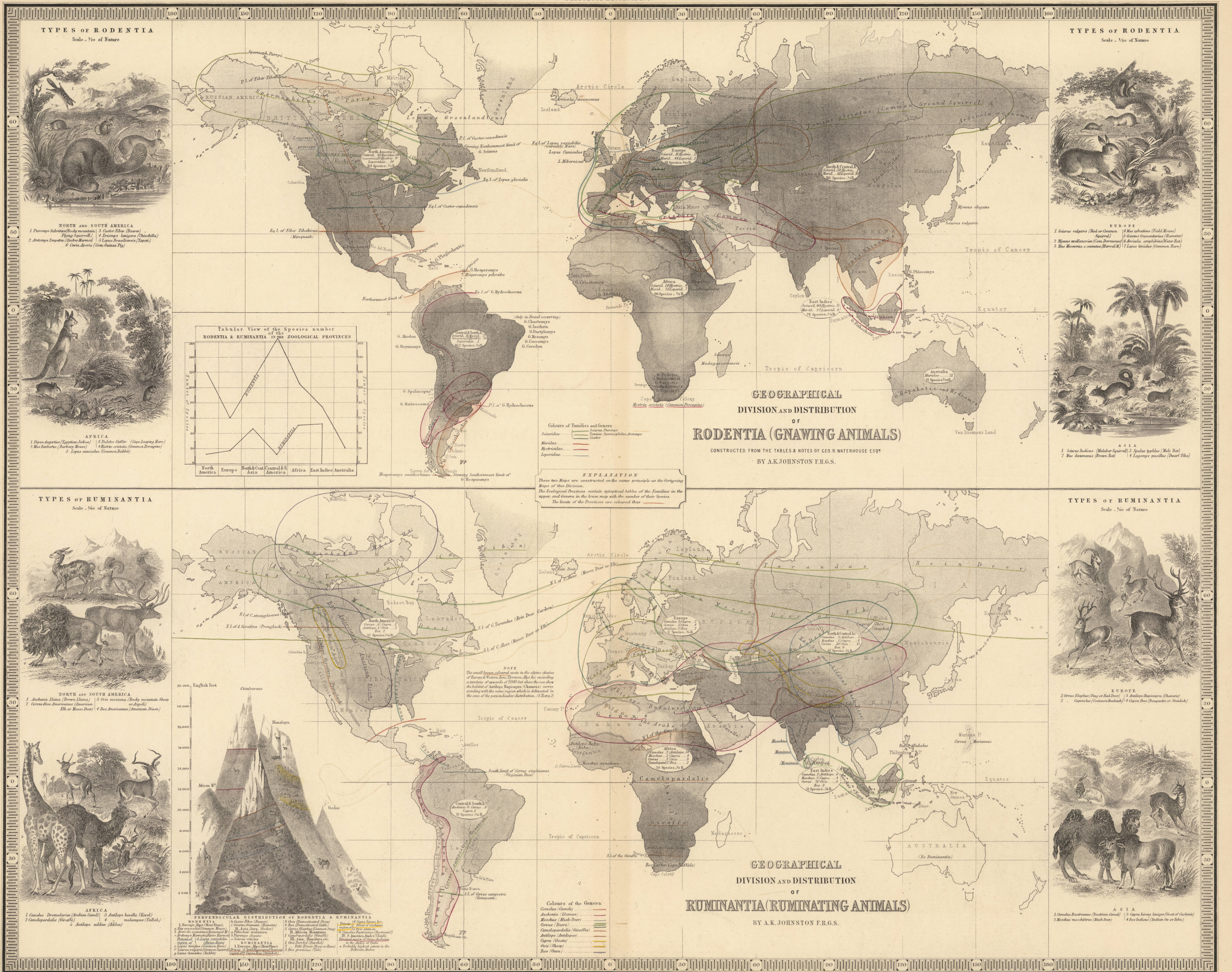


PHYTOLOGY & ZOOLOGY N° 5.



TYPES OF RODENTIA

Scale - 1/20 of Nature



- NORTH AND SOUTH AMERICA**
- 1 *Peromyscus subivans* (Rocky Mountain Flying Squirrel)
 - 2 *Peromyscus leucopus* (White-footed Mouse)
 - 3 *Castor fiber* (Beaver)
 - 4 *Sciurus harrisi* (Harrisi Squirrel)
 - 5 *Lepus sylvaticus* (Eastern Cottontail)
 - 6 *Cavia aperea* (Guinea Pig)



- AFRICA**
- 1 *Dipus asperatus* (Egyptian Jerboa)
 - 2 *Mus barbatus* (Barbary Mouse)
 - 3 *Thalopus capivi* (Cape Hare)
 - 4 *Mus crinitus* (Common Egyptian Mouse)
 - 5 *Lepus arvensis* (Common Rabbit)

TYPES OF RUMINANTIA

Scale - 1/60 of Nature



- NORTH AND SOUTH AMERICA**
- 1 *Antelope americana* (American Antelope)
 - 2 *Cervus montanus* (Rocky Mountain Sheep)
 - 3 *Cervus canadensis* (Elk or Moose Deer)
 - 4 *Bos americanus* (American Bison)



- AFRICA**
- 1 *Camelus dromedarius* (Arabian Camel)
 - 2 *Antelope addax* (Addax)
 - 3 *Antelope korymbus* (Korymbus)
 - 4 *Antelope oryx* (Oryx)

TYPES OF RODENTIA

Scale - 1/20 of Nature



- EUROPE**
- 1 *Sciurus vulgaris* (Red or Common Squirrel)
 - 2 *Mus musculus* (Common House Mouse)
 - 3 *Mus domesticus* (House Mouse)
 - 4 *Mus sylvaticus* (Field Mouse)
 - 5 *Castor fiber* (Beaver)
 - 6 *Lepus timidus* (Common Hare)



- ASIA**
- 1 *Sciurus indicus* (Indian Squirrel)
 - 2 *Mus musculus* (Common House Mouse)
 - 3 *Sciurus pygmaeus* (Pygmy Squirrel)
 - 4 *Lepus timidus* (Common Hare)

TYPES OF RUMINANTIA

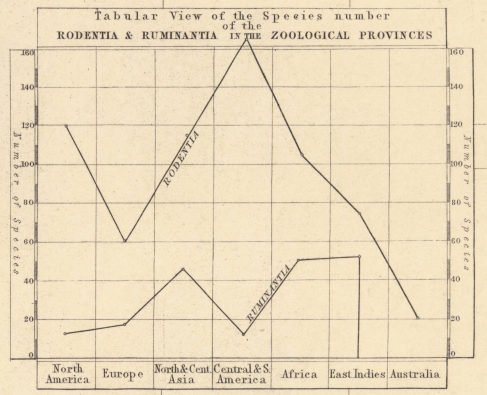
Scale - 1/60 of Nature



- EUROPE**
- 1 *Ovis montanus* (Mountain Goat)
 - 2 *Cervus elaphus* (Red Deer)
 - 3 *Cervus capreolus* (Roedeer or Stag)
 - 4 *Cervus moschatus* (Moschus or Stag)



- ASIA**
- 1 *Camelus bactrianus* (Bactrian Camel)
 - 2 *Antelope moschatus* (Moschus)
 - 3 *Cervus kashmiricus* (Kashmir Stag)
 - 4 *Bos indicus* (Indian Buffalo)



EXPLANATION

These two Maps are constructed on the same principle as the foregoing Maps of this Division.

