

ON THE CLASSIFICATION  
AND  
GEOGRAPHICAL DISTRIBUTION  
OF THE  
MAMMALIA,

BEING THE  
LECTURE ON SIR ROBERT READE'S FOUNDATION,  
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TO WHICH IS ADDED AN APPENDIX  
"ON THE GORILLA,"

AND  
"ON THE EXTINCTION AND TRANSMUTATION OF  
SPECIES."

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*Mammalia*

abundant remains of this *Elephas primigenius* (as it has been prematurely called, since it was the last of our British elephants) have been found in temperate and high northern latitudes in Europe, Asia and America. This, like other Arctic animals, was peculiar in its family for its range in longitude. The Musk Buffalo was its contemporary in England and Europe, and still lingers in the northernmost parts of America.

I have received evidences of Elephantine species from China and Australia, proving the proboscidian pachyderms to have once been the most cosmopolitan of hoofed herbivorous quadrupeds.

Both the proboscidian and toxodontal orders of *UNGULATA* may be called aberrant: the dentition of the latter, and several particulars of the organization of the Elephant, indicate an affinity to the *Rodentia*; the cranium of the *Toxodon*, like that of the *Dinothera*, resembles that of the *Sirenia* in its remarkable modifications.

The typical Ungulate quadrupeds are divided, according to the odd or even number of the toes, into *PERISSODACTYLA* and *ARTIODACTYLA*<sup>1</sup>: the single hoof of the horse, the triple hoof of the tapir, exemplify the first: the double hoof of the camel, the quadruple hoof of the hippopotamus, exemplify the second. In the perissodactyle or odd-toed *UNGULATA*, the dorso-lumbar vertebræ differ in number in different species, but are never fewer than twenty-two; the femur has a third trochanter, and the medullary artery does not penetrate the fore part of its shaft. The fore part of the astragalus is divided into two very unequal facets. The os magnum and the digitus medius which it supports are large, in some disproportionately so, and the digit is symmetrical: the same applies to the ectocuneiform and the digit which it supports in the hind foot. If the species be horned, as the Rhinoceros, the horn is single; or, if there be two, they are placed on the median line of the head, one behind the other, each being thus an odd horn.

<sup>1</sup> From *περισοδάκτυλος*, qui digitos habet impares numero; and *ἄρτιος*, par, δάκτυλος, digitus.—*Quarterly Journal of the Geological Society*, No. 14, May, 1848.

There is a well-developed post-tympanic process which is separated by the true mastoid from the paroccipital in the Horse, but unites with the lower part of the paroccipital in the Tapir, and seems to take the place of the mastoid in the Rhinoceros and Hyrax. The hinder half, or a larger proportion, of the palatines enters into the formation of the posterior nares, the oblique aperture of which commences in advance either of the last molar, or, as in most, of the penultimate one. The pterygoid process has a broad and thick base and is perforated lengthwise by the ectocarotid. The crown of from one to three of the hinder premolars is as complete as those of the molars: that of the last lower milk-molar is commonly bilobed. To these osteological and dental characters may be added some important modifications of internal structure, as, e. g., the simple form of the stomach and the capacious and sacculated cæcum, which equally evince the mutual affinities of the odd-toed or perissodactyle quadrupeds with hoofs, and their claims to be regarded as a natural group of the *UNGULATA*. Many extinct genera, e. g. *Coryphodon*, *Pliolophus*, *Lophiodon*, *Tupirotherium*, *Palaotherium*, *Ancitherium*, *Hipparion*, *Acerotherium*, *Elasmotherium*, &c., have been discovered, which once linked together the now broken series of Perissodactyles, represented by the existing genera *Rhinoceros*, *Hyrax*, *Tapirus*, and *Equus*. The placenta is replaced by a diffused vascular villosity of the chorion in all the recent genera of this order, excepting the little *Hyrax*, in which there is a localised annular placenta, as in the Elephant. But the diffused placenta occurs in some genera of the next group, shewing the inapplicability of that character to exact classification.

In the even-toed or 'artiodactyle' Ungulates, the dorso-lumbar vertebræ are the same in number, as a general rule, in all the species, being nineteen. The recognition of this important character appears to have been impeded by the variable number of moveable ribs in different species of the Artiodactyles, the dorsal vertebræ, which those ribs characterize, being fifteen in the Hippopotamus and twelve in the

The monodactyle Horse is a better and swifter beast of draught and burthen than its tridactyle predecessor the miocene *Hipparion* could have been. The nearer to a Tapir or a Rhinoceros in structure, the further would an equine quadruped be left from the goal in contending with a modern Racer.

With respect to the geographical distribution of the hoofed Mammalia, I may first remark that the order *Ruminantia* is principally represented by Old World species, of which 162 have been defined; only 24 species have been discovered in the New World, and none in Australia, New Guinea, New Zealand, or the Polynesian Isles.

The Camelopard is now peculiar to Africa; the Musk-deer to Africa and Asia: out of about 50 defined species of Antelope, only one is known in America, and none in the central and southern divisions of the New World. The Bison of North America is distinct from the Bison of Europe. The Musk-ox, peculiar for its limitation to high northern latitudes, is the sole bovine species that roams over the arctic coasts of both Asia and America. The Deer-tribe are more widely distributed. The Camels and Dromedaries of the Old World are represented by the Llamas and Vicuñas of the New. As, in regard to a former (tertiary) zoological period, the fossil *Camelidæ* of Asia are of the genus *Camelus*, so those of America are of the genus *Auchenia*. This geographical restriction ruled prior to any evidence of man's existence.

Palæontology has expanded our knowledge of the range of the Giraffe; during miocene or old pliocene periods, species of *Camelopardalis* roamed in Asia and Europe. Passing to the non-ruminant Artiodactyles, geology has also taught us that the Hippopotamus was not always confined, as now, to African rivers, but bathed, during pliocene times, in those of Asia and Europe. But no evidence has yet been had that the Giraffe or Hippopotamus were ever other than Old-World forms of *Ungulata*.

With respect to the Hog-tribe, we find that the true Swine (*Sus*) of the Old World are represented by Peccaries (*Dico-*

*tyles*) in the New; and geology has recently shewn that tertiary species of *Dicotyles* existed in North as well as South America. But no true *Sus* has been found fossil in either division of the New World, nor has any *Dicotyles* been found fossil in the Old World of the geographer. *Phacochærus* (Wart-hogs) is a genus of the Hog-tribe at present peculiar to Africa.

The Rhinoceros is a genus now represented only in Asia and Africa; the species being distinct in the two continents. The islands of Java and of Sumatra have each their peculiar species; that of the latter being two-horned, as all the African Rhinoceroses are. Three or more species of two-horned Rhinoceros formerly inhabited Europe<sup>1</sup>, one of which we know to have been warmly clad and adapted for a cold climate; but no fossil remains of the genus have been met with save in the Old World of the geographer. One of the earliest forms of European Rhinoceros was devoid of the nasal weapon: it has long been extinct.

Geology has given a wider prospect of the range of the Horse and Elephant, than was open to the student of living species only. The existing *Equidæ* and *Elephantidæ* properly belong, or are limited to, the Old World; and the Elephants to Asia and Africa, the species of the two continents being quite distinct. The horse, as Buffon remarked, carried terror to the eye of the indigenous Americans, viewing the animal for the first time, as it proudly bore their Spanish conqueror. But species of *Equus*, like species of *Mastodon*, coexisted with the *Megatherium* and *Megalonyx* in both South and North America, and perished with them, apparently before the human period.

The third division of the *GYRENCEPHALA* enjoy a higher degree of the sense of touch than the Ungulates through the greater number and mobility of the digits and the smaller extent to which they are covered by horny matter. This substance forms a single plate, in the shape of a claw or nail,

<sup>1</sup> See my *History of British Fossil Mammals*, 8vo, p. 350.