

The JELERANG, *Sciurus Javanicus*, is one of the handsomest of the Squirrels. It is a native of Java, part of India, and Cochin China. Its total length is about two feet, the tail and body being equal to each other in measurement. In color it is one of the most variable of animals, so that it has been more than once described under different names. The usual color of the Jelerang is a dark brownish-black on the back, the top of the head yellowish, and the sides and abdomen golden yellow.

The HARE SQUIRREL, *Sciurus leporeus* (Plate LVI), is one of the most beautiful of our native squirrels, being remarkable for its splendid tail, with its rich white border. The color of the body resembles that of the common English hare, becoming somewhat lighter on the sides. It is a native of California, and smaller than the Gray Squirrel, to which it bears a great similarity.

The BLACK SQUIRREL, *Sciurus niger* (Plate LVI), is a native of many parts of North America. The whole of its fur, with very slight and variable exceptions, is of a deep-black color; even the abdomen, which in most animals is lighter than the back, displays the same inky hue. The total length of the animal is about two feet ten inches, including a tail thirteen inches long. It is vanishing before the inroads of the Gray Squirrel, and seems to be a timid creature, flying in terror from the anger of the Red Squirrel. When undisturbed, it is an active and lively animal, and is remarkable for a curious habit of suddenly ceasing its play, and running to some water to refresh itself. After drinking, which it does by putting its nose and mouth in the water, it carefully washes its face.

The GREY SQUIRREL, *Sciurus Carolinianus*, has, on the back, for three-fourths of its length, fur of a dark lead color, succeeded by a slight indication of black edges with yellowish-brown in some of the hairs, giving it on the surface a dark grayish-yellow tint. The feet are light-gray, three-fourths of the tail is a yellowish-brown, the remainder black, edged with white, the lower surface of the body white. It differs in many respects from the Northern Gray Squirrel; its bark is more shrill, and instead of mounting the tree when alarmed, it plays around the trunk. It is less wild than the Northern species, and haunts swampy places, or trees overhanging rivers, and is constantly found in the cypress swamps. It is abundant in Florida, Georgia, and the Carolinas, but does not extend northward.

The NORTHERN GRAY SQUIRREL, *Sciurus leucotes*, is the most active species in the Atlantic States. It sallies forth with the sun, and for four or five hours industriously searches for food. After a siesta at noon, it resumes its labors. It is not, in Audubon's opinion, a very provident animal, and lays in but a small stock of food in its nest, and does not gather and bury any winter stores. In fact it is, in a cold climate, in a state of partial torpidity requiring little food. This Squirrel is, unfortunately, fond of green corn and young wheat, and hence is regarded with hatred by the farmer. In Pennsylvania, an ancient law offered three pence a head for every squirrel destroyed, and in one year, 1749, eight thousand pounds sterling were spent in such payment, a sum representing the death of six hundred and forty thousand squirrels.

This Squirrel is styled by Audubon the Migratory Squirrel, from the long migrations it occasionally performs. At such periods they congregate in various districts of the northwest, and turn their steps in an eastern direction. "Onward they come," writes Audubon, "devouring on their way everything that is suited to their taste, laying waste the corn and wheat-fields of the farmer, and as their numbers are thinned by the gun, the dog, and the club, others fall in and fill the ranks. It has often been inquired how they cross rivers like the Hudson and the Ohio. It has even been asserted that they carry to the shore a piece of bark, seat themselves upon it, and hoist their tails as a sail. Unfortunately, the story is not true." The same naturalist saw a migration which crossed the Hudson. He says they swam clumsily.

The RED SQUIRREL or CHICKAREE, *Sciurus Hudsonius* (Plate LVI), is the most common species around New York, and throughout the Eastern States. It is fearless to a great degree of the presence of man, and in its quick graceful motions from branch to branch, reminds one of a bird. It is always neat and cleanly in its coat, industrious, and provident. The Chickaree obtained its name from its noisy chattering note which it repeats at frequent intervals. Unlike the Gray Squirrel, it exhibits the greatest sprightliness amid the snows and frosts of our Northern regions, and consequently consumes in winter as great a quantity of food as at any other season. It wisely makes ample provision, and the quantity of nuts it often lays up is almost incredible. It is too cautious to trust a single hoard, but forms several. Shell-barks, butter-nuts, and the like, it obtains by gnawing off the portion of the branch on which the nuts hang. After having thrown down a considerable quan-

tity, it drags them into a heap, covers them with leaves till the thick outer covering falls off or opens, and then carries off the nuts more conveniently. But even if these stores of nuts fail, the Chickaree can live on the cones of the pine and fir-tree. In the southern part of New York, and in more Southern States, it is satisfied with a hollow tree for its winter residence, but in Northern New York, Massachusetts, Canada, and further north, it digs deep burrows in the earth. It can swim and dive moderately well.

The LONG-EARED SQUIRREL, *Sciurus macrotus* (Plate LVI), is a remarkable species found in Borneo. Its title is not due to the length of the ears, but to the very long hair-tufts with which these organs are decorated. This fringe of hair is about two inches in length, of a glossy blackish-brown color, and stiff in texture. The color of the back and exterior of the limbs is a rich chestnut-brown, which fades into paler fawn along the flanks, and is marked by a single dark longitudinal stripe, extending from the fore to the hinder limbs. This dark band is narrow at each end, but of some width in the centre. The inside of the limbs is a pale chestnut, and the paws are jetty black. The tail is remarkably bushy, reminding the spectator of a fox's "brush," and is generally of the same color as the back, but grizzled with yellowish-white hairs, which are thickly sown among those of the darker hue.

The two following genera comprise the Flying Squirrels. Their common character consists in their being provided with wing-like membranes, extending along the flanks between the fore and hind legs. These membranes are covered with hair, and form regular parachutes, which enable them to sustain themselves in the air longer than the rest of the family, and thus perform extraordinary leaps.

GENUS SCIUROPTERUS.

This genus is divided into *sixteen* to *nineteen* species, and comprises the Flat-tailed Flying Squirrels, which range from Lapland and Finland to North China and Japan, and southward through India and Ceylon, to Malacca and Java; while in North America they occur from Labrador to British Columbia, and south to Minnesota and California.

The FLYING SQUIRREL, *Sciuropterus volucella*, may be taken as a type of the genus. It is called also the Assapan. It is the smallest of all the squirrels, measuring, tail and all, only about nine inches in length. Its







HARE SQUIRREL
BLACK SQUIRREL

TAGUAN FLYING SQUIRREL
LONG EARED SQUIRREL
RED SQUIRREL
GROUND SQUIRREL

PLATE LVI. RODENTIA.



fur is delicate and soft, brownish gray on the back, lighter on the sides of the neck, yellowish-white on the whole underside. The paws are silver-white, the flying membrane is edged with black and white, and the bright eyes are of a black-brown color.

The Flying Squirrel is a harmless and very gentle species, becoming tame in a few hours. After a few days it will take up its residence in some crevice, or under the eaves, and will remain there for years. They are gregarious, and live in considerable communities. There is nothing resembling flying in their movements, they merely descend from a high position by a gliding course, alight on a tree, ascend it at once, and again descend with their membrane expanded. They do not build nests, like the true squirrels, but confine themselves to a hollow in a branch.

The LYUTAGA, *Sciuropterus Sibericus*, inhabits the northern portion of Eastern Europe, but is most common, as its name indicates, in Siberia. It is about the same size as our native Flying Squirrel. The thick, silky fur is of a grayish-brown in the summer season; it grows longer in winter, and its color changes to a silver-gray.

GENUS PTEROMYS.

The *twelve* species of this genus comprise the Round-tailed Flying Squirrels. It is a more southern form than the preceding genus, and is confined to the wooded regions of India from the Western Himalayas to Java and Borneo, with species in Fozosa and Japan.

The TAGUAN, *Pteromys petaurista* (Plate LVI), is a native of India, where it is tolerably common. It is rather a large species, as its total length is nearly three feet, the tail occupying about one foot eight inches, measured to the extremity of the long hairs with which it is so thickly clothed. The general color of this animal is a clear chestnut, deepening into brown on the back, and becoming more ruddy on the sides. The little pointed ears are covered with short and soft fur of a delicate brown, and the tail is heavily clad with bushy hairs, grayish-black on the basal portions of that member, and sooty-black towards the extremity. The parachute membrane is delicately thin, scarcely thicker than ordinary writing-paper, when it is stretched to its utmost, and is covered with hair on both its surfaces, the fur of the upper side being chestnut, and that of the lower surface nearly white. A stripe of grayish-black

hairs marks the edge of the membrane, and the entire abdomen of the animal, together with the throat and the breast, is covered with beautiful silvery grayish-white fur.

THE MARMOTS.

From Squirrels which flit through the air with the graceful gliding of a bird, we pass now to the genera composing creatures which burrow in the ground, or pass a more or less subterranean life.

GENUS TAMIAS.

The *five* species of the genus are chiefly North American, ranging from Mexico to Puget Sound on the West, and from Virginia to Montreal on the East coast. One species is found over all Northern Asia. The animals of this genus differ from the true squirrels in several important particulars. They have a sharp convex nose, adapted to digging in the earth; they have longer heads, and their ears are set further back than those of squirrels; they have a more slender body, and shorter extremities. They have cheek pouches, and round narrow tails.

The CHIPMUCK, *Tamias lysteri* (Plate LVI), is also called the Chipping Squirrel or Ground Squirrel. It is found in most parts of the United States, and its beautiful markings attract the attention of all who see it. It is among quadrupeds, what the wren is among birds, lively, busy, agile, and graceful. Its clacking resembles the chip, chip, chip of a young chicken. "We fancy we see one of these sprightly Chipping Squirrels," writes Audubon, "as he runs before us with the speed of a bird; skewering along a log or fence with his chops distended by the nuts he has gathered, he makes no pause till he reaches the entrance of his subterranean storehouse. Now he stands upright, and his chattering cry is heard, but at the first step we make toward him he disappears. As we remove stone after stone from the aperture leading to his deep burrow, and cut through the tangled roots, we hear his angry querulous tones. We are within a few inches of him, and can see his large dark eyes. But at this moment out he rushes, and ere we can grab him has passed us, and finds security in some other hiding-place." The same writer caught one of these animals in Louisiana which had sixteen chin-quapin nuts in its cheek-pouches, and saw another with a table-spoonful

and a half of trefoil in the same receptacles. It is a very prudent creature, continuing to add to its winter store till the frost stops its work. Dr. Wright watched one collecting its store. It took a hickory nut and pushed it into one of its pouches with both paws, then it stuffed two into the other cheek, and finally took another nut in its teeth. It always carried four nuts at a time. The stock they thus accumulate is very large; often a peck of corn or nuts has been found in spring in the burrows of one of these Squirrels.

The Chipmuck has a slender body, and is beautifully marked. The anterior portion of the back is hoary-gray, the hinder portion reddish-fawn. A dark line runs along the back, a broad yellowish-white line runs from the shoulders to the thighs, bordered on each side with black. The fur on the body is a beautiful downy-white.

The BURUNDUK, *Tamias striatus*, is smaller than the common squirrel, but stouter built. The head is long, the eyes large, the ears short and small, the limbs strong, the soles of the feet bare, the tail is only slightly bushy. The color of the short, rough, thick-lying fur is, on the head, neck, and sides, yellowish; on the back there are five black stripes; the two lowest inclosing a yellowish band between them. The abdomen is grayish-white; the tail black above, yellowish below; the whiskers are black. The Burunduk is a native of Siberia.

GENUS SPERMOPHILUS.

The *twenty-six* species of this genus are distributed from the Arctic Ocean to Mexico on the west coast of this continent, but they do not pass east of Lake Michigan and the Lower Mississippi. In the Old World they extend from Siberia through South Russia to the Amoor and Kamschatka, being most abundant in the desert plains of Tartary and Mongolia. These pretty creatures have a long head, a slender body, ears hidden in their fur, a short tail, only bushy at the extremity, five toes on the hind feet, and large cheek-pouches.

The LEOPARD MARMOT, *Spermophilus Hoodii* (Plate LVII), is about the same size as the Chipmuck, and is remarkable for the brilliant and conspicuous manner in which its fur is diversified with contrasting hues. Along the back are drawn eight pale yellowish-brown bands, and nine dark-brown bands of greater width. The five upper bands are marked with pale spots. The coloring is slightly variable, both in distribution

and depth of tint, for in some specimens the dark bands are paler than in others, while in several specimens the pale spots have a tendency to merge altogether and form bands. The average length of this creature is nearly eleven inches, the tail slightly exceeding four inches in length. The cheek-pouches are moderate in dimensions. It is an inhabitant of Northern America.

The burrow of the Leopard Marmot is generally driven perpendicularly into the ground, to the depth of four or nearly five feet; but on the plains of the Upper Missouri, where the soil is sandy, the burrow is almost horizontal, and lies barely a foot below the surface. Its bite is very severe, and it snaps fiercely at all who try to capture it.

The LINE-TAILED SPERMOPHILE, *Spermophilus grammarius*, has a wide bushy tail, and large, pointed ears. The length of the animal is about twelve inches; the color is grayish, the tail is white and black, in alternating longitudinal bands, two black, and three white. It is found in Colorado.

GENUS ARCTOMYS.

The *eight* species of the genus are found in the northern parts of North America as far as Virginia and Nebraska to the Rocky Mountains and British Columbia, but not in California. In the Eastern Hemisphere they extend from the Swiss Alps to Lake Baikal and Kamschatka, and as far south as the Himalayas. The generic characteristics are strong claws, fit for burrowing, a tail of moderate length, short limbs, and a hare-lip.

The MARMOT, *Arctomys marmota* (Plate LVII), is about the size of an ordinary rabbit, and not very unlike that animal in color. The general tint of the fur is grayish-yellow upon the back and flanks, deepening into black-gray on the top of the head, and into black on the extremity of the tail. It is common in all the mountainous districts of Northern Europe, and lives on the high peaks of the Swiss and Savoy Alps, in the vicinity of the glaciers. It forms small societies, composed of two or three families, and digs out burrows on the slopes exposed to the sun.

Marmots have a summer and winter residence—a town and country mansion. In summer they betake themselves to the highest part of the mountain, where they devote themselves to breeding and rearing their young, the number of which varies from two to four, and who remain

with the parents until the following summer. When autumn arrives, they descend to the region of pasturage, and dig out a new burrow for their winter home, which is always deeper than the summer retreat. It is then they make hay—cutting grass, turning and drying it, which when cured, they carry into the chamber appointed for its reception.

The BABAC, *Arctomys babak* (Plate LVII), extends from Southern Poland and Galicia to the Amoor. It inhabits the steppes and stony plateaux, avoiding sandy spots and woodlands. Its thick fur is of a ruddy-yellow on the upper side of the body, rather darker on the head; the tip of the tail is almost black, the throat and chest grayish-white.

The Babacs live in settlements containing a very large population, which in the summer present an animated sight. At sunrise young and old leave their burrows, and eagerly lick up the dew; then they eat the leaves and blades of grass, and seem to sport merrily on the hillocks they have thrown up. But they vanish at once when any danger comes in sight. In June they begin to collect their winter provisions, and when the autumn is felt gather their hay-harvest. In the first half of September they retire into their winter abode, stop the entrance to the burrow with stones, sand, and grass, and pass into a state of semi-torpidity.

The WOODCHUCK or POUCHED MARMOT, *Arctomys monax* (Plate LVII), has a thick body and very short legs. The head is short and conical, the ears short, rounded, and thickly covered with hair, eyes moderate, whiskers numerous. The fore-feet have four toes and a rudimentary thumb, the hind-feet have five toes. The name Woodchuck properly belongs to this animal, although it is often applied to the Pecan.

The Woodchuck is subject to many variations in the color of its fur. Generally the back is grizzly or hoary, the cheeks light-gray, whiskers black; head, nose, feet, and tail dark-brown; eyes black; the whole under-surface a reddish-orange. It is fond of sitting in an erect posture, sitting on its rump, and letting its fore-legs hang loosely. It keeps in this position when feeding, inclining the head and forepart of the body forward and sideways. If pursued they run very fast for eight or ten yards, then stop and squat down; then start again. When walking leisurely, they place their feet flat upon the ground. They sleep during the greater part of the day, but leave their burrows early in the morning and in the evening. They climb trees very awkwardly. They become torpid in the winter, and remain underground till the grass has sprung up.

GENUS CYNOMYS.

The *two* species inhabit the plains east of the Rocky Mountains from the Upper Missouri to the Red River and the Rio Grande. Their burrows are numerous on the prairies, and the manner in which they perch themselves on little mounds and gaze on intruders is noticed by all travelers.

The PRAIRIE DOG, *Cynomys ludovicianus* (Plate LVII), is found in vast numbers wherever the soil is favorable for its subterranean works, and where there is vegetation sufficient to support it. Its color is reddish-brown on the back, mixed with gray and black. The abdomen and throat are grayish-white; the extreme half of the tail is covered with a brush of deep blackish-brown hair. The cheek-pouches are rather small, and the incisor teeth are large and protruding from the mouth. The length of the animal rather exceeds sixteen inches, the tail being a little more than three inches long. The cheek-pouches are about three-quarters of an inch in depth, and are half that measurement in diameter.

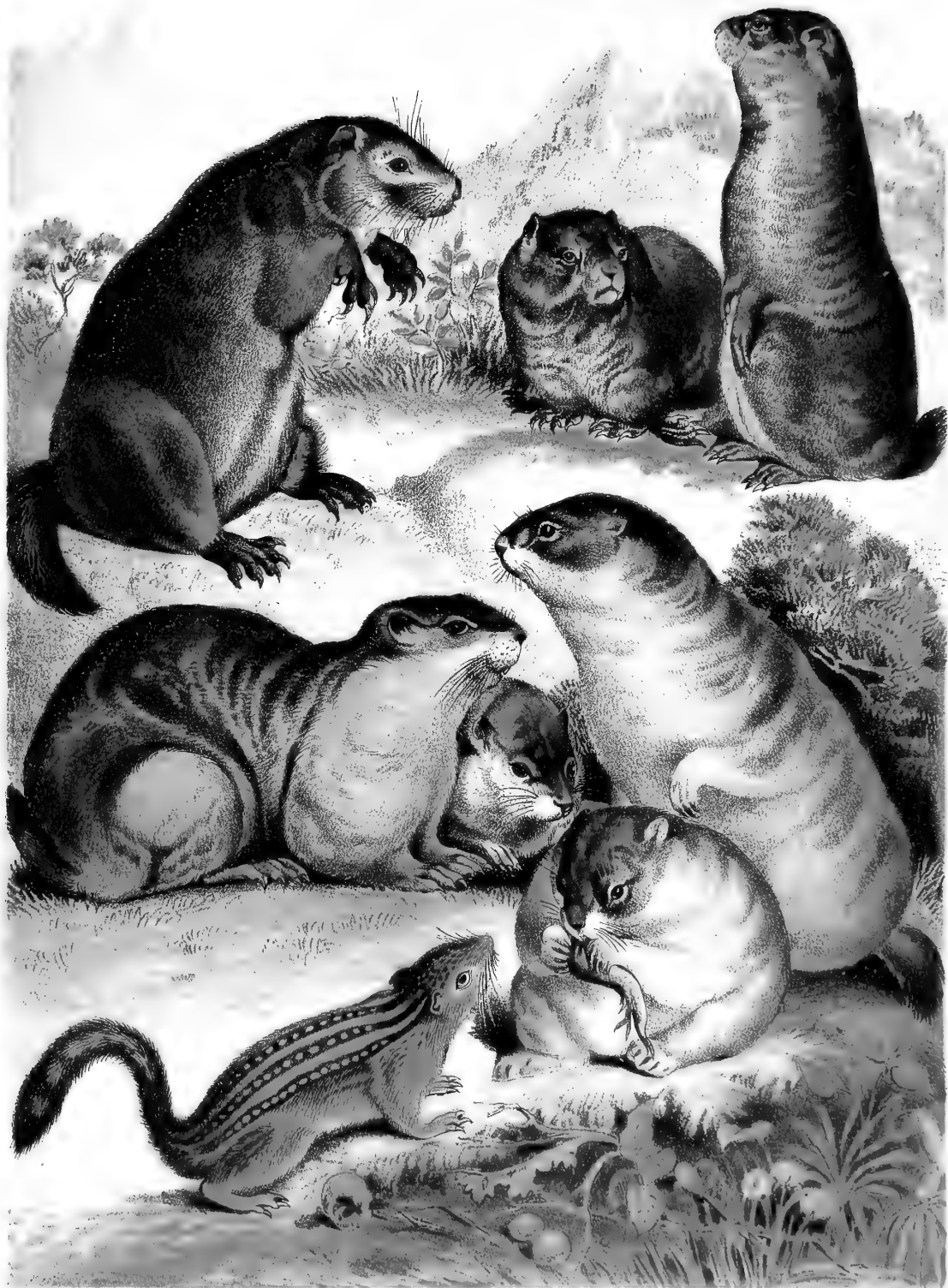
As long as no danger is apprehended, the little animals are all in lively motion, sitting upon their mounds, or hurrying from one tunnel to another as eagerly as if they were transacting the most important business. Suddenly a sharp yelp is heard, and the peaceful scene is in a moment transformed into a whirl of indistinguishable confusion.

As it is so wary an animal it is with difficulty approached or shot, and even when severely wounded it is not readily secured, owing to its wonderful tenacity of life. A bullet that would instantly drop a deer has, comparatively, no immediate effect upon the Prairie Dog, which is capable of reaching its burrow, even though mortally wounded in such a manner as would cause the instantaneous death of many a larger animal.

The mode by which this animal enters the burrow is very comical. It does not creep or run into the entrance, but makes a jump in the air, turning a partial somersault, flourishing its hind legs and whisking its tail in the most ludicrous manner, and disappearing as if by magic.

The burrows of the Prairie Dog are generally made at an angle of forty degrees, and after being sunk for some little distance run horizontally, or even rise toward the surface of the earth. It is well known that these burrows are not only inhabited by the legitimate owners and excavators, but are shared by the burrowing owl and the rattlesnake.