The Zoogeographical Provinces contain typical tables of the families in the upper, and genera in the lower map with the number of their species.

The limits of the Provinces are coloured thus:

- Arctic Circle
- Tropic of Cancer
- Equator
- Tropic of Capricorn



Colours of the Genera

- Cantharis (Cane)
- Antelope (Antelope)
- Camelopardalis (Giraffe)
- Capra (Goat)
- Ovis (Sheep)
- Bos (Ox)

GEOGRAPHICAL DIVISION AND DISTRIBUTION OF RODENTIA (GNAWING ANIMALS)

CONSTRUCTED FROM THE TABLES & NOTES OF GEO. WATERHOUSE ESQ.

BY A.K. JOHNSTON F.R.G.S.

GEOGRAPHICAL DIVISION AND DISTRIBUTION OF RUMINANTIA (RUMINATING ANIMALS)

BY A.K. JOHNSTON F.R.G.S.

ZOOLOGICAL GEOGRAPHY.

MAMMIFEROUS ANIMALS: ORDERS RODENTIA AND RUMINANTIA.

SECTION I.—RODENTIA (GNAWING ANIMALS). BY GEO. R. WATERHOUSE, ESQ.

It will be perceived, upon inspecting the List of the Species of Rodents, and the tabular arrangement displaying their geographical distribution and classification, that the species of the same group most frequently have a wide range in the same, or nearly the same, parallels of latitude; but when the species are inhabitants of the high ridges of mountains, they will follow the course of the mountains, though that course may be in the opposite, or north and south, direction.

America, and Australia, might, in this point of view, be regarded as but one zoological province, and as distinct from the groups of islands comprehended under the head Polynesia, these islands having no representatives of the order Rodentia, at least none but such as there is good reason to believe have been introduced by shipping; whilst the different quarters of the globe included in the first province have each numerous representatives of the group under consideration.

TABLE I.—SHOWING THE DISTRIBUTION OF RODENTIA OVER THE GLOBE

Table with columns for FAMILIES AND Genera of RODENTIA, and columns for EUROPE, ASIA, AFRICA, AMERICA, AUSTRALIA, and ZOOL. PROV. OF THE MAP. The table lists various rodent species and their distribution across these regions.

1 Amongst other examples, the species of the genera Pteromys, Spermophilus, Tamias, Arctomys, Arvicola and Lagomys may be mentioned. 2 Lagomys princeps has a range of 38 degrees of latitude; the Chinchilla likewise have a very extended range in the north and south directions.

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TABLE II.—LIST OF THE RODENTIA, WITH THEIR GEOGRAPHICAL DISTRIBUTION.

