Report on North American Zoology. By John Richardson, *M.D., F.R.S., &c.*

The following paper having reference to the animals of only a single zoological province, bears the same relation to the valuable report made to the Association by the Rev. Leonard Jenyns, "On the present State of Zoology*," that *a local fauna* does to a work embracing the whole *animal kingdom*. As it leaves untouched the principles of systematic arrangement, structure, physiology, and in fact the fundamental doctrines of the science, the only subjects coming properly within its scope appear to be, *an enumeration of the animals inhabiting North America*; the *peculiarities of the fauna which they constitute* when contrasted with those of the other zoological provinces into which the earth may be divided; and *the geographical range of groups or individual species*, with the circumstances which tend to influence its extent, such as the *configuration of the land, climate, vegetation, &c.* The only author who has written on the latter branch of the subject is Mr. Swainson, to whom we are indebted for an enumeration of the generic forms peculiar to North America †. No separate treatise has hitherto been devoted to the laws which regulate the distribution of animals in North America, and the geographical limits of each species have been very imperfectly pointed out in the systematic works containing descriptions of the animals. Hence, as the reports called for by the British Association are designed to exhibit the present state of science, and not for the publication of new facts or the mere enunciation of the reporter's opinions, portions only of the outline of a complete fauna will be traced in the following sketch; but the purpose of the report will be answered if it serves to point out the gaps in North American zoology which require to be filled up, and to direct the attention of travellers and resident naturalists to those investigations which are im-

* Vide *Report of the Fourth Meeting*, &c. London, 1835, p. 143. Mr. Jenyns limits his report to "those researches which of late years have tended to elucidate the characters and affinities of the larger groups of animals, and thereby to advance our knowledge of their natural arrangement." The great extent of the field of inquiry thus marked out will appear by a quotation from the first zoologist of the age: "*En un mot, la méthode naturelle serait toute la science, et chaque pas qu'on lui fait faire approche la science de son but.*" (Cuv., *Reg. An.*, i. 10.)

† Published in the *Encyclopædia of Geography*; and in his volume on the *Geography and Classification of Animals*, forming part of *Lardner's Cyclopædia*.

portant to the interests of science. A correct knowledge of the species is clearly the first point to be attained, being indispensable for the due discussion of the other subjects embraced by a local fauna; but though this has formed the chief aim of the works hitherto devoted to North American zoology, great uncertainty still exists as to many species, the original descriptions being so obscure that they do not enable us to recognise the animals; and even the commonest quadrupeds, about whose identity, when found in certain localities, there can be no doubt, have in very few instances, indeed, been satisfactorily compared with the analogous ones inhabiting distant districts of America or belonging to the old world. A critical review of the various opinions entertained by zoologists respecting the several species, (such as that which the Prince of Musignano has instituted in his observations on Wilson's *Ornithology*,) would be obviously of great utility, but want of space excludes it from this report, wherein the *Mammalia* alone will be noticed in detail. The preference is given to this order, partly because, the number of species being small, individual notices can be compressed within reasonable limits, but chiefly because opinions are more various concerning the quadrupeds than respecting the contents of the other orders. A sketch of the labours of the different authors who have brought North American zoology to its present state might have been introduced, but its utility would not compensate for the space it would occupy, and the task has been already to a certain extent executed in the introductions to the several volumes of the *Fauna Boreali-Americana*. The reader is therefore referred to that work, to the *American Natural History* of Dr. Godman, the *Fauna Americana* of Dr. Harlan, and especially to Pennant's *Arctic Zoology*, which contains ample references to all the older writers. Fischer's *Synopsis Mammalium* is a good book of reference for the published species of *Mammalia* up to the year 1828.

Previous to entering upon the details of the report, it is necessary to state that in it the term of North America is restricted to that part of the continent which lies north of the tropic of Cancer, thus including New Mexico, the Peninsulas of Florida and California, and as nearly as may be meeting the limits of the very different and peculiar South American zoological province. In considering Mexico as the region in which the Northern and Southern American faunæ meet and mingle, I follow the opinions of Professor Lichtenstein * and Mr. Swain-

* "Erläuterungen der Nachrichten des Franc. Hernandez von den vierfüssigen Thieren Neuspaniens, von Herr Lichtenstein." Gelesen in der Akademie der Wissenschaften am 28 Jun. 1827. Berlin.

son *, and dissent from those who consider the Isthmus of Darien as a zoological boundary †.

Physical Geography.

The great range of the Rocky Mountains forms a most remarkable feature in the physical aspect of North America. Viewed as a continuation of the Cordilleras de los Andes of the southern continent, and extending from the Straits of Magalhães to the Arctic sea through 120° of latitude, it is by far the longest mountain chain in the world. In Mexico it divides into three branches; the western one passing through the province of Guadalaxara to the Rio Gila; the eastern one extending through the Texas towards the confluence of the Missouri and Mississippi, where it terminates after assuming the appellation of the Ozark Mountains; and the highest or central branch continuing northwards to between the 29th and 30th parallels of latitude, where it is linked to the lateral forks by connecting spurs, or as Humboldt names them "counter forts." Within this mountain system, between the parallels of 19° and 24½°, lie immense *table lands*, elevated to the height of 6000 or 7000 feet above the sea. The central Cordillera of Mexico has a direction of N. 10° W. from the 25th to the 38th degree of latitude; and from thence the course of the ridge is with very slight deflections about N. 28° W. to the 69th parallel and 138th meridian, near the mouth of the Mackenzie, where the Rocky Mountains terminate. Travellers, who have crossed the mountains at various parts, inform us that they are divided into several parallel ridges; this is the case near the sources of the Rio del Norte; again between the 37th and 41st parallels; in the 58th parallel; and lastly, in the 64th, where according to the report of the fur-hunters thirteen successive ridges must be crossed before the western declivity is attained. Many of the peaks of the Rocky Mountains rise to a considerable altitude: thus, Spanish Peak, lat. 37° 20′ N.; James Peak, 38° 38′; and Bighorn, lat. 40°, have been ascertained by officers of the United States to be from 10,000 to 12,000 feet in height. Mount Hooker and Mount Brown, in the 52nd and 53rd parallels, were stated by the late Mr. Douglas, but from less perfect data, to be respectively 15,690 and 15,900 feet above the sea. It is manifest that animals may travel along the acclivities of a mountain chain whose summits enter within the limits of perpetual snow, from the

* *Encyclopædia of Geography*, 1834; *Geography and Classification of Animals*, by William Swainson, Esq., 1835.

† *Penny Cyclopædia*, art. America.

arctic circle down to the table lands of Mexico, almost without varying their climate; and that were the altitude of the ridge between the tropics great enough and sufficiently continuous to join the temperate zones of North and South America, we might expect to find many species of quadrupeds and birds common to both; but it so happens that in the Isthmus of Panama, nearly at the place where the elevation for the accomplishment of such an union would require to be greatest, the Cordilleras are depressed to a height not exceeding 500 or 600 feet, and still further south there is a plain extending from sea to sea between Rio Naipipi and the Gulf of Cupica*. It is not, however, as Humboldt has remarked, the altitude of the mere peaks which is to form an element in an inquiry of this kind, but rather the heights of the backs of the mountains over which the passes from one side of the chain to the other are usually made. But we have no positive information respecting the height of the passes of the Rocky Mountains, and even the altitude of the base of the range above the sea, which forms a material item in the computation of the absolute elevation of the peaks, has not been calculated from barometric measurement, but merely by vague estimates of the descent of rivers. Major Long assigns to this base a height of 3000 feet, while Lieutenant Pike with less probability more than doubles that altitude.

The Rocky Mountains are bounded on the Atlantic side by vast plains, having a gradual inclination to the eastward, and forming, from the 50th degree of latitude down to the Gulf of Mexico, a water-shed traversed by the Red River, the Arkansas, Missouri, and Mississippi. A zone to the westward of the latter river about 200 miles broad is well wooded, but the remainder consists of sandy and naked prairies, whose surface though gently undulated presents as few landmarks to guide the traveller on his way as he would meet with in the middle of the ocean†.

Between the 50th and 54th parallel lie plains of similar character, crossed by the forks of the Saskatchewan, which falls into Hudson's Bay; and still further north the Peace River flows towards the Arctic sea through a fertile tract generally level, and inclosing portions of prairie land, but more encroached on by pine forests than the southern plains. The valley of the Mackenzie beyond the 61st parallel, instead of being separated from the Rocky Mountains by an intervening level tract of land, skirts their bases until it issues in the Arctic sea. We thus perceive that to the eastward of the Rocky Moun-

* Humboldt.

† The eastern banks of the Mississippi are in general thickly wooded, but in the State of Illinois there are some considerable tracts of prairie lands.

tains there is an immense longitudinal valley extending from the Arctic sea to the Gulf of Mexico, crossed by no dividing ridges of note, but forming three separate water-sheds; the southerly one having, in addition to a general easterly declination to the Mississippi, also a descent from the 49th parallel towards the outlet of the latter river in the Gulf of Mexico; the northerly one having an inclination towards the Arctic sea, commencing between the 53rd and 54th degrees of latitude and the central one, which is necessarily the most elevated, having merely an easterly descent towards Hudson's Bay. The valley or plain is widest beween the 40th and 50th parallels, where it includes 15 degrees of longitude. This configuration of the land evidently gives great facilities for the range of herbivorous quadrupeds from north to south, and is the line of route pursued by many species of migratory birds; and while the Mackenzie furnishes a channel by which the anadromous fish of the Arctic sea can penetrate 10 degrees of latitude to the southward, the Mississippi offers a route by which those of the Gulf of Mexico can ascend far to the north.

There are no mountain chains to the eastward of the Mississippi at all approaching to the Rocky Mountains in magnitude, the most remarkable of the existing ones being the Alleghanies or Apalachian ranges, which have a breadth of about one hundred miles, and rise from 2000 to 3000 feet above the sea, springing from a base elevated 1000 or 1200 feet. They extend from Alabama and the northern confines of Georgia nearly to the banks of the St. Lawrence, their general direction being about N.E. by N., that is, nearly parallel to a line drawn from Carolina to Nova Scotia through the principal promontories of the Atlantic coast, and forming an angle of five points with the Rocky Mountain chain. The strip of country intercepted between the Alleghanies and the Atlantic, undulating and rising moderately towards the base of the mountains and generally very level near the coast, has a width of 200 miles in the Carolinas. In Georgia the low land becomes broader, and sweeping to the westward round the south end of the chain it joins the valley of the Mississippi. To the southward the level is continued into the peninsula of Florida, and this tongue of land must be noticed as influencing the distribution of animal life, not only by its southerly extension, amounting to five degrees of latitude, but also by its forming a barrier to the direct passage of fish from the Atlantic coast to the same parallel in the bottom of the Gulf of Mexico, and thus partly accounting for the very peculiar ichthyology of the Mississippi and its tributaries as contrasted with that of the eastern rivers.

The whole northern shore of the Gulf of Mexico is low and swampy, and from the very gradual shoaling of the water, inapproachable by ships, except at the mouths of rivers. The coast preserves much the same character on the Atlantic side up to Virginia, being almost everywhere skirted by low sandy islands, inclosing extensive lagoons and winding channels, into which numerous large rivers open, and permit the access of anadromous fish to the foot of Alleghanies. In the middle and eastern districts of the United States the Atlantic plain is narrowed by an incurvature of the coast and the extensive encroachments of the Chesapeake, Delaware, and Long Island Sounds, to whose muddy beaches vast numbers of water-fowl resort. A narrow valley, having a direction of N. by E., runs from the last-mentioned sound to join the transverse basin of the St. Lawrence: it is occupied on one side by the River Hudson and on the other by Lake Champlain and the River Richelieu*.