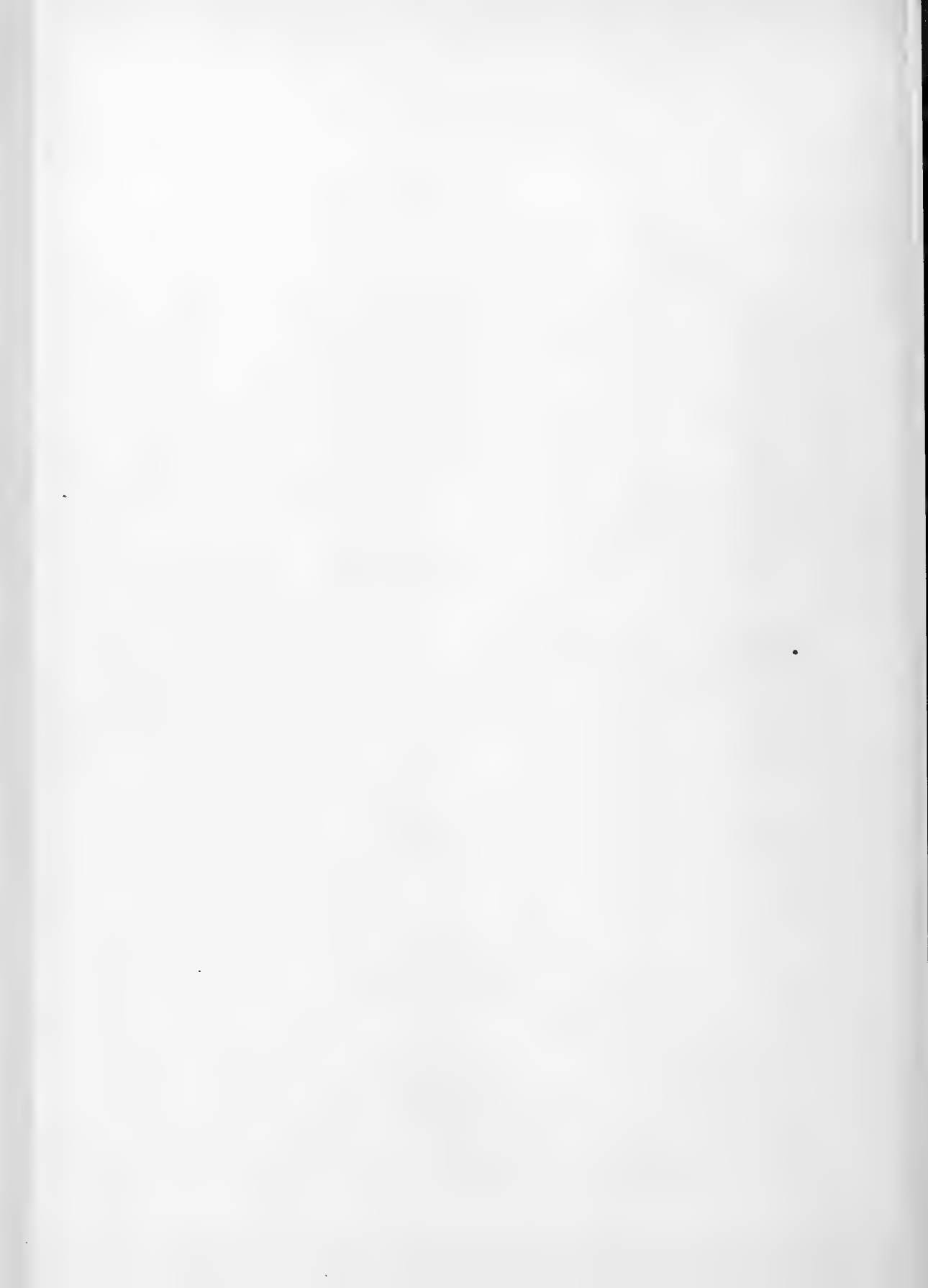




POUCHED MARMOT
PRAIRIE DOG
LEOPARD SPERMOPHILE

COMMON MARMOT
BABAC

PLATE LVII RODENTIA



According to popular belief, the three creatures live very harmoniously together; but careful observations have shown that the snake and the owl are interlopers, living in the burrows because the poor owners cannot turn them out, and finding an easy subsistence on the young Prairie Dogs. A rattlesnake has been killed near a burrow, and when the reptile was dissected, a Prairie Dog was found in its stomach.

From the most recent accounts, it appears that the Prairie Dog does not hibernate, but that it is as fresh and lively during winter as in the heat of summer.

Prairie Dogs who live far away from any river or stream obtain drink from wells dug by themselves that have concealed openings. No matter what the depth, the dogs will keep digging until they reach water. A frontiersman named Leach, formerly of Mercer county, Pennsylvania, says he knows of one such well two hundred feet deep, and having a circular staircase leading down to the water. Every time a dog wants a drink she descends this staircase, which, considering the distance, is no mean task.

GENUS ANOMALURUS.

The *five* species of this African genus consist of animals which resemble Flying Squirrels, but differ from all other members of the family in internal structure. They are found only in the Island of Fernando Po and West Africa.



CHAPTER IV.

THE SEWELLELS, PORCUPINES, AND CAVRES.

THE FAMILY HAPLOODONTIDÆ—THE FAMILY CHINCHILLIDÆ—THE CHINCHILLAS AND VISACHAS—
THE OCTODONTIDÆ—THE HUTIA CONGA—THE DEGU—THE TUKOTUKO—THE GUNDY—THE
COYPU—THE GROUND PIG—THE CANADIAN PORCUPINE—THE BRAZILIAN PORCUPINE—THE
COMMON PORCUPINE—THE TUFTED TAILED PORCUPINE—THE AGOUTI—THE SOOTY PACA—
THE CAPYBARA—THE GUINEA PIG—THE MARA—THE PIKAS.

THE family HAPLOODONTIDÆ has been constituted by Professor Lilljeborg to comprise some curious rat-like animals having affinities with both the Beavers and Marmots, and inhabiting the West Coast of America from the southern part of British Columbia to the mountains of California. It contains only *one* genus.

GENUS HAPLOODON.

According to Wallace there are *two* species of this genus; their generic characteristics are a stout, heavy form, a cylindrical body, short legs, flat head, bushy tail, and very long whiskers. The eyes are small, the under-fur is woolly, the walk is plantigrade.

The SEWELLEL, *Haploodon rufus*, was first discovered during the expedition of Clark and Lewis to the Columbia River in 1805. It lives in communities like the prairie dog, sitting upon mounds at its burrows, and whistling as the latter do in the early morning. It is about as large as the musk rat; its color is brown mixed with black, with grayer tints on the abdomen. Little is known of its habits, but it seems to be ascertained that it is not a hibernating animal. The name is derived from the Nisqually language. The Indians hunt them for their skins, which they sew together and dress with the fur on. It is said to cut bundles of herbs and place them out to dry for future use. One species is found north of the Columbia River, the other in California.

The family CHINCHILLIDÆ is confined to the Alpine zones of the

Andes from the boundary of Ecuador and Peru to Southern Chili, and over the pampas to the Rio Negro and the Uruguay. It comprises *three* genera.

GENUS CHINCHILLA.

The genus is usually divided into *two* species, according to the difference of their fur. They are "rabbits with long tails," a link, in fact, between the rabbit and the mouse. Their color is a light gray, with white and dark brown markings. They are found in the Andes of Peru and Chili, south of nine degrees S. lat.; at about eight thousand to twelve thousand feet above the sea level.

The CHINCHILLA, *Chinchilla lanigir* (Plate LVIII), lives chiefly among the higher mountainous districts, where its thick silken fur is of infinite service in protecting it from the cold. It is a burrowing animal, banding together in great numbers in certain favored localities. The food of the Chinchilla is exclusively of a vegetable nature, and consists chiefly of various bulbous roots, which it disinters by means of its powerful fossorial paws. While feeding, it sits upon its hinder-feet, and conveys the food to its mouth with its fore-feet, which it uses with singular adroitness. It is an exceedingly cleanly animal, as might be supposed from the beautiful delicacy of its fur.

As far as is known, the Chinchilla is not a very intelligent animal, seeming to be hardly superior to the guinea-pig in intellect, and appearing scarcely to recognize even the hand that supplies it with food. They are of a gentle nature and easily tamed, and the Chilenos are fond of keeping them in their houses.

GENUS LAGIDIUM.

The members of this genus have longer ears, and more bushy tail than those of the preceding genus. As yet only *three* species are known, and they inhabit the loftiest plateaus of the Cordilleras from eleven thousand to sixteen thousand feet. They have four toes, while the Chinchillas have only four on their hind-feet.

The ALPINE VISCACHA, *Lagidium Cuvieri*, has a thick snout, long hind-legs, and a long tail. The fur is very soft and long, and of an ash-gray color which, on the sides, approaches to yellow. The upper surface of the tail is covered with long hair of a brownish-black color. The whiskers are remarkably long, and reach to the shoulders.

GENUS LAGOSTOMUS.

This genus, which contains only *one* species, has a close resemblance to the Chinchilla. They have four toes on the front feet, and three on the hind; the latter armed with long claws.

The VISCACHA, *Lagostomus trichodactylus* (Plate LVIII), is the Viscacha of the Pampas. Their habitat is the vast plains of South America, or the basin of La Plata river. They live in communities, and hollow out very deep burrows. Grasses and vegetables constitute the chief part of their food. Their usual posture is that generally assumed by rabbits; and they use their feet to convey their food into their mouths. Their movements are very active, and they are excessively wary and difficult to approach. They are hunted for the sake of their fur. Their burrows are dug in common, and inhabited in common, and are provided with countless exits and entrances; often forty or fifty tunnels have been found, and the burrow is divided into as many chambers as there are families. During the day they live underground, at sundown they steal out one by one, and in the twilight a numerous company assembles. The horsemen of the Pampas and the condor are deadly enemies to the Viscachas. These persecuted creatures display an almost human affection for each other; if one is wounded when outside the burrow, its companions carry it off into the safest recess. The Indians believe that if a burrow is stopped up, the inhabitants of the neighborhood assemble and dig out their buried kinsfolk.

The family OCTODONTIDÆ includes a number of curious and obscure rat-like animals, mostly confined to the mountains and open plains of South America, but having a few stragglers in other parts of the world. Of the *eight* genera, two are peculiar to the West India islands; and two to Africa.

GENUS CAPROMYS.

The generic characteristics of the *three* species are a short, thick body with powerful hindquarters; a short, thick neck; a long, broad head; broad, almost hairless ears; large eyes; strong legs, with five toes on the hind, and four on the front feet. The fur is abundant, smooth, and glistening.

The HUTIA CONGA, *Capromys pilorides*, is described by Oviedo in

1525 as a rabbit-like animal found in San Domingo which constituted the chief food of the natives. It measures about a foot and a half in length, and stands about eight inches high. The color of its coat is yellowish-gray and brown, with a reddish tinge on the shoulders; the paws are black, and a longitudinal stripe on the abdomen is gray. This animal lives either in trees, or in the thickest bushwood, and is only visible by night. The disproportionate development of the hind-quarters renders it awkward on land, but it climbs skilfully, making use of its tail. On the ground it sits up like a rabbit, and makes short leaps. In many parts of Cuba it is still hunted for the sake of its flesh. Its food consists of fruits, leaves, and bark. When kept in confinement, it shows a preference for strong-smelling plants, such as mint and thyme, which other rodents do not like.

GENUS OCTODON.

This genus contains *three* species. The animals contained in it have a thick compact body, a short thick neck, a large head, a tail bushy at the end, and long hind-legs. All the feet have five toes.

The DEGU, *Octodon Cummingii*, is of a brownish-gray color on the back, and a grayish-brown below; the root of the tail is nearly white; the inside of the ears is white, the tail black at the extremity. The Degu is one of the commonest animals in Central Chili, being found by hundreds in every fence or thicket; it runs fearlessly about the high roads, and boldly enters the gardens and fields. It seldom attempts to climb the trees, but at the first sign of danger rushes with upright tail into one of the many entrances into its burrow. It does not hibernate, but collects provisions, like the hibernating animals. It soon becomes tame in captivity.

GENUS CTENOMYS.

The *six* species of this genus are found in the Pampas in the Campos of Brazil, in Bolivia, and in Terra del Fuego. Their small eyes and ears indicate their underground habits. Their limbs are short, the coat is smooth. They are found in astonishing numbers in the plantless desert of the plateaus of the Cordilleras, where the soil is perforated like a sieve with their burrows.

The TUKOTUKO, *Ctenomys Magellanicus*, is betrayed to the traveler by the peculiar grunting sounds which, in regular succession, are heard proceeding from the earth. The animal that utters them is about the size of the hamster, of a brownish-gray color on the body, and with white feet and tail. The Tukotuko was first described by Darwin, who discovered it at the eastern entrance to the Straits of Magellan. Wide, dry, sandy, and barren plains are its home. Here it burrows, like a mole, for a long distance, during the night. By day it rests. Its motion on the surface of the ground is clumsy, it cannot leap over the slightest obstacle, and when out of its hole, can be easily captured. In all probability it does not hibernate.

GENUS CTENODACTYLUS.

We take this genus as the representative of the African branch of the family. The head is thick and blunt, the ears round and short, the eyes moderate in size, the whiskers uncommonly long, the limbs strong, the hind ones longer than the fore ones; the tail is a mere stump, but is covered with long bristles.

The GUNDY, *Ctenodactylus massoni*, is found in the wildly romantic valleys of the Djebel Aures, and in the southern elevations of Algeria, near the Sahara. In the winter months it is seen at midday on the rocks, but always high enough to be safe from surprise. With its head directed to the valley, and lying close to the rock, it looks like a part of it. It is everywhere common, living in clefts, and under stones, and is remarkable for its agility. The slightest noise makes it hop back into its hole, which usually defies all the sportsman's efforts. The best time to watch it is the morning, as at sunrise it begins to descend into the valley in search of food. When it reaches the fields, it sits up like a rabbit, and gnaws the stalks of growing corn. Traps and nooses of hair are employed to catch it, and the Arab children amuse themselves by setting them. The flesh is very like that of a chicken. The velvety fur is used to make purses.

The family ECHEMGIDÆ or Spring Rats, is best known as the COYPU or large beaver-like water-rat of Peru and Chili. It is divided into *ten* genera, two of which inhabit South Africa, but all the rest are confined to the continent of South America east of the Andes.





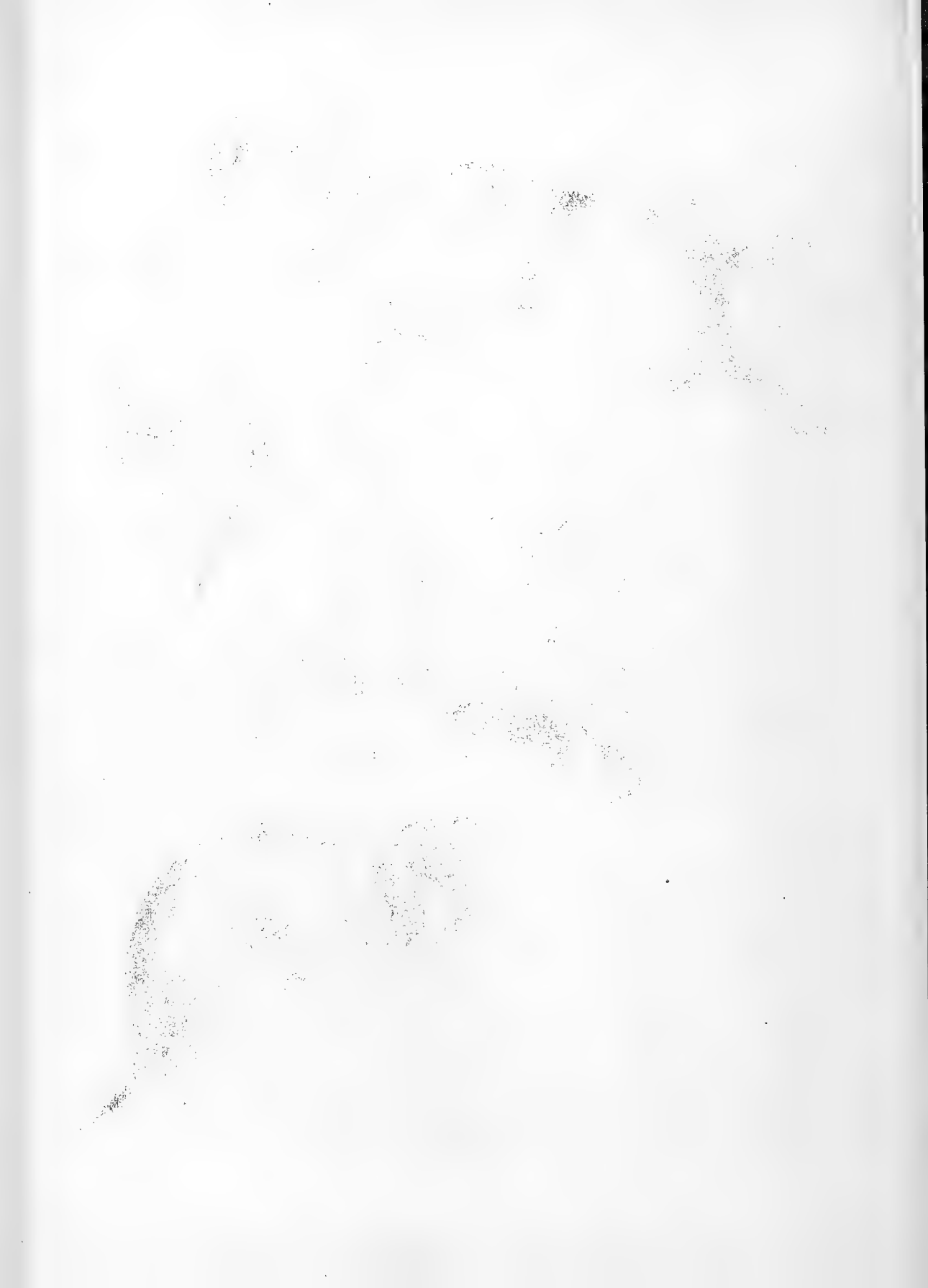


VISCACHA
CHINCHILLA

COMMON PORCUPINE
COYPU

CANADIAN PORCUPINE

PLATE LVIII. RODENTIA.



GENUS MYOPOTAMUS.

The COYPU, *Myopotamus coypu* (Plate LVIII), the *only* species, greatly resembles the beaver. It is about the same size, and has palmated feet, but its tail is cylindrical and scaly. It is common in Chili and La Plata, and is also, though more rarely, found in Brazil and the other states of South America, where the natives incessantly persecute it on account of its valuable fur. As it remains in its burrow during the day, it is hunted at night with dogs. Some time ago the exportation of Coypu skins was carried on very extensively.

The color of the Coypu is a light reddish-brown. It is agile and lively, and very amusing in its behavior. If anything is thrown into its trough, it takes it up in its fore-feet, and washes it with the skill of a laundress. It lives on the banks of streams and lakes where the water-plants are large enough to hide it. It dives badly, but swims well. It walks slowly, owing to its shortness of limb, and only ventures on land when passing from one stream to another.

GENUS AULACODES.

The GROUND FIG, *Aulacodes swinderianus*, is the *only* species of this African genus. It is one of the links between the beavers and the porcupines, and has a considerable affinity with the latter animals.

It is found in many parts of Southern Africa, as well as on the coast of Guinea, where it is not at all uncommon. The hair of this animal is rather peculiar, and approximates closely to the quill-hairs of the true porcupines, being either flat and grooved above, or developed into flexile spines. The tail is but sparsely covered with hair, and is rather short in proportion to the size of its owner. The hinder feet are only furnished with four toes, armed with large, rounded, and rather blunt claws. The ears are short and rounded.

The Porcupines are divided into two families. The Tree Porcupines, or CERCOLABIDÆ, a group of *three* genera entirely confined to America, where they range from the northern limit of trees on the Mackenzie River to the southern forests of Paraguay. They are absent from the Southern United States. The True Porcupines, or HYSTRICIDÆ, also have *three* genera, and are confined to the Eastern Hemisphere.

GENUS ERETHIZON.

The *three* species are distributed as follows: One, throughout Canada and as far south as Northern Pennsylvania and west to the Mississippi; the second from California to Alaska and west to the Missouri; the third in the northwest part of South America.

The CANADIAN PORCUPINE, *Erethizon dorsatum* (Plate LVIII), is also called the Urson. Its chief food consists of living bark, which it strips from the branches as cleanly as if it had been furnished with a sharp knife. When it begins to feed, it ascends the tree, commences at the highest branches, and eats its way regularly downward.

In the work of Messrs. Audubon and Bachman is a very amusing little story of the manner in which the tame Urson above mentioned repelled an attack made upon it by a fierce dog.

"A large, ferocious, and exceedingly troublesome mastiff belonging to the neighborhood, had been in the habit of digging a hole under the fence, and entering our garden. Early one morning we saw him making a dash at some object in the corner of the fence, which proved to be our Porcupine, which had, during the night, made its escape from the cage.

"The dog seemed regardless of all its threats, and probably supposing it to be an animal not more formidable than a cat, sprang upon it with open mouth. The Porcupine seemed to swell up in an instant to nearly double its size, and as the dog pounced upon it, it dealt him such a sidewise blow with its tail, as to cause the mastiff to relinquish his hold instantly, and set up a loud howl in an agony of pain. His mouth, tongue, and nose were full of Porcupine quills. He could not close his jaws, but hurried, open-mouthed, off the premises."

GENUS CERCOLABES.

The *twelve* species of this genus range from Mexico to Paraguay on the east side of the Andes. They are distinguished by long tails, usually prehensile, and short quills.

The BRAZILIAN PORCUPINE or COENDOO, *Cercolabes prehensilis* (Plate LIX), as might be presumed, from the prehensile tail and the peculiarly armed claws, is of arboreal habits, finding its food among the lofty branches of trees. On the level ground it is slow and awkward, but it

climbs with great ease, seldom using its tail, except as an aid in descent.

The total length of the Coendoo is about three feet six inches, of which the tail composes one foot six inches. Its nose is thick and blunt, like that of the common porcupine, and the face is furnished with very long whisker-hairs of a deep black. The numerous spines which cover the body are parti-colored, being black in the centre and white at each extremity. Their length is rather more than two inches on the back, an inch and a half on the fore-legs, and not quite an inch on the hinder-limbs. A number of short quills are also set upon the basal half of the tail, the remainder of that organ being furnished with scales, and tapering to its extremity. The color of the scales is black. The entire under surface of the tail is covered with similar scales, among which are interspersed a number of bright chestnut hairs. The abdomen, breast, and inner face of the limbs are clothed with dense, brown, coarse hairs. It is a nocturnal animal; sleeping by day, and feeding by night.

GENUS HYSTRIX.

Southern Europe, Africa, all India, Ceylon, and South China are the homes of the *five* species of HYSTRIX. They are all remarkable for the coat of spines or quills with which they are defended.

The COMMON PORCUPINE, *Hystrix cristata* (Plate LVIII), is found in Europe, Africa, and India. It is over two feet in length. The spines or quills vary considerably in length, the longest quills being flexible, and not capable of doing much harm to an opponent. Beneath these is a plentiful supply of shorter spines, from five to ten inches in length, which are the really effective weapons of this imposing array. Their hold on the skin is very slight, so that when they have been struck into a foe, they remain fixed in the wound, and unless immediately removed work sad woe to the sufferer. For the quill is so constructed, that it gradually bores its way into the flesh, burrowing deeper at every movement, and sometimes even causing death.

The Porcupine is a nocturnal animal, and is therefore not often seen even in the localities which it most prefers. It is said not to require the presence of water, and its food is entirely of a vegetable nature. This animal takes up its abode in deep burrows which it excavates, and in which it is supposed to undergo a partial hibernation.

GENUS ATHERURA.

The Brush Tailed Porcupines, divided into *five* species, are found in West Africa, India, Siam, Borneo, and Sumatra. They are small, with short naked ears, and a long tail, partly covered with scales, and ending in a tuft of most extraordinary formation.

The TUFTED TAILED PORCUPINE, *Atherura Africana* (Plate LIX), is a comparatively slender animal, about two feet in length.

The quills which cover the body are very short in proportion to the size of the animal, and are flattened like so many blades of grass. The tail is scaly throughout a considerable part of its length, but at the tip is garnished with a tuft of most extraordinary-looking objects, which look very like narrow, irregular strips of parchment. The coloring of the quills is diversified, but as a general rule they are black toward the extremity and white toward the base.

The Agoutis and Cavies are placed by Mr. Wallace in the family CAVIDÆ. There is a striking external resemblance between them, they inhabit the same regions of South America, and with one exception are all found east of the Andes. They are divided into *six* genera.

GENUS DASYPROCTA.

The AGOUTI, *Dasyprocta aguti* (Plate LIX), is the type of the *nine* species of the genus. It ranges from Mexico to Paraguay, one species inhabiting the small West India Islands of St. Vincent, Lucia, and Grenada. The habits of all the species are very similar.

The Agoutis are natives of South America and the West Indies. Woods spreading over hills and mountains are the localities where they generally take up their abode; and the clefts of rocks, or the hollows in trees, serve for their retreats. If ready-made places of shelter are not procurable, they dig burrows. They are nocturnal in their habits, and feed principally on roots and fruit. But when in captivity they are omnivorous, and manifest an unbearable voracity, for they gnaw everything they can get at. They are hunted by dogs, but although tolerably swift are unable to sustain a long chase. When running, they resemble the common hare, and, like that animal, are apt to overbalance themselves when running down hill. They can be easily tamed, but display little affection.

GENUS CÆLOGENYS.

The members of this genus are found from Guatemala to Peru. There is perhaps only *one* species in the genus, the so-called second species found in Eastern Peru being doubtful. They are remarkable for the extraordinary development of a portion of the skull. The cheek-bone is enormously enlarged into a mass of bone, concave and rough on the exterior; the lower edge of this bony development descends beneath the lower jawbone. Connected with this curious structure is a cheek-pouch with a very small opening, for which no use has been discovered. There are also two large cheek-pouches which open into the mouth. The name *Cælogenys* means hollow-cheeked.

The SOOTY PACA, *Cælogenys paca* (Plate LIX), is a pretty animal, the rows of white spots which decorate its sides standing out in pleasing contrast to the rich black-brown hue with which the remainder of the fur is tinged. The throat and abdomen are white, and the lowermost of the four rows of white spots is often nearly merged into the white fur of the under portions of the body. The coloring is rather variable in different individuals. The paws are light flesh-color, and the large full eyes are dark-brown. The total length of this animal is about two feet. It is an active animal, in spite of its clumsy looks, and not only runs with considerable speed, but is a good swimmer, and can jump well.

The favorite localities of the Pacas are in wooded districts, in marshy grounds, or near the banks of rivers. Their domiciles are excavated in the ground, but are at no great depth, and are remarkable for the admirable state of cleanliness in which they are preserved by the inhabitants.

GENUS HYDROCHÆRUS.

The *only* species inhabits the banks of rivers from Guayana to La Plata. Its size, its harsh coarse hair, its hoof-like toes and clumsy bearing are so swinish, that it seems to be a kind of wild hog. From this external resemblance the name *Hydrochærus* or Water Hog is derived.

The CAPYBARA, *Hydrochærus capybara* (Plate LIX), is the largest of all the living rodent animals, rather exceeding three feet in total length, and being so bulkily made that when it walks its abdomen nearly touches the ground. The muzzle of this animal is heavy and blunt, the eyes are set high in the head, and are moderate in size, the tail is wanting, and

the toes are partially connected together by a development of the skin. The color of the Capybara is rather indeterminate, owing to the manner in which the hairs are marked with black and yellow, so that the general idea which its coat presents is a dingy, blackish-gray, with a tinge of yellow. The hairs are rather long, and fall heavily over the body. The incisor teeth are of enormous dimensions, and the molars are very curiously formed, presenting some analogy to those of the elephant.

It is a water-loving animal, and not only swims well, but is a good diver. It is gregarious, being generally found in small herds upon the banks of the streams.

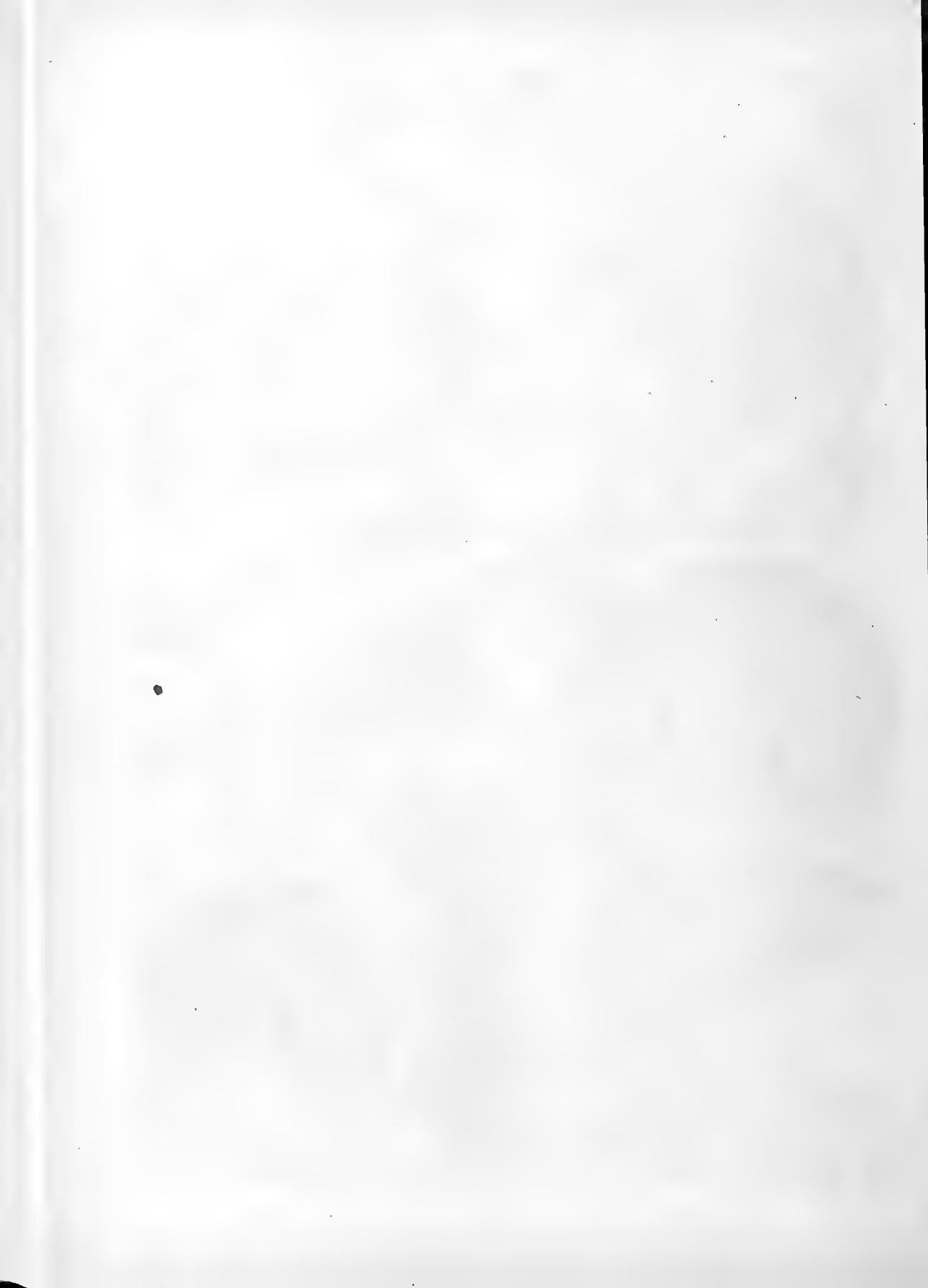
GENUS CAVIA.

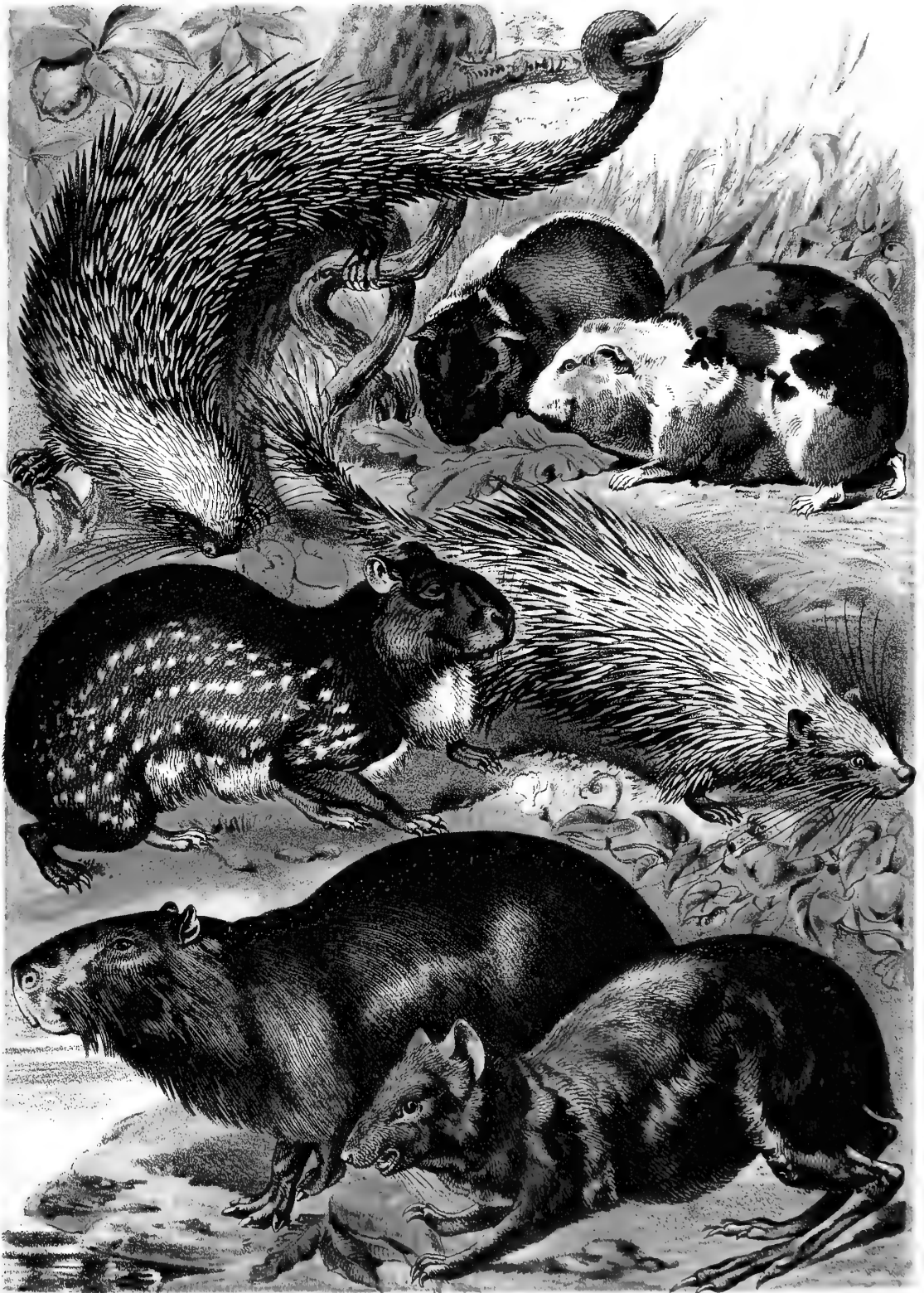
Of the *nine* species into which the genus is divided, one is found west of the Andes in Peru, the others are distributed from Brazil to the Straits of Magellan. The common name Guinea Pig is quite a misnomer, as they are not pigs, and are not found in Guinea.

The GUINEA PIG, *Cavia cobaga* (Plate LIX), is so well known, as hardly to require description. In their native wilds these pretty creatures lead a nocturnal life, and either dig out burrows for themselves, or find a retreat among the herbage. In captivity they eat bread, roots, vegetables, and grasses. It is often thought that they never drink, but this is a mistake. The color is very variable, but is generally composed of white, red, and black in patches. Their domestication dates back to a very distant period. This fact may at least be inferred from their being marked by large black and yellow patches on a white ground, a peculiarity of color which they presented even before their introduction into Europe in the middle of the sixteenth century.

GENUS DOLECHOTIS.

The PATAGONIAN CAVY or MARA, *Dolechotis Patagonicas*, is an animal which is remarkably swift for a short distance, but is so easily fatigued that it can be run down by a man on horseback. It is more tameable than the agouti, and is often kept in a state of domestication. It is generally found in couples, a male and his mate occupying the same "form." It does not seem to burrow, nor to keep so close to its retreat as the agouti, but is fond of crouching in a form like our common hare. It is about thirty inches in length, and about nineteen inches high at the crupper, which is the most elevated part of the animal. At the shoulder





BRAZILLIAN PORCUPINE

SOOTY PACA

CAPYBARA

GUINEA PIG

TUFTED TAILED PORCUPINE

AGOUTI

PLATE LIX RODENTIA



it hardly exceeds sixteen inches. The fur of this animal is soft and warm, and from the contrasting colors of black, white, and golden brown, presents a very handsome appearance.

The family LAGOMYEDES consists of small Alpine and desert animals which range from the south of the Ural Mountains to Cashmere and the Himalayas, at heights of eleven thousand to fourteen thousand feet, and northward to the Polar regions. In America they are confined to the Rocky Mountains from about forty-two to sixty degrees north latitude.

GENUS LAGOMYS.

This *solitary* genus is divided into *eleven* species. The animals comprised in it have the dentition of the hare, are nearly tailless, and have the form of the *Anicolæ*. Hence the generic title which means Hare-Mouse.

The NORTH AMERICAN PIKA, *Lagomys princeps*, is often called the "Little Chief Hare." It is about seven inches in length, of a grayish-brown color, varied with black and yellowish-brown. These animals range along the summits of the Rocky Mountains near the forest line. They do not wander far from their homes, and are very timid, retreating at the slightest alarm. They are not hares in any of their habits, but sit up like marmots or prairie dogs.

The ALPINE PIKA, *Lagomys Alpinus*, has been described by Pallas, Radde, and Przewalski. It is found on all the mountain heights of Inner Asia, and occurs even in Kamschatka. It prefers woody regions, and avoids the bare high steppes. In the latter it is replaced by a species named OTOGONO, *Lagomys otogono*. This species lives in clefts in the rocks or in burrows that it digs. Usually large numbers of these subterranean dwellings are found together, so that when one Pika is discovered hundreds or thousands are not far off. During the winter they do not come above-ground; in summer, too, when the weather is bright, they keep concealed, but on a dull day they are active. They are active and industrious creatures, and collect large quantities of hay which they shelter from the rain by a covering of leaves. They make runs under the snow from their burrows to their haystacks, and have the precaution of supplying each run with an air-hole. They have many enemies. Every bird or beast of prey attacks them. In hard winter the Mongols feed their horses with the fodder the poor Otogono have collected.

CHAPTER V.

HARES AND RABBITS.

THE FAMILY LEPORIDÆ—THE AMERICAN HARES—THE POLAR HARE—THE NORTHERN HARE—THE WOOD HARE—THE BRAZILIAN HARE—THE JACKASS RABBIT—THE AFRICAN HARES—THE SAND HARE—THE EUROPEAN HARE—THE COMMON HARE—THE ALPINE HARE—THE RABBIT—THE WILD RABBIT—THE DOMESTIC RABBIT.

THE family LEPORIDÆ consists of only *one* genus divided into *thirty-five* to *forty* species. Only one species occurs in South America, while one or two North American species extend into Mexico and Guatemala. In the Old World they extend from Iceland to Japan, and as far north as Greenland and the Arctic Ocean.

GENUS LEPUS.

The Hares and Rabbits are the only rodents that have more than two front teeth. They have a long body, with high hinder limbs, a long skull, with large ears and eyes, five toes on the front, four on the hind-feet, very mobile deeply-cleft lips, a thick fleecy coat, and a short, erect tail. All the species live on soft, juicy plants, but yet eat anything else that they can get. Their motions are peculiar. When walking slowly they seem clumsy and awkward, but in full speed they are very fleet, and can in the wildest race make turns of wonderful quickness.

THE HARE.

The POLAR HARE, *Lepus timidus*, inhabits the whole Arctic Circle. Like other Polar animals, it changes its color according to the season. In winter it is pure white, excepting the tips of the ears, which are black. In summer it is of a light-yellowish brown-gray, with black ears. Its length is about two feet, its weight eight to ten pounds.

The NORTHERN HARE, *Lepus Americanus* (Plate LX), presents itself in four different varieties. In winter it is white, the tips of the ears having a narrow black border, in summer it is of a pale yellowish-brown. The species in some of its varieties is found as far south as New Mexico; it occurs in most parts of the State of New York, and exhibits more of the habits of the English Hare than any of our native species. In the Eastern and Middle States the color undergoes very slight change.

The WOOD HARE, *Lepus sylvaticus*, is also called the Gray Rabbit. It is found throughout the United States and Canada. It is very timid, and does not burrow, but makes a "form." It is very like the MARSH HARE, *Lepus palustris*, but the latter has a shorter tail and broader ears, and is of a yellowish-brown color. The Marsh Hare is common in Florida and Mexico in bushy swamps and the borders of creeks.

TROWBRIDGE'S HARE, *Lepus Trowbridgii*, is the smallest of our hares; the tail is rudimentary, the ears are as long as the head. The color is yellowish-brown. It is found east of the Cascade Range, and on the coast from Fort Crook to Cape St. Lucas.

The JACKASS RABBIT, *Lepus callotis* or *Texianus* (Plate LX), has very large ears, more than one-third longer than the head. A dark-brown stripe is seen on the top of the neck, and a black stripe from the rump extends to the root of the tail, and along its upper surface to the tip. The upper surface of the body is mottled deep buff and black, the throat and belly white, the under side of the neck dull rufous.

It received its name from the troops in the Mexican War, who found it very good eating, and it formed an important article of provisions for J. W. Audubon during his travels in Mexico. It inhabits the southern parts of New Mexico, the western parts of Texas, and the elevated lands westward of the *tierra caliente* or coast lands of Mexico. On the Pacific coast it is replaced by the California Hare.

Till it was better known, this hare was described as enormously large, and equal in size to a fox. A fine large specimen, however, only measures about one foot nine inches in length.

AFRICAN HARES.

The species are distinguished by their diminutive size and extremely long ears. They are of a sandy color, and live in the deserts or their neighborhood.

The SAND HARE, *Lepus Æthiopicus*, is found in the mountains and coast-lands of Abyssinia. As the inhabitants, both Christian and Mohammedan, observe the precept of the Law of Moses which enumerates the Hare among the unclean beasts not fit for food, the Sand Hare has acquired no fear of man, and, in place of running away, merely walks to some bush. The European sportsman, who gives chase, sees the animal as he approaches again move slowly to some other bush. Even the sound of the gun does not quicken its pace for any length of time. If pursued by dogs, however, it alters its tactics, and displays great fleetness, agility, and endurance.

The COMMON HARE, *Lepus vulgaris* (Plate LX), is distinguished from the rabbit by the redder hue of its fur, the great proportionate length of its black-tipped ears, which are nearly an inch longer than the head; by its very long hind-legs, and its large and prominent eyes. The color of the Common Hare is grayish-brown on the upper portions of the body, mixed with a dash of yellow; the abdomen is white, and the neck and breast are yellowish-white. The tail is black on the upper surface and white underneath, so that when the creature runs it exhibits the white tail at every leap. Sometimes the color of the Hare deepens into black, and there are many examples of albino specimens of this animal.

The Hare does not live in burrows, like the rabbit, but only makes a slight depression in the ground, in which she lies so flatly pressed to the earth that she can hardly be distinguished from the soil and dried herbage among which she has taken up her abode. In countries where the snow lies deep in winter, the Hare lies very comfortably under the white mantle which envelops the earth, in a little cave of her own construction. She does not attempt to leave her "form" as the snow falls heavily around her, but only presses it backward and forward by the movement of her body, so as to leave a small space between herself and the snow. By degrees the feathery flakes are formed into a kind of domed chamber, with the exception of a little round hole which serves as a ventilating aperture. This air-hole is often the means of her destruction as well as of her safety, for the scent which issues from the aperture betrays her presence.

The Hare is by no means a timid animal. It fights desperately with its own species, and in defence of its young it will attack even man. In England the hare is shot, and hunted either with greyhounds or a pack of hunters. Its long and powerful limbs enable it to make pro-

digious bounds, and it has been known to leap over a wall eight feet high.

It is a wonderfully cunning animal, and is said by many who have closely studied its habits to surpass the fox in ready ingenuity. Sometimes it will run forward for a considerable distance, and then, after returning for a few hundred yards on the same track, will make a great leap at right angles to its former course, and lie quietly hidden while the hounds run past its spot of concealment. It then jumps back again to its track, and steals quietly out of sight in one direction, while the hounds are going in the other.

The Hare also displays great ingenuity in running over the kind of soil that will best suit the formation of her feet, and has been known on more than one occasion to break the line of scent most effectually by leaping into some stream or lake, and swimming for a considerable distance before she takes to the land again.

In pursuing the Hare with greyhounds, the dogs are held in couples in a leash, and are let loose when a hare is seen. This is the method adopted in coursing matches. In this sport a judge rides after the dogs, and makes note of their performance; the number of turns, and the like, which each of the contestants successfully achieve, and not the mere seizing of the hare, decide the victory.

The Hare has been often tamed. The poet Cowper amused his solitude with his tame hares, and celebrated them in his verse. Dr. Franklin had a hare that used to sit between a cat and a greyhound before the fire, and lived on the best terms with them, and they have been taught various tricks, such as beating drums, firing pistols, and dancing.

The SNOW HARE, *Lepus Alpinus*, is very similar to the American Hare. It is more lively and daring than the common species. The head is shorter, rounder, and more arched; the ears are smaller, the eyes are dark-brown. In winter the Snow Hare is pure white, except the tips of the ears; but in summer is a uniform grayish-brown. The IRISH HARE, *Lepus Hibernicus*, closely resembles the Snow Hare, but does not change its color. In the high north, the Hares remain white all the year through.

THE RABBIT.

The RABBIT or CONEY, *Lepus cuniculus* (Plate LX), is distinguished from the Hare by its smaller dimensions, its grayer color, and its shorter

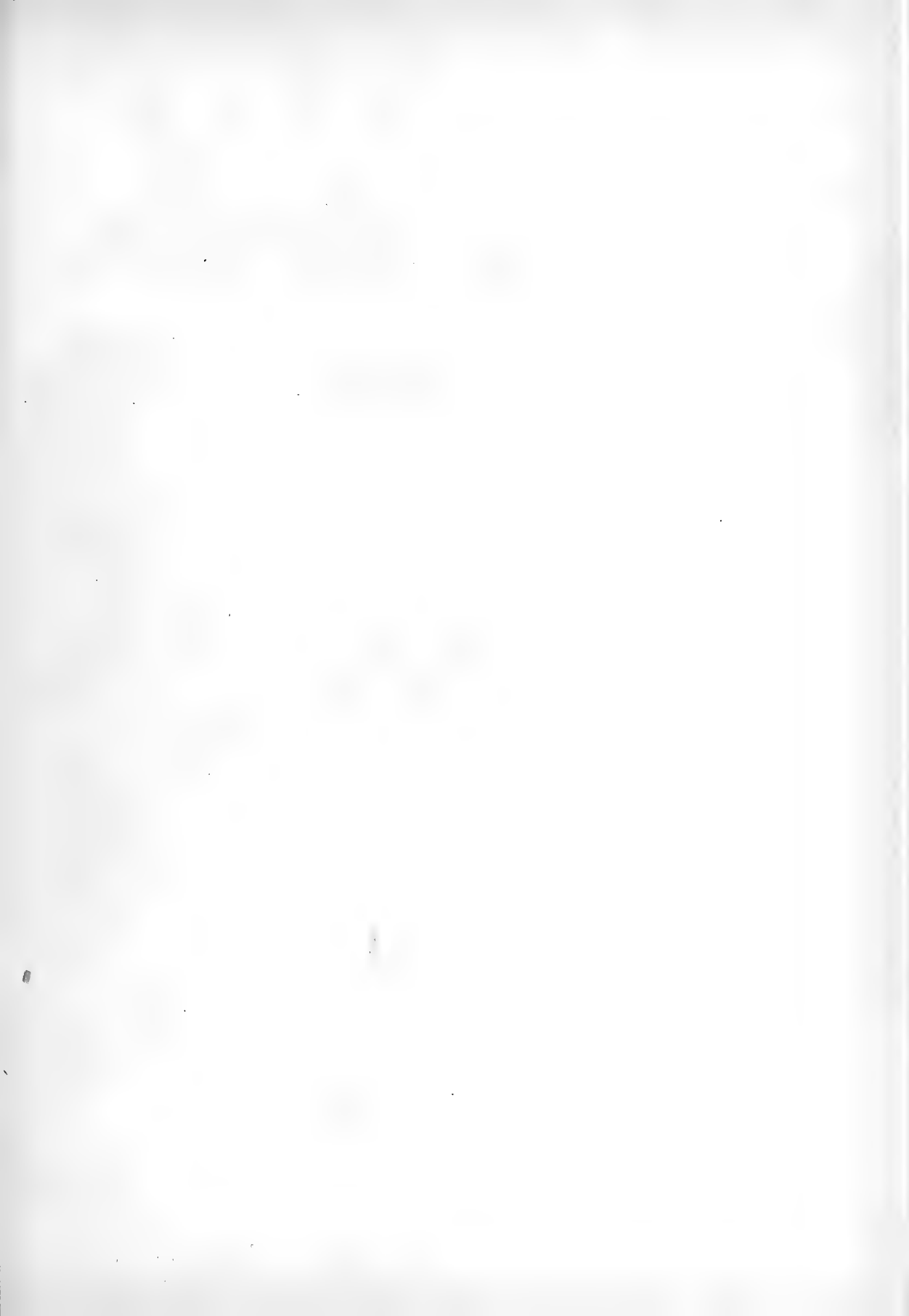
ears, as well as by its habits. It has been extensively acclimatized in America. It exists in great numbers in Sable Island, Nova Scotia, and on Rabbit Key, near Key West. It is found everywhere in Europe, and is supposed to have spread northward from Africa.

The Rabbit is one of the most familiar of British quadrupeds, having taken firm possession of the soil into which it has been imported, and multiplied to so great an extent that its numbers can hardly be kept within proper bounds without annual and wholesale massacres. As it is more tameable than the hare, it has long been ranked among the chief of domestic pets, and has been so modified by careful management that it has developed itself into many permanent varieties, which would be considered as different species by one who saw them for the first time. The little brown, short-furred wild Rabbit of the warren bears hardly less resemblance to the long-haired, silken-furred, Angola variety, than the Angola to the pure Lop-eared variety with its enormously lengthened ears and its heavy dewlap.

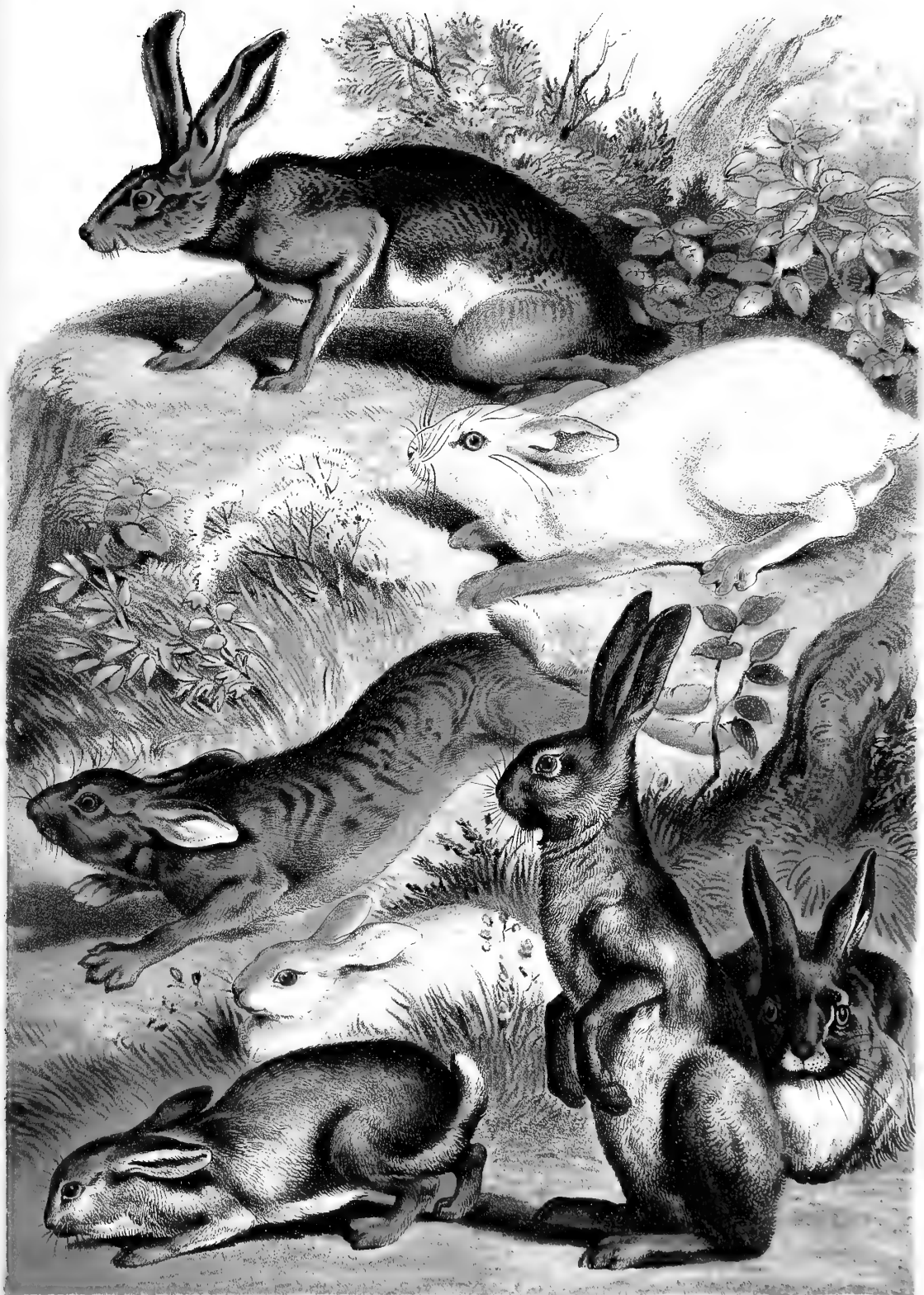
In its wild state the Rabbit is an intelligent and amusing creature, full of odd little tricks, and given to playing the most ludicrous antics as it gambols about the warren in all the unrestrained joyousness of habitual freedom. No one can form any true conception of the Rabbit nature until he has observed the little creatures in their native home; and when he has once done so, he will seize the earliest opportunity of resuming his acquaintance with the droll little creatures.

The female Rabbit is exceedingly prolific, and has seven or eight litters a year, with from four to eight in each. Some days before bringing forth, the Rabbit excavates a chamber which is specially destined for its progeny. This burrow, which is straight or crooked, as the case may be, invariably terminates in a circular apartment, furnished with a bed of dry herbage, which again is covered with a layer of down, that the mother has torn from the lower portion of her body. On this bed the young are deposited.









TEXAS OR JACKASS RABBIT
 NORTHERN HARE SUMMER COAT
 DOMESTIC RABBIT
 COMMON WILD RABBIT

NORTHERN HARE WINTER COAT

COMMON HARE

PLATE LX RODENTIA



ORDER XI.

E D E N T A T A.

FAMILIES.

- 71. BRADYPODIDÆ - - - - - SLOTHS.
- 72. MANIDIDÆ - - - - - SCALY ANT EATERS.
- 73. DASYPOLIDÆ - - - - - ARMADILLOS.
- 74. ORYCTEROPODIDÆ - - - - - ANT BEARS.
- 75. MYRMECOPHAGIDÆ - - - - - ANT EATERS.



DENDAGA

CHAPTER I.

THE SLOTHS AND ARMADILLOS.

THE EDENTATA—THE SLOTHS—THE TWO-TOED SLOTH—THE AI OR THREE-TOED SLOTH—THE SPOTTED SLOTH—THE SCALY ANT-EATERS—THE PHATAGIN—THE PANGOLIN—THE TATOUHON—THE GIANT ARMADILLO—THE TATONAY—THE ARMADILLO—THE APAR—THE PICHEOGO.

THE animals constituting the present Order are the scanty survivors of numerous families which, in earlier periods of the world's history, assumed vast proportions. Many of the fossil species whose bones are dug out of the bowels of the earth, were as large as the ox, the rhinoceros, and the elephant. Of the species now existing, none exceed three feet in length. These singular animals are almost confined to South America, two families are scantily represented in Africa, and one of these extends over all the East.

The name, EDENTATA, means "toothless"; all the order, however, are not completely devoid of teeth, although this is the case with several species; in all, the incisors are wanting, and there is an empty space in front of their jaws. The teeth, in those that have any, are all alike, and have only one fang. The order is divided into *five* families.

THE SLOTHS.

The family BRADYPODIDÆ is formed by *three* genera of arboreal animals, confined to the great forests of South America from Guatemala to Brazil and Eastern Bolivia. The Sloths, from their climbing habits, were for a long time classed among the monkeys. On the ground they move, with extreme slowness, and this inactivity is the source of the common English name. But if we follow with our eye their motions on a tree, in the midst of those conditions of existence which are natural to

them, they leave on our mind a very different impression. They embrace the branches with their strong arms, and bury in the bark the enormous claws which terminate their four limbs. As the last joint of their toes is movable, they can bend them to a certain extent, and thus convert their claws into powerful hooks, which enable them to hang on trees. Hidden in the densest foliage, they browse at their ease on all that surrounds them; or, firmly fixed by three of their legs, they avail themselves of the fourth to gather the fruit and convey it to their mouths. They appear sleepy during the day, their eyes not being fitted for sunlight. Their stomach, like that of the ruminants, is divided into four compartments, but it is not known whether they chew the cud. They have no tail, or visible ear. Their fur is harsh, long, and abundant.

GENUS CHOLOEPUS.

The *two* species are sloths with two toes on the fore-limbs, and the sexes are alike in appearance. They are found in the virgin-forests from Costa Rica to Brazil.

The TWO-TOED SLOTH or UNAN, *Choloepus didactylus* (Plate LXI), measures about thirty inches in length. The hair on the forehead and neck is of an olive-green gray color; on the body, olive-gray; on the breast, olive-brown. The muzzle is hairless and flesh-colored; the soles of the feet are also flesh-colored, while the nails are bluish-gray. They pass their whole lives suspended with their backs downward from the branches of trees, hooking their curved talons over it. Their food consists of leaves, buds, and young shoots.

GENUS BRADYPUS.

The Sloths forming the *two* species of this genus possess three toes on the fore-limbs, and extend from the Amazon River to Rio de Janeiro.

The AI or THREE-TOED SLOTH, *Bradypus tridactylus* (Plate LXI), is rather smaller than the Unan. The color of this animal is rather variable, but is generally of a brownish-gray, slightly variegated by differently tinted hairs, and the head and face being darker than the body and limbs. The hair has a curious hay-like aspect, being coarse, flat, and harsh toward the extremity, although it is very fine toward the

root. The cry of this creature is low and plaintive, and is thought to resemble the sound Ai. The head is short and round, the eyes sunk in the head, and nose large and moist.

GENUS ARCTOPITHECUS.

The *eight* species of this genus have three toes on the fore-limbs, and the males have a colored patch on the backs. They extend from Costa Rica to Brazil and Eastern Bolivia.

The SPOTTED SLOTH, *Arctopithecus flaccidus*, differs from the other Sloths only by possessing a curious black spot on the back which looks like a hole in the trunk of a tree, and is found only in the males. The fur of most of the sloths has a greenish tinge very like that of the "vegetable horsehair" which clothes many of the trees in Central America, and this probably conceals them from their enemies, the harpy-eagles.

THE SCALY ANT-EATERS.

The family MANIDIDÆ or Scaly Ant-eaters are the only Edentata found out of America. They extend in Africa to the West Coast and the Cape, and in Asia from the Himalayas to Ceylon, Borneo, and Java, as well as to South China.

GENUS MANIS.

The *solitary* genus comprises *eight* species. In all, the upper part of the body is covered with large flat scales of horn, which overlap each other like the plates in a fir-cone, and which resemble the scales of a fish more than anything else. The body and tail are long, the head small, the legs short, the claws long and fit for digging. The horny scales do not occur on the under-side of the body; they are sharp at the edges, and uncommonly hard. Between these scales are a few thin hairs. The snout has no scales, but is protected by a horny skin.

The PHATAGIN or LONG-TAILED MANIS, *Manis longicaudatus* (Plate LXI), is a native of West Africa. The body is two feet, the tail three feet in length. When attacked, it rolls itself up into a ball. The negroes kill it with clubs, sell its hide to Europeans, and eat the flesh, which is white and tender. The tongue of the Phatagin is long, and is either inserted into the holes of the ants on which it lives, or laid across their path.

The PANGOLIN or SHORT-TAILED MANIS, *Manis brevicaudatus*, is an Eastern species. It has five toes. Sir Emerson Tennent gives the following short account of it: "Of the Edentates, the only example in Ceylon is the Scaly Ant-eater, called by the Singalese, Caballaya, but usually known by its Malay name of Pengolin, a word indicative of its faculty of 'rolling itself up' into a compact ball, by bending its head toward its stomach, arching its back into a circle, and securing all by a powerful hold of its mail-covered tail. When at liberty, they burrow in the dry ground to a depth of seven or eight feet, where they reside in pairs, and produce annually two or three young.

THE ARMADILLOS.

The family DASYPODIDÆ ranges from South Texas to the plains of Patagonia. It is divided into *six* genera, which are all very much alike. The legs are short, the body compact, the tail of medium length, the horny plates form rings around the body; the other horny integuments on the head and tail are composed of a number of small plates joined together, and forming patterns which differ in the various species. The whole of the animal, even to the long and tapering tail, is covered with these horny scales, with the exception of the upper part of the legs.

GENUS TATARIA.

The TATOUHON, *Tataria septemcinctus*, is a native of Guinea, Brazil, and Paraguay, and is about thirty inches in length. Its color is a very dark brown-black, whence it is often called the BLACK TATU.

According to Audubon: "The Armadillo is not a fighting character, and, in general, does not evince any disposition to resent an attack. In fact, one of them, when teased by a pet parrot, struck out with its claws only till pressed by the bird, when it drew in its head and feet, and, secure in its tough shell, yielded, without seeming to care much about it, to its noisy and mischievous tormentor, until the parrot left it to seek some less apathetic and more vulnerable object."

GENUS PRIMODONTES.

The GIANT ARMADILLO, *Primodontes gigas*, measures more than four feet six inches in length, the head and body being rather more than three

feet long. The teeth are very remarkable, there being from sixteen to eighteen small molars on each side of the jaws. The tail is about seventeen inches long, and tapers gradually to a point from the base, at which spot it is nearly ten inches in circumference. This member is covered with regularly graduating horny rings, and when dried and hollowed, is used as a trumpet by the Botocudos. The Tatou is found in Brazil and Surinam.

GENUS XENURUS.

The TATOUAY, *Xenurus unicinctus*, is mostly remarkable for the undefended state of its tail, which is devoid of the bony rings that encircle the same member in the other Armadillos, and is only supplied with a coating of brown hair. For about three inches of the extremity the under-side of the tail is not even furnished with hair, but is quite naked, with the exception of a few rounded scales.

GENUS DASYPUS.

The ARMADILLO, *Dasypus sexcinctus* (Plate LXI), is about two feet long, and is protected by a coat of six rings of armor-plates. It lives in burrows about two yards long, which, at the entrance, only admit the creature's body, but enlarge in the interior, where it can turn round. Here it passes most of its time. As it is a nocturnal animal, its eyes are more fitted for the dark than for the bright glare of sunlight, which dazzles the creature, and sadly bewilders it. If it should be detected on the surface of the ground, and its retreat intercepted before it can regain its hole, the Armadillo rolls itself up, and tucking its head under its chest, draws in its legs and awaits the result. When taken in hand, it kicks so violently with its powerful legs, that it can inflict severe lacerations with the digging claws.

GENUS TOLYPEUTES.

The APAR, *Tolypeutes tricinctus*, is remarkable for the solid manner in which its armor is attached. It is sometimes called the MATAKO or the BOLITA, from its rolling itself into a ball. It measures about eighteen inches in length. The three rings which characterize it gradually nar-

row from the back to the sides. The rest of the body is hidden by a coat of rough irregular-shaped plates, each of which is composed of a number of small irregular pieces. The color of the animal is a plumbous gray, the skin between the rings is white, but dark on the lower side of the body, where some very strong plates cover the upper parts of the limbs.

GENUS CHLAMYDOPHORUS.

The PICHAGO, *Chlamydophorus truncatus*, is a native of Chili.

The top of the head, the back, and the hind-quarters are covered with a shelly plate, which runs unbroken to the haunches, over which it dips suddenly, looking as if the creature had been chopped short by the blow of a hatchet, and a piece of shell stuck on the cut extremity. The remainder of the body is covered with long silken hair, very like that of the mole in its soft texture. It is a very little creature, scarcely surpassing the common mole in dimensions, and living, like that animal, almost entirely below the surface of the earth. Its feet are formed for burrowing, and are most powerful instruments for that purpose, though they are not well fitted for rapid progress over the ground.

Its food consists, as far as is known, of worms, and other subterranean creatures, in addition to those which it may catch in its nocturnal expeditions into the open air. As is the case with the mole and other subterranean animals, the eyes are of minute dimensions, and are hidden under the soft and profuse fur of the face.



CHAPTER II.

THE AARD VARK AND ANT-EATERS.

THE AARD VARK OF THE CAPE—THE GREAT ANT-EATER OR TAMANOIR—THE TAMANDUA—
THE LITTLE ANT-EATER.

THE family ORYCTEROPIDÆ consists of only *one* genus. The animals belonging to it have the general form of an Ant-eater, but the bristly skin and obtuse snout of a pig.

GENUS ORYCTEROPUS.

The AARD VARK, *Orycteropus capensis*, is the best known of the *two* species.

It is short-legged; its claws are thick, sharp, and almost like hoofs. Its skin is hard, and covered with scanty and rough hair; its head, which is very long and tapering, is terminated by a kind of snout. Its mouth is furnished with molar teeth of a very peculiar structure. If a horizontal section is made of one of these teeth, it presents the appearance of a piece of cane.

The Aard Vark measures rather more than three feet in length, not including the tail, which is about a foot and a half long. Its height is eighteen inches. It lives in burrows, which it hollows out with great rapidity. When its head and fore-feet are buried in the ground, it maintains its position with so much obstinacy that the strongest man is unable to draw it out. Its food consists of ants, or rather *termites*, insects which are commonly designated by the name of white ants, on account of their resemblance to very large specimens of the race. It is well known that these termites live enclosed in a mound of earth in the form of a dome. The Aard Vark, squatting down by the side of it, scratches till an entrance is effected through the walls, and immediately legions of the insects rush out to defend their habitation. Without losing a

moment, the quadruped darts out its tongue, which is covered with a viscous humor, into the midst of the restless crowd, and then draws it back covered with the victims.

This exclusive description of food communicates to the flesh a strongly acidulated taste; nevertheless the Hottentots and the colonists at the Cape of Good Hope are partial to it, and hunt these animals. A slight blow on the head with a stick is sufficient to kill it. The Aard Vark is represented in Northeastern Africa by the species *Orycteropus Ethiopicus*, and it is probable that a third species occurs in Senegal.

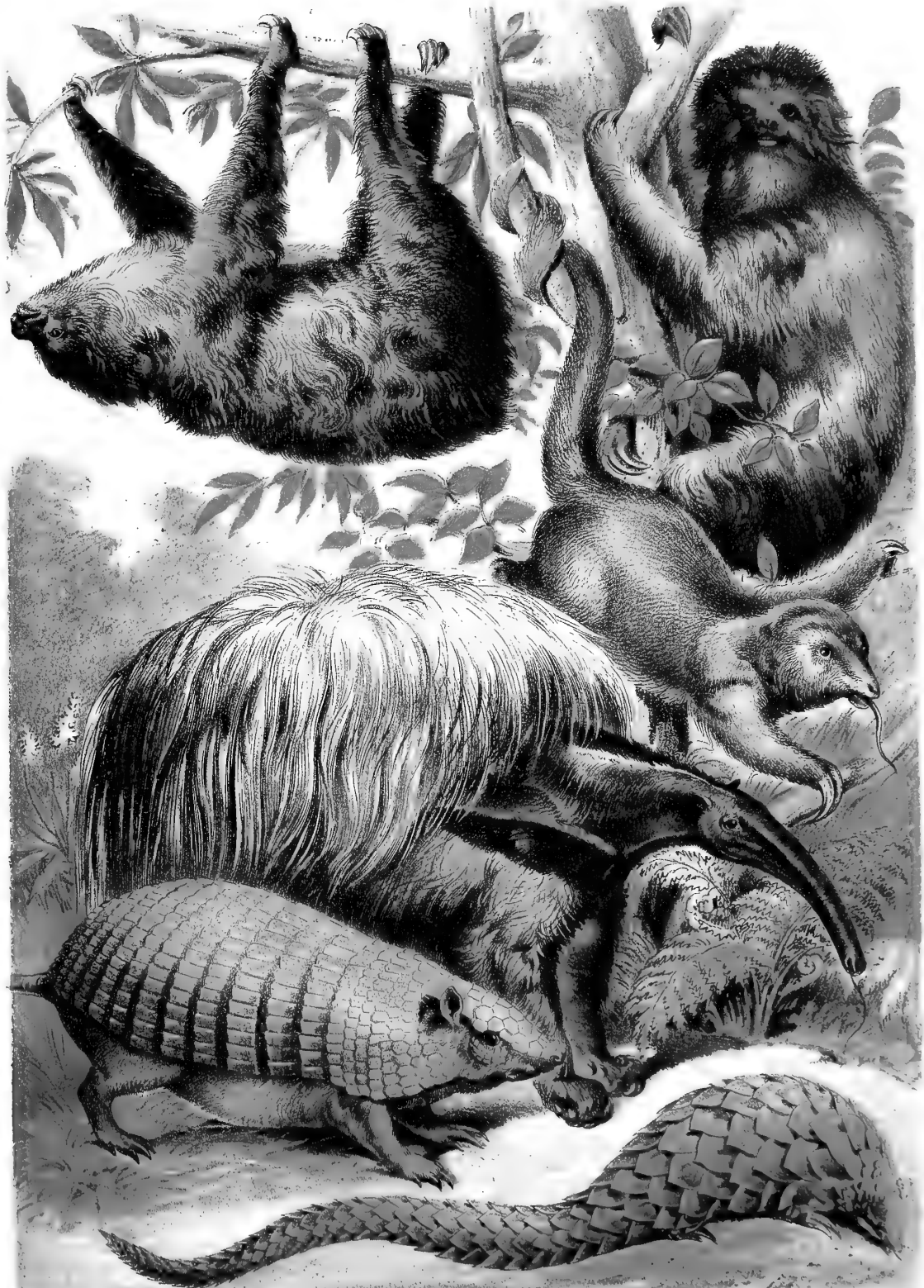
The family MYRMECOPHAGIDÆ comprises *three* genera of true Ant-eaters. They have little resemblance to the Aard Vark. The body is more elongated, the head and snout more pointed, and the tail is much longer. The hinder legs are weaker than the fore ones. The mouth is very small, the tongue long, thin, and round like a worm. The eyes and ears are small. There is not a trace of teeth.

GENUS MYRMECOPHAGUS.

The GREAT ANT-EATER, *Myrmecophagus jubatus* (Plate LXI), the *only* species, is also called the ANT BEAR or TAMANOIR. It possesses a wonderfully elongated and narrow head, and is thickly covered with long, coarse hair, which on the tail forms a heavy plume. The color of this animal is brown, washed with gray on the head and face, and interspersed with pure white hairs on the head, body, and tail. The throat is black, and a long triangular black mark arises from the throat, and passes obliquely over the shoulders. There are four toes on the fore-feet, and five on the hinder. In total length it measures between six and seven feet, the tail being about two feet six inches long.

The claws of the fore-feet are extremely long and curved, and the animal folds them back upon a thick, rough pad which is placed in the palm, and seems to render the exertion of walking less difficult. As, however, the Ant Bear is forced to walk upon the outer edge of its fore-feet, its progress is a peculiarly awkward one, and cannot be kept up for any long time. Its mode of feeding is similar to that of the Aard Vark. It extends its long extensile tongue, which is covered with a glutinous secretion to which the ants adhere, and which prevents them from making their escape during the short period of time that elapses between the





SLOTH
GREAT ANT-EATER
ARMADILLO

AI
LITTLE ANT-EATER
PHATAGIN

PLATE LXI EDENTATA



moment when they are first touched and that in which they are drawn into the mouth. It makes no burrows, but contents itself with the shade of its own plummy tail when it retires to rest. While sleeping, it likes a rough bundle of hay thrown on the ground. The eye is very sly and cunning in its expression. It is a native of Paraguay, Brazil, and Guinea.

It is nocturnal, solitary, and listless in its habits, and delights in damp forests and marshy savannahs, in which its insect food is most abundant. The female only produces a single young one at a time, which she constantly carries on her back. In the gardens of the Zoological Society of London, which was in possession of two specimens, they were fed on bread soaked in milk, and eggs; but it became certain that they had also a taste for blood, as they were one day noticed sucking the flesh of a rabbit which had been given them.

GENUS TAMANDUA.

The *two* species of four-toed Ant-eaters extend from Guatemala and Ecuador to Paraguay. They possess one of the characteristics which are peculiar to American monkeys, that of grasping branches firmly by the tail, a portion of which is bare of hair underneath.

The TAMANDUA, *Tamandua tetradactyla*, has four toes on the hind, five on the fore-feet. It inhabits the same districts as the Great Ant-eater, but extends into Peru. Its total length is about forty inches, its average height about a foot or fourteen inches. The head is not so elongated, nor the muzzle so prominent as in the Great Ant-eater; the neck is thick, the ears oval, and the hair short over the whole body. Its color, too, is much lighter than that of the Tamanoir, and a black stripe passes over each shoulder. It is much more active than the preceding species, and is an excellent climber of trees, which it ascends in search of the insects on which it feeds. The tail is long and tapering.

A live specimen has been carried to London, where it soon came to know its keeper, leaping upon his shoulder, and poking its worm-like tongue into every fold of his clothing, as well as into his ears, nose and eyes. When strangers approached, it ran to the bars of its cage, and put its tongue out to lick their hands; its food was milk, sweet biscuits, and chopped meat.

GENUS CYCLOTHURUS.

The *two* species of Two-toed Ant-eaters are found in South America from Honduras and Costa Rica to Brazil.

The LITTLE ANT-EATER, *Cyclothurus didactylus* (Plate LXII), is a truly curious animal, possessing many of the habits of the two preceding animals, together with several customs of its own. The head of this creature is comparatively short; its body is covered with fine silken fur, and its entire length does not exceed twenty or twenty-one inches. The tail is well furred, excepting three inches of the under surface at the extremity, which is employed as the prehensile portion of that member, and is capable of sustaining the weight of the body as it swings from a branch. On looking at the skeleton, a most curious structure presents itself. On a side view, the cavity of the chest is completely hidden by the ribs, which are greatly flattened, and overlap each other so that on a hasty glance the ribs appear to be formed of one solid piece of bone. There are only two claws on the fore-feet and four on the hinder limbs. Its silky coat is usually fox-red, but darker specimens have been seen.

The Little Ant-eater is a native of tropical America, and is always to be found on trees. It possesses many squirrel-like customs, using its fore-claws with great dexterity, and hooking the smaller insects out of the bark crevices in which they have taken refuge. While thus employed it sits upon its hind limbs, supporting itself with its prehensile tail. The claws are compressed, curved, and very sharp, and the animal can strike smart blows with them. It is a bold little creature, attacking the nests of wasps, putting its little paw into the combs, and dragging the grubs from their cells.

Like its larger relations, it is nocturnal in its habits, and sleeps during the day with its tail safely twisted round the branch on which it sits.



ORDER XII.

MARSUPIALIA.

FAMILIES.

76. DIDELPHIDÆ - - - - - OPOSSUMS.
77. DASYURIDÆ - - - - - NATIVE CATS.
78. MYRMECOBIIDÆ - - - - - NATIVE ANT-EATER.
79. PERAMELIDÆ - - - - - BANDICOOTS.
80. MACROPODIDÆ - - - - - KANGAROOS.
81. PHALANGISTIDÆ - - - - - PHALANGERS.
82. PHASCOLOMYIDÆ - - - - - WOMBATS.



MARSUPIALIA

CHAPTER I.

THE OPOSSUMS AND BANDICOOTS.

THE MARSUPIALS—THE TRUE OPOSSUMS—THE VIRGINIA OPOSSUM—MERRIAN'S OPOSSUM—THE CRAB-EATING OPOSSUM—THE YAPOCK—THE POUCHED MOUSE—THE TASMANIAN DEVIL—THE NATIVE CAT—THE ZEBRA WOLF—THE NATIVE ANT-EATER—THE STRIPED BANDICOOT—THE CHÆROPUS.

THE name MARSUPIALIA is derived from the Latin word *marsupium* "a purse," and indicates the characteristic peculiarity of the whole Order. The pouch varies considerably in the various species. Usually it is tolerably large, and it contains the *mammæ* or teats. The young, when born, are exceedingly minute, and are transferred by the mother into the pouch, when they instinctively attach themselves to the teats. By degrees they loosen their hold, and put their little heads out of the living cradle. In a few weeks more they leave the pouch entirely, but their mother is always ready to receive them again into their cradle.

The Order is divided into *seven* families, six of which are Australian, and one American.

The family DIDELPHIDÆ or TRUE OPOSSUMS range through all the wooded districts of South America from Texas to the River Platt, with one species extending to the Hudson River, and west to the Missouri. They are most numerous in the great forest region of Brazil, but the number of species is very uncertain.

GENUS DIDELPHYS.

With the exception of the Yapock, and a small rat-like animal, HYRACODON, found in Ecuador, all the members of the family belong to this genus, and form *twenty* species.

The OPOSSUM, *Didelphys Virginiana* (Plate LXII) is about the size of a large cat. They have the thumbs opposable and nailless, the tail generally bare and prehensile for its terminal half, or more. The mouth is provided with fifty teeth. They sally out at twilight or at night to feed on small quadrupeds, birds, eggs, insects, molluscs, and even fruits or young vegetable shoots, from which they suck the sap. The females are remarkably prolific; they have from ten to fifteen young at a litter, and nurse their progeny with tender solicitude. The Opossum being plantigrade, walks and runs awkwardly, but climbs well.

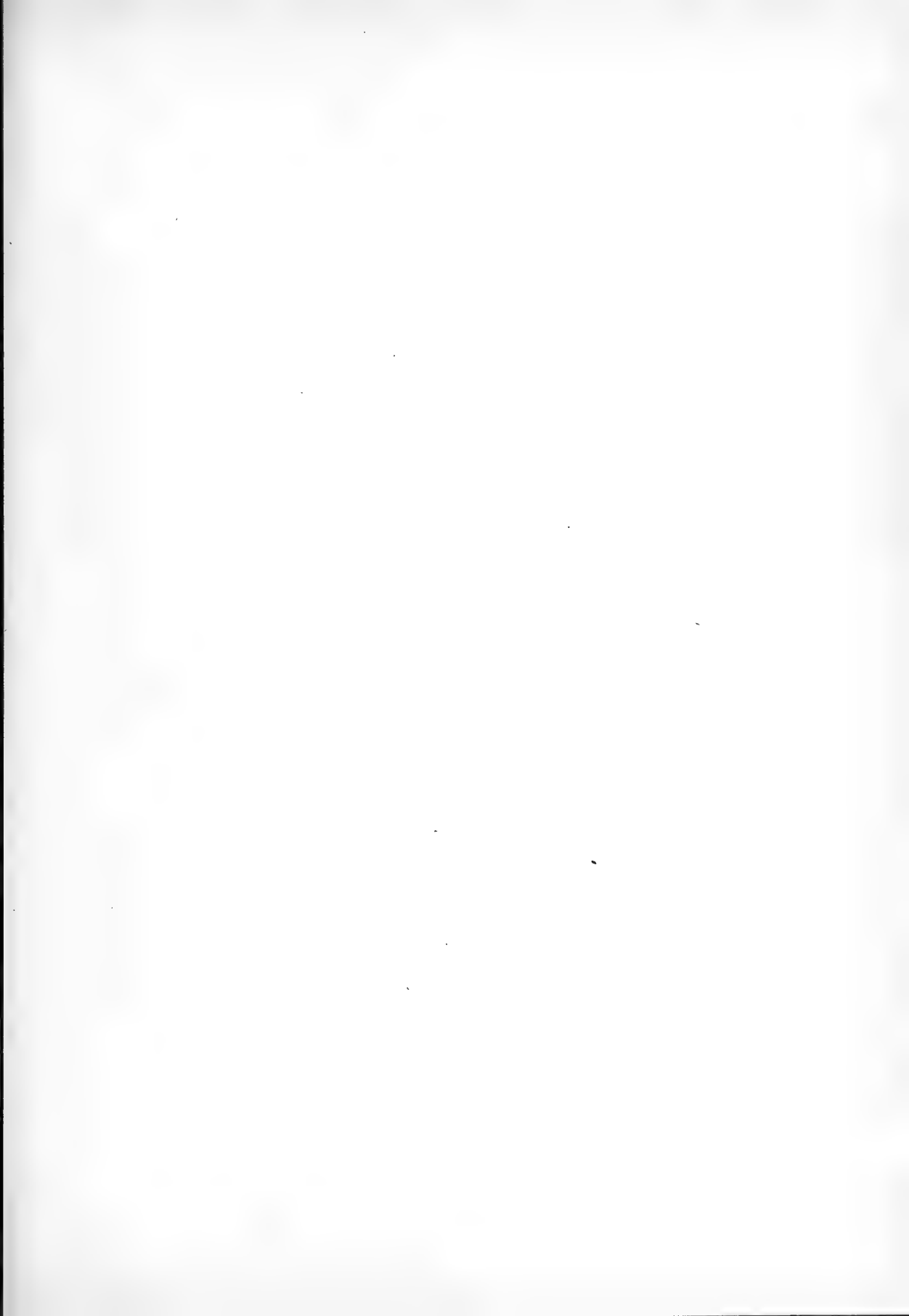
MERRIAN'S OPOSSUM, *Didelphys dorsigera* (Plate LXII), has no true pouch, the place being indicated only by a fold of skin. The mother carries her young on her back, where they cling tightly to her fur with their feet, and twine their tails around hers. It is a very small animal, measuring when full-grown only six inches from the nose to the root of the tail. The fur is very short, and of a pale grayish-brown on the upper portions. Round the eye is a deep brown mark, the forehead, cheeks, limbs, and feet are of a yellowish-white, inclining to gray. Its native country is Surinam.

The CRAB-EATING OPOSSUM, *Didelphys cancrivora*, is not so large an animal as the Virginia Opossum, being only thirty or thirty-one inches in total length, the head and body measuring sixteen inches, and the tail fifteen. It can also be distinguished by the darker hue of its fur, the attenuated head, and the uniformly colored ears, which are generally black, but are sometimes of a yellowish tint. It is peculiarly fitted for dwelling in trees, where it swings with its prehensile tail.

GENUS CHEIRONECTES.

The YAPOCK, *Cheironectes yapock* (Plate LXII); is the *only* species of the genus. It may be considered as the Marsupial representative of the Otter.

The general hue of the fur is a pale fawn-gray, with a very *watery* look about it, and set closely upon the skin. Four dark bands of sooty-black are drawn across the body in a peculiar, but extremely variable manner. The hind-feet are furnished with a membranous web. The claws are small and weak, and the thumb-joint is not opposable to the others. The ears are moderate in size, sharp, and pointed, and the head







VIRGINIA OPOSSUM
YAPOCK OPOSSUM

MERIAN'S OPOSSUM
BANDICOOT

DASYURE
CHAEROPUS

PLATE LXII MARSUPIALIA.



tapers rapidly toward the nose. The Yapock has large cheek-pouches, extending far backward along the sides of the mouth, and capable of containing a large supply of food.

The family DASYURIDÆ forms a group of Carnivorous and Insectivorous Marsupials ranging from the size of a wolf to that of a mouse. They are found in Australia, Tasmania, and New Guinea, and are placed in *ten* genera. They all possess sharp-edged and pointed teeth.

GENUS ANTECHINUS.

The *twelve* species are distributed over all Australia and Tasmania, and are the most common of Australian quadrupeds. They are all small, hardly exceeding the size of a common mouse.

The YELLOW-FOOTED POUCHED MOUSE, *Antechinus flavipes*, is a very pretty little creature. The face, head, and shoulders are dark-gray, the sides of the body a warm chestnut. The chin, throat, and abdomen are white, the tail black, and often tufted. They are arboreal animals, and run up and down a perpendicular trunk with singular activity.

GENUS SARCOPHILUS.

The TASMANIAN DEVIL, *Sarcophilus ursinus* (Plate LXIII), is the *only* species. Its fur is of a deep dead-black, without any glossiness, and there is a conspicuous white mark across the breast. The body is heavy and thick-set, the muzzle blunt, the mouth wide. Its length, exclusive of the tail, is about twenty inches. It is a creature of unparalleled ferocity and stupidity, and lives in a state of passionate and purposeless anger. It is incapable of fear, and more than a match for most dogs. It is now nearly exterminated, as it plays sad havoc in the poultry-yard. It burrows in the ground.

GENUS DASYURUS.

The DASYURE or NATIVE CAT, *Dasyurus viverrinus* (Plate LXII) is of a dark brown, almost black color, diversified with many spots of white scattered at random over the whole of the body. The tail is moderately long, but not prehensile, and is thickly covered with hair. They make their abodes in the hollows of decayed trees. This is the best known of the *four* species.

GENUS THYLOCINUS.

The ZEBRA WOLF, *Thylocinus cynocephalus*, the *only* species, is the largest and most destructive of the Carnivorous Marsupials. They are also called "Native Tigers" or "Native Hyænas," and being destructive to sheep, have been extensively destroyed by the farmers. The general tint of the fur is a grayish-brown, washed with yellow. It is about equal to the jackal in size, and if attacked will fight in the most desperate manner.

The family MYRMECOBIIDÆ consists of only *one* genus and *one* species, the Native Ant-eater, a small, bushy-tailed, squirrel-like animal, found in the South and West of Australia. It is remarkable for possessing no fewer than fifty-two teeth. The pouch is rudimentary.

GENUS MYRMECOBIUS.

The NATIVE ANT-EATER, *Myrmecobius fasciatus* (Plate LXIII) is a beautiful little animal. The general color is a bright fawn on the shoulders, which deepens into blackish-brown from the shoulders to the tail, the fur of the hinder portions being nearly black. Across the back are drawn six or seven white bands, broad on the back, and tapering off towards their extremities. The under parts of the body are of a yellowish-white. The tail is thickly covered with long, bushy hair, and has a grizzled aspect. Its long tongue is nearly as thick as a common black-lead pencil, and is capable of protrusion to some distance.

The number of its young averages from five to eight. Its usual habitation is in the trunk of a fallen tree, or in a hollow in the ground. It is a native of the borders of the Swan River.

The family PERAMELIDÆ are small Insectivorous Marsupials, approximating in form to the kangaroo. They range over the whole of Australia. They have a rat-like aspect, and their gait is a mixture of running and jumping. The pouch opens backward.

GENUS PERAMELES.

The STRIPED BANDICOOT, *Perameles fasciata* (Plate LXII), is of a blackish-yellow color. Over the hinder quarters are drawn some boldly marked black lines, which, when viewed from behind, form a singular

and rather pleasing pattern, the dark stripes being made more conspicuous by bands of whitish-yellow. These marks continue as far as the root of the tail, and a single, narrow dark line runs along the whole upper side of the tail, which is of the same color as the body. The fur is rather light upon the head, and the under parts of the body, together with the feet, are white, slightly tinged with gray.

The LONG-NOSED BANDICOOT, *Perameles nasuta*, is not unlike the preceding animal in form. The face, head, and body are of a brown tint, pencilled with black on the upper portions, and the sides are of a pale brown. The edge of the upper lip is white, as are also the under portions of the body, and the fore-legs and feet. The fur is very harsh to the touch. The total length of this animal is about twenty-one inches, the tail being five inches in length.

The genus contains eight species, one of which, *Perameles Gunii*, is peculiar to New Guinea.

GENUS CHÆROPUS.

The *solitary* species of this genus is a very pretty little animal with something of the appearance of the mouse-deer. The name, *Chæropus* or "Swine-footed," has been given to it from the fact that the fore-feet have only two toes of equal length, with hoof-like claws, which leave a track very much like that of the hog.

The CHÆROPUS, *Chæropus castanotis* (Plate LXII), is about equal in size to a small rabbit, and the soft, woolly fur is much of the same color as that of the common wild rabbit.

It is an inhabitant of New South Wales. Its speed is considerable, and its usual haunts are among the masses of dense scrub foliage that cover so vast an extent of ground in its native country. Its nest is similar to that of the Bandicoot, being made of dried grass and leaves rather artistically put together, the grass, however, predominating.



CHAPTER II.

THE KANGAROOS, PHALANGERS, AND WOM-BATS.

THE KANGAROO—THE WOOLLY KANGAROO—THE WALLABEE—THE ROCK KANGAROO—THE TREE KANGAROO—THE KANGAROO HARE—THE JERBOA KANGAROO—THE POTOROO—THE KOALA—THE SOOTY PHALANGIST—THE VULPINE PHALANGIST—THE CUSCUS—THE TAGUAN—THE GREAT FLYING PHALANGER—THE SUGAR SQUIRREL—OPOSSUM MOUSE—THE WOMBAT.

THE most prominent characteristic of the family MACROPODIDÆ is the relative disproportion of their anterior and posterior members. While the former are short and weak, the latter are singularly long, thick, and strong. Thence the name of *Macropodidæ* or “long-footed.” The tail is long and powerful, and constitutes a sort of fifth member, destined to facilitate in the Kangaroos that mode of progression which is peculiar to them.

GENUS MACROPUS.

The *four* species of the genus have all powerful tails, not so long as the body.

The KANGAROO, *Macropus major* (Plate LXIII), is sometimes called the Great Kangaroo. The average dimensions of an adult male are generally as follows: the head and body exceed four feet, and the tail is rather more than three feet in length; the circumference of the tail at its base is about a foot. When it sits erect after its curious tripod fashion, supported by its hind-quarters and tail, its height is rather more than fifty inches; but when it wishes to survey the country, and stands erect upon its toes, it surpasses in height many a well-grown man. The female is very much smaller than her mate, being under six feet in total length, and the difference in size is so great that the two sexes might well be taken for different species.

The color of the animal is brown, mingled with gray, the gray predominating on the under portions of the body and the under-faces of the limbs. The fore-feet are black, as is also the tip of the tail.

The WOOLLY KANGAROO, *Macropus laniger*, has a woolly matted coat, of a rusty yellow color, changing to gray upon the head and shoulders. The sides of the mouth are white, and the toes are covered with black hairs. The tail is uncommonly large and powerful, and is covered with short hair.

GENUS HALMATURUS.

The WALLABEE, *Halmaturus ualabatus*, is the most typical of the *eighteen* species. It is not as large as the common or the woolly kangaroo, being only four feet six inches in total length, of which measurement the tail occupies two feet. Its fur is rather long and coarse in texture. The color is a darkish-brown washed with a warm rusty hue, and obscurely pencilled with whitish-gray. The under portions of the body are of a yellowish tint, and the feet and the wrists are quite black. The dorsal third of the tail is of the same color as the back, but the remaining two-thirds change abruptly from brown to black.

The animal is an inhabitant of New South Wales, and is of tolerably frequent occurrence in the neighborhood of Port Jackson. It is sometimes known by the name of the Aroe Kangaroo.

GENUS PETROGALE.

The genus comprises *seven* species of Kangaroos, which have derived their generic title from their rock-loving habits.

The ROCK KANGAROO, *Petrogale penicillada*, is the most striking of the group.

The color of the animal is of a purplish-gray, warming into a rusty red upon the hind-quarters. A white band runs along the throat to the chest. The total length of a male adult is about four feet. The tail has a tuft of dark hairs about three inches in length. The body is robust, and the feet thickly covered with fur.

GENUS DENDROLOGUS.

The *two* species are peculiar to New Guinea.

The TREE KANGAROO, *Dendrologus ursinus* (Plate LXIII), is called *ursinus*, or bear-like, as the hairs of its fur are thought to bear some resemblance to those of the American black bear. The whole of the back and the upper parts of the body are a deep, glossy black, the hairs being rather coarse, and running to some length. The under parts of the body are of a yellowish hue, and the breast is washed with a richer and deeper tint of chestnut. The tail is of the same color as the body, and is of very great length, probably to aid the animal in balancing itself as it climbs among the branches of the trees on which it loves to disport itself.

GENUS LAGORCHESTES.

The KANGAROO HARE, *Lagorchestes leproides*, is found in the interior of Australia. All the *five* species in the genus have many hare-like traits, such as squatting close to the ground, "doubling" when pursued, and running with great celerity.

The total length of this animal is about two feet, the tail occupying about thirteen inches. The color of the fur is very like that of the European hare, but the different specimens vary much, some being much redder than others. The fore-legs are black, the hinder feet a brownish white. A buff-colored ring surrounds the eye, and the back of the neck is washed with yellow. The tail is of a very pale brownish-gray.

GENUS BETTONGIA.

The *six* species forming this genus have very short, broad heads. Their general color is a palish brown, pencilled with white, and their size is about that of a hare.

The BRUSH-TAILED BETTONG, *Bettongia penicillata*, is also called the Jerboa Kangaroo. It is very common over the whole of New South Wales.

It is a nocturnal animal, and its nest is a very ingenious specimen of architecture. It conveys the materials for it by twisting its prehensile







PHALANGER
TASMANIAN DEVIL

KOALA
KANGAROO

TREE KANGAROO
MARMOSET
WOMBAT

PLATE XIII MARSUPIAIIA



tail round a bundle of grass and hopping away merrily with its burden. The mother invariably drags a tuft of grass over the entrance whenever she leaves or enters her home.

GENUS HYPSSIPRYMNUM.

The POTOROO or KANGAROO RAT, *Hypsiprymnus minor*, is the most typical of the *four* species.

It is but a diminutive animal, the head and body being only fifteen inches long, and the tail between ten and eleven inches. The color of the fur is brownish-black, pencilled along the back with a gray-white. The under parts of the body are white, and the fore-feet are brown. The tail is equal to the body in length, and is covered with scales, through the intervals of which sundry short, stiff, and black hairs protrude.

The family PHALANGISTIDÆ constitutes one of the most varied and interesting groups of Marsupials, being modified in various ways for an arboreal life. These variations within the range of a single family indicate the great antiquity of the Australian fauna. It comprises *eight* genera.

GENUS PHASCOLARCTUS.

The KOALA, *Phascolarctus cinereus* (Plate LXIII), is the Australian representative of the American sloth. The toes of the forefeet or paws are divided into two sets, the one composed of the two inner toes, and the other of the three outer.

The head has a very unique aspect, on account of the tufts of long hairs which decorate the ears. The muzzle is devoid of hair, but feels like cotton velvet when gently stroked with the fingers.

GENUS PHALANGISTA.

The PHALANGISTS are characterized by possessing a prehensile tail. This member, although to all appearance covered with a heavy coating of long hair, has its inferior surface for some distance from the extremity bare of fur. The genus contains *five* species.

The SOOTY PHALANGIST or TAPOA, *Phalangista fuliginosa*, is prized for its soft and beautiful fur which usually is of a deep blackish-brown

color. The tail is very full, the hair being thick, long, and bushy. The ears are rather elongated, and externally naked. The underside of the body is of the same color as the upper portions.

The VULPINE PHALANGIST, *Phalangista Vulpina*, is often called simply the Opossum. It merits by its form and nature, its distinguishing epithet of Vulpine or Fox-like.

It is an extremely common animal, and is the widest diffused of all the Australian opossum-like animals. It is nocturnal, residing during the day in the hollows of decaying trees. The nature of its food is of a mixed character. If a small bird be given to a Vulpine Phalangist, the creature seizes it in his paws, and then tears it to pieces and eats it. In all probability, therefore, the creature makes no small portion of its meals on various animal substances, such as insects, reptiles, and eggs. It is a tolerably large animal, equalling a large cat in dimensions.

GENUS CUSCUS.

The WOOLLY PHALANGERS are divided into *eight* species. The tail, instead of being covered with hair, is naked, except at the base, and is thickly studded with minute tubercles. They are not found in Southern Australia; but are natives of New Guinea, the Moluccas, and Northern Australia.

The SPOTTED CUSCUS, *Cuscus maculatus*, in size is equal to a tolerably large cat, and its tail is remarkably prehensile. Its movements are slow and cautious, and its food is chiefly of a vegetable nature. Its fur is beautifully soft and silken in its texture, but the color is singularly variable. Another species, called the Ursine Cuscus, is of a uniform deep brown.

GENUS PETAURISTA.

The TAGUAN, *Petaurista taguanoides*, is the *only* species of the genus. It is provided with a parachute membrane on the flanks, which enables it to float through the air like the flying squirrels.

In color it is extremely variable; the back is of a rather deep blackish-brown, darker or lighter in different individuals, the feet and muzzle are nearly black, and the under surface of the body and membrane is white. The upper surface of the parachute membrane is rather grizzled, on account of the variegated tints of black and gray with which the hairs are annulated. Many varieties of color, however, exist in the animal.

GENUS BELIDEUS.

The *five* species of Flying Opossums are found in New Guinea, as well as in Australia.

The GREAT FLYING PHALANGER, *Belideus Australis* (Plate LXIII), is an inhabitant of New Holland. Its color is variable, but generally may be described as brown tinged with gray, with a darker line along the spine. The abdomen and under portions of the flying membrane are white, very perceptibly worked with yellow. The feet are blackish-brown, the tail is covered with long and soft fur of a brown tint. The total length of the animal is a little over three feet. The native name for the creature is the HEPOONA ROO.

The SUGAR SQUIRREL, *Belideus sciureus*, is also called the NORFOLK ISLAND FLYING SQUIRREL, and the SQUIRREL PETAURUS. Its fur is very beautiful, being of a nearly uniform brownish-gray, of a peculiarly delicate hue, and remarkably soft in its texture. The parachute membrane is gray above, but is edged with a rich brown band, and a bold stripe of blackish-brown is drawn along the curve of the spine, reaching from the point of the nose to the root of the tail. The head is somewhat darker than the rest of the body. The under parts of the body are nearly white. Its long and bushy tail is covered with a profusion of very long, full, soft hair, grayish-brown above, and of a beautiful white underneath.

GENUS ACROBATA.

The OPOSSUM MOUSE, *Acrobata pygmæus*, is also called the Flying Mouse. It is about the size of our common mouse, and when it is resting upon a branch, with its parachute, or umbrella of skin, drawn close to the body by its own elasticity, it looks very like it.

Its color is the well-known mouse-tint; but on the abdomen, and under portions of the skin-parachute, the fur is beautifully white.

The remaining genera DROMECIA and TARRIPES call for only slight mention. The former contains *five* species of beautiful dormouse-like creatures. The latter is formed of *one* species which is a true honey-sucker, with an extensile tongue, and of the size of a mouse.

The family PHASCOLOMIGIDÆ contains only *one* genus of *three* species.

The animals comprised in it are tailless, terrestrial burrowing animals, about the size of a badger, but feeding on roots and grass.

GENUS PHASCOLOMYS.

The WOMBAT, *Phascolomys ursinus* (Plate LXIII), is popularly styled the Australian Badger. In all its exterior appearance it is a rodent; in its internal anatomy it approximates to the beaver.

Its fur is warm, long, and very harsh to the touch, and its color is gray, mottled with black and white. The under parts of the body are grayish-white, and the feet are black. The muzzle is very broad and thick. The length of the animal is about three feet, the head measuring seven inches.

It is nocturnal in its habits, living during the day in the depths of a capacious burrow.

Its teeth present a curious resemblance to those of the rodent animals, and its feet are broad, and provided with very strong claws, that are formed for digging in the earth. There are five toes to each foot, but the thumb of the hinder feet is extremely small, and devoid of a claw. This animal is remarkable for possessing fifteen pairs of ribs—in one case sixteen pairs of ribs were found—only six pairs of which reach the breast-bone.



ORDER XIII.

MONOTREMATA.

FAMILIES.

83. ORNITHORHYNCHIDÆ - - - - - DUCKBILLS.
84. ECHIDNIDÆ - - - - - ECHIDNÆ.

MONOTREMATA

THE DUCK MOLE AND AUSTRALIAN HEDGEHOG.

THE MONOTREMATA—THE FAMILY ORNITHORHYNCHIDÆ—THE DUCK MOLE—THE FAMILY ECHIDNIDÆ—THE NATIVE HEDGEHOG—THE TASMANIAN SPECIES—CONCLUSION.

THE strange animals belonging to the order MONOTREMATA appear to be a link between Mammals, Birds, and Reptiles. That they are Mammals, is beyond dispute, for the females have lacteal glands, and secrete genuine milk; but their interior anatomy is that which is familiar to us in birds; externally, and as regards the skeleton, they are the very opposite of birds. They are small mammals, with short limbs, beak-like jaws covered with a dry skin, small eyes, a short flat tail, feet with five long toes and powerful claws. They have no external ear.

THE DUCK-BILLS.

The family ORNITHORHYNCHIDÆ is found in East and South Australia and Tasmania. It is represented by a *solitary* species of a *single* genus, an animal of so strange an appearance, that when the first stuffed specimen was brought to England, it was taken for the contrivance of some swindler.

GENUS ORNITHORHYNCHUS.

The DUCK MOLE, *Ornithorhynchus paradoxus* (Plate LXIV), is known also as the MULLINGONG. The name *Ornithorhynchus* signifies "bird's beak," and describes the duck-like bill the creature possesses. It is an

animal duly organized for aquatic life. Its feet have five toes, terminated by stout nails. The front feet are completely webbed. The tail is broad, of middling length, and flattened on its lower surface. The beak is flattened, and is not much unlike that of a swan or duck. Two great horny excrescences, placed on each jaw, supply the place of molars. Its coat is pretty thick, and is of a brown color, more or less tinged with russet, changing to light-fawn on the abdomen.

In the males, the heels of the posterior members are each armed with a spur or dew claw, pierced with a hole at its extremity. This spur allows to escape, at the will of the animal, a liquid, secreted by a gland which is situated on the thigh, and with which the spur communicates by a broad subcutaneous conduit. This liquid has nothing venomous about it. The organ in question, very much developed in the males, is quite rudimentary in the females, and, as she ages, disappears entirely. Dr. Bennett allowed himself frequently to be wounded with this spur, and experienced no ill effects.

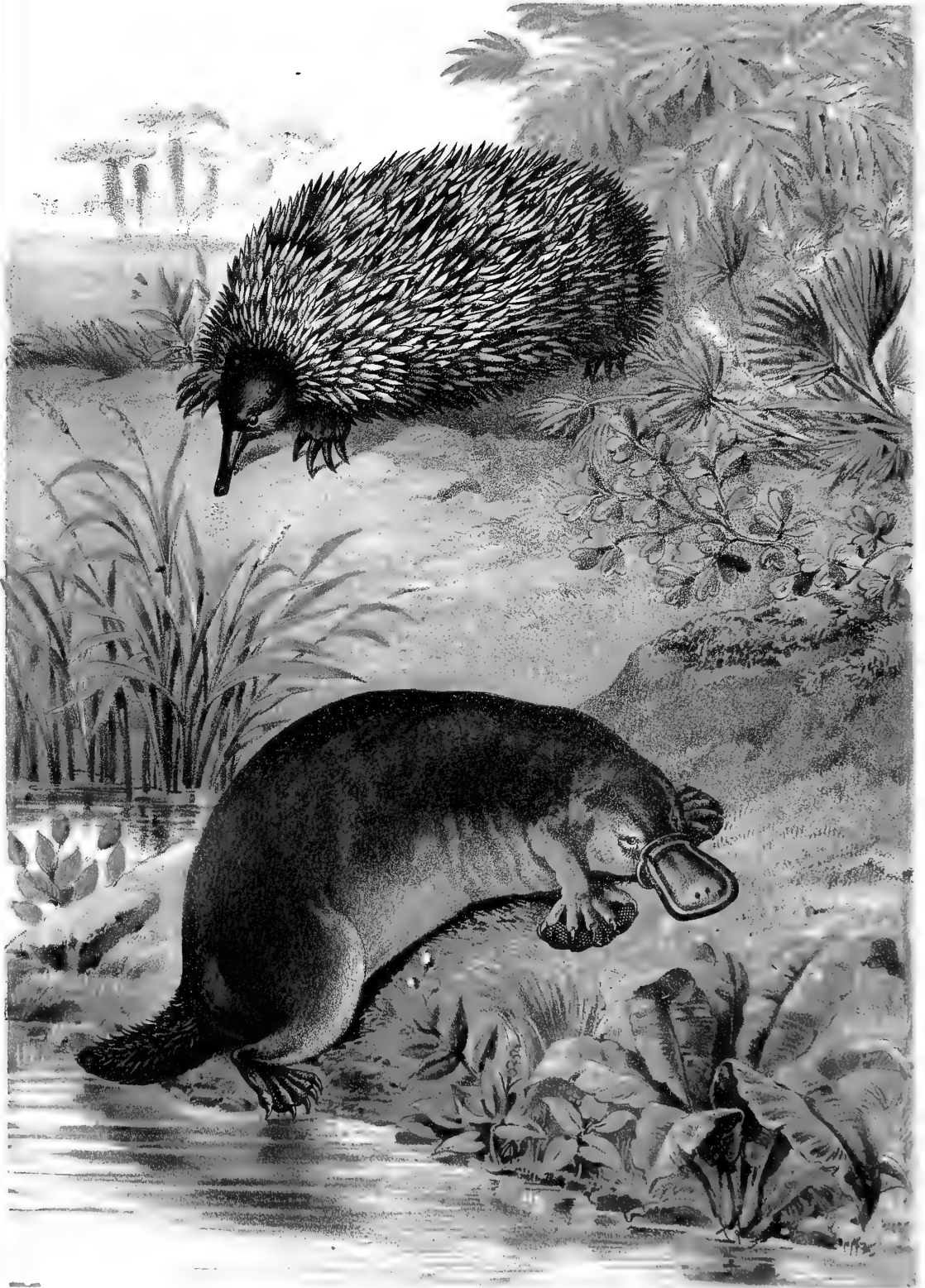
The Duck Mole can run on land and swim in water with equal ease. Its fore-feet are used for digging as well as swimming, and are armed with powerful claws. The animal has been seen to make a burrow two feet in length through hard gravelly soil in less than ten minutes. It uses its beak as well as its feet when digging. The burrow in which the Mullingong lives is generally from twenty to forty feet in length, and always bends upward toward a sort of chamber in which the nest is made. This nest is of the rudest description, consisting of a bundle of dried weeds thrown carelessly together. The burrow has a very evil odor, which is unpleasantly adherent to the hand that has been placed within it.

Owing to the extremely loose skin of the Mullingong, it can push its way through a very small aperture, and is not easily retained in the grasp, wriggling without much difficulty from the gripe of the fingers. The loose skin and thick fur are also preventives against injury, as the discharge of a gun, which would blow any other animal nearly to pieces, seems to take but little external effect upon the Duck Bill. The animal is, moreover, so tenacious of life, that one of these creatures which had received the two charges of a double-barreled gun, was able, after it had recovered from the shock, to run about for twenty minutes after it had been wounded.

The food of the Mullingong consists of worms, water insects, and







PORCUPINE ANT-EATER
DUCK MOLE

PLATE LXIV MONOTREMATA



little molluscs, which it gathers in its cheek-pouches as long as it is engaged in its search for food, and then eats quietly when it rests from its labors. The teeth, if teeth they may be called, of this animal are very peculiar, consisting of four horny, channeled plates, two in each jaw, which serve to crush the fragile shells and coverings of the animals on which it feeds. It seems seldom to feed during the day, or in the depth of night, preferring for that purpose the first dusk of evening or the dawn of morning. During the rest of the day it is generally asleep. While sleeping, it curls itself into a round ball, the tail shutting down over the head and serving to protect it.

The young Mullingongs are curious little creatures, with soft, short flexible beaks, naked skins, and almost unrecognizable as the children of their long-nosed parents. When they attain to the honor of their first coat, they are most playful little things, knocking each other about like kittens, and rolling on the ground in the exuberance of their mirth. Their little twinkling eyes are not well adapted for daylight, nor from their position can they see spots directly in their front, so that a pair of these little creatures that were kept by Dr. Bennett used to bump themselves against the chairs, tables, or any other object that might be in their way. They bear a farther similitude to the cat in their scrupulous cleanliness, and the continual washing and pecking of their fur.

THE AUSTRALIAN HEDGEHOG.

The family ECHIDNIDÆ contains *one* genus, which is divided into *two* closely allied species. These animals, although quite as extraordinary as the Duck Bill in their internal structure, are not so peculiar in their external appearance, having very much the aspect of a hedgehog or spiny ant-eater. One of the species inhabits East and South Australia, the other, Tasmania.

GENUS ECHIDNA.

Both species have squat, thick-set bodies, short legs, very short tails; the beak and tongue narrow and elongated; the toes armed with digging claws; the back covered with spines. The males, like the Duck Mole, have a spur on the heel. They inhabit sandy places, where they

dig out burrows, and live on ants, which they catch by projecting their tongue covered with a viscous humor into the dwellings of these insects.

The AUSTRALIAN HEDGEHOG, *Echidna aculeata* (Plate LXIV) is found on the mainland of Australia. The head is elongated like that of the proper ant-eaters, and contains in the jaws no teeth of any kind. The spines or prickles begin at the back of the head, and form a thick covering upon the upper part of the animal. The head, limbs and abdomen are covered with hair of a dark-brown color and very stiff and bristly. The prickles are dirty yellow, with black tips.

If this animal is attacked, it rolls itself into a ball, and is then difficult to hold, as the spines can give severe wounds. It is almost impossible to drag it from its burrow, as it spreads its spines out against the walls of the tunnel. It is probable that it passes the dry season in a state of sleep, for it is, during that period, seldom seen abroad. Cold also has a great influence on it, and a slight decline of temperature seems to place it in a state of hibernation.

It is called NICOBEJAN, JANOKAMBINE, and COGERA, by the natives who roast it in its skin as European gypsies roast the hedgehog. Some of them have been kept in captivity; they were quiet, and liked to be caressed. They were fed on sugared liquids.

The second species, *ECHIDNA SETOSA*, is found in Tasmania. It resembles the above in every respect except color, which is of a darker brown instead of the black and yellow which decorates the spines of the common species. The prickles are comparatively few, and there is much close fur between them.

CONCLUSION.







I N D E X .

THE ANIMALS NAMED IN CAPITALS APPEAR IN THE ILLUSTRATIONS.

A.

Aard Vark, 743.
 " WOLF, 240.
 Adder, 614.
 Adjag, 266.
 AGOUARA, 313.
 Agouta, 161.
 AGOUTI, 726.
 Aguarachay, 253.
 AI, 738.
 Alactaga, 697.
 Almiqui, 162.
 ALPACA, 528.
 Angwantibo, 112.
 Anoa, 597.
 Ant-Bear, 744.
 ANT-EATER, GREAT, 744.
 " LITTLE, 746.
 " NATIVE, 752.
 " PORCUPINE, 766.
 Antelope, Indian, 623.
 " Musk, 629.
 " SABLE, 615.
 " Sabre, 614.
 Aoudad, 646.
 Apar, 741.
 Ape, Bonnet, 67.
 " Death's Head, 94.
 " Hussar, 51.
 " Javanese, 65.
 " Moor, 52.
 " Nun, 50.
 " Red, 51.
 " Satan, 90.
 " Shaggy, 90.
 " White-nosed, 51.
 ARGALI, BEARDED, 647.
 ARMADILLO, 741.
 " Great, 740.
 Arrianha, 303.
 Ashkoko, 682.
 ASS, COMMON, 448.
 " WILD, 447.
 " Wild African, 448.
 Atak, 340.
 Atumba, 105.
 AYE-AYE, 115.

B.

BABAC, 715.
 Babakoto, 103.
 BABOON, 56.
 BABYROUSSA, 588.
 BADGER, 304.
 " American, 304.
 " Mexican, 304.
 Bandicoot, Long-nosed, 753.
 " STRIPED, 752.
 Bangsring, 154.
 Banteng, 595.
 Barasinga, 556.
 Barrigudo, 80.
 Bat, African Leaf, 135.
 " Barbastelle, 139.
 " Big-eared, 142.
 " Bull Dog, 139.
 " California, 140.
 " Carolina, 141.
 " Creek, 143.
 " Daubenton's, 140.
 " DOG-HEADED, 143.
 " FRUIT-EATING, 128.
 " Georgian, 141.
 " Hoary, 142.
 " HORSESHOE, GREAT, 135.
 " " Lesser, 134.
 " " Noble, 135.
 " Little Brown, 141.
 " Long-eared, 142.
 " Mouse-colored, 139.
 " NEW YORK, 141.
 " Northern, 138.
 " Pale, 143.
 " Red, 141.
 " Serotine, 139.
 " VAMPIRE, 132.
 Beagle, 277.
 BEAR, BLACK, 322.
 " BROWN, 320.
 " Cinnamon, 323.
 " GRIZZLY, 323.
 " POLAR, 318.
 " Sand, 303.
 " SLOTH, 326.
 " Spectacled, 327.

BEAR, SUN, 325.
 " SYRIAN, 321.
 BEAVER, AMERICAN, 702.
 " EUROPEAN, 700.
 Beden, 644.
 Beisa, 614.
 Bettong, Brush-tailed, 756.
 BIG HORN, 648.
 Binturong, 231.
 Bison, American, 586.
 Black Cat, 295.
 BLACK FISH, 373.
 Blau Bok, 616.
 BLOODHOUND, 278.
 Blue Buck, 631.
 BOAR, WILD, 499.
 Bokambul, 107.
 Bonassus, 584.
 BORELE, 477.
 BRAHMIN BULL, 592.
 Buansuah, 266.
 Budeng, 44.
 BUFFALO, AMERICAN, 586.
 " Mountain, 589.
 " CAPE, 599.
 " Indian, 603.
 Bulan, 159.
 Bunder, 69.
 Burunduk, 713.

C.

Cabramontes, 643.
 Cacajao, 91.
 CAMEL, 514.
 " BACTRIAN, 522.
 CAMELOPARD, 568.
 Campagnol, 697.
 CAPYBARA, 727.
 CARACAL, 218.
 CARCAJOU, 554.
 CARIBOU, 548.
 Cat, Angola, 214.
 " CHINESE, 211.
 " DOMESTIC, 214.
 " Egyptian, 212.
 " Long-tailed, 207.
 " MALAY, 211.

- Cat, Manx, 214.
 " Marbled, 205.
 " Marten, 215.
 " NATIVE, 751.
 " Pampas, 207.
 " Red, 223.
 CATTLE, ALDERNEY, 583.
 " Brahmin, 592.
 " DURHAM, 582.
 " Pampas, 577.
 " SCOTCH, 583.
 " Wild, 576.
 Cavy, Patagonian, 723.
 Chacma, 58.
 Chameck, 82.
 CHAMMOIS, 633.
 " Cape, 613.
 Chati, 207.
 CHEETAH, 224.
 Chickara, 631.
 Chickaree, 609.
 CHIMPANZEE, 27.
 " Black, 31.
 CHINCHILLA, 719.
 CHIPMUCK, 712.
 CHEROPUS, 753.
 CIVET, 228.
 " American, 316.
 Coaita, 81.
 COATI, 313.
 " Red, 314.
 " White, 314.
 Coendoo, 724.
 Colocolo, 208.
 COLUGO, 149.
 COUGAR, 196.
 COYOTE, 253.
 COYPU, 723.
 CRYPTOPROCTA, 226.
 Cuscus, Spotted, 758.
 Cuxio, 90.
- D.
- Dachshund, 278.
 Daman, Tree, 683.
 DASYURE, 751.
 Dauw, 453.
 DEER, AXIS, 557.
 " FALLOW, 560.
 " Hog, 558.
 " MOUSE, 532.
 " MUSK, 565.
 " Pampas, 558.
 " Persian, 556.
 " RED OR STAG, 552.
 " ROE, 563.
 " VIRGINIAN, 554.
 Degu, 721.
 Desman, Pyrenean, 166.
 " RUSSIAN, 166.
 DEVIL, TASMANIAN, 751.
 DHOLE, 265.
 DINGO, 291.
 DOG, BULL, 285.
- Dog, Chesapeake Bay, 281.
 " CHINESE, 291.
 " COACH, 289.
 " Colley, 283.
 " DALMATIAN, 289.
 " DANISH, 289.
 " ESQUIMAUX, 283.
 " Hare-Indian, 276.
 " Labrador, 287.
 " Leonberg, 287.
 " Maltese, 290.
 " NEWFOUNDLAND, 285.
 " Poodle, 289.
 " PRAIRIE, 716.
 " PUG, 289.
 " ST. BERNARD, 284.
 " Saint John's, 287.
 " SHEPHERD'S, 282.
 " Spitz, 283.
 " THIBET, 285.
 DOLPHIN, 386.
 " Bottle-nosed, 387.
 " Gladiator, 390.
 " White Beaked, 387.
 DORMOUSE, COMMON, 699.
 " Fat, 698.
 Douc, 45.
 Douroucouli, 92.
 Drill, 63.
 DROMEDARY, 514.
 Dseren, 622.
 DUCK-MOLE, 763.
 DUGONG, 400.
 " Australian, 401.
 Duyker Bok, 630.
 Dziggetai, 445.
- E.
- ELAND, 607.
 ELEPHANT, AFRICAN, 672.
 " ASIATIC, 665.
 ELK, 539.
 ERMINE, 296.
 " Kane's, 297.
 " New York, 297.
- F.
- FENNEK, 260.
 FERRET, 296.
 " Black-footed, 298.
 Fisher, Marten, 295.
 FOX, ARCTIC, 262.
 " BLUE, 263.
 " COMMON, 256.
 " Gray, 262.
 " Kit, 262.
 " Large-eared, 264.
 " SILVER, 261.
- G.
- Galago, 112.
 " Giant, 114.
 GALET, 226.
- Garangang, 234.
 Gaur, 594.
 Gayal, 593.
 GAZELLE, 617.
 " Ariel, 618.
 Gelada, 53.
 Genet, Common, 230.
 " PALE, 230.
 Gibbon, Agile, 35.
 " HULOCK, 35.
 GIRAFFE, 569.
 GNU, 633.
 GOAT, ANGORA, 640.
 " Bezoar, 639.
 " CASHMERE, 639.
 " COMMON, 637.
 " Dwarf, 642.
 " Egyptian, 641.
 " Mamber, 641.
 " MOUNTAIN, 635.
 Goffer, 701.
 Goral, 635.
 GORILLA, 23.
 Grampus, 390.
 Greyhound, Italian, 276.
 " IRISH, 274.
 " Persian, 274.
 " Russian, 274.
 " Scotch, 273.
 Grison, 299.
 Ground Pig, 723.
 Guanaco, 525.
 GUENON, 51.
 Guereza, 45.
 GUINEA PIG, 723.
 Gundy, 722.
- H.
- Hamadryad, 60
 HAMSTER, 692.
 Hare, Cape, Leaping, 697.
 " COMMON, 732.
 " Irish, 733.
 " Marsh, 731.
 " NORTHERN, 731.
 " Polar, 730.
 " Sand, 732.
 " Snow, 733.
 " Trowbridge's, 731.
 " Wood, 731.
 Harrier, 277.
 " Welsh, 277.
 Hartebeest, 632.
 HEDGEHOG, AUSTRALIAN, 766.
 " EUROPEAN, 158.
 " Long-eared, 158.
 " Madagascar, 159.
 HEMIGALE, 230.
 HIPPOPOTAMUS, 486.
 " Small, 492.
 Hoe-rat, 340.
 Hog, BERKSHIRE, 504.
 " Bush, 507.

- Hog, Pencilled, 506.
 " Wild, of India, 501.
 Horse, 410.
 " ARAB, 418.
 " Austrian, 437.
 " Barb, 422.
 " Black Dray, 444.
 " CLYDESDALE, 443.
 " French, 438.
 " Galloway, 441.
 " Hackney, 434.
 " Holstein, 438.
 " Hunter, 434.
 " Italian, 439.
 " Pacer, 432.
 " Percheron, 443.
 " RACE, 427.
 " Russian, 436.
 " Spanish, 440.
 " TROTTING, 428.
 HOUND, FOX, 277.
 " Otter, 277.
 " Stag, 277.
 Hulman, 42.
 Huneman, 42.
 Hunting dog, 264.
 Huron, 299.
 Hutia Conga, 720.
 HYENA, BROWN, 243.
 " Dog, 264.
 " SPOTTED, 244.
 " STRIPED, 242.
 HYRAX, 681.
- I.
- IBEX, 643.
 ICHNEUMON, 235.
 Indris, Crowned, 103.
 Inia, 383.
- J.
- JACKAL, 255.
 " Black-banded, 256.
 " Cape, 256.
 JAGUAR, 198.
 Jairo, 619.
 Jelerang, 708.
 Jemlack, 641.
 JERBOA, 697.
- K.
- Kaberoo, 250.
 KAHAU, 44.
 Kakang, 109.
 Kulan, 302.
 KALONG, 128.
 KANCHIL, 532.
 KANGAROO, 754.
 " Rock, 755.
 " TREE, 756.
 " Woolly, 755.
 " Hare, 756.
 " Rat, 757.
- Katshkar, 648.
 Keitloa, 479.
 Killer, 390.
 " Cape, 391.
 KINKAJOU, 315.
 KOALA, 757.
 KOODOO, 609.
 Kuda Ayer, 462.
 Kuichua, 207.
 Kulan, 445.
 Kuwuk, 211.
- L.
- Landjak, 256.
 Lapunder, 71.
 LEMMING, 698.
 Lemur, Black-fronted, 105.
 " Cat, 106.
 " Diadem, 109.
 " FLYING, 149.
 " Grey, 107.
 " Ring-tailed, 106.
 " Red, 106.
 " Ruffed, 105.
 " White-fronted, 105.
 " SLOW-PACED, 109.
 LEOPARD, AFRICAN, 201.
 " ASIATIC, 202.
 " Seal, 343.
 Linsang, 230.
 LION, AFRICAN, 183.
 " ASIATIC, 183.
 " Maneless, 183.
 LLAMA, 527.
 Lobo, 251.
 Lori, Bengal, 110.
 LYNX, BAY, 222.
 " Booted, 220.
 " CANADIAN, 220.
 " Common, 219.
 " Marsh, 217.
 " PERSIAN, 217.
 " Polar, 220.
 " Southern, 220.
- M.
- MACAQUE, 65.
 Magots, 72.
 Maikong, 254.
 Maki, 104.
 " Dwarf, 107.
 Mammoth, 657.
 Mampalon, 233.
 MANATEE, 399.
 Mandrill, 62.
 Mangabey, 52.
 Mangouste, 234.
 " Crab-eating, 237.
 " Zebra, 237.
 Mangue, 239.
 Manul, 211.
 MANIS, LONG-TAILED, 739.
 " Short-tailed, 740.
- Mara, 728.
 Maracaya, 207.
 Marikina, 99.
 Marimonda, 81.
 Markhor, 641.
 MARMOSET, 96.
 " Dwarf, 99.
 " Leoncito, 98.
 MARMOT, 714.
 " Leopard, 713.
 " POUCHED, 715.
 Marquay, 206.
 Marten, Beech, 294.
 " PINE, 293.
 MASTIFF, 284.
 Mastodon, 658.
 Magotte, 104.
 Meerkat, 238.
 Meloncillo, 234.
 Mexican Mopsey, 291.
 Miko, 79.
 Mink, 297.
 MIRIKI, 83.
 Mehogoo, 481.
 Moholi, 113.
 MOLE, AMERICAN, 165.
 " Blind, 164.
 " Broad-handed, 166.
 " Changeable, 163.
 " COMMON EUROPEAN, 164.
 " Gibb's, 168.
 " Hairy-tailed, 166.
 " Japanese, 167.
 " Oregon, 166.
 " Prairie, 166.
 " STAR-NOSED, 165.
 " Rat, 696.
 Mongoose, 106.
 Monkey, Bartlett's, 83.
 " Bearded, 51.
 " CAPUCIN, 78.
 " Diana, 51.
 " Gibraltar, 72.
 " GREEN, 51.
 " HOWLING, BLACK, 86.
 " " Red, 86.
 " Negro, 44.
 " PROBOSCIS, 44.
 " SPIDER, 81.
 " SQUIRREL, 93.
 MOOSE, 541.
 Moufflon, 647.
 MOUSE, BARBARY, 692.
 " COMMON, 690.
 " HARVEST, 691.
 " Jumping, 697.
 " Le Conte's, 694.
 " Pouched, 751.
 " Wilson's Meadow, 698.
 " Field, New Jersey, 606.
 " " Sonora, 697.

- Mouse, Field, Texan, 697.
 Mule, 456.
 MULLINGONG, 764.
 Munga, 67.
 Mungos, Banded, 239.
 Muntjak, 564.
 Musang, 231.
 MUSK-OX, 653.
 MUSTANG, 411.
- N.
- NARWHAL, 377.
 Nelbander, 71.
 Nicobejan, 766.
 Noctule, 140.
 Nyentek, 310.
 Nylghau, 611.
 Nyule, 234.
- O.
- OCELOT, 205.
 " Gray, 206.
 " Painted, 206.
 Opossum, Crab-eating, 750.
 " MERRIAN'S, 750.
 " Mouse, 759.
 " VIRGINIA, 750.
 " YAPOCK, 750.
- Otter, California, 302.
 " Chinese, 303.
 " Common, 300.
 " Javanese, 303.
 " NORTH AMERICAN, 301.
 " SEA, 302.
- OUISTITI, 98.
 OUNCE, 203.
 OURANG-OUTAN, 32.
 Ourebi, 627.
 Ox, 575.
- P.
- PACA, SOOTY, 727.
 Paguma, Marked, 232.
 " Whiskered, 232.
 " Woolly, 232.
- Pallah, 624.
 PANDA, 316.
 PANTHER, 202.
 " Black, 203.
 " JAPANESE, 202.
 " Sunda, 202.
- Paseng, 639.
 Passan, 613.
 PECCARY, COLLARED, 494
 " White-lipped, 495.
- Peeshoo, 220.
 PENTAIL, 155.
 PHALANGER, FLYING, 759.
 Phalangist, Sooty, 757.
 " Valpine, 758.
- PHATAGIN, 739.
 Picheogo, 742.
 Pika, Alpine, 729.
- Pika, North American, 729.
 " Otogono, 729.
- Pinchaque, 463.
 Pinche, 98.
 Pipistrelle, 138.
 POINTER, 279.
 POLECAT, 298.
 Pony, EXMOOR, 442.
 " SHETLAND, 441.
 " Welsh, 442.
- PORCUPINE, BRAZILIAN, 724.
 " CANADIAN, 724.
 " COMMON, 725.
 " TUFTED-TAILED, 726.
- PORPOISE, 388.
 " Right-whale, 387.
- Potoroo, 757.
 Potto, 111.
 Pougoune, 231.
 Press, 154.
 PRONG HORN, 625.
 PUMA, 196.
- Q.
- QUAGGA, 452.
- R.
- RABBIT, 733.
 " JACKASS, 731.
 " ROCK, 681.
- RACCOON, 311.
 " Black-footed, 313.
 " California, 313.
 " CRAB-EATING, 313.
- Raccoon Dog, 259.
 Rat, Beaver, 695
 " BROWN, 688.
 " BLACK, 689.
 " Cotton, 694.
 " Florida, 693.
 " Rocky Mountain, 693.
 " Madagascar, 108.
 " Musk, 695.
 " POUCHED, FUR COUNTRY 700.
 " Trunked, 152.
 " WATER, 697.
- RATEL, 306.
 Rasse, 229.
 REINDEER, 545.
 RETRIEVER, 281.
- RHINOCEROS, INDIAN, 471.
 " Javanese, 473.
 " LITTLE BLACK, 477.
 " Rough-eared, 476.
 " Sumatran, 474.
 " WHITE, 481.
- Rimau-dahan, 208.
 Roode Bok, 631.
 RORQUAL, 362.
- Rorqual, Great Indian, 365.
 " Southern, 367.
- S.
- SAGUIN, 98.
 " Silver, 99.
- Saiga, 624.
 Saimiri, 93.
 Saki, Black, 91.
 " Scarlet-faced, 91.
 " WHITE-HEADED, 90.
- Salamander, 701.
 Sambur, 557.
 SABLE, 294.
 " American, 295.
- Sanga, 579.
 SAPAJOU, 77.
 " Horned, 79.
- Sasin, 623.
 SEA BEAR, NORTHERN, 329.
 SEA-COWS, 397.
 " " of Steller, 404.
- SEA-ELEPHANT, 344.
 Sea-Leopard, False, 343.
 SEA-LION, 329.
 " " Northern, 332.
- Sea-Unicorn, 377.
- Seal, Bearded, 341.
 " Caspian, 340.
 " Crab-eating, 342.
 " CRESTED, 345.
 " COMMON, TRUE, 339.
 " Fur, Australian, 331.
 " " Cape, 331.
 " " Southern, 331.
 " Grey, 342.
 " Hair, Australian, 332.
 " " Cape, 332.
 " " California, 331.
 " HARP, 340.
 " Richard's, 341.
 " Ross's Large-eyed, 343.
 " White-bellied, 342.
- Serval, 215.
 SETER, 279.
 " Irish, 280.
- Sewellel, 718.
- Sheep, CRETAN, 650.
 " Fat-tail, 649.
 " HIGHLAND, 653.
 " Leicester, 651.
 " MERINO, 652.
 " ROCKY MOUNTAIN, 648.
 " SOUTHDOWN, 651.
- Shrew, Berlandier's, 170.
 " Broad-nosed, 170.
 " Carolina, 170.
 " ELEPHANT, 151.
 " Etruscan, 169.
 " Forster's, 169.
 " Mouse, 169.
 " Masked, 170.
 " Mouse, 168.
 " Navigator, 170.

SHREW, OTTER, 162.
 " PENTAIL, 155.
 " Short-tailed, 170.
 " SQUIRREL, 155.
 " Thick-tailed, 169.
 " Thompson's, 170.
 " Water, 169.
 Siamang, 38.
 SKUNK, 308.
 " California, 310.
 " Large tailed, 310.
 " Texan, 310.
 Sloth, Spotted, 739.
 " THREE-TOED, 738.
 " TWO-TOED, 738.
 Soosook, 382.
 Spaniel, Blenheim, 290.
 " COCKER, 280.
 " KING CHARLES, 290.
 " Water, 280.
 SPERMOPHILE, LEOPARD, 713.
 " Line tailed, 714
 Sphinx, 60.
 SPRING BOK, 620.
 SQUIRREL, BLACK, 708.
 " European, 707.
 " Flying, 710.
 " Grey, 708,
 " GROUND, 712.
 " HARE, 708.
 " LONG-EARED, 710.
 " Northern Grey, 709
 " RED, 709.
 " Sugar, 759.
 Stag, Maned, 557.
 Stoat, 296.
 Surilho, 308.
 Syra, 207.

T.

TAGUAN (SQUIRREL), 711.
 " (Marsupial), 758.
 Tagnicate, 495.
 Tajaca, 404.
 Talapoin, 47.
 Tamandua, 745.
 Tanager, 744.
 Tamarin, 99.
 Tangalung, 229.
 TAPIR, AMERICAN, 458.
 " Baird's, 463.
 " MALAY, 462.
 Tapoa, 715.
 Tarpan, 410.
 TARSIER, SPECTRE, 114.
 Tatouay, 741.
 Tatouhon, 740.

Tayra, 300.
 TEE-TREE, 94.
 " Collared, 95.
 Teledu, 305.
 Tendrac, 161.
 TENREC, 160.
 " Banded, 160.
 TERRIER, BLACK AND TAN, 288.
 " Bull, 288.
 " Fox, 289.
 " Scotch, 288.
 " SKYE, 288.
 " Yorkshire, 288.
 Thresher, 391.
 TIGER, BENGAL, 188.
 " Clouded, 208.
 Tikus, 159.
 Tucuxi, 384.
 Tukotuko, 722.
 Tupaia Tana, 153.
 Turnspit, 278.

U.

Uakari, 91.
 Unan, 738.
 Unko, 35.
 URCHIN, 158.

V.

VAMPIRE, 132.
 " Californian, 133.
 VICUNA, 529.
 VISCACHA, 720.
 " Alpine, 719.

W.

WAH, 316.
 Walawy, 108.
 Wallabee, 755.
 WALRUS, 334.
 Wanderoo, 71.
 WAPITI, 550.
 WART-HOG, AFRICAN, 510.
 " Asian's, 511.
 Water-buck, 628
 Wauwau, 36.
 WEASEL, 298.
 " Bridled, 298.
 " Little Nimble, 297.
 " Richardson's, 298.
 " Small Brown, 298.
 " Small, 297.
 " Tawny, 297.
 " Yellow-cheeked, 297.

Whale, Biscay, 358.
 " Black, Howling or
 " Caaing, 392.
 " Bottle-nosed, 375.
 " Bunched, 360.
 " California Grey, 367.
 " Cape, 358.
 " GREENLAND OR RIGHT,
 " 350.
 " Humpback, 360.
 " Northern Finner, 364.
 " Pike, 366.
 " Pilot, 392,
 " Right Australian, 358.
 " Scrag, 358.
 " Shortheaded, 374.
 " SPERM, 368.
 " Sulphur Bottom, 364.
 " WHITE, 393.
 WILD CAT, 222.
 " European, 209.
 " Texas, 223.

Wolf, Alpine, 266.
 " BLACK, 251.
 " Crab-eating, 254.
 " GREY, 251.
 " Jackal, 250.
 " Maned, 254.
 " PRAIRIE, 252.
 " Red, 254.
 " RED of Texas, 252.
 " Striped, 250.
 " WHITE, 252.
 " Zebra, 752.

WOLVERENE, 299.
 WOMBAT, 760.
 WOODCHUCK (Marmot), 715.
 " (Marten), 295.

X.

Xiphius, 376.

Y.

Yaguarundi, 198.
 YAK, 595.
 Yarke, 90.
 YAPOCK, 750.

Z.

ZEBU, 592.
 ZEBRA, 454.
 ZENICK, 238.
 ZIBETH, 228.
 Zorilla, 307.

INDEX OF SCIENTIFIC NAMES.

- | A. | B. | C. |
|-------------------------------|------------------------------|--------------------------|
| Acrobata pygmæus, 759. | Babyroussa Alfurus, 508. | Canis aureus, 254. |
| Addax nasomaculatus, 614. | Balæna Biscayensis, 358. | “ Azara, 253. |
| Ælurus fulgens, 316. | “ gibbosa, 358. | “ cancrivorus, 254. |
| Æpycerus melampus, 624. | “ marginata, 358. | “ dingo, 291. |
| Alcephalus caama, 632. | “ mystacetus, 350. | “ domesticus, 266. |
| Alces Americanus, 541. | Balænoptera Australis, 367. | “ Dukhunensis, 266. |
| “ palmatus, 539. | “ rostrata, 366. | “ griseus, 262. |
| Amphisorex Linneanus, 169. | Bassaris astuta, 316. | “ jubatus, 254. |
| Anoa depressicornis, 597. | Belideus Australis, 759. | “ agopus, 262. |
| Antechinus flavipes, 751. | “ sciureus, 759. | “ fuliginosus, 263. |
| Antilocapra Americana, 625. | Beluga Canadensis, 394. | “ latrans, 252. |
| Antilope bezoartica, 623. | “ catodon, 393. | “ lupaster, 250. |
| Antrozous pallidus, 143. | Bettongia pencillata, 756. | “ occidentalis, 251 |
| Aonyx leptonyx, 303. | Bibos frontalis, 593. | “ “ var. albus, 252. |
| Aplocerus Americanus, 635. | “ gaurus, 594. | “ “ ater, 251. |
| Arctitis binturong, 231. | “ Sondaicus, 595. | “ “ gigas, 251. |
| Arctocebus Calabarensis, 112. | Bison Americanus, 587. | “ “ rufus, 252. |
| Arctocephalus Antarcticus, | “ bonassus, 584. | “ ochropus, 253. |
| “ 331. | Bos taurus, 575. | “ pallipes, 256. |
| “ cinereus, 331. | Brachyotus Daubentonii, 140. | “ Primævus, 266. |
| “ nigrescens, | Bradypus, tridactylus, 738. | “ procyonides, 259. |
| “ 331. | Brachyurus calvus, 91. | “ simensis, 250. |
| “ nivosus, 332. | “ melanocephalus, | “ Sumatrensis, 266. |
| Arctomys babac, 715. | “ 91. | “ velox, 262. |
| “ marmota, 714. | Bubalus buffelus, 603. | Capra ægagrus, 639. |
| “ monax, 715. | “ Caffer, 599. | “ Ægyptiana, 641. |
| Arctonyx collaris, 303. | “ vulgaris, 605. | “ angoriensis, 640. |
| Arctopithecus flaccidus, 739. | | “ Argali, 647. |
| Ariela tæniata, 237. | | “ ibex, 643. |
| Arvicola amphibius, 697. | | “ Jemlacea, 641. |
| “ arvalis, 698. | | “ laniger, 639. |
| “ Pennsylvanica, 698. | | “ mambrica, 641. |
| Ateles bartlettii, 83. | Callicephalus caspicus, 340. | “ megaceros, 641. |
| “ Beelzebub, 81. | “ vitulinus, 339. | “ montana, 643. |
| “ paniscus, 81. | Callithrix lugens, 95. | “ musimon, 647. |
| “ pentadactylos, 82. | “ personata, 94. | “ polii, 648. |
| Atherura Africana, 726. | “ torquata, 95. | “ Pyrenæa, 643. |
| Auchenia guanaco, 525. | Callorhinus ursinus, 329. | “ reversa, 642. |
| “ llama, 527. | Camelopardalis girafa, 569. | “ Syriaca, 644. |
| “ paco, 528. | Camelus Arabicus, 514. | “ tragelaphus, 646. |
| “ vicuña, 529. | “ Bactrianus, 522. | Capreolus vulgaris, 563. |
| Aulacodes swinderianus, 723. | Canis adustus, 250. | Capromys pilorides, 720. |
| | “ Alpinus, 266. | Castor Canadensis, 702. |
| | | “ fiber, 704. |

- Catoblepas gnu*, 633.
Catodon macrocephalus, 368.
Cavia cobaga, 728.
Cebus apella, 79.
 " *capucinus*, 78.
 " *fatuellus*, 79.
 " *hypoleucus*, 78.
 " *leucogenys*, 78.
 " *olivaceus*, 78.
Centetes ecaudatus, 160.
 " *variegatus*, 160.
Cephalophus mergens, 630.
 " *natalensis*, 631.
Cercocebus collaris, 52.
 " *fuliginosus*, 52.
Cercolabes prehensilis, 724.
Cecoleptes caudivolvulus, 315.
Cercopithecus Diana, 51.
 " *Mona*, 51.
 " *petaurista*, 51.
 " *ruber*, 51.
 " *Sabæus*, 51.
Cervicapra urebi, 627.
Cervulus muntjak, 564.
Cervus Aristotelis, 557.
 " *axis*, 557.
 " *barasinga*, 557.
 " *campestris*, 558.
 " *Canadensis*, 550.
 " *Elephas*, 552.
 " *hippelaphus*, 557.
 " *hyelaphus*, 558.
 " *Virginianus*, 554.
 " *Wallechii*, 556.
Cheirogaleus millii, 108.
 " *murinus*, 108.
Cheiromys Madagascariensis, 115.
Cheironectes yapock, 750.
Chinchilla laniger, 719.
Chlamydomorphus truncatus, 742.
Chœropus castanotis, 753.
Cholœpus didactylus, 738.
Chrysochloris holoserica, 163.
Cœlogenys paca, 727.
Colobus guereza, 45.
 " *Satanas*, 46.
 " *ursinus*, 46.
Condylura cristata, 165.
Cricetus frumentarius, 692.
Crossarchus obscurus, 239.
Cryptoprocta ferox, 226.
Ctenodactylus massoni, 722.
Ctenomys Magellanicus, 722.
Cuscus maculatus, 758.
Cyclothorus didactylus, 746.
Cynalurus jubatus, 224.
Cynictis Levaiillanti, 238.
Cynocephalus babuin, 56.
 " *hamadryas*, 60.
 " *Maimon*, 62.
 " *Mormon*, 63.
 " *porcarius*, 58.
Cynocephalus sphinx, 60.
Cynogale Bennetti, 233.
Cynomys ludovicianus, 716.
Cynopithecus niger, 74.
Cystophora cristata, 345.
- D.
- Dama vulgaris*, 560.
Dasyprocta agouti, 726.
Dasyypus sexcinctus, 741.
Dasyurus viverrinus, 751.
Delphinapterus Peronii, 387.
Delphinus Delphis, 386.
Dendrologus ursinus, 756.
Desmodus rufus, 133.
Didelphys cancrivora, 750.
 " *dorsigera*, 750.
 " *Virginiana*, 750.
Dioploodon Schellensis, 377.
Dipus Ægyptus, 697.
 " *alactaga*, 697.
Dolichotis Patagonicus, 728.
Dysopes nasutus, 144.
- E.
- Echidna aculeata*, 766.
Elasmognathus Bairdii, 463.
Elephas Africanus, 672.
 " *Indicus*, 666.
 " *mastodon*, 658.
 " *primigenius*, 657.
Enhydris marina, 302.
Equus Asinus, 448.
 " *Burchellii*, 453.
 " *caballus*, 410.
 " *hemionus*, 445.
 " *onager*, 447.
 " *Quagga*, 452.
 " *tæniopus*, 448.
 " *Zebra*, 454.
Erinaceus auritus, 158.
 " *Europeus*, 158.
Eriodes hypoxanthus, 83.
Erethizon dorsatum, 724.
Eubalæna Australis, 358.
Eumetopias Stelleri, 332.
- F.
- Felis catus*, 209.
 " *chati*, 207.
 " *concolor*, 196.
 " *domesticus*, 214.
 " " *angolensis*, 214.
 " " *ecaudatus*, 214.
 " *ferox*, 208.
 " *griseus*, 206.
 " *Japonicus*, 202.
- Felis Javanensis*, 211.
 " *leo var. Barbarus*, 183.
 " " *var. Goojratensis*, 183.
 " " *var. Persicus*, 183.
 " *Leopardus*, 202.
 " *macrocelis*, 208.
 " *macrouros*, 207.
 " *maniculatus*, 212.
 " *manul*, 211.
 " *marmoratus*, 205.
 " *melas*, 203.
 " *pajeros*, 207.
 " *pardalis*, 205.
 " *pardus*, 201.
 " *pictus*, 206.
 " *onca*, 199.
 " *serval*, 215.
 " *syra*, 207.
 " *tigrinus*, 206.
 " *tigris*, 188.
 " *uncia*, 203.
 " *undatus*, 211.
 " *variegatus*, 202.
 " *viverrinus*, 215.
 " *yaguarandi*, 198.
Fiber zibethicus, 695.
- G.
- Galago agisymbanus*, 113.
 " *crassicaudatus*, 114.
 " *Moholi*, 113.
Galeopithecus volans, 149.
Galictis barbara, 300.
 " *vittata*, 299.
Galidictis vittata, 233.
Gazella dorcas, 617.
 " *euchore*, 620.
Genetta Senegalensis, 230.
 " *vulgaris*, 230.
Geomys bursarius, 700.
 " *pinetus*, 701.
Globocephalus deductor, 392.
Grampus Cuvierii, 350.
Gulo luscus, 299.
Gymnura Rafflesii, 159.
- H.
- Halichærus gryphus*, 342.
Halicore Dugong, 400.
 " *tabernaculi*, 401.
Halicyon Richardsii, 341.
Halmaturus ualabatus, 755.
Hapale lacchus, 98.
 " *Cedipus*, 98.
 " *Pygmæa*, 99.
Haploodon rufus, 718.
Helarctos Malayanus, 325.
Helictis Nepalensis, 310.
Hemicentetes speciosus, 161.

Hemigale Hardwickii, 230.
 Herpestes griseus, 234.
 " Ichneumon, 235.
 " Javanicus, 234.
 " Nyula, 234.
 " Widdringtonii, 234+.
 Hesperomys campestris, 696.
 " Sonoriensis, 697.
 " Texana, 697.
 Hippopotamus amphibius, 486.
 " liberiensis, 492.
 Hippotragus leucophoeus, 616.
 " niger, 615.
 Hapalemur griseus, 107.
 Hyæna brunnea, 243.
 " crocata, 244.
 " striata, 242.
 Hydrochærus capybara, 727.
 Hydromys chrysogaster, 695.
 Hylobates agilis, 36.
 " Hulock, 35.
 " lar, 35.
 " Rafflesii, 35.
 Hylomys suillus, 155.
 Hyperoodon bidens, 375.
 Hysiprymnus minor, 757.
 Hyrax Abyssinicus, 682.
 " arboreus, 683.
 " capensis, 683.
 Hystrix cristata, 725.

I.

Ictonyx capensis, 307.
 Indris brevicaudatus, 103.
 " mitratus, 103.
 Inia Amazonica, 383.

J.

Jaculus Hudsonius, 698.

K.

Kobus ellipsoprymnus, 628.

L.

Lagidium Cuvieri, 719.
 Lagomys Alpinus, 729.
 " otogono, 729.
 " princeps, 729.
 Lagorchestes leproides, 758.
 Lagostomus trichodactylus,
 720.
 Lagotherix Humboldtii, 80.
 Lasiurus cinereus, 142.
 " Noveboracensis, 141.
 Lemur catta, 106.
 " leucomystax, 105.
 " macaco, 105.
 " mongos, 106.

Lemur ruber, 106.
 " varius, 105.
 Lepilemur furcifer, 108.
 Leptonyx Weddellii, 343.
 Lepus Æthiopicus, 732.
 " Alpinus, 733.
 " Americanus, 731.
 " callotis, 731.
 " cuniculus, 733.
 " Hibernicus, 733.
 " palustris, 731.
 " Sylvaticus, 731.
 " Texianus, 731.
 " timidus, 730.
 " Trowbridgii, 731.
 " vulgaris, 732.
 Linsang gracilis, 230.
 Lobodon carcinophoca, 342.
 Lontra Brasiliensis, 303.
 Loris gracilis, 110.
 Lutra Californica, 302.
 " Canadensis, 301.
 " vulgaris, 300.
 Lycaon pictus, 264.
 Lynx caligatus, 220.
 " Canadensis, 220.
 " chaus, 217.
 " fasciatus, 223.
 " maculatus, 223.
 " melancticus, 218.
 " pardinus, 220.
 " rufus, 222.
 " vulgaris, 219.

M.

Macacus Cynomolgus, 65.
 " erythricus, 71.
 " Inuus, 72.
 " nemestrinus, 71.
 " pileatus, 67.
 " rhesus, 69.
 " silenus, 71.
 " sinicus, 67.
 Macropus laniger, 755.
 " major, 754.
 Macroscelides proboscideus,
 151.
 " Rosetti, 152.
 Macrotus Californicus, 133.
 Manatus Australis, 399.
 " latirostris, 400.
 Manis brevicaudatus, 740.
 " longicaudatus, 739.
 Martes abietum, 293.
 " Americana, 295.
 " Canadensis, 295.
 " foina, 294.
 " Pennantii, 295.
 " zibellina, 294.
 Megaderma frons, 135.
 Megalotis Lalandii, 264.
 Megaptera longimana, 360.

Meles taxus, 304.
 Mellivora capensis, 306.
 Mephitis macroura, 310.
 Mephitis mephitis, 308.
 " mesoleuca, 310.
 " occidentalis, 310.
 " suffocans, 308.
 Microcebus myoxinus, 107
 Midas argentatus, 99.
 " rosalia, 99.
 " ursulus, 99.
 Molossus nasutus, 144.
 Monodon monoceros, 377.
 Morunga clephantina, 344.
 Moschus Moschiferus, 565.
 Mungos fasciatus, 239.
 Mus barbarus, 692.
 " minutus, 691.
 " musculus, 689.
 " rattus, 688.
 Mustela vulgaris, 298.
 Mycetes Caraya, 86.
 " seniculus, 85.
 Mydaus Meliceps, 305.
 Myiopithecus talapoin, 47.
 Myodes lemmur, 698.
 Myogale moschata, 166.
 " pyrenaica, 166.
 Myopotamus coypu, 723.
 Myoxus avellanus, 699.
 " glis, 698.
 Myrmecobius fasciatus, 742.
 Myrmecophagus jubatus, 744.
 Mystacina tuberculata, 143.

N.

Nanotragus Hemprichii, 630.
 Nasua leucorhyncha, 314.
 " nasica, 313.
 " rufa, 314.
 Nemorhedus goral, 635.
 Neotoma Drummondii, 693.
 " Floridiana, 693.
 Neotragus moschatus, 629.
 Noctilio Americanus, 144.
 " leporinus, 144.
 Nycticetus tardigradus, 109.
 Nycticetus crepuscalensis, 143.
 Nyctinomus nasutus, 144.
 " obscurus, 144.
 Nyctipithecus trivirgatus, 92.
 Nycteris, 135.

O.

Octodon Cumingii, 721.
 Ommatophoca Rossii, 343.
 Orca capensis, 391.
 " gladiator, 390.
 Oreamnos canna, 607.
 Ornithorhynchus paradoxus,
 763.

Orycteropus capensis, 743.
 Oryx beisa, 614.
 " capensis, 613.
 " leucoryx, 614.
 Otaria jubata, 329.
 Otolicnus, 113.
 Ovibos moschatus, 653.

P.

Pagomys foetidus, 340.
 Paguma larvata, 232.
 Paradoxurus fasciatus, 231.
 " typus, 231.
 Pedetes capensis, 697.
 Pelagius albiventer, 342.
 Perameles fasciata, 752.
 " nasuta, 753.
 Perodicticus Potto, 111.
 Petaurista taguanoides, 758.
 Petrogale pencillata, 755.
 Phacochoerus Æliani, 511.
 " Æthiopicus, 510.
 Phalangista fuliginosa, 757.
 " vulpina, 758.
 Phascolarctus cinereus, 757.
 Phascolomys ursinus, 760.
 Phoca Barbata, 341.
 Phocæna communis, 388.
 Phyllostoma spectrum, 132.
 Physalus antiquarum, 363.
 " gibbaldii, 364.
 Physalus indicus, 365.
 " sulphureus, 364.
 Physter tursio, 373.
 Pithecia hirsuta, 90.
 " leucocephala, 90.
 " satanas, 90.
 Platanista gangetica, 382.
 Plecotus auritus, 142.
 Poephus grunniens, 595.
 Portax pictus, 611.
 Potamochoerus Africanus, 507.
 " pictus, 506.
 Potamogale velox, 162.
 Primodontes gigas, 740.
 Procapra gutturosa, 622.
 Prochilus labiatus, 326.
 Procyon cancrivorus, 313.
 " Hernandezii, 313.
 " lotor, 321.
 " psora, 313.
 Propithecus diadema, 109.
 Proteles cristatus, 240.
 Pteromys petaurista, 711.
 Pteropus edulis, 138.
 " Edwardsii, 138.
 Ptilocercus Lowii, 155.
 Putorius agilis, 297.
 " cicognantii, 298.
 " ermineus, 290.
 " foetidus, 295.
 " frenatus, 298.

Putorius furo, 296.
 " fuscus, 297.
 " Kaneii, 297.
 " Nigripes, 298.
 " Noveboracensis, 297.
 " pusillus, 297.
 " Richardsonii, 298.
 " vison, 297.
 " xanthogenys, 297.

R.

Reithrodon Le Contes, 694.
 Rhinoceros bicornis, 477.
 " indicus, 471.
 " Keitloa, 479.
 " lasiotis, 476.
 " simus, 481.
 " sondaicus, 473.
 " Sumatranus, 474.
 Rhinolophus ferrum equinum,
 135.
 " hipposideros,
 134.
 " nobilis, 135.
 Rhinopoma microphyllum,
 136.
 Rhyncocyon cirnei, 152.
 Rhytina Stelleri, 404.
 Rupicapra tragus, 633.

S.

Saiga tartarica, 624.
 Saimiris sciureus, 94.
 Sarcophilus ursinus, 751.
 Scalops aquaticus, 165.
 " argentatus, 166.
 " Brewerii, 166.
 " latimanus, 166.
 " Townsendii, 166.
 Sciuropterus volucella, 710.
 Sciurus Carolinianus, 708.
 " Europeanus, 708.
 " Hudsonius, 709.
 " Javanicus, 708.
 " leporinus, 708.
 " macrotus, 710. }
 " niger, 708.
 Scotophilus Carolinensis, 141.
 " Georgianus, 141.
 Semnopithecus entellus, 42.
 " maurus, 44.
 " nasica, 44.
 " nemæus, 45.
 Siamanga syndactyla, 38.
 Sigmodon hispidum, 694.
 Simia Satyrus, 32.
 Solenodon Cubanus, 161.
 " paradoxus, 162.
 Sorex araneus, 169.
 " Berlandieri, 170.

Sorex brevicaudatus, 170.
 " Carolinensis, 170.
 " Etruscus, 169.
 " fodiens, 169.
 " Forsteri, 169.
 " longirostris, 170.
 " navigator, 170.
 " pachyurus, 169.
 " personatus, 170.
 " platyrrhinus, 170.
 " talpoides, 170.
 " Thompsoni, 170.
 " vulgaris, 168.
 Spalax typhlus, 696.
 Spermophilus grammarius,
 714.
 " Hoodii, 713.
 Steno Tucuxi, 384.
 Suricata zenick, 238.
 Sus aper, 499.
 " cristatus, 501.
 Synotus macrotis, 142.
 " Townsendii, 142.

T.

Talpa cæca, 164.
 " Europea, 164.
 Tamandua tetradactyla, 745.
 Tamias lysteri, 712.
 " striatus, 713.
 Taphozous, 138.
 Tapirus indicus, 462.
 " terrestris, 458.
 " villosus, 463.
 Tarandus caribou, 548.
 " rangifer, 545.
 Tarsius spectrum, 114.
 Tartaria septemcinctus, 740.
 Taxidea Berlandieri, 304.
 " Labradorica, 304.
 Tetracerus quadricornis, 631.
 Thalassarctos ursinus, 318.
 Theropithecus Gelada, 53.
 Thylocenus cynocephalus, 752.
 Tolypeutes tricinctus, 741.
 Tragelaphus kudu, 609.
 Tragulus pygmæus, 532.
 Tremarctos ornatus, 327.
 Trichechus Rosmarus, 334.
 Troglodytes Gorilla, 23.
 " Niger, 27.
 " calvus, 31.
 Tupaia ferruginea, 154.
 " Javanica, 154.
 " Tana, 153.
 Tursio erebennus, 387.

U.

Urotrichus Gibbsii, 168.
 " talpoides, 167.

Ursus Americanus, 322.
 " Arctos, 320.
 " cinnamomeus, 323.
 " ferox, 323.
 " Isabellinus, 321.
 Urva cancrivora, 237.

V.

Vespertilio barbastellus, 139.
 " Daubentonii, 140.

Vespertilio murinus, 139.
 " nitidus, 140.
 " noctula, 140.
 " pipistrellus, 138.
 " serotinus, 139.
 " subulatus, 141.
 Vesperugo Nilsonii, 138.
 Viverricula malayensis, 229.
 Viverra civetta, 228.
 " tangarunga, 229.
 " zibetha, 228.

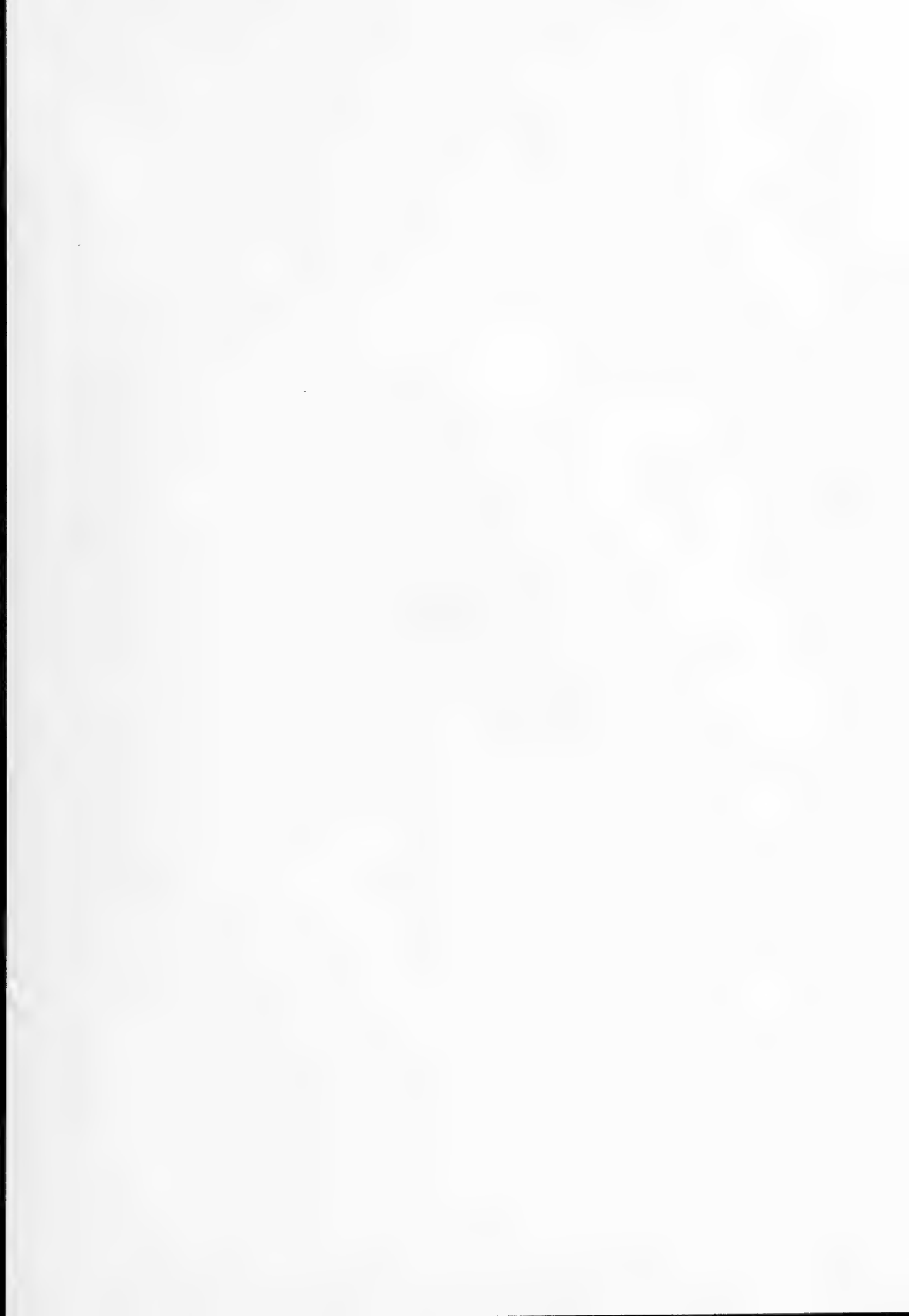
X.

Xenurus uncinatus, 741.
 Xiphius Sowerbiensis, 376.

Z.

Zalophus Gillespii, 331.
 " lobatus, 332.

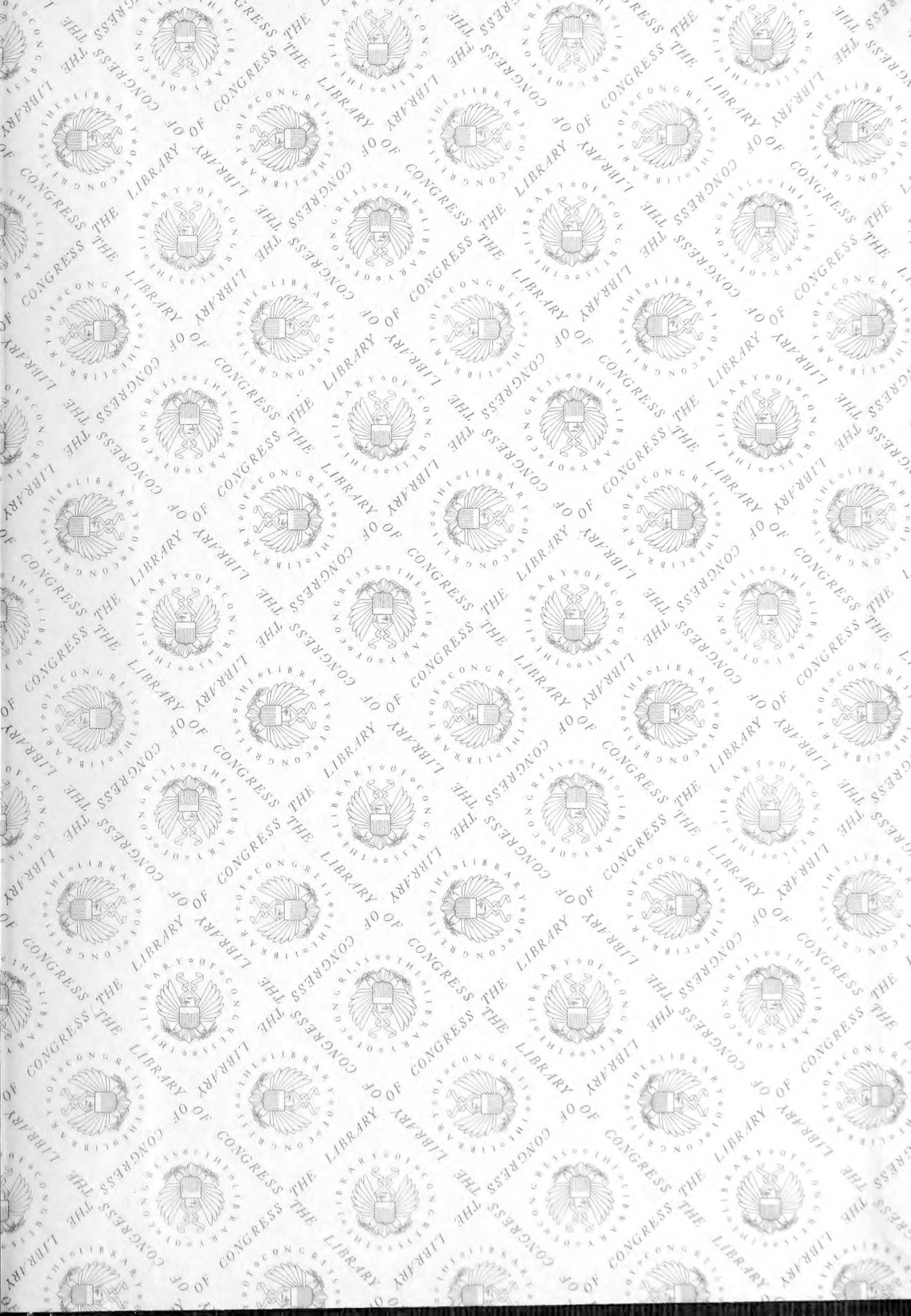












LIBRARY OF CONGRESS



0 009 159 184 4 ●