I. FAMILY.—SCIURIDÆ (SQUIRREL FAMILY.)				II. FAMILY.—MURIDÆ (RAT FAMILY.)			
A.—European and North Asiatic Species.				Geographical Distribution.			
GENUS SCIURUS.	Linn.	Common Squirrel.	Europe, Northern Asia, and Japan.	SECT. 1. MYOXINA.	Linn.	Common Dormouse.	In the southern and western parts of temperate Europe.
vulgaris	Linn.	Common Squirrel	Europe, Northern Asia, and Japan.	avellanarius	Linn.	Common Dormouse	In the southern and western parts of temperate Europe.
anomalous	Gild.	Georgian " "	Georgia, subalpine beech and oak forests of Mount Caucasus.	elegans	Wagner	Japan	Japan.
Syracus	Ehrenb.	Syrian " "	Syria and Arabia.	orbilius	Wagner	" "	From Sennar.
B.—African Species.				quercinus	Linn.	" "	In France, the western parts of Germany and Switzerland, and likewise in North Africa, viz., in Tunis and Morocco.
Stangeri	Wat.	Stanger's Squirrel	Fernando Po.	melanurus	Wagner	Black-Tailed "	Sinai.
rufobrunneus	" "	Red-armed " "	" "	Dryas	Schreb.	" "	Southern districts of the Volga, in Georgia, and in Hungary.
erythrocyneus	" "	Red-checked " "	" "	Glis	" "	" "	In southern and temperate parts of Europe, up to the Volga, and into Georgia.
pyrrhopus	F. Cuv.	Red-footed " "	Fernando Po and Ashanti.	cineraceus	Rüppell	Ash-coloured "	Port Natal, South Africa.
Cepapi	Smith	Cepapi " "	South Africa.	murinus	Desm.	Cape " "	Cape of Good Hope.
multicolor	Rüppell	Many-colored Sq.	Abyssinia.	coupei	F. Cuv.	Senegal " "	Senegal.
annulatus	Desm.	Ringed-tailed " "	Gambia and Senegal districts, and Abyssinia.	GENUS GRAPHIURUS.			
punctatus	Temm.	Freckled " "	Ashanti.	capensis	Ogilby	Cape Graphiurus	South Africa.
Poenis	Smith	Fernando Po " "	Fernando Po.	elegantus	" "	Elegant "	South Africa, west coast.
nasutus	Kuhl	Congo " "	Ashanti.	SECT. 2. DIPODINA.			
Congicus	L.	Congo " "	Congo.	GENUS ALACTAGA.			
gatalus	L.	Barbary " "	Barbary, Morocco.	Jaculus	Pall.	" "	Occurs in Europe in the Steppes between the Danube and the Don, and extends down into the Crimea; ranges eastwards to Barnaul on the River Obi, and in the south-east direction into Great Tartary—Brant is correct in regarding the <i>D. decumanus</i> and <i>D. sibiricus</i> of Lichtenstein, as well as the <i>D. scullianus</i> of Evermann, as specifically identical with the <i>Mus Jaculus</i> of Pallas.
albovittatus	Desm.	White Striped Ground Sq.	Gambia, Senegal, and Abyssinia.	alactatus	Wagner	" "	West coast of Arabia.
Namaguensis	Licht.	South African Ground "	South Africa.	halticus	Illiger	" "	In the Steppes of Mongolia.
rufinus	Rüppell	" "	Abyssinia.	acotium	Pall.	" "	From the Steppes between the Danube and Don, and extends through Great Tartary into Afghanistan.
Madagascariensis	Shaw	Madagascar " "	Madagascar.	elater	Licht.	" "	In the Kirghiz Steppes.
C.—Indian Species.				platyrus	F. Cuv.	" "	On the east shore of the Sea of Aral, near the River Kovan.
Indicus	Exrl.	Bombay, or Malabar Sq.	Nearly throughout Hindoostan, from Travancore in the South up to Bengal.	tetractylus	Licht.	" "	Barbary.
bicolor	Sparrm.	Bicoloured " "	Java, Sumatra, Malacca, Siam, Assam, and Nepal.	GENUS DIPUS.			
ephippium	Müller	" "	Borneo.	sagitta	Pall.	" "	Between the Don and the Volga, in the southern steppes of the banks of the Irith, and extends through Soongaria into Mongolia.
Leschenaultii	Desm.	" "	Java, Sumatra, Singapore.	egyptius	Hasselq.	Egyptian Gerboa	On the Upper Nile, from Syene to Dongola, on the west coast of Arabia; and likewise in Tripoli.
auriventris	Is. Geoff.	" "	Sumatra, Siam.	hirtipes	Licht.	" "	Arabia Petraea.
macrourus	Lesson	" "	Ceylonis.	macrotarsus	Wagner	" "	In the Kirghiz Steppes north of the Sea of Aral, on the east shores of the Caspian; also in the vicinity of Sarepta, on the River Volga. In Bokhara, near the Sea of Aral.
Keraudrenii	Lesson	" "	Birman Empire.	telum	Licht.	" "	" "
hippurus	Is. Geoff.	" "	Java, Sumatra, Borneo, Malacca, Assam, Bhotan.	GENUS JACULUS.			
rufoniger	Gray	" "	China.	labradorius	Davies	Labrador Jumping Mouse	North America, from the 60th parallel southwards, into the United States.
castaneiventris	" "	" "	" "	cafer	Pall.	" "	South Africa.
prevostii	Desm.	" "	Borneo, Malay Peninsula, Siam, China.	SECT. 3. CTENODACTYLINA.			
vittatus	Raffles	" "	Sumatra, Borneo, Malacca, Canton.	GENUS CTENODACTYLUS.			
plantani	Ljung	" "	Java, Sumatra.	massoni	Gray	" "	North Africa (Tunis and Tripoli).
nigro-vittatus	Is. Geoff.	" "	Java, Sumatra, Borneo, Canton.	SECT. 4. MURINA.			
finlaysoni	Horsf.	" "	Siam, and Sichang Island in the Gulf of Siam.	GENUS SMITHUS.			
laticaudatus	Müller	" "	Borneo.	betulinus	Pall.	" "	Between the Oural Mountains and the Jensei; and there appears to be good reason to believe that a small rodent found in Sweden is identical with the present species.
philippinensis	Wat.	" "	Mindanao (Philippine Islands).	nordmanni	Keys et B.	" "	In the Crimea.
pygæythrurus	Is. Geoff.	" "	Pegu.	vagus	Pall.	" "	Found in Northern Asia between the Rivers Obi and Jensei, ascending as high as latitude 57°, and descends into Tartary.
albifrons	Raff.	" "	Singapore, the Island of Pulo Penang in the Strait of Malacca	GENUS MUS.			
caniceps	Gray	" "	Bhotan, Northern India.	A.—European and N. Asiatic Species.			
bimaculatus	Temm.	" "	Malacca.	decumanus	Pall.	Common Brown Rat	Found in all parts of the world.
cinnamomeus	Hodgs.	" "	Nepal, Sikkim, Assam.	rattus	Linn.	Black Rat	Found throughout Europe, excepting in the extreme north, and like the Common Brown Rat, has been conveyed to various parts of the globe. It is, however, less frequently met with than that animal.
lokrioides	Hodgs.	" "	Nepal, Assam.	alexandrinus	Is. Geoff.	" "	Tunis, Egypt, Nubia, Italy, and Spain.
chinensis	Gray	" "	China.	caraco	Linn.	Field Mouse	Eastern Siberia.
flavimanus	Is. Geoff.	" "	Cochin-China.	syriacus	Linn.	" "	Throughout Europe, and in western Siberia.
insignis	F. Cuv.	" "	Java, Sumatra, Borneo.	musculus	Pall.	" "	Found in all parts of the world.
tristriatus	Waterh.	" "	Forests of the Ghauts.	agrarius	Pall.	" "	From the Rhine, through Germany, into Western Siberia.
palmarum	Linn.	" "	Deccan, Calcutta.	hortulanus	Nordm.	" "	Botanic Garden at Odessa.
sublineatus	Waterh.	" "	Madras, Nilgherries.	minutus	Pall.	Harvest Mouse	Throughout the whole of temperate Europe, and in the temperate parts of Siberia.
McClendani	Horsf.	" "	Assam and Bhotan.	latipes	Bennett	" "	Trebizond.
tennis	Müller	" "	Singapore.	abottii	Waterh.	" "	" "
modestus	" "	" "	Sumatra, Borneo, Malacca.	B.—Indian Species.			
melanotis	" "	" "	Java, Sumatra, Borneo.	giganteus	Harw.	" "	Continental India, Java, and Sumatra.
exilis	" "	" "	Java, Sumatra, Borneo, Malacca.	perchal	Shaw	" "	India.
rufiventris	" "	" "	Celebes.	indicus	Is. Geoff.	" "	Continental India, Java, Sumatra, Celebes, Java.
leucopus	Forster	" "	" "	decumanoides	Hodgs.	" "	Northern and central hilly portions of Nepal.
murinus	" "	" "	" "	picioris	Temm.	" "	Japan.
D.—North and Central American Species.				speciosus	" "	" "	Java.
capistratus	Bosc.	Fox Squirrel	Middle and southern parts of the United States. A variety of this species is found in Texas and Mexico.	leucogaster	Müller	" "	Sumatra.
subauratus	Bachm.	Golden-bellied Squirrel	New Orleans and Mexico.	flavescens	Elliot	" "	Maharatta country.
cinereus	Gmel.	Cat " "	Middle and northern parts of the United States.	booduga	Gray	" "	" "
leucotis	Gapper	White-eared Grey " "	From the middle portions of the United States to Hudson's Bay.	platythrix	Bennett	" "	Deccan—Maharatta country.
Carolinensis	Gmel.	Carolina Grey " "	From the Peninsula of Florida westwards into Louisiana, and in the northern direction, extending into North Carolina.	leggada	Gray	" "	Maharatta country.
niger	Linn.	Black " "	States of New York and Pennsylvania, and extends into Upper Canada.	striatus	Linn.	" "	India.
Auduboni	Bachm.	Larger Louisiana Black Sq.	Louisiana.	argenteus	Temm.	" "	Japan.
fuliginosus	Pall.	Lesser " "	Louisiana, along the banks of the Mississippi.	tanezumii	" "	" "	" "
Hudsonius	" "	The Chickaree " "	From the arctic extremity of the woods, southwards to the 40th parallel of latitude—rare below that parallel.	mollissimus	Licht.	" "	Arabia and Syria.
Richardsonii	Bachm.	Columbia Pine Squirrel	Frequents the pine forests of the Rocky Mountains, west of the great chain.	prætextus	" "	" "	" "
lanuginosus	Downy	" "	North-west coast near Sitka, and at Paget's Sound.	C.—African Species.			
Lewisii	Smith	" "	From the Missouri.	pumilio	Sparrm.	" "	South Africa.
Clarkii	H. Smith	" "	Missouri.	vittatus	Wagner	" "	" "
augurogaster	F. Cuv.	California "	California and Mexico.	dorsalis	Smith	" "	North Africa—Algiers.
Douglasii	Gray	Douglas' "	California and California.	barbatus	Linn.	Barbary Mouse	Province of Sameni—Abyssinia.
Collisi	Richard.	Collie's "	California.	imberbes	Rüppell	" "	On the banks of the Dembea Lake, Abyssinia.
nigrescens	Bennett	" "	California.	leucosternon	" "	" "	In houses of Massowah, on the coast of Abyssinia.
Bottle	Lesson	" "	" "	albipes	" "	" "	Common house-rat at Massowah, Abyssinia.
mustelinus	Bachm.	" "	" "	abysinnicus	Alleni	Waterh.	Province of Sameni, Abyssinia.
leporinus	" "	" "	North America.	hayi	Hayi	" "	Fernando Po.
occidentalis	" "	" "	" "	fuscirostris	Wagner	" "	Marocco.
mollipilus	" "	" "	North California.	limbatus	" "	" "	" "
Boothie	Gray	" "	Honduras.	orientalis	Rüppell	" "	Throughout the north-eastern portions of Africa (Egypt, Nubia, and the coast of the Red Sea).
Richardsonii	Ogilby	" "	North-west coast of South America—Mexico?	gentilis	Licht.	" "	Egypt and Nubia.
variegatoides	" "	" "	" "	dolichurus	Smuts.	" "	Cape of Good Hope.
Langsdorffii	Brandt	" "	Brazil and Guayana.	colonus	Brants	" "	South Africa (Algoa Bay).
variabilis	Is. Geoff.	Brazilian Squirrel	Brazil and Guayana.	verroxii	Smith	" "	South Africa, near Cape Town.
æstuans	Linn.	" "	Guayana, Brazil, Peru, and Bolivia.	Natalensis	Wagner	" "	South Africa, in the neighbourhood of Port Natal.
stramineus	Gervais	" "	Peru.	muscardinus	" "	" "	Cafraria.
pusillus	Geoff.	" "	Ceyenne.	silvaceus	" "	" "	Cape of Good Hope.
igniventris	Wagner	" "	Brazil.	modestus	Smith	" "	South Africa—Cafferland.
pyrrhonotus	" "	" "	North-west portions of Brazil.	minutoides	" "	" "	North America.
glivularis	" "	" "	" "	Lecomtei	Aud. et B.	" "	" "
GENUS PEROMYSDUS.				Michiganensis	" "	" "	" "
leucogenys	Temm.	Japan Flying "	Japan.	Carolinensis	" "	" "	New Jersey and South Carolina.
nitidus	Desm.	" "	Java, Sumatra, Borneo, Malacca, Siam.	humilis	Bachm.	" "	Georgia.
petaurista	Pall.	" "	From Bengal southwards to Travancore.	palustris	Wagner	" "	New York.
Orai	Tickell	" "	Tenasserim, Midnapour, Chyebassa.	Americanus	Dekay	" "	" "
magnificus	Hodgs.	" "	Nepal, chiefly the central and northern hilly districts.	E.—Central American Species.			
nobilis	Gray	" "	Nepal (lower, central, and northern hilly districts), and Dargulling	tequina	Gray	" "	Coban. (These two species perhaps do not belong to the genus Mus.)
inornatus	Is. Geoff.	" "	From Cashmere.	F.—Australian Species.			
elegans	Müller	" "	Java, and in the island of Nusa-Kambang, near Java.	Australis	Gray	" "	Liverpool plains.
albiventer	Gray	White-bellied Flying Sq.	Nepal.	setiger	Gould	" "	Van Diemen's Land.
caniceps	" "	" "	Dargulling.	albocinereus	Wagner	" "	Moore's River—interior of Western Australia.
finbriatus	Hodgs.	" "	Nepal, Dargulling.	fusipes	Waterh.	" "	King George's Sound, Bass' Straits, and Van Diemen's Land.
alboniger	Hodgs.	" "	Nepal, Dargulling.	inultra	Gray	" "	New South Wales, Mosquito Islands, and Van Diemen's Land.
Horsfieldii	Waterh.	" "	I. of Banca?	Gouldii	Waterh.	" "	New South Wales, South Australia.
sagitta	Desm.	" "	Java, Sumatra.	Adelaidensis	Gray	" "	South Australia.
genibarbis	Horsf.	" "	Java.	Greyi	Gould	" "	Port Essington.
Momonga	Temm.	" "	Japan.	delicatulus	Gould	" "	New South Wales.
volans	Linn.	" "	Siberia.	hirsutus	Gould	" "	Port Essington.
volucella	Linn.	" "	Canada and the United States.	Nova-Hollandiæ	Wat.	" "	New South Wales.
sabrinus	Rich.	" "	Forests of Canada, the Rocky Mountains, and the fur countries up to the 57th parallel.	penicillatus	Gould	" "	Darling Downs.
Oregonensis	Bachm.	" "	From the pine woods on Columbia River.	lineolus	" "	" "	(Oakley Creek.)
GENUS ANOMALURUS.	Waterh.	" "	" "	gracilicaudatus	" "	" "	" "
Fraseri	Temm.	Fraser's Anomalurus	Fernando Po and Sierra Leone.	G. Mus (ISOMYS, SUNDEV.)	Sundev.	" "	Bahr el Abiad.
Pelli	" "	" "	Ashanti.	testicularis	Is. Geoff.	" "	Nubia, Abyssinia, and Arabia.
GENUS TAMIAS.				Niloticus	Is. Geoff.	" "	Egypt.
striatus	Linn.	Black-striped Tamias	On the Oural Mountains, and throughout the wooded portions of Siberia, as far as the Sea of Okhotsk, and the Anadyr.	Cabrinus	Is. Geoff.	" "	Sinai.
Uthensis	Pallas	" "	From the region of the River Uth (Russia).	dimidiatus	Cretsch.	" "	Maharatta Country.
quadrivittatus	Rich.	Four-striped " "	Fur countries of North America, and extends southwards along the eastern declivity of the Rocky Mountains to the sources of the Platte and Arkansas.	russatus	Wagner	" "	Deccan, Madras, and Nepal.
Lysteri	" "	Lyster's " "	Ranges on the eastern side of the Rocky Mountains, from the 50th parallel down to the Carolinas.	G. Mus (GOLMUDA, GRAY)	Gray	" "	India.
tenebrosus	Bachm.	" "	North America.	Ellothii	" "	" "	Maharatta Country.
Hindei	Gray	" "	Common in woods on the west coast of North America.	G. Mus (Vandeleuria, G.)	Bennett.	" "	Deccan, Madras, and Nepal.
Townsendii	Bachm.	" "	Plentiful along the banks of the Rio Colorado.	oeraceus	" "	" "	India.
minimus	" "	" "	" "	G. Mus (Nesokia, GRAY)	Gray	" "	Maharatta Country.
GENUS SPERMOPHILUS.				Kok	" "	" "	Northern and central hilly districts of Nepal.
fulvus	Licht.	Fulvous Spermophilus	On the banks of the southern portions of the River Oural, extending northwards to about the 50th degree	hydrophilus	Hodgs.	" "	South Africa.
mgosarius	Licht.	" "	Found between the Caspian Sea and Lake Aral, on the banks of the River Oural, and westwards as far as Sarepta on the Volga.	GENUS DEXTROROMYS.	Smith	" "	" "
brevicaudatus	Brandt.	Short-tailed " "	From the Altai.	mesomelas	Licht.	" "	Java and Sumatra.
undulatus	Everm.	Wave-marked " "	On the River Oural; extends from about the 50th to the 56th degree of north latitude. Common at Orenbourg.	melanotis	Smith	" "	Gambia district, Western Africa, and Fernando Po.
musicus	Ménétr.	" "	On the Caucasus Mountains, extending nearly up to the snow line.	GENUS CHACETOMYS.	F. Cuv.	" "	" "
Evermanni	Brandt.	Evermann's " "	Found in Austria; extends northwards into Silesia, and eastwards through temperate Europe, and into Siberia.	Gambianus	Waterh.	" "	" "
Ciillus	Linn.	" "	From the Altai; extends northwards into Silesia, and eastwards through temperate Europe, and into Siberia.	GENUS HAPALOTIS.	Licht.	" "	" "
erythrocyneus	Brandt	Red-checked " "	Altai Mountains, and mountains of Bakhsh.	alpinæ	" "	" "	White-footed Hapalotis.
concolor	Is. Geoff.	" "	Persia, particularly in the great plain of Sultania.	longicaudatus	Gould	" "	Long-tailed "
xanthopymnus	Bennett	Erzeroum " "	Erzeroum.	murinus	Murine	" "	Murine "
Richardsonii	Sabine	Richardson's " "	Prairies of the Saskatchewan.	Mitchellii	Ogilby	" "	Mitchell's "
Franklinii	" "	Franklin's " "	Prairies, and ranging southwards to Mexico?	GENUS PHLEOMYS.			
Hoodii	Licht.	Hood's " "	Mexico and California.	Cumingii	Waterh.	Indian Phleomys	Island of Luzon (Philippines).
Mexicanus	Licht.	Mexican " "	Banks of the Columbia.	GENUS GERBILLUS.			
Douglasii	Rich.	Douglas' " "	Upper California.	Indicus	Harw.	Indian Gerbillus	Found almost throughout Hindoostan, extending from Bengal, southwards to Travancore.
Beecheyi	Bennett	Beechey's " "	California.	Cuvieri	F. Cuv.	Cuvier's "	Madras.
macrourus	" "	Long-tailed " "	From the arctic coasts and Rocky Mountains, down to the 58th parallel.	erythrouros	Gray	" "	India.
Parryi	Rich.	Parry's " "	Western prairies.	montanus	Smith	" "	Afghanistan.
annulatus	Aud. et B.	Ring-tailed " "	Eastern declivity of the Rocky Mountains, from the 57th degree down to the sources of the Arkansas.	pyrgurus	F. Cuv.	" "	South Africa—vicinity of Cape Town.
lateralis	Say	Flank-striped " "	Inhabits the prairies on the Wallawalla (Columbia River).	Libycus	Licht.	" "	South Africa—near the sources of the Orange River.
Townsendii	Bachm.	Townsend's " "	From the Alps.	Burtoni	F. Cuv.	" "	North Africa—Egypt and Arabia Petraea.
GENUS ARCTOMYS.				pyrrauidum	F. Cuv.	" "	Darfour.
Marmotta	Linn.	Alpine Marmot	From the Alps.	tenis	Smith	" "	South Africa—to the north of Latako.
Bobac	Schreb.	Bobac " "	In Poland, Russia, Siberia.	auricularis	Desm.	" "	South Africa, western districts, principally north of the Orange River.
Himalayanus	Hodgs.	Nepal " "	Northern hilly region of Nepal, and in Tibet.	ægyptius	Desm.	" "	Tunis, Tripoli, Egypt, and Nubia.
Thibetanus	Hodgs.	Tibet " "	Tibet. Perhaps the same as <i>A. bobac</i> .	teunurus	Wagner	" "	Syria.
caudatus	" "	Long-tailed " "	From the Valley of Gombur—Cashmere.	crassus	Sundev.	" "	Arabia Petraea.
Empetra	Schreb.	Quebec " "	Frequents the woods of Canada, and the fur countries up to the 60th parallel.	venustus	" "	" "	Bahr el Abiad.
prunosus	G						

(TABLE II.—continued.)

Main table listing rodent species, their authors, and geographical distributions. Includes sections for Genus Mystemys, Genus Hydromys, Genus Chrysomys, Genus Hesperomys, Genus Arvicolina, Genus Arvicola, Genus Lepus, Genus Caviina, Genus Chinchilla, Genus Sigmodon, Genus Muridae, Genus Hesperomys (Oxy-mycterus), Genus Hesperomys (Calomys), Genus Arvicolina (Arvicola), Genus Lepus, Genus Caviina, Genus Chinchilla, Genus Sigmodon, Genus Muridae, Genus Hesperomys (Oxy-mycterus), Genus Hesperomys (Calomys), Genus Arvicolina (Arvicola), Genus Lepus, Genus Caviina, Genus Chinchilla, Genus Sigmodon, Genus Muridae.

South American Muridae, which have been described as members of the Genus Mus, but which require further examination.

North American Species.

American Species.

1 Besides the above species, some other small Rodents, inhabitants of Brazil, have been associated with the Arvicole, but without sufficient examination; indeed, we know not yet that they even belong to the section Muridae.

2 No doubt most of the above eighteen species will require to be located in the genus Hesperomys.

3 Mr Darwin states that "on the east side of the South American continent, the Copya ranges from lat. 34 deg. to Rio Chupat in 43 deg. 30 min. a not in Tierra del Fuego. So that on the Atlantic side of the continent, the plains of Patagonia check its range southwards; as on the Pacific side the deserts of Neuquen, on the east coast of Brazil.

4 On the west coast it is found from the valley of the Rio Chilo (lat. 33 deg.) to 43 deg. south, or perhaps even further, but Chile do to the north. I may notice that the animal occurs in Peru and Bolivia; it is said to be rare in Paraguay, and was not met with by Pr. von Schlegel, on the east coast of Brazil.

5 Mr Darwin states that "near the coast of the Atlantic, the northern limit of the Patagonian Cavy is formed by the Sierra Tapalquen in lat. 37 deg. 30 min., where the plains rather suddenly become greener and more humid. The limit certainly depends upon this change, since near Mendoza (33 deg. 30 min.), where the country is very stony, the animal again occurs. Its limit southwards is between Port Desire and Port Julian."

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SECTION II.

RUMINANTIA (RUMINATING ANIMALS).

CLASSIFICATION AND EXTENSION OVER THE GLOBE.

The order Ruminantia is distinguished from all the other orders of Mammalia, by the existence of four stomachs, arranged for the act of ruminating or chewing the cud. These animals are essentially herbivorous, and are all possessed of the cloven hoof; and it is only among them that species are met with whose foreheads are armed with horns. This order, which is one of the most natural and best defined of all the primary groups into which the Mammalia have been divided, is principally represented by the ox, the sheep, the goat, and the deer; but it is usual also to classify with them the giraffe, camels, antelopes, llamas, &c. They are subdivided into 9 genera, comprising in all 180 species, forming about one-eighth of all Mammalia. Following the general law of distribution, the Ruminantia are most numerous in equatorial regions, but, as if created expressly for the use of the human family, they are distributed over all latitudes, in the northern hemisphere at least, from the equator to the regions within the arctic circle; so that, wherever man is found, he is accompanied by those animals most necessary for the supply of his wants and comforts, and most conducive to his progress in arts and civilization. From them he derives a considerable portion of his food and clothing, whether in a savage or a civilized state of society. Their milk, their flesh, their wool, hides, horns, and hoofs, are all converted to his uses; whilst from many of them he derives the most valuable assistance in the labours of the field, and in the transport of commodities. Thus the rein-deer, as is well known, forms the chief comfort, and the principal means of subsistence to the Laplander; and the yak or kash-gow, confers similar benefits on the inhabitants of Tibet and Pamir. Other cattle require the provident care of man to subsist them through the winter, but the kash-gow is left entirely to itself. If the snow on the elevated flats lies too deep for him to crop the herbage, he rolls himself down the slopes, and eats his way up again. The strong, wiry, and pliant hair of its tail is made into ropes, which for strength do not yield to those manufactured from hemp; and the hair of its body is woven into mats. The milk of the yak is richer than that of the common cow. In tropical countries, again, the camel affords to the inhabitants the means of traversing the wide and trackless desert. From this general distribution of the valuable order of animals under consideration we must except the continent of Australia; among the peculiar fauna of that country, as well as in Madagascar, New Guinea, and the greater number of the South Sea islands, no species of this order has yet been discovered.

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DIVISION AND INTENSITY OF THE SPECIES.

Asia and Africa contain by far the greatest number of species of the Ruminantia, the former possessing 96 and the latter 50 of all species, and they form the chief habitat of the numerous genera of Cervus and Antelope, which together comprise more than the half of all Ruminantia. Hence it is not surprising that the Old World, as a whole, should possess such a vast preponderance in species over the New World,—this difference, as shown in the last two columns of the following table, being nearly seven to one; for while the Old World has 162, the New World has only 24 species. From this table also it will be seen, that the genera Camelus, Camelopardalis, and Moschus are almost entirely peculiar to the Old World, that Auchenia is entirely confined to the countries of South America, and that the genus Cervus is the most widely distributed of all:—

TABLE SHOWING THE DIVISION OF RUMINANTIA OVER THE GLOBE.

Table with columns for Genera, Europe, Asia, Africa, America, and Zoological Provinces. Rows list species like Camelus, Auchenia, Moschus, Cervus, etc., with their counts in each region.

DISTRIBUTION OF GENERA AND SPECIES.

1. Camelus (Camels). The Arabian camel (Djamel of the Arabs), from which the dromedary is only distinguished by higher breeding and finer qualities—both being possessed of only one hump—is a native of Asia, where, from the earliest ages to the present day, it has formed the chief means of communication between the different regions of the East. Its present geographical distribution extends over Arabia, Syria, Asia Minor, to the foot of the Caucasian chain, the south of Tartary, and part of India. In Africa, it is found in the countries extending from the Mediterranean to the Senegal, and from Egypt and Abyssinia to Algiers and Morocco. It is also very abundant in the Canary Islands.

Arabia produces the greatest number of these valuable animals, the province of Nejed being, on this account, entitled Om el Bel—the mother of camels; and the camel of Oman is celebrated for its fleetness and beauty. After the conquest of Granada, the Arabian camel was introduced into Spain by the Moors, and at that time it was abundant in the southern provinces, but as a species it is now extinct. The only place in Europe where this camel is now reared is in Pisa, where it was probably introduced during the sixteenth century, and where, in the arid plains of San Rossora, the country bears a faint resemblance to the desert regions of Asia and Africa.

The Bactrian camel (Camelus Bactrianus), is distinguished from the former by having two humps on its back, by its hair being more rough and shaggy, and by being stronger and more muscular; it is the camel of Central Asia, being most abundant in the countries to the north of the Taurus and the Himalayan Mountains. It is also found in the Crimea and the other countries bordering on the Caucasian Mountains; but, although it is said by Pallas to occur in a wild state in the Desert of Shamo, and on the borders of China, it is comparatively rare except in the central districts already mentioned, and in south-western Asia it is almost unknown. In most of these countries this valuable servant of man occurs chiefly in a domesticated state.

2. Auchenia (Llamas). These "camels of the New World" differ from the former species, in being much smaller, and having no hump on the back; but they bear in other respects a strong resemblance to them, both in external and internal structure. They are confined exclusively to South America, and chiefly to the western part of the great chain of the Andes, extending from the wooded islands of Tierra del Fuego, northwards through Patagonia, Chile, Bolivia, Peru, Ecuador, and New Granada, as far as Caracas in Venezuela. As explained in the notes on the perpendicular distribution of Ruminantia, this limitation is determined by the low temperature of the regions referred to; and to this cause also must be ascribed their occurrence in the plains of the southern extreme of the continent. Mr. Darwin states, indeed, that this is the characteristic quadruped of Patagonia. "It generally lives," says the same accurate observer, "in small herds of from half-a-dozen to thirty in each; but on the banks of the S. Cruz, we saw one herd which must have contained at least five hundred." They are observed in great numbers on the northern shores of the Strait of Magalhaens. On the Andes, they are most numerous in Chile and Peru.

3. Moschidae (Musk Deer). This group of ruminants is distinguished from all others by the absence of true horns. The principal species Moschus moschiferus (the genuine musk deer), from which the whole group derives its name, forms an important object of the chase in the countries in which it occurs, on account of the substance called musk, which is secreted in a bladder-formed cavity in the abdomen of the male. Its chief habitat is the mountainous countries of Central and South-Eastern Asia, between China and Tartary, and in the regions extending from Lake Baikal to the Altai Mountains; it is also common in Nepal, Bhotan, Tibet, and the adjacent countries of China and Tonquin. Of the other six species, four occur in India, Ceylon, Sumatra, and Borneo, and two in the countries of Senegambia, Guinea, and Sierra Leone, in Western Africa.

4. The Cervidae (or Deer family) consists of that order of ruminants which have solid horns or antlers. They are generally remarkable for elegance of form, vigour, and speed. The species are very numerous and widely distributed, but our space will only admit of a notice of a few of the more important of them. The largest of this genus, Cervus alces (the elk;—the moose deer of America), is an inhabitant of the colder regions both of the Old and the New World. The European elk, which recent investigation proves to be quite a different animal from the American moose, inhabits the forest regions of Scandinavia, Eastern Prussia, Poland, Lithuania, and Russia, as far as Finland and the White Sea, extending eastward through the countries of Asiatic Tartary and Lake Baikal, and southward, occasionally, to the Caucasus. It does not extend to the north of latitude 64° in the Scandinavian Peninsula; and the elk is now extinct in Scania, the southernmost province of Sweden, where once it was very abundant. The American moose deer at one time extended as far south as the Ohio and Cape Breton. They are still found in considerable numbers near the Bay of Fundy, but are not known in the State of Maine. From Dr. Richardson, we learn that they frequent the woody tracts, in the fur countries, to their most northern limits; they probably reach their highest latitude on the shores of the Arctic Sea, near the mouth of the Mackenzie River, latitude 69° north; farther eastward, towards the Coppermine River, they are not found higher than latitude 65°; on the west, they extend beyond the Rocky Mountains as far as the Atna River, where they were observed by Wrangell, in 1839.

Cervus tarandus (the Rein-deer). This valuable animal, the presence of which so materially enhances the comfort and promotes the civilization of the inhabitants of the polar regions, is widely spread over the northern parts of Europe, Asia, and America. The Caribou, or rein-deer of America, occurs in greatest numbers between latitude 63° and 66° north; its southernmost limit being about latitude 50°. In Europe, the rein-deer inhabits Iceland, Spitzbergen, Northern Russia, and Scandinavia; but its chief habitat is in Finmark and Lapland. It is also abundant throughout the greater part of Siberia and Kamtchatka.

Cervus dama (the Fallow-deer). This gentle creature, the principal ornament of our parks, is an inhabitant of several European countries, as far as latitude 53° north. It does not occur in Russia proper, but is found in Lithuania, Moldavia, and Greece; it is less common in France and Germany than in England, and is abundant in the wooded districts of the centre and north of Scotland. It extends to the north of Persia and China, and is found in the northern part of Africa, as far south as Abyssinia.

Cervus elaphus (the common Stag or Red-deer) is a native of the temperate countries of Europe (excepting Russia proper), from about latitude 63° north in Scandinavia, southward to the Caucasian Mountains. It also occurs in Siberia, from the regions of the Altai Mountains to the Lena River. In Britain, the range of the stag is now limited to the large parks and chases of England, and to the heath-clad mountains of Scotland, where the largest herds, perhaps, occur on the banks of Lochiel in Argyleshire.

Cervus capreolus (the common Roe or Roebuck) is one of the smallest and most elegant of European deers. It belongs exclusively to the Old World, and is widely distributed over the temperate regions of Continental Europe, as far as latitude 58° north; and in Asia, eastward to the River Lena, in Siberia, and southward to Armenia and Persia. In England, it is still abundant in the wooded districts of Westmoreland and Cumberland; in Scotland, it is very rare to the south of the Forth, but very abundant everywhere to the north of that river. It is unknown in Ireland.

Of the American fallows, the most celebrated is Cervus Virginianus (the Virginian Deer), which

occurs in all the countries of the New World, from Canada on the north, to Cayenne on the south, but is most abundant in Virginia and Louisiana. The number of species of this and the other families belonging to each separate country will be readily found by reference to the preceding table.

5. Camelopardalis (Giraffe). This singular and celebrated animal forms an isolated genus among the ruminants. It is exclusively confined to the continent of Africa, in which there is now ascertained to be at least two species, one of which (Camelopardalis antiquorum) inhabits Nubia, Abyssinia, and the adjacent countries to Lake Tchad; and the other (Camelopardalis Australis, Sw.), the southern regions of Africa to the Orange and Lion Rivers, in latitude 29° south.

6. Antelope (Antelopes). Of this very extensive genus, Africa, as has been already stated, may be considered as the head-quarters, since, as shown on the map, this continent alone contains thirty-four species; while Asia has eleven, Europe two, and America only one. The most celebrated of the whole genus is the European species, Antelope rupicapra (the Chamois), which is a denizen of the alpine districts of Europe and Western Asia, namely, the Alps, Pyrenees, the Tatra, and Grecian Mountains, and among the ranges of the Caucasus and Taurus.

7. Capra (Goats). These well-known and valuable ruminants, like the preceding, are inhabitants of the alpine regions of Europe; as well as the Taurus Mountains, and Kamtchatka in Asia, and some parts of Africa.

Capra ibex (the Bouquetin or Steinbok). In the Pyrenees, the Alps, and the mountains of the Tyrol, the ibex frequents the loftiest ranges, in the vicinity of the snow line, and appears to ascend even to a greater height than the chamois. The greatest number of species of the goat family occurs in Asia, one of the most celebrated being the goat of Cashmir, which is also spread over Tibet and the countries of the Kirghiz, to the north of the Caspian Sea.

8. Ovis (Sheep). These, the most ancient of our domestic animals, may be traced originally to the countries of Western Asia. They herd in flocks, in a wild state, on the inaccessible mountainous districts of Asia, Europe, Africa, and America. Like the goats, they are most numerous in Asia. America furnishes only two species, Ovis Californiana and Ovis montana (Rocky Mountain Argali)—the latter of which inhabits the chain of the Rocky Mountains, from about latitude 40° to latitude 60° north. They also frequent the elevated ridges intersecting the country between this mountain range and the Pacific, but they have not been observed further to the eastward than the declivity of these mountains, nor are they found in any of the hilly tracts near Hudson Bay.

9. The Bovine tribe (Oxen). These comprise the largest of ruminating animals, and consist of groups having a greater or less resemblance to the domestic races of oxen. They are widely distributed, either in a wild or domesticated state, over most countries of the globe. Bos bubalus (the buffalo), which has been long known as a domesticated animal in India, has spread thence westwards into Egypt, Greece, Italy, and Spain; and eastwards to China, Cochinchina, and the islands of Sumatra, Java, Borneo, and the Philippines. Bos Caffer (the Cape buffalo), is a ferocious animal, which congregates in large herds, and is much dreaded by travellers. It is peculiar to the countries of Southern Africa. The New World furnishes two remarkable species of this order—(1.) Bos Americanus (the American bison), which, although its range is much circumscribed, still roams in numerous herds over the remote and uninhabited prairie lands watered by the Arkansas, Platte, Missouri, Saskatchewan, and Peace Rivers, to about latitude 64° north; while, on the south, they extend as far as New Mexico and California. (2.) Bos moschatus, oribos mos. Blainville (the musk ox). This singular animal is considered by many naturalists as forming an appropriate connection between the sheep and the ox. It is peculiar to the frozen regions of North America; its southern range beginning where the northern limit of the bison terminates, and extending thence (latitude 64° north) over the barren regions of the polar districts to Melville Island; thus attaining, with the rein-deer, the highest latitude of any known species of ruminants.

PERPENDICULAR DISTRIBUTION.

In perpendicular distribution, the order Ruminantia affords the most striking examples of the limitation of certain genera and species to particular mountainous regions, in which alone are combined those thermal and climatological conditions which appear to be necessary for their very existence. Of these we shall note some of the most remarkable examples in the different regions of the globe, explanatory of the diagram on the map.

EUROPE.—In the Alps, where the line of perpetual snow reaches a height of 8,700 feet, the Antelope rupicapra and Capra ibex (chamois and steinbok) attain the greatest height of any of the order; their peculiar habitat being between the upper limit of trees and the snow line, which, on the northern declivities, is about 700 feet lower than on the southern. Oxen graze on the Alps at a height of nearly 8,000 feet, and sheep pasture at a still greater elevation. Capra elaphus (the common stag) does not ascend higher into the wooded regions than about 7,000 feet, and Capra dama (the fallow deer) about 6,000 feet.

ASIA.—Here, as in the European Alps, goats and sheep attain the highest elevation. Thus the goat of Cashmir (Capra hircus laniger), and the argali (Ovis ammon), browse on the comparatively naked table-lands of Tibet, at a height of from 10,000 to 13,000 feet above the level of the sea. The Ovis polii (the Pamir sheep or rass) lives at the still greater height of 15,600 feet, in the table-land of Pamir, eastward of Bokhara; and the burrhel (Ovis burrhel) inhabits the highest ridges of the Himalayan chain, where it is described as "bounding lightly over the incrustated snows, at an altitude where his human pursuers find it difficult to breathe." A specimen in the Museum of the Zoological Society, London, is said to have been shot near the Boorendo Pass, at an elevation of about 17,000 feet—considerably above the line of perpetual snow; and consequently it attains, with the exception of the llama, perhaps the greatest absolute height of any of the Ruminantia. Bos grunnicus (the yak or kash-gow) grazes among the snow on the summit of the rugged passes of Tibet. Wherever the mercury does not rise above zero, is a climate for the yak. Indeed, so rigorously is this animal confined to regions of extreme cold, that in the case of two of them being removed to Kabul, though at an elevation of 6,000 feet above the level of the sea, the climate was so ill suited to their nature that they declined as the snow left the ground, and died early in the spring. In the extensive table-lands of Central Asia, the Bactrian camel probably attains a considerable elevation; but this can only be assumed from the fact of its occurrence in the Mongolian plains, the mean height of which is from 3,000 to 5,000 feet.

AFRICA.—The giraffe (Camelopardalis) inhabits countries in this continent which rise considerably above 5,000 feet, and the antelopes and buffaloes frequent regions still higher; but there is no exact data on which to found calculations on perpendicular distribution in this quarter of the globe.

SOUTH AMERICA.—Here the llama inhabits the bleak and rocky precipices of the Cordillera de los Andes, in regions bordering on the limit of perpetual snow. On the approach of winter, however, it quits these desolate regions to pasture in the plains; and in Patagonia, the lowness of the temperature permits it to approach the vicinity of the sea. From this it spreads over the elevated regions of the Andes, and in large herds attains, on Chimborazo, the limit of perpetual snow, which there reaches a height of 15,800 feet. On the Bolivian Andes, where the snow line rises still higher, it probably attains a height of 18,000 feet.

1 Wood's Journey to the Oxus, p. 221.

2 It may be necessary again to remind the reader, that in this and the other sheets of the Zoological Division, domesticated animals are not generally taken into account in treating of the distribution of species.

3 Journal, p. 166

4 Wood's Journey to the Oxus, p. 232.

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