The British Atlantic territory is also deeply indented by the Bay of Fundy, remarkable for the rise of its tides, and the extent of its mud banks exposed at low water. The island of Newfoundland, viewed merely in reference to its physical geography, appears as a prolongation of the coast line; in its animal productions and vegetation it corresponds with the adjacent coast of Labrador. Its surface, as well as that of New Brunswick, Nova Scotia, and the northern part of the United States, is considerably varied by hills.

We have next to notice a great transverse valley, commencing with the mediterranean sea or gulf of the St. Lawrence, continued first to the south-westward behind the Alleghanies in the channel of the river St. Lawrence and basins of Lakes Erie and Ontario, and afterwards more directly to the west by the valleys of Lakes Huron, Michigan, and Superior, from the two latter of which there are communications by low tracts of land with the great basin of the Mississippi. Canals have been executed and more are projected in the Canadas and United States for connecting the several systems of water communication, by means of which an interchange of fish from widely diverging rivers will hereafter take place.

The interior prairie lands lying to the northward of the great Canada lakes have on their eastern boundary a well-wooded, but swampy zone of nearly level limestone strata analogous to the valley of the Mississippi in its general direction, and having on or near its eastern border an almost continuous water-course,

* A recent traveller states that the only instances of tidal waters of sufficient depth to carry large ships crossing primitive mountain chains, are those of the Hudson and St. Lawrence. *Vide* Stuart's *Three Years in America.*

which may be traced on the map as the River and Lake Winipeg, lower part of the Saskatchewan, Beaver Lake, Mississippi, Athabascow River and Lake, Slave River and Great Slave Lake, from whence Mackenzie's River issuing sweeps round the north end of the zone, and approaches the base of the Rocky Mountains within the Arctic circle. This longitudinal watercourse lying nearly at a right angle with the transverse valley of the St. Lawrence cuts off a large north-east corner of the continent, including the Canadas, Labrador, Rupert's Land, and the more northern districts. Though this tract, which equals Europe in extent, has a greatly varied surface and includes some high groups of hills, it possesses no continuous mountain ranges of great elevation, nor indeed any peaks which reach the limits of perpetual snow. Its lakes are numerous and often large, the proportion of water to land being great. In a zoological point of view the district admits of being divided into two portions: the northern one, destitute of trees and therefore named the "barren grounds," lies beyond a line running W.N.W. from Hudson's Bay in the 60th parallel to Great Bear Lake in the 65th. The southerly portion is wooded, and although it embraces many degrees of latitude it presents a surprising uniformity everywhere in its ferine inhabitants. The great inland sea of Hudson's Bay, occupying the centre of the whole north-east district, (the lands north of Hudson's Strait being considered as part of it,) materially influences its temperature, and consequently its capability of supporting animal life. The south and south-west shores of this bay are flat and swampy with muddy beaches, whereon vast flocks of waterfowl halt for a time in the course of their autumn migrations from the northern breeding-places to their southerly winter haunts.

On the Pacific side of the Rocky Mountains we have to the northward an expanded wing, as it were, of the continent prolonged by the peninsula of Alaska and the Aleutian Islands, and similar in geological and zoological characters, as far as has been ascertained, to the eastern barren grounds. Further to the south the coast line approaches the Rocky Mountains, but it recedes again in Upper California; while Lower or old California runs out in a peninsular form like Florida, intercepting the Gulf of Cortes or the Vermilion Sea, which though much narrower than the Gulf of Mexico extends nearly as far northwards. The Pacific coast is flanked at some distance by a range termed by Humboldt the "*Californian Maritime Alps*".

These are in general nearly parallel to the Rocky Mountains, and become more and more elevated as they proceed northwards

from the comparatively low peninsula of California until they attain an elevation of 9000 feet opposite Cape Mendocino in the 40th degree of latitude. Near the 45th parallel, Mount Hood* rises 16,000 feet, and in the 46th stands Mount St. Helens, which is 14,000 feet high; the Columbia flows between these lofty peaks. Mount Fairweather in latitude 59° has an altitude of 14,000 feet, and Mount St. Elias in the 60th parallel attains to 17,000. These peaks are volcanic, and in the Aleutian Islands there is another volcanic mountain 7000 feet high. The Californian Alps are divided into ridges by long narrow valleys, and between them and the Rocky Mountains lies an extensive prairie tract, 700 miles long, from 100 to 200 wide, destitute of water, and very similar in character to those which lie on the eastern side of the ridge just named†. Between the forks of the Columbia there are also wide prairie lands covered with *artemisiæ*, and nourishing several interesting and large species of *tetrao*.

The mountain system of Russian America is unknown. The peninsula of Alaska and the Aleutian Isles, extending towards Asia, separate from the Pacific the sea of Kamtschatka, which nourishes several fish of very peculiar forms and some singular cetaceous animals.

Climate.

Many precise and long-continued meteorological observations are required to be made in various districts of North America before a general view of the climate having any pretensions to accuracy can be offered. Abstracts of temperatures already recorded are expressed in the subjoined table, which is constructed after a model furnished by Humboldt. It is preceded by a few remarks, which are either simply explanatory, or which detail facts not readily expressible in a tabular form, yet of importance to the naturalist who investigates the distribution of animals in North America.

* Dr. Gairdner, an excellent naturalist now employed in a medical capacity on the banks of the Columbia by the Hudson's Bay Company, has executed a map, from which I have extracted the following positions of the most remarkable peaks of the Californian Alps that have received names. Mount Pit, 41° 36′ N.; Mount Shasty, 43° 16′ N.; Mount Vancouver, 44° 18′ N.; Mount Hood, 45° 16′ N.; Mount St. Helens, 46° 05′ N.; Mount Rainier, 46° 57′ N.; and Mount Baker, 48° 27′ N.

† Dr. Coulter states that the Californian Alps form an union with the Rocky Mountains north of the 42nd parallel, about the summit level dividing the head-waters of the Columbia from those which fall into the Bay of St. Francisco. (*Geogr. Tr.*, v. 68.) The "counterfort" here alluded to, hems in the Snake River or south branch of Columbia and limits the range of the bison westwards. The difficulty of traversing this connecting ridge is well described by Washington Irving in his recent work of Astoria.

Writers on climate have remarked that the eastern coasts of continents in the northern hemisphere have a lower mean temperature than the western coasts. This is certainly true in the higher latitudes of North America, for the winters are much milder and the vegetation more luxuriant to the westward of the Rocky Mountains *. On the coast of Hudson's Bay down to the 56th parallel the subsoil is perpetually frozen, and further inland in the 50th degree of latitude the mean annual heat is only 36° F. and the ground is covered with snow for more than six months in the year. Even in the 45th parallel on the north side of the Canada lakes the frost is continuous for more than six months, and the grallatorial and most of the granivorous birds can find no means of support during the winter season; consequently the migration of the feathered tribes is much more general than in the countries of Europe lying under the same parallels. Occasional frosts occur as low down on the Atlantic coast as the confines of Florida, where during the late war several British soldiers were severely frostbitten; this was near the 30th parallel, or that of Morocco, Cairo, and Suez. In Mexico and Old California there are also sharp frosts even on the low grounds, from local causes. The severity of the winters in the 40th parallel and even lower on the Atlantic coast of North America destroys many evergreens which flourish all the year in Scotland, 18 degrees further north.

The decrement of mean annual heat on an increase of latitude is greater in North America than in Europe, and in the former country there is a wider difference between the summer and winter temperatures; that is, the isothæral lines in their passage through America curve convexly towards the pole and the isocheimal lines towards the equator.

Vegetation (the growth of forests in particular) is more influenced by the amount and duration of heat than by the severity of the winter cold. In countries whose mean heat is below 63°, spring, or the renewal of vegetation, takes place, as Humboldt has shown, in that month which attains a mean temperature of 33° or 34°; and deciduous trees push out their leaves when the mean rises to 52°. It follows from this that the sum of the temperatures of the months which attain the latter heat furnish a measure of the strength and continuance of vegetation. On the eastern coast at Winter Island, lying in latitude 64¼°, no month of the year reaches a mean heat of 52°; but in the in-

* Geologists may find it worth while to inquire how far the superior climate of the Pacific coast is influenced by the active volcanos of the maritime Alps. No recent volcanos exist in the Rocky Mountains or more eastern ranges.

terior at Fort Enterprise and Fort Franklin, in 64½° and 65°, there are two such months. In latitude 45° near the middle of the continent there are five, in latitude 35° there are nine, and towards the southern extremity of Louisiana, in 29½° N. lat., there are eleven; while within the tropics the trees are evergreen.

The gradual ascent of the isothæral lines as they recede from Hudson's Bay is shown by the direction of the northern termination of the woods. On the coast near Churchill trees cease about the 60th parallel; but at the distance of sixty miles from the sea their boundary line rises rapidly, and then takes nearly a straight W.N.W. course, until it reaches Great Bear Lake, in latitude 65°: still further west on the banks of the Mackenzie the woods run to 68° N. lat. We do not know the course of the line of termination of the woods in the interior of Russian America. In the elevated lands of New Caledonia the snow is said to be very deep in winter, and to cause a great scarcity of the larger ruminating animals; but near the mouth of the Columbia there are almost constant rains during that season, with little frost or snow. There are some peculiarities in the climate of Lower California and the adjoining parts of Mexico, which are mentioned in the subjoined note*.

In the high latitudes of North America, at some distance from the coast, the intense colds of winter have a very considerable, though indirect influence on the summer vegetation, and consequently on the capabilities of the country for maintaining animal life: for independent of the accumulation of

* In a paper by Dr. Coulter, published in the 5th vol. of the *Transactions of the Geographical Society*, the following remarks on the climate of Mexico and California occur:—"The mercury in a thermometer shaded from the sun, but within the influence of radiation from an arid plain, frequently stood at 140° F., but this great heat was owing to temporary and local causes. The surface of the country, composed of bare mountains or arid plains completely destitute of water, does not mitigate the cold winds blowing from the Rocky Mountains lying to the north and north-east; hence when they blow for any length of time it freezes even to the south of Pitis, in latitude 29° N., and in the winter of 1829-30 it froze at that place every night for nearly two months. On the table land of Mexico similar cases of cold occur more frequently, as may be easily conceived from their greater elevation and the same general scarcity of water. At Veta Grande, Zatatecas, during the month of December, 1825, it frequently froze hard. The condition of the countries on the confines of Sonora and California is peculiar, as lying between the summer and winter rains. The whole rain of Mexico may be said to fall in the summer months, but in Upper California it rains only in the winter. The summer rains reach the lower part of Sonora, where they are scanty and irregular, and from Pitis northwards across the sands it rarely rains at all; as is also the case in the northern portions of Lower California, where the summer rains scarcely prevail to the northward of Loretto, the capital." (*Lib. cit.*, p. 70.)

irritability which may be supposed to take place in trees and other plants during their long and complete hybernation, an increased effect is given to the sun's radiation by the clearness of the atmosphere, brought about in the following manner. During the intense winter colds, which are very seldom interrupted by a rise of the temperature to the thawing point, the solvent power of the air is so much diminished that almost all the moisture is deposited in the form of snow*; but in spring it is increased by the heating action of a sun that never sets, while the ice-covered lakes, bearing so large a proportion to the land in America, supply it with moisture slowly. The consequence is unusual clearness of the atmosphere, enabling the rays of the sun to produce their full effect. On the confines of the arctic circle an agreeable warmth is often perceived in the sunshine during the months of April and May, when the temperature of the air in the shade is below zero. But for this adaptation of the constitution of the atmosphere to circumstances, the short summer of arctic America would be insufficient to clear the earth of the accumulated snows of nine months' winter. Professor Leslie, overlooking the powerful effect of direct radiation from the sun, and which indeed he could not know from experimenting only in an insular climate, was led from theory to fix the mean temperature of the pole at 32° F., and to declare that some great error must have pervaded all the thermometrical observations of Sir Edward Parry and the other arctic voyagers which showed the mean annual heat of places lying near the 70th parallel to be below zero. He has also described the whole of arctic America as involved in almost perpetual fogs; but this is true only of the sea-coast, and even there merely in some of the summer months, when fogs are produced by the intermingling currents of air of different temperatures, coming from the heated lands, the cooler open water or chilling masses of ice in the offing. Most of the winter nights are beautifully clear, and but for the intense cold, astronomical observations could be made nowhere in the northern hemisphere with more frequency.

* When air thus deprived of moisture is heated by admission into a warm room it causes all the wood-work to shrink in an extraordinary manner, and so dries and chops the cuticle of the human body that it readily becomes electric by friction with the palm of the hand, till the hairs stand erect, and a peculiar odour is evolved, like that which may be perceived when the rubber of an electrifying machine presses hard upon the cylinder.

No.	Locality. Name of Place.	Latitude. N.	Longitude. W.	Altitude.	Mean Of the Year.	Of six summer months, April to September.	Of six winter months, October to March.
		° ′	° ′	Feet.	°	°	°
1	Cumana	10 27	65 15	0	81·86	.....	.....
2	Havannah	23 10	82 13	0	78·08	.....	.....
3	Vera Cruz	19 11	96 01	0	77·72	.....	.....
4	Fort St. Philip (Louis.)	29 29	89 21	0	70·37	79·29	60·85
5	Pensacola	30 24	87 14	0	69·07	79·00	59·14
6	Baton Rouge	32 26	91 18	60	67·99	77·06	57·75
7	Xalappa	19 32	98 20	4330	67·64	.....	.....
8	Natchez	31 28	90 30	180	64·76	.....	.....
9	Mexico	19 26	99 05	7468	64·40	.....	.....
10	Norfolk (Virginia)	36 58	76 16	0	63·45	73·52	53·38
11	Annapolis	38 58	76 27	0	57·42	70·75	44·09
12	Toluca (Mexico)	19 16	99 21½	8823	57·20	.....	.....
13	Cincinnati	39 06	82 40	510	53·78	.....	.....
14	New York	40 40	73 58	0	53·78	.....	.....
15	Philadelphia	39 57	75 09	0	53·38	67·16	39 59
16	Detroit	42 19	83 00	564	53·08	68·70	37·44
17	Newport	41 30	71 18	0	52·09	64·87	39·30
18	Council Bluffs	41 25	95 43	.....	50 68	68·67	32 65
19	Cambridge	42 25	71 03	0	50·36	.....	.....
20	Ft. Constitution (Maine)	43 04	70 49	0	47 91	61·39	34 42
21	Fort Niagara	43 15	79 05	240	47·48	61·60	33·36
22	Portland	43 38	70 18	0	46·47	61·12	31·81
23	Prairie du Chien	43 03	90 52	.....	45·19	63·49	26·90
24	Penetanguishene	44 48	80 40	600	45·16	59·54	30·97
25	St. Peter's	44 53	93 08	680	44·12	64·01	24·23
26	Green Bay	44 40	87 00	600	44·06	61·68	26·44
27	Eastport	44 44	67 04	0	42·49	54·89	30·09
28	Quebec	46 47	71 10	0	41·74	.....	.....
29	Mackinac	45 51	85 05	600	40·12	55·31	24 94
30	Cumberland House	53 57	102 17	800	32·01	55·97	8·12
31	Fort Chepewyan	58 43	111 18	500	29·19	50·55	7 86
32	Nain	57 08	61 20	0	26·42	.....	.....
33	Churchill	59 02	92 05	0	25·30	.....	.....
34	Fort Reliance	62 46	109 01	350	21·47	.....	.....
35	Fort Franklin	65 12	123 13	200	17·24	39·95	−5·46
36	Fort Enterprise	64 28	113 06	850	14·19	37·78	−9·39
37	Winter Island	66 11	83 11	0	6·84	26·28	−12 59
38	Felix Harbour	70 00	91 53	0	5·29	27·71	−17·11
39	Port Bowen	73 14	88 55	0	3·62	23·64	−16·30
40	Igloolik	69 20	81 53	0	2·20	24·08	−19·68
41	Melville Island	74 47	110 48	0	−1·71	22·36	−25 79
42	East Coast of Greenland	70 to 74°	10 to 21° W.	0	.....	.....	.....
43	Spitzbergen	79 21	10 to 11° E.	0	.....	.....	.....
44	North of ditto	81½ to 82½°	17¼ to 24½° E.	0	.....	.....	.....

Note.—The table is constructed upon the following authorities: 1, 2, 3, 8, 13, 14, 19, 10, 11, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 29, Keating, *Exped. to St. Peter's River,* son, *Frankl. First and Second Journ, Ed. Phil. Journ.*, xi. p. 1;—37, 39, 40, 41, 44, Parry's *Greenl.*

Temperature.						Number of months which have a mean temperature of 52° or above.	Sums of their temperatures.	Means of their temperatures.	Highest temperature recorded.	Lowest temperature recorded.	No.
Of three spring months, March, April, May.	Of three summer months, June, July, August.	Of three autumn months, September, October, November.	Of three winter months, December, January, February.	Of the warmest month.	Of the coldest month.						
°	°	°	°	°	°		°	°	°	°	
83·66	82·04	80·24	80·24	84·38	79·16	12	1062	81·86			1
78·98	83·30	78·98	71·24	83·84	69·58	12	937	78·08			2
77·90	81·50	78·62	71·96	81·86	71·06	12	933	77·72			3
70·56	82·89	72·75	54·08	84·31	51·59	11	789	71·66	92	+28	4
69·80	82·71	71·22	52·54	84·04	51·34	10	726	72·56	94	+20	5
69·40	82·36	68·92	51·28	84·80	49·71	10	714	71·44	99		6
.....	69·32										7
65·48	79·16	66·12	48·56	79·70	46·94						8
											9
62·91	74·68	66·37	46·51	80·21	43·73	9	622	69·11	88	+20	10
56·08	73·37	62·60	34·31	79·88	29·28	8	540	67·47	92	+ 8	11
48·20											12
54·14	72·86	54·86	32·90	74·30	30·20	7	458	66·29			13
51·26	79·16	54·50	29·84	80·78	25·34						14
53·33	72·75	57·31	29·77	75·32	26·30	7	460	65·73	89	— 1	15
55·12	76·08	56·31	26·78	77·60	22·94	6	416	69·37	91	—14	16
48·53	71·16	57·79	30·87	74·02	26·30	6	399	66·45	86	0	17
52·68	77·03	50·76	22·23	79·62	12·80	5	363	72·56	104	—17	18
47·66	70·70	49·82	33·98	72·86	29·84						19
46·95	67·99	52·37	24·33	69·84	20·55	6	376	62·67	86	— 7	20
43·82	68·65	52·17	25·27	70·42	22·40	5	329	65·83	90	0	21
45·04	67·66	50·73	22·45	69·95	17·63	5	325	64·91	96	—10	22
44·16	71·76	46·60	14·93	73·66	6·20	5	337	67·39	94	—22	23
41·13	69·91	47·20	22·70	73·15	21·23	5	320	64·00	90	—32	24
47·47	72·88	44·57	11·65	75·47	3·26	5	340	68·06	93	—29	25
45·73	69·55	46·32	14·67	72·49	9·40	5	329	65·78	92	—23	26
39·90	60·85	50·95	21·60	62·32	17·53	4	242	60·42	88	— 9	27
38·84	68·00	46·04	14·18	73·40	13·81	5	318	63·60			28
37·09	64·11	45·02	14·27	67·34	10·53	4	249	62·29	86	—18	29
31·37	67·80	33·49	—4·62	73·73	—14·19	3	213	71·13	87	—44	30
23·96	62·41	34·08	—3·67	65·70	—9·56	3	187	62·40	97	—44	31
23·90	48·38	33·44	—0·60	51·80	—11·20						32
52·20	—6·80										33
12·71	.....	.....	—20·30	.....	—25·00	.....	.....	.....	.....	—70	34
14·05	50·40	21·12	—16·60	52·10	—23·78	1	52	52·10	80	—53	35
8·72	51·71	19·34	—23·03	55·36	—29·12	2	109	54·28	78	—57	36
2·65	35·00	14·67	—24·96	36·68	—29·97	0	0	0	54	—42	37
—1·43	40·73	7·26	—28·70	44·57	—33·13	0	0	0	70	—47	38
—5·74	34·92	10·58	—25·09	37·29	—28·91	0	0	0	50	—47½	39
—2·19	34·63	3·12	—26·76	40·04	—32·80	0	0	0	50	—50	40
—6·94	36·44	—3·44	—33·02	42·41	—37·19	0	0	0	60	—55	41
.....	34·53	.....	.....	35·29							42
.....	34·50	.....	.....	35·98							43
.....	.....	.....	.....	33·13							44

26, 32, 33, Humboldt, *Mém. d'Arcueil*, iii. p. 462, and *Ed. Phil. Journ.*, iii. p. 1;—4, 5, 6, 1825;—7, Lyon's *Mexico*, Lond. 1828, ii. p. 196;—24, 30, 31, 34, 35, 36, Richard-*Voyages*;—38, Ross's *Second Voyage*;—43, Franklin, *Ed. Phil. Journ.*;—42, Scoresby's

Although the progress of colonization in the Atlantic States of North America has considerably restricted the range of the indigenous quadrupeds, and also somewhat modified the migratory movements of several groups of birds, we have no decided evidence that any one species has become extinct in that country through the agency of man; and ample opportunities are still afforded to the naturalist of making himself acquainted with the habits and structure of its ferine inhabitants. Whether we regard the striking peculiarities of the North American fauna, or the remarkable coincidence of most of its generic forms with those of Europe and Asia, and the considerable proportion of species common to both continents, its study is interesting and instructive to the general zoologist. But it is to the resident American naturalist that we especially look for a correct history of the animals which surround him. He has a field before him in a great part untrodden, and where cultivated, so overrun with weeds, that the fruit cannot be collected: for the early settlers having bestowed familiar European names on the specifically and in some cases generically distinct animals which they encountered in their new abodes, these were adopted by the naturalists of the Old World either without examination or after a comparison of dried and distorted exuviæ only. Mistakes thus originating are still suffered to encumber our systematic works, and the American zoologist will do good service to the branch of science which he cultivates, if, like the immortal Cuvier, trusting solely to his own powers of observation, he sits down on his own shore to dissect, examine, and reason for himself.

A correct view of the distribution of animals through the North American zoological province cannot be given until several large districts have been much more thoroughly investigated. Exclusive of deficiencies in our knowledge of the species which frequent the country lying to the eastward of the Rocky Mountains, the whole tract to the westward of that ridge, from Mexico to the Icy Cape, may be said to be as yet a *terra incognita* to zoologists. Of the animal productions of Russian America almost nothing has been made public since the days of Steller, with the exception of a few species described in the *Zoologischer Atlas* of Eschscholtz, now unfortunately brought to an abrupt conclusion by the death of its author. All that is known of the zoology of New Caledonia and the banks of the Columbia is derived from voyagers or travellers who have partially described the objects of chase by their popular names—the notices occurring in the narrative of Lewis and Clark being by far the fullest. The ornithological portion of the natural

history appendix to Captain Beechey's voyage by Mr. Vigors is our principal authority for the Californian birds; while the only professedly complete view of the Mexican fauna is the almost obsolete work of Hernandez. European museums, that of Berlin especially, have since the overthrow of the Spanish dominion in the New World obtained many specimens from Mexico, but we have not been able to procure a complete list of species, nor has the *Prodromus Faunæ Mexicanæ* announced by Professor Lichtenstein yet reached England. In the mean time we have had recourse to that author's elucidations of Hernandez (*Abhandl. der Ac. der Wissensch. zu Berlin*, 1827); to Deppe's sale list of Mexican specimens collected by himself, and M. Schiede, dated 1830; and to a paper by Mr. Swainson in the *Philosophical Journal* for 1827, describing one hundred species of Mexican birds: but as these papers do not notice the range of the species, they are very imperfect substitutes for Professor Lichtenstein's expected work.

From the geographical position of Mexico on the verge of the tropical region, the peculiar physical configuration of its surface, and its being the boundary between the northern and southern zoological provinces of America, it is the region which above all others is likely when properly studied to yield information respecting the laws which influence the distribution of animals. This has been well shown by Professor Lichtenstein in his paper in the *Berlin Transactions* already quoted. He compares the whole of New Spain to a great mountain, whose volcanic summit, attaining an elevation of 17,000 feet, enters within the snow line*, while its middle, temperate region is traversed by numerous valleys communicating at various heights, with wide basins, whose bottoms are little more than a thousand feet above the sea level. Hence the traveller journeying down the deep descent of one of these magnificent ravines through forests of beeches, oaks, and pines loaded with *cacti* and *epidendra*, finds himself suddenly on the level shores of the Rio Alvarado surrounded by palms, and has an opportunity of seeing the animal productions, of the north and south, of the alpine regions and tropics, nay of the eastern and western hemispheres, mingled together. Wolves of northern aspect dwelling in the vicinity of monkeys; humming birds returning periodically from the borders of the frozen zone with the northern buntings and soft-feathered titmice to nestle near parrots and curucuis; our common European whistling ducks,

* The observations of Humboldt place the inferior limit of perpetual snow within ten degrees of the equator in America at about 16,000 feet.

shovellers, gadwalls, and teals swimming in lakes which swarm with sirens (axolotl), and wherein the northern phaleropes seek their food in company with Brazilian parras and boatbills; associations which occur in no other region of the earth. Though the Mexican valleys or plains, having various altitudes, furnish appropriate stations for peculiar assemblages of animals, and by the common practice of the country the different regions are distinguished as "cold", temperate, and "hot", yet we know too little of the differences of climate to enable us to characterize these local faunæ with precision. It may be stated, however, that the low and hot maritime tract (*tierra caliente*) and the interior valleys nourish forms which have heretofore been considered as peculiarly South American, such as howling monkeys, hapales, armadillos, ant-bears, coatis, peccaris, coandus, jaguars, ocelots, maccaws, and ibises, though they do not range to the northward of the 19th degree of latitude *. This district also abounds in genera of birds common in the Brazils, (*icterus*, *tanagra*, *lanius*, and *muscicapa* † Linn.,) but on a close examination few of the species are found to extend to both continents.

In the temperate region, where the *cerealia* are cultivated, the animals accord little with those of South America, but resemble closely those of the east coast of North America—deer, opossums, skunks, rabbits, squirrels, and other gnawers replacing the southern monkeys and armadillos; in place of parrots there are party-coloured woodpeckers; and instead of tanagers and hepoazas we meet with thrushes, buntings, hedge-creepers, and warblers. The couracous, humming birds, and troupials go partially beyond this region to colder districts or higher latitudes; and it may be remarked of the couracous that they are larger and more brilliant in the elevated Mexican woodlands than in the Brazilian forests, while it may be affirmed of the troupials that they spread from their most congenial residence in the temperate regions of Mexico, northwards to the United States, and southwards to Cayenne and Brazil.

In the elevated cold region the fauna assumes an Europeo-Asiatic character. The fields abound with hares, the woods with squirrels; and a destructive sand rat, resembling the Canadian one, infests the maize grounds. There are also a spermophile scarcely differing from the Siberian one, the "cacamitzli" (*bassaris astuta*) a beast of prey of a new genus, one or two

* The Sais, Saguins, Sloths, Tapirs, and Tajasous, also Brazilian, do not exist in this district, but there are a few agoutis.—*Lichtenstein.*

† The genera Pipra, Todus, Myothera, Euphone, &c. are wanting in the warm district.—*Lichtenstein.*

species of skunk, some pretty weasels, (but no martins,) and a wolf very much like the Canadian species, which descends also to the warmer valleys. The white-head sea-eagle, the Virginian horned owl, the common barn owl*, and a smaller species, with sparrowhawks and falcons are the common birds of prey in the cold region, where the Brazilian urubitingas and naked-headed carrion vultures also come. Snow-birds, buntings, grosbeaks, a great variety of finches, and a peculiar kind of long-legged ground cuckoos are the chief singing birds, and among the water-fowl which cover the extensive alpine lakes there are at least ten or twelve of our northern ducks. Terns and gulls seldom fail to appear at certain seasons, but they are species that have been described by Hernandez alone, and are not yet introduced into our systems†. These remarks, though greatly abridged from the original, will serve to show how much the North American fauna in general would be elucidated by an investigation of that of Mexico.

In the following observations on the *Mammalia*, the arrangement of Cuvier's *Règne Animal* is adopted.

Ord. QUADRUMANA.

One animal of this order (*inuus silvanus*) ranges in the Old World northward to the rock of Gibraltar, lying in the 36th parallel, but we are informed by Lichtenstein that no monkey has been observed in the New World beyond the 29th degree of north latitude. Mr. Ogilby again tells us that there are no real *quadrumana* in America‡, none of the monkeys inhabiting that quarter of the globe having a thumb truly opposable to the fingers, and he has therefore proposed to arrange them in a group named

* There is reason to believe that many owls which have heretofore been considered as only geographical varieties of the *Strix flammea* are in fact distinct species, though closely resembling the European type.

† The views of Mr. Swainson with respect to the junction of the North and South American zoological provinces in Mexico correspond generally with those of Lichtenstein, though these authors do not appear to have been acquainted with each other's labours on that subject. Lichtenstein's paper is of a prior date to the *Geographical Dictionary* or Mr. Swainson's Treatises in *Lardner's Cyclopædia.*

‡ Ogilby, *Zool. Proc.*, No. 39, 1836. "In *ateles* the thumb is either merely rudimentary or entirely absent; in *mycetes*, *lagothrix*, *aotus*, *pithecia* and *hapale* it is similar to the other fingers and in a line with them; while in *cebus* and *callithrix*, though placed a little further back than the other fingers, it is weaker, and acts in the same direction with them, never in opposition to them." "None of the true *quadrumana* have prehensile tails." The American monkeys have other peculiarities, of which the most characteristic are their lateral nostrils. That they rarely sit erect is indicated by their hairy buttocks.

pedimana, which with the exception of the phalangers of the Indian archipelago is proper to the New World and to Australia. There are no apes nor baboons without tails in the group; even the callosities of the buttocks are wanting, and a large proportion of the species have prehensile tails endowed with so great a delicacy of touch that they have been compared to the trunk of the elephant. This modification of structure evidently indicates great capability of travelling from tree to tree in lofty and crowded forests, and it is worthy of remark that America excels the other quarters of the world in the variety of animals which use the tail as an organ of prehension or progression among trees, for not only the genera *mycetes*, *brachyteles*, *ateles*, *lagothrix*, and *cebus* among the *quadrumana* possess this power, but also *didelphis* among the *marsupiata*, *cercoleptes** ranking with the *carnivora*, and *syntheres* and *capromys* with the *rodentia*.

The monkeys which enter the southern provinces of Mexico belong to the genera *mycetes* and *hapale*†.

Ord. CARNIVORA. *Fam.* CHEIROPTERA.

The members of this family which have hitherto been detected in North America belong to that tribe of the "true or insectivorous bats" which Cuvier has characterized as possessing only one bony phalanx in the index, and two in each of the other fingers. This is in fact the only tribe of *cheiropteræ* which is distributed generally over the world, and to it all the European bats belong, with the solitary exception of the Italian *dinops Cestonii*. The other subdivision of the true bats, comprising *molossus*, *dinops*, *nyctinomes*, *cheiromeles*, *noctilio* and *phyllostoma*, is chiefly South American, though it has a few representatives in the warmer regions of the old continent. *Phyllostoma*, the most remarkable of the generic groups, is indeed peculiar to the new world; but *phyllostoma spectrum*, placed by Geoffroy in a distinct genus named *vampirus*, is the only species which authors have mentioned as ranging northwards to New Spain‡.

The following bats have been noted as inhabitants of the United States and British America; and though they almost all belong to the cosmopolitan genus *vespertilio*, none of the American species have been detected in other countries.

* The closest affinities of cercoleptes are with the *ursiform plantigrada*.—OWEN, *Zool. Proc.*, No. 32, 1835.

† "Brüll-affen" and "Klammer-affen."—LICHTENSTEIN, *op. cit.*, p. 97.

‡ Desmar. *Mamm.*, GRIFF. *Cuv.*, &c.

Rhinopoma carolinensis, Geoff. *Mus.**
Taphozous rufus, Wils. *Am. Or.* 50.
Vespertilio carolinensis, Geoff. *Mus.* 47.
„ arquatus, Say. *Long's Exp.*
„ subulatus, Id. *Ib.*
„ *Audubonii*, Harlan.
„ *melanotus*, Rafinesque.
„ *calcaratus*, Id.
„ *cyanopterus*, Id.
Vespertilio monachus, Raf.
„ *phaiops*, Id.
Plecotis megalotis, Id.
Nycticeius noveboracensis, Penn. 31, 2.
„ *humeralis*, Raf.
„ *tessellatus*, Id.
„ pruinosus, Godm. *p.* 72. *f.* 3.
Hypexodon mystax, Raf.

The first species of the above list is in Geoffroy's opinion not a true *rhinopoma*, and the native country of the only individual which has been seen is very doubtful †. The red bat of Pennsylvania is the only American *taphozous*, the other members of the genus being inhabitants of Africa and the East Indies. The remaining bats of the list are analogous to those of the temperate parts of Europe; but most of the species are still imperfectly described, nor have their distinctive characters been properly investigated, and consequently nothing certain can be stated respecting their distribution. It can scarcely be matter of surprise that these nocturnal animals are so little known in the New World, when we consider that though Pennant described only five species as natives of Great Britain, seventeen are figured in Mr. Bell's recent work. The American bats which have been admitted into systematic works, on M. Rafinesque's authority, have been named rather than characterized; and few of the many genera proposed by this author have been adopted by naturalists, owing to his want of precision and inattention to structure. His labours are not, however, to be entirely disregarded; for he has certainly detected many new animals both in Europe and America, being one of the first investigators of the natural history of the latter country who was not prevented from judging for himself by an overweening deference to European authority. His genus *nycticeius*, characterized by having only two widely separated upper incisors, includes a considerable number of species hitherto ranged with *vespertilio*, and according to M. Temminck comprises even the genus *atalapha*, which Rafinesque had incorrectly founded on the *vespertilio noveboracensis*, from a supposed want of these two incisors, which nevertheless exist. The characters of *hypexodon* are equally vague, and it is not likely that any one of these three genera will be permanently adopted. *Nycticeius pruinosus* has been taken on the Saskatchewan, the Missouri, and at Philadelphia; and *vespertilio subulatus*, having a range

* The doubtful species, or those which particularly require further elucidation, are in *italics*.

† Desmar., *l. c.*

of 24 degrees of latitude from the Arkansas to Great Slave Lake, is probably the most generally diffused of the American bats.

Ord. CARNIVORA, cont. *Fam.* INSECTIVORA.

Sorex brevicaudus, SAY, *Long's exp.*
„ parvus, ID.
„ personatus, GEOFFR. *Mus.* 15, 122.
„ Forsteri, RICH. *F.B.A.*
„ palustris, ID. *Ib.*
„ *talpoides*, GAPPER, *Zool. J.* 5.
Condylura cristata, GODM. *pl.*
„ *longicaudata*, RICH. *F.B.A.*
„ macroura, HARL. RICH. *F.B.A.* 24.
„ *prasinata*, HARRIS, LESS. *man.*
Scalops canadensis, GODM. *pl.*

In no other family of *carnivora* do the North American members differ so much from the European ones as this, the range both of generic forms and of species being more than usually restricted within certain geographical limits. None of the family are known to inhabit South America; the European genera *erinaceus*, *talpa*, and *mygale* have not been detected in North America, while *condylura*, *scalops*, and all the shrews in the above list are peculiar to the latter country. *Cladobates*, *centenes*, and *chrysochloris* belong to the East Indies, Madagascar, and the Cape of Good Hope, the supposed American species of the last-mentioned genus (*chrysochloris rubra vel rufa*) having no other authority for its origin than that of Seba, upon which very little dependence can be placed.

The shrews above enumerated closely resemble their European congeners, with whom they have not been sufficiently compared; *palustris* in particular is with difficulty distinguishable from *fodiens* or *Daubentonii*. Little has been done towards determining the range of the North American species. Those which inhabit the Atlantic states were formerly considered as identical with European species; but after Mr. Say, in his expedition up the Missouri, had detected and described as new *brevicaudus* and *parvus*, these names were applied to the coast shrews, though it is by no means certain that they are more appropriate than the older appellations. *S. brevicaudus* is said by Mr. Taylor* to be an inhabitant of the Alleghany range, at the height of 2000 feet above the sea, where during the winter it makes long galleries in the deep snow. *S. palustris* and *Forsteri* have a high northern range, extending within the arctic circle to the limit of the woods. The latter differs from the description of *S. personatus* principally in wanting a black mark on the end of the nose and in the colour of the under fur, so that without a comparison of specimens they cannot be positively pronounced to be distinct. *S. talpoides*, the

* *Mag. Nat. Hist.*

largest of the American shrews, was detected in Canada by Dr. Gapper, who has deposited a specimen in the Bristol museum. The distribution of *condylura* and *scalops* has been but partially traced, but it is probable that they do not extend beyond the 53rd parallel. Mr. Taylor captured the *scalops canadensis* on the north eastern end of the Alleghanies at an elevation of 1500 feet, while the *condyluræ* were confined to the bottom meadow lands. Lichtenstein thinks it probable that the moles entirely destitute of sight mentioned by Hernandez as inhabitants of Mexico, belong to the genus *scalops*. Authors disagree in their accounts of the dentition of the *scalopes*. Baron Cuvier says that they have the teeth of the desmans, and such is the case in the specimens which I have examined, the total number of teeth being 44. Desmarest enumerates only 30 teeth in all, and Dr. Godman, who is followed by Lesson, reckons 36. Harlan describes a species (*pennsylvanica*), of which he has merely the skeleton, possessing 40 teeth. The teeth of the Canadian species round away by use in a very remarkable manner, so as to look like rows of seed pearls. The genus of the animal named "black mole," considered by some as a *talpa*, is uncertain, but it is most likely a *scalops*: Mr. Taylor found it on the Alleghany range. The *condyluræ* would form an interesting subject for a monograph; the species are, perhaps, more numerous than has hitherto been suspected, and their manners are as yet almost unknown. The remarkable enlargement of the tail, which has given origin to one of the specific appellations, is, according to Dr. Godman, merely a sexual peculiarity confined to certain seasons.

Ord. CARNIVORA cont. *Fam.* CARNIVORA.

DIV. 1. *Plantigrada.*

Ursus arctos*? RICH. *F.B.A.*
„ ferox, ID. *l.c.* 1.
„ americanus, F. CUV. *Hist. des Mam.*
„ maritimus, ROSS, *Voy. pl.*
Procyon lotor, BUFF. 8, 43.
Nasua, *species duæ*, LICHT. HERN.
Meles labradoria, RICH. *F.B.A.* 2.
Gulo luscus*? EDW. 103.
„ barbara, GRIFF. CUV. *pl.*
Bassaris astuta, LICHT. HERN.

DIV. 2. *Digitigrada.*

Putorius vison, BUFF. 13. 43.
„ *vulgaris**? PENN. *Arct. Zool.*
„ *erminea**? ID. *Ib.*
Mustela canadensis, GMEL. RICH. *F.B.A.*
„ { *huro*, F. CUV. *Dict. des Sc.* 29.
{ *martes**? RICH. *F.B.A.*
Mephitis americana, SABINE, *Fr. Voy.*
Mephitis nasua, BENN. *Zool. Proceed.*
„ *putorius*, CATESB. 62.
„ *interrupta*, RAF. *An. of Nat.*
„ *vulpecula*, FISCH. *Syn.*
„ *myotis*, ID. *Ib.*
„ *itzqui-epatl*, HERNANDEZ, *Mex.*
„ *conepatl*, ID. *Ib.*

Lutra canadensis, Fr. Cuv. *B. des Sc.* 27.
„ lataxina*? Id. *Ib.*
Enhydra marina*, Cook, *Third Voy.* 43.
Lupus occidentalis, Rich. *F.B.A.* 3.
„ mexicanus, Lin. Licht. Hern.
„ latrans, Rich. *F.B.A.* 4.
„ ochropus, Eschsch. *Zool. Atl.* 2.
„ *nigrirostris*, Licht. Hern.
Vulpes lagopus*, Thien. *Nat. Bem.*
„ *isatis*, Id. *Id.*
„ fulvus, Rich. *F.B.A.* 5.
„ cinereo-argentatus, Schreb.
„ velox, Say, *Long. Exp.*

Felis *onca*, Fr. Cuv. *H. des Mam. pl.*
„ discolor, Cuv.
„ *pardalis*, Griff. Cuv. *pl.* y.
„ rufa, Schreb. 109, 13.
„ *mitis*, F. Cuv. *H. des Mam.* No. 18.
„ canadensis*? Geoff.
„ *Griffithsii*, Fisch. *Syn.* Griff. *Cuv. Ocel.* 3.
„ *chiliguoaza*, Fisch. *Syn.* Griff. &c. *Ocel.* 4.
„ *maculata*, Horsf. & Vig. *Zool. J.* 4, 13.

It is to this great family that the terrestrial quadrupeds which are common to the old and new continents mostly belong. The generic forms are those of Europe, with a few exceptions, such as *procyon*, *nasua*, *bassaris* and *mephitis*, which seem to be stragglers from the South American zoological province. On the other hand, the genus *lutra*, which is a northern form, sends a few species to the south of the Isthmus of Darien.

Plantigrada.—Two bears of the preceding list are peculiar to the New World, namely *ferox* and *americanus*, the former dwelling principally in the Rocky Mountains, but occasionally descending to the neighbouring prairies, while the latter inhabits all the wooded districts from Carolina to the Arctic Sea, being, however, less numerous near the coast. The *maritimus* is common to all the northern regions, but it ought in fact to be considered rather as a sea animal than a land one: it traverses the whole of the icy seas from Nova Zembla and Spitzbergen to Greenland, and from thence along Arctic America to the shores of Siberia. It is, in fact, the most northern quadruped, having been seen by Sir Edward Parry in the 82nd degree of latitude, and it descends on the Labrador coast to the 55th. The males, and females that are not gravid, travel far in the winter time over the ice in quest of food*. The *ursus arctos* does not range in America much to the south of the Arctic circle, being confined to the "barren-grounds:" its identity with its European namesake has not been been properly established. Lichtenstein, in his observations on the work of Hernandez, mentions two or three species of *nasua* as existing in Mexico, one of them being white with large black spots. The raccoon (*procyon lotor*) ranges from Canada as far south, it is said, as Paraguay: on the coast of the Pacific, its skins are ob-

* Vide *App. to Capt. Back's Journey*, wherein an instance is quoted of a whale having been killed by the crew of a vessel which was beset in the winter by ice 60 miles from the land. Next day many bears and arctic foxes came to feed on the crang!!

tained by the fur-dealers up to latitude 60°, but more correct observations as to the identity of the species are required before so extensive a range can be ascribed with certainty to this animal. Mr. Collie, when with Captain Beechey, saw a small ursine animal very abundant on the coast of California, which is probably the *procyon cancrivorus* or an allied species.

The *meles labradoria*, which is perfectly distinct from the European badger, has its northern limit about the 55th parallel, where it inhabits the prairies only. The *meles hudsonius*, mentioned by Cuvier in the *Règne Animal* as differing very little from the *meles vulgaris* of Europe, is entirely unknown to us. The Mexican species, supposed to be indicated by Hernandez, is very doubtful. The wolverene (*gulo luscus*) does not vary, according to Cuvier, from the European glutton by permanent characters; next to the polar bear and arctic fox it is the most northern carnivorous quadruped, its range extending to Parry's Isles in latitude 75° N., if not to a still higher parallel. *Gulo barbara*, enumerated by Lichtenstein in his list of Mexican animals, extends southwards through all the warmer districts of America. Mr. Gray pointed out to me its closer resemblance in external form to the weasels than to the northern glutton, and its differences from the latter in the form of its feet, which, though plantigrade, are slightly webbed, in its long tail, and in its having a tooth fewer in each jaw; it should therefore be separated, together with its allied species, in which case *gulo* would remain entirely a northern genus. *Bassaris astuta* is a Mexican animal, noticed by Hernandez under the name of *tepemaxtlatan*, which has characters intermediate between *viverra* and *nasua*, and is therefore placed in a new genus by Lichtenstein.

Digitigrada.—The American weasels and martins have greatly perplexed naturalists, and their synonyms are involved in much confusion; yet we can pretty confidently assert that five species only are known in the fur-countries from latitude 50° N. to the Arctic sea. The range of the described species is limited to the northern or middle districts of the United States; but Lichtenstein informs us that some new kinds inhabit the elevated lands of Mexico. The ermine has been seen as high as the 73½ degree of latitude on the west side of Baffin's Bay*. It is very probable that both the ermine and stoat of America are distinct species from those of the old continents, the superior quality of the fur of the Siberian ermine being one marked difference; while there are others, such as the much smaller skull of the

* Sir J. Ross, *First Voyage*.

American animal, which will be more readily acknowledged by naturalists. Baron Cuvier holds the *putorius vison* to be a distinct species from the *mustela putorius* of Europe, though some zoologists confound them* ; it ranges from Carolina to the arctic sea. The pine-martin of America is also most probably a different species from the European one, and in fact the comparisons of Mr. Yarrell have shown that in the form of its skull it approaches more closely to the *martes foina*, or beech martin. Most of the American martins noticed by authors we believe to be merely nominal species ; thus the *huro* of Frederick Cuvier is the common American pine-martin in its pale summer dress, and the same is most probably the case with the *lutreocephala* of Harlan†, while the *zibellina* of American naturalists is the same animal in its prime dark winter fur. The pine-martin ranges northwards to the limits of the woods, and many specimens corresponding with the descriptions of *huro* and *lutreocephala* were observed at Fort Franklin, where the natives considered them, and the darker and often smaller martin sold by the furriers under the name of sable, to form only one species‡. The *m. vulpina* of Rafinesque and *m. leucopus* of Kuhl require further investigation.

The "fisher", or "wejack" (*mustela canadensis*), is found up to the 60th parallel. Its synonymy is embroiled in confusion, which is attempted to be unravelled in the *Fauna Boreali-Americana* ; but on referring to Fischer's synopsis, we discover that it has more recently received other appellations, and among the rest that of *mustela Godmanii*, apparently from an apprehension that the animal described in Dr. Godman's natural history is either a distinct species or a well-marked variety. Now, on referring to this description, we observe that it is substantially the same with that drawn up by Mr. Sabine (in the appendix to Sir John Franklin's first journey) of the common wejack, or woodshuck, with the single addition of "tail smallest at the end", which is not really the case in the wejack.

The *mephitis americana* ranges northwards to the 61st parallel§, but its southern limits cannot be ascertained until the species are more clearly defined. Some authors consider every

* Fischer, probably misled by Pennant's miserable figure of the animal in the *History of Quadrupeds*, has named a fictitious species *enhydra gracilis*. (*Synops.*)

† Dr. Godman says that the original specimen described by Dr. Harlan under the appellation of *lutreocephala* is an overstuffed vison, long kept in Peale's museum.

‡ Vide Yarrell's *Zool. Jour.* for 1836.

§ Vide King's *Narrative of Capt. Back's Journey*. Bentley, 1836.

individual differing in the distribution of its stripes as a distinct species, while Cuvier ranks them all as mere varieties, thus attributing to the animal a most extensive range through North and South America. The *americana*, which is the most northern species, is very uniform in its markings within the limits of the fur countries. Kalm describes one differently zoned as an inhabitant of Canada; the *bête puante*, discovered by Du Pratz in Louisiana, has been named *mephitis*? *myotis* by Fischer; Rafinesque distinguishes the *mephitis interrupta* of the same country; and Hernandez points out two Mexican skunks by the names of *itsqui-epatl* and *cone-epatl*. The *m. nasua* is an inhabitant of California. There is, perhaps, an error in the statement made by some naturalists, that the South American *mephitis chincha* extends its range to the southern parts of the United States, for though the Baron finds the osteological characters of all to be the same, the varieties distinguished by the number and distribution of their stripes do not usually occur together in the same districts, nor range through many degrees of latitude.

According to Baron Cuvier, the *lutra canadensis*, which extends northwards to the vicinity of the polar sea, is the same species with the *brasiliensis*; and the *lataxina* has an almost equally extensive range from Great Slave Lake, where it was found by Mr. King, to Carolina, where F. Cuvier's specimens were obtained, and the Brazils, whence the Baron received it. The variety of climates inhabited by *lataxina* will be still more remarkable if, as Cuvier seems to intimate, it be specifically the same with the European otter, for he says they do not differ by any permanent characters. Even the domestic dog does not change his abode to the same extent without undergoing more sensible alterations of form. Were the otter to live entirely in the water, the severity of the seasons would be greatly tempered to it; but it is wont in the high northern latitudes to travel far through the snow in quest of open water when its summer haunts are frozen up.

With regard to the species of the genus *canis* much difference of opinion will most likely continue to prevail among naturalists, from the general uniformity of their external forms, the great difficulty of characterizing the differences by brief descriptions, and the want of a sufficient number of specimens in any one collection for comparison. The physiognomy of the American wolf when contrasted with that of its European namesake is very distinct; but a family likeness prevails throughout the whole group of American wolves, however much they may differ in size, colours, or even in habits. The *lupus occidentalis*

travels northwards to the islands of the Arctic Sea, but its southern range cannot be defined until its identity with the common wolf of the United States be proved or disproved. According to Lewis and Clark, the latter crosses the continent to Upper California. The Mexican wolf seems to differ from *occidentalis* chiefly in the black parts of the fur forming bands on the flanks; an accurate comparison of the two is still required. *Canis latrans*, or the prairie wolf, is found on the Saskatchwan and Missouri, being confined, as its name imports, to the prairie lands. It is probable that the Californian *ochropus* and the Mexican *nigrirostris* are but varieties of *latrans*. Authors are not more decided with respect to the species of foxes. Cuvier thinks that the *canis fulvus* differs from the European *vulpes* merely in having more brilliant fur; but, as Mr. Bennett has remarked, it is impossible for any one to contemplate the two species together in the Zoological Gardens without observing their very different aspects: the black, silver, and cross foxes of the furriers are mere varieties of *fulvus*. A notion exists in the United States that the descendants of European foxes introduced by the early settlers are now numerous in the country, but the fact has not been established by a decisive comparison of specimens, and it is possible that the animal of supposed European origin is the Virginian fox (*cinereus* or *cinereo-argentatus* of Schreber), which at certain seasons has a reddish hue. The latter ranges from Upper Canada across the continent to the banks of the Columbia, southwards to the Gulf of Mexico, and, according to Cuvier, throughout tropical America. The kit-fox (*velox*) is peculiar to the prairies, and does not go higher than the 55th parallel of latitude; it is very similar in habits to the Asiatic *corsac*. Thieneman has distinguished two species of arctic fox, which were formerly confounded under the name of *lagopus*. One for which he has retained this appellation is stated in Fischer's synopsis to be an inhabitant of Europe only; but it is the species which frequents the arctic coasts of America as far west as Mackenzie's River, and descends along the shores of Hudson's Bay to the 58th parallel. The other species, named *isatis*, characterized by its acute ears and coloured tip of the tail, is said to be an inhabitant of the northern parts of Asia and America; but I suspect that its range in the latter country is confined to the west side of the Rocky Mountains, as it did not fall under my observation to the eastward. On the Pacific coast the arctic fox is said to occur as far south as the 58th or 59th degree of latitude.

The confusion of synonyms in the genus *felis* is not less per-

plexing than in that of *canis*, and though the labours of F. Cuvier, Temminck, and others have expunged several nominal species from the American fauna, no dependance can be placed on the accounts which previous writers have given of their distribution. Temminck has remarked that there is no proof of either *felis onca* or *pardalis* having been killed in North America; but both these and the puma, or cougar (*concolor*), are mentioned by Lichtenstein as inhabitants of Mexico, probably on the authority of specimens communicated by Messrs. Deppe and Schiede. The puma is decidedly common to North and South America: Langsdorff observed it in Upper California, Dr. Godman adduces authenticated instances of its having been killed in Kentucky and New York, and it is said to have strayed occasionally as far north as Canada. The existence of the jaguar (*onca*) within the limits of the United States is more doubtful, though Lewis and Clark say that they saw it on the banks of the Columbia, and Dr. Harlan includes both it and the ocelot (*pardalis*) in his fauna of the United States. In neither case, however, have we any information respecting the means used for identifying the species; and as *felis mitis*, now known to range northwards to Mexico*, was confounded with *pardalis* until its peculiar characters were pointed out by F. Cuvier, we are not in a condition to say which of the two enter the United States, if, indeed, either of them come so far north. According to Temminck, *felis rufa* inhabits every part of the United States, but does not exist in Canada: it ranges to the banks of the Columbia, and Mr. Bullock found it in Mexico. The pee-shew, or *felis canadensis*, is the most northern of the cat-kind, being, in fact, the only species which extends beyond the Canada lakes, whence it ranges through the woody districts of the fur-countries up to the 66th parallel. Temminck states that it is also an inhabitant of the northern parts of the Old World, and he has therefore proposed to change its name to *borealis*. The name of *canadensis* having been occasionally given to the bay lynx by the naturalists of the United States, erroneous impressions of the southerly range of the former have been produced. *Felis carolinensis* and *mexicana* of Desmarest, and *montana*, *floridana*, and *aurea* of Rafinesque, are doubtful species, the occurrence of whose names in systematic works shows the necessity for extended and correct observations by resident naturalists. The *lynx fasciatus* of the latter author is founded upon Lewis and Clark's description of a cat killed by them on the banks of the Columbia; but the species requires further eluci-

* Lichtenstein. It is supposed to be the jaguar of New Spain of Buffon.

dation before it can be considered as established. Lieutenant-colonel H. Smith has figured two ocelots in Griffith's Cuvier, —No. 3, which came from Mexico, and was preserved in Bullock's museum, and No. 4, which he supposes to be a native of the same country, and to be the species figured by Buffon, Supp. 3, 18. The former is named *f. Griffithsii*, and the latter *f. chibiguaza* in Fischer's synopsis. The *felis maculata* of Horsfield and Vigors, figured in the Zoological Journal, was brought from Mexico by Captain Lyon.

Ord. CARNIVORA, cont. *Fam.* AMPHIBIA.

Calocephalus vitulinus*, F. CUV.
„ fœtidus*, FABR.
„ hispidus*, SCHRÖB.
„ gröenlandicus*, EGEDE.
„ lagurus, F. CUV.
„ barbatus*, FABR.
Stemmatopus cristatus*, GMEL.

Otaria jubata, PERON.
„ ursina, ID.
„ pusilla, BUFF. 13, 53.
„ californiana, CHORIS, *Voy.* 11.
„ Stelleri, LESS. FISCH. *Syn.*
Trichechus rosmarus*, LIN.

Few of the amphibious carnivora enumerated above are peculiar to America, for though the *otariæ* are found only in the Pacific, they range to its Asiatic as well as the American shores; the others are mostly common to the northern seas of Europe, Asia, and America. As it is only of late years that the seals of Europe have been investigated with any success, there is little probability of the American list being either correct or complete*.

Captain James Ross states that the smaller seals (*vitulina fœtida* and *hispida*) come into the bays and near to the shores of the arctic seas in winter, living under the ice, in which they preserve breathing-holes; while the harp and great seals (*groenlandica* and *barbata*) keep at a distance from the land among the packed ice and partially open water. *Calocephalus lagurus* was sent from Newfoundland by De la Pilaye, and it is probable that *leucoplus* (THIEN.), which inhabits Iceland, ranges over to Greenland and Davis's Straits, in which case it belongs also to the American fauna. The leonine seal (*stemmatopus cristatus*) descends further southwards on the American coast than elsewhere, one having been captured near New York. This specimen has been described as a distinct species under the name of *mitrata* (Fischer, *syn.*). Most of the Davis's Straits seals have been enumerated by authors as inhabitants also of the sea of

* All the *calocephali* of the above list, except *fœtidus* and *lagurus*, are mentioned by Graah as inhabitants of the east coast of Greenland, as are also *stemmatopus cristatus* and *trichechus rosmarus*. (Vide *Exp. to East Coast of Greenland*, by Capt. W. A. Graah.)

Kamschatka. Of the *otariæ* which also frequent the sea just named, *jubata* is said, though without satisfactory evidence, to exist also in the Straits of Magalhães. *O. Stelleri* is very imperfectly known, even the genus to which it belongs being uncertain. The existence of the *otaria fasciculata*, or the "ribbon seal", is surmised merely because a piece of back-skin was transmitted from the Kurile islands to Pennant, and figured by him in the *History of Quadrupeds*.

The *trichechus rosmarus* is found in all the arctic seas, though there are some deep sounds, such as Regent's and Bathurst's Inlets, into which it does not enter. It descends along the Labrador coast to the Magdalene islands, in the 47th parallel.

Ord. MARSUPIATA*.

Didelphis virginiana, Griff. Cuv. *pl.*
„ opossum, Buff. 10, 45, 46.
Didelphis cancrivora, Griff. Cuv. *pl.*

As the marsupial animals are now confined to America, New Holland, and some parts of the Indian archipelago, and geological researches indicate that they are the earliest mammiferous animals whose remains exist in the ancient strata of the earth, the study of these zoological provinces must be interesting to those who seek to develope the condition of the world at former periods. Comparative anatomists have shown that the *marsupiata* are inferior to other *mammalia* in their simple unconvoluted brain, less perfect organs of voice, and lower intelligence; the *rodentia* are next to them in these respects; and the existence of *marsupiata* and the great numbers of *rodentia* in the North American fauna are its chief characteristics when contrasted with that of Europe. It has been said that when the ancient *marsupiata* existed they were exposed to the attacks of no enemy having higher intellectual powers than a reptile. In the present day the opossums of America and the phalangers of India have many enemies of different classes, yet they do not seem to be in any immediate danger of extinction; and the more numerous marsupials of Australia are kept sufficiently under by carnivorous beasts of their own order, aided by birds

* Though Cuvier has arranged the *marsupiata* as an order, he considers it rather as forming a division, or subclass, parallel to the rest of the mammalia, and representing all the other orders. Mr. Owen agrees with him in observing, that "the marsupials, including the monotremes, form a very complete series, adapted to the assimilation of every form of organic matter." M. Desmoulins and Mr. Swainson have distributed them among the several orders, esteeming what Cuvier supposed to be merely analogies to be in reality affinities. The *didelphidæ* being carnivorous, are not, in either view of the matter, out of place at the end of the *carnivora*.

of prey, and above all by man and his attendant dog. In the order *rodentia* we have an example of productiveness being sufficient to ensure the species from extinction, though assailed by hosts of foes of all kinds.

Only one *didelphis* is common to North America, namely, the *virginiana*, which extends to the Canada lakes, being, moreover, like the rest of the genus, an inhabitant of the inter-tropical parts of the continent. Mr. Collie saw it in California, and Temminck says it inhabits Mexico. *Didelphis cancrivora* and *opossum* range, according to Lichtenstein, as far north as Mexico, and if one of these be not the "coyopollin" of Hernandez, there is a fourth species in that country. Authors have somewhat arbitrarily used the name of coyopollin as a synonym of *dorsigera* and *philander*; but it is by no means certain that the latter species reaches Mexico.

Ord. RODENTIA.

Sciurus cinereus, Buff. 10, 25.
„ capistratus, Griff. Cuv. *pl.*
„ ? *grammurus*, Say, *Long. Exp.*
„ niger, Rich. *F.B.A.*
„ Collinæi, Id. *Beech. App.* 1.
„ Clarkii, Smith, *Griff. Cuv. pl.*
„ Lewisii, Id. *l.c. pl.*
„ hudsonius, Rich. *F.B.A.* 17.
Tamias Lysteri, Id. *F.B.A.* 15.
„ quadrivittatus, Id. *F.B.A.* 16.
„ *buccatus*, Licht. *Deppe's List.*
Pteromys sabrinus, Rich. *F.B.A.*
„ alpinus, Id. *l.c.* 18.
„ volucella, Buff. 10, 21.
Spermophilus lateralis, Rich. *F.B.A.* 13.
„ Hoodii, Id. *l.c.* 14.
„ Richardsonii, Id. *l.c.* 11.
„ Franklinii, Id. *l.c.* 12.
„ Beecheyi, Id. *l.c.* 12 B.
„ Douglasii, Id. *l.c.*
„ Parryii, Id. *l.c.* 10.
„ *guttatus*? Id. *l.c.*
„ spilosus, Benn. *Zool. Pr.*, 1833.
„ ? Ludovicianus, Griff. Cuv.
Arctomys empetra, Rich. *F.B.A.* 9.
„ ? *brachyurus*, Harlan, *fauna.*
„ *pruinosus*, Penn.
„ *caligatus*, Eschsch. *Zool. At.* 6.
„ *ochanaganus*, King, *Narr. &c.*
„ monax, Edw. 104, Griff. Cuv.
Mus leucopus, Raf. Rich. *F.B.A.*
„ ? *virginicus*, Reich. Fisch. *Syn.*
Meriones labradorius, Rich. *F.B.A.* 17.
Neotoma Drummondii, Rich. *F.B.A.* 8.
„ floridana, Say & Ord. *Ac. Sc. Ph.*
Sigmodon hispidum, Say.
„ *ferrugineum*, Harl. *Sill. Jour.*
Fiber zibethicus, Cuv.
Arvicola riparius, Ord.
„ xanthognathus, Leach. *Zool. M.*
„ pennsylvanicus, Rich. *F.B.A.*
„ noveboracensis, Id. *l.c.*
„ borealis, Id. *l.c.*
„ *rubricatus*, Id. *Beech. App.*
Mynomes pratensis, Raf. *An. Nat.* 1820.
Georychus helvolus, Rich. *F.B.A.*
„ trimucronatus, Id. *l.c.*
„ hudsonius, Id. *l.c.*
„ groenlandicus, Id. *l.c.*
Geomys bursarius, Davies, *Lin. Tr.* 5, 8.
„ borealis, Rich. *nov. sp.*
„ Douglasii, Id. *F.B.A.*
„ bulbivorus, Id. *l.c.* (*diplostoma*).
„ umbrinus, Id. *l.c.*
„ talpoides, Id. *l.c.*
„ *pinetis*, Raf.
„ Drummondii, Rich. *nov. sp.*
„ mexicanus, Licht. Hern.
Saccomys anthophilus, F. Cuv.
„ *fasciatus*, Raf. (*Cricetus*).
Apluodontia leporina, Rich. *F.B.A.* 18 C.
Castor fiber*?, L.
Eretizon dorsatum, Griff. Cuv. *pl.*
Synetheres prehensilis, F. Cuv.
Lepus glacialis, Leach.
„ americanus, Gmel.
„ *virginianus*, Harl.
„ *mexicanus*, Licht.
„ *cunicularius*, Id.
Lagomys princeps, Rich. *F.B.A.* 19.
Dasyprocta carolinensis, F. Cuv.

North America exceeds the other quarters of the world in the

number of species and variety of forms of its rodent animals; but they are still very imperfectly known, as their original describers have too frequently contented themselves with noticing the colour of the fur and the length of the tail, disregarding osteological characters, and rarely noting the dentition, so that many of the species enumerated in the American fauna are of uncertain genera, and many nominal ones have been introduced. The American naturalist who shall sedulously collect *rodentia* from various parts of his country, and describe minutely their characters, adding comparative notices of the species of each genus, will confer a great obligation on the lovers of science. Rafinesque has noticed a considerable number of animals of this order, some of them so peculiarly striped that they could not easily be mistaken were they to come under the observation of another zoologist; but in the instances in which his animals have been traced he is found to be so often inaccurate, and his generic characters are so generally imperfect, that science would sustain little loss if his notices were expunged from our books of natural history, were it not that they serve the purpose of inducing search in the localities he points out. In the preceding list we have omitted most of the doubtful species which have been admitted into the systems.

Sciurus cinereus, which has a multitude of synonyms tacked to it, inhabits most parts of the United States, being very abundant in Carolina and Pennsylvania. *Sc. rufiventer* of Geoffroy, *magnicaudatus* of Say, and *ludovicianus* of Curtis, quoted by Harlan, do not, as far as we can judge by the published descriptions, differ from certain states of *cinereus*. A *sc. hypoxanthus* occurs in Lichtenstein's list of Deppe's Mexican animals; but no character is given, so that we have no means of ascertaining in what respect it differs from the fulvous-bellied condition of *cinereus*. The *sc. capistratus*, or fox-squirrel, is a larger species, which varies greatly in its colours, and inhabits the middle and southern states of the Union: it is generally supposed to be one of the Mexican squirrels described by Hernandez, and named by some authors *variegatus*, but this wants confirmation. Say's *sc. grammurus* lives in holes, does not voluntarily ascend trees, and has very coarse fur; hence it is most probably a spermophile: it was found near the sources of the Arkansa. The black squirrels of the United States are generally referred to *capistratus;* but a smaller and totally black species (having no white muzzle) inhabits the northern shores of Lake Huron, and to this we have restricted the name of *niger* in the *Fauna Boreali-americana*. The larger black kind exists in Canada, and Hernandez mentions Mexican squirrels which are totally black, along

with others which are white with yellow tints. *Sciurus Colliæi* from California, figured in the appendix to Beechey's Voyage, differs from any species inhabiting the Atlantic states, but nearly agrees with Hernandez's account of the Mexican "*tlalmototli*". *Sc. Clarkii* and *Lewisii*, figured by Lieut.-Colonel Hamilton Smith in Griffith's Cuvier, were brought from the Missouri by the travellers whose names they bear. The latter is supposed by the editor of the work referred to, to be the *sc. annulatus* of Desmarest, whose native country was previously unknown. The *sciurus hudsonius*, named locally red-squirrel, or chickaree, the most northern American species, has a range from the arctic extremity of the woods to Massachusetts. Though destitute of cheek-pouches, it has been generally ranked as a tamias, perhaps on account of the dark line which occasionally divides the fur of the back from that of the belly; and, indeed, it resembles the *tamias* in forming burrows at the foot of the pine-tree, on which it seeks its food: it is evidently the *rubro-lineatus* of Warden, and probably the *ruber* of Rafinesque.

The *tamias Lysteri* ranges on the eastern side of the Rocky Mountains from the 50th parallel down to the Carolinas; it is the *tamias americanus* described by Kuhl (*Beitrage*, 69)*. Cuvier states, that the *t. striatus* inhabits both Asia and America; but we have met with no American animal that resembles Buffon's figure 10, 28, which Cuvier quotes. *T. quadrivittatus* inhabits the fur-countries, and goes southwards along the eastern declivity of the Rocky Mountains to the sources of the Platte and Arkansa. *T. buccatus* is a Mexican animal, which differs from the other admitted species of *tamias* in wanting longitudinal stripes and colours on the flanks. We cannot help surmising, therefore, that it may be a spermophile, for the two genera are very nearly allied, the only material difference in the dentition being, that the anterior molar of the upper jaw, which falls early in the true squirrels, but remains till old age in the tamias, is smaller in the latter than in the spermophiles. The typical species of each differ, indeed, a little in the feet; but *t. quadrivittatus* and *sp. lateralis* possess intermediate characters, which unite the two groups very closely, so that we may be prepared to find authors differing as to which genus or subgenus certain species ought to be referred. *Pteromys volucella* inhabits Canada, the United States, and, according to Lichtenstein, Mexico also. *Pt. sabrinus* and *alpinus*, which are not yet fully established as distinct from each other, and closely resemble the *volans* of Siberia, frequent the

* Fischer, *syn.*

forests of Canada, the Rocky Mountains, and the fur countries up to the 57th parallel.

The marmots are numerous in North America, particularly those which enter the subgenus *spermophilus*. These animals abound in the prairies, which are analogous to the Siberian steppes near Lake Aral, that are also overrun by spermophiles; but the only species that can be considered as common to the New and Old World is *guttatus* of North California and New Caledonia. This little animal is certainly so similar to the "souslik" of the Wolga, that the published figures or descriptions do not afford any distinctive marks; but no satisfactory comparison of specimens has yet been made. It is probable that Lichtenstein alludes to this species when he says, that there is a spermophile in Mexico which cannot be distinguished from the Siberian *citillus*: *guttatus* was considered by Pallas to be merely a variety of *citillus*. *Sp. Parryii* is the most northern species, being an inhabitant of the arctic coasts and the Rocky Mountains down to the 58th parallel. *Spermophilus lateralis* resides on the eastern declivity of the Rocky Mountains, from the 57th parallel down to the sources of the Arkansas. *Beecheyi* comes from Upper California, and *Douglasii*, which nearly resembles it, and is perhaps only a local variety, is from the adjoining district of the banks of the Columbia. *Franklinii*, *Richardsonii*, and *Hoodii* abound on the prairies of the Saskatchewan, the last ranging southwards to Mexico*, and being perhaps the Mexican squirrel of Seba, which is described as brown, with five or seven longitudinal whitish stripes. The *arctomys griseus* of Rafinesque, founded on Lewis and Clark's description of a Missouri animal, does not appear very different from *sp. Richardsonii*. *Sp. spilosus*, described by Mr. Bennett in the *Zoological Proceedings*, is from California. *Ludovicianus*, the "prairie dog" of the Missouri, has not been described as possessing cheek-pouches. *Arctomys empetra* frequents the woods of Canada and the fur countries up to the 60th parallel, while *monax* belongs to Maryland and the more southern Atlantic states. *A. brachyurus* is known only from Lewis and Clark's description of a Columbia river animal. The alpine districts of New Caledonia are the abode of a marmot named the "whistler", or perhaps more than one species is included under this trivial appellation, for the accounts given of it by the traders apply almost equally to the *pruinosus* of Pennant, the "tarpogan", or *caligatus* of Eschscholtz, and the *ochanaganus* described and figured by Mr. King in his recent

* Mexican specimens exist in the Museum at Frankfort. Dr. Ruppel.

narrative of Captain Back's journey. The latter animal agrees exactly with Eschscholtz's in the remarkable post-auricular black bar, in the general colour, and in the relative length of the fur on the different parts of the body, but differs in some minor points, and particularly in its smaller size, which may, however, be owing to its youth.

The only species of the restricted genus *mus* which is unequivocally indigenous to North America* is the *mus leucopus* of Rafinesque; and this so closely resembles *mus sylvaticus* of Europe that there are scarcely grounds for impugning the opinion of the older naturalists, who considered it to be the same species. In my dissections I did not succeed in detecting cheek-pouches, but Dr. Gapper has discovered cheek-pouches in a Canadian animal differing in no respect from it in exterior appearance, which he has therefore named *cricetus myoides*, and figured in the *Zoological Journal*. The *mus leucopus* is found everywhere, from the arctic circle down to the United States, and some authors state that it is common throughout the Union; but Dr. Harris says that it is not found in Massachusetts. It readily domesticates itself in the habitations of man, wherever the *mus decumanus*, *rattus*, and *musculus*, introduced from the other side of the Atlantic, have not penetrated. The *myoxus virginicus* of Reich, quoted in Fischer's synopsis, seems very closely allied to *mus leucopus;* it is an inhabitant of the foot of the Alleghanies. The *mus nigricans* of Rafinesque is supposed to be merely the common black rat (*rattus*).

The *meriones labradorius* inhabits America from the 60th parallel to an unascertained distance southwards. We have received several examples from different parts of the United States, and the *canadensis* of authors has not been proved to be a distinct species. Rafinesque indicates others, viz., *soricinus*, *leonurus*, *hudsonius*, *megalops*, and *sylvaticus;* but his notices are not sufficiently detailed for scientific purposes. Dr. Mitchell is equally vague in his account of a *meriones sylvaticus*.

Neotoma Drummondii abounds in the Rocky Mountains and *floridana* in Florida. As these animals resemble the *myoxi* in external form, it is desirable to know whether, like them, they are destitute of a cæcum. They build well-protected nests above ground, instead of burrowing like the meadow-mice, and appear to be omnivorous, like the common rat, than which they are even more destructive. Of M. Le Comte's *neotoma*

* A species inhabits Port Famine, in the Straits of Magellan, *mus magellanicus*. (King, *Zool. Proc.*, 1835.)

gossipina, which inhabits the southern states, we know no more than the name. The *sigmodon** *hispidum* is found on the banks of the river St. John, which flows between Georgia and Florida. The *ferrugineum* inhabits cotton-fields on the Mississippi. *Fiber zibethicus* ranges from the Arctic Sea nearly to the Gulf of Mexico.

Though the various species of *arvicola* differ in size, aspect, and in the relative strength of their members, so as to be readily distinguishable from each other when brought into apposition, it is very difficult to frame specific characters by which they can be recognised when apart; and it is not therefore surprising that many nominal species should have been proposed, and, what is equally adverse to the interests of science, that many perfectly distinct animals should have been described under a common name. Until a revision of the genus has been accomplished, and American and European examples have been accurately compared with each other, we cannot admit that any one species is common to the two countries, as *amphibius* has been supposed to be. The majority of *arvicolæ* in our list belong to the fur-countries, though some, as *riparius* and *pennsylvanicus*, extend also far into the United States; the latter is the smallest as well as the most common American species. *A. rubricatus*, distinguished by a bright red stripe on the flanks, was seen by Mr. Collie in Behring's Straits†. The *georychi*, or lemmings, distinguished from the true meadow-mice by their thumb-nails and extremely short tails, all belong to the northern extremity of the continent, unless the very doubtful *spalax vittatus* of Rafinesque, found in Kentucky, shall be hereafter discovered to belong to this genus. The *mynomes pratensis* of Rafinesque requires further examination, as do also his *lemmus talpoides*, *albovittatus*, and *noveboracensis*, indicated rather than characterized in the *American Monthly Magazine* for 1820.

Though the "gauffres", or pouched rats, abound in all the prairie lands and sandy tracts of the United States, their history is still very obscure. The species, which are numerous, have been mostly confounded with the *tucan* of Hernandez or the *hursarius* of Shaw; but various generic names have been proposed, such as *geomys*, *pseudostoma*, *ascomys*, *diplostoma*, and *saccophorus*. The first figure of the Canada species published by Major Davies in the Linnean Transactions, represents the very large cheeks as filled from within and pendent externally,

* This genus requires further examination.

† *A. Nuttallii* appears in Dr. Harlan's list, but we do not know its distinctive characters nor its habitat.

slipping, as it were, from under the common integuments by a longitudinal slit, and having their surface covered with short hair. Cuvier, however, says of this figure, "*il n'y a rien de semblable dans la nature*", the true form, in his opinion, being that represented in the Transactions of the Berlin Academy, 1822–3, pl. 3, or in the *Fauna Boreali-Americana*, 18. B., where the pouches, running backwards under the integuments of the cheek, open externally on each side of the comparatively small true orifice of the mouth, producing the appearance which is alluded to in the generic appellation, signifying "false", or "double mouth". If the latter be the true form, the pouches can be filled and emptied only by the fore feet, which do not seem to be well calculated for such a purpose. Moreover, the late Mr. Douglas, whose ability as an observer no one will question, informed me that the pouches are filled from within the mouth by the action of the tongue, becoming, when fully distended, pendulous externally; but when empty being retracted like the inverted finger of a glove. Mr. Drummond also sent me several specimens of different species from various parts of the United States, some of them prepared with the empty pouches folded beneath the skin of the cheeks, and others with them filled and hanging down. Mr. Schoolcraft, on the other hand, has given a description of a gauffre from personal observation which corresponds with the view of the matter entertained by Cuvier. To reconcile these jarring statements, I adopted both of Rafinesque's genera, *geomys* and *diplostoma* in the *Fauna Boreali-Americana*; but since the publication of that work I have ascertained by the examination of a considerable number of specimens that the character of the dentition is the same in all; consequently they form but one genus, and Mr. Douglas's account of the cheek-pouches I now consider as well supported by the specimens I have examined. *Geomys borealis* inhabits the plains of the Saskatchewan, *Douglasii* and *bulbivorus* those of the Columbia; *bursarius* is from Canada, *pinetis* from Georgia, *talpoides* from Florida, *umbrinus* from Louisiana, *Drummondii* from Texas, and *mexicanus*, as its name imports, from Mexico. *Diplostoma fusca* and *alba* of Rafinesque were brought from the Missouri; but as the specimens were imperfect and the descriptions are equally so, they must be considered as doubtful*.

* Rafinesque characterized *diplostoma* as differing from *geomys* in the total absence of a tail, and in having only four toes on each foot; but Cuvier says that his specimens showed five toes, as in *geomys;* and it is very probable that the tails had been removed by the Indian hunters in preparing the skins. All the species that have come under our notice had short tapering tails,

Saccomys anthophilus of F. Cuvier has the teeth of *geomys*, but he has placed it in a separate genus on account of the supposed peculiarity of its pendent pouches; it is smaller than any *geomys* we have seen, and differs from all that we have enumerated in the greater length of its tail. The *cricetus fasciatus* of Rafinesque from Kentucky is probably either a *geomys* or *saccomys;* but if so, it is peculiar in having ten transverse black streaks on the back, if indeed this appearance was not produced, as is sometimes the case, by cracks in mounting the skin. *Apluodontia leporina* inhabits New Caledonia and the banks of the Columbia, where its skins are used for clothing, and form an article of traffic.

The beaver ranges on the eastern side of the continent, from the most northern woods down to the confluence of the Ohio with the Mississippi; and it would appear, from a remark of Dr. Coulter's, that on the western side it descends in the neighbourhood of the Tule lakes to the 38th parallel. The purpose served in the economy of the animal by the castoreum and a fatty substance deposited in the adjoining sacs has not yet been made out. The Canada porcupine (*erethizon dorsatum*) inhabits the country lying between the 37th and 67th parallels. The *hoitzlacuatzin* of Mexico is identified by Lichtenstein with the *synetheres prehensilis**, we do not know with what propriety; but if he be correct, it is, if not a solitary instance, at least very nearly so, of a rodent animal being common to North and South America. The spotted cavy (*cœlogenys*) and perhaps a species of *cavia* and one of *dasyprocta* extend from South America to the West Indies and Mexico; but in other respects the animals of this numerous order differ greatly in the zoological provinces of North and South America.

The most northern American hare is *lepus glacialis*, which

thinly clothed with very short whitish hairs. The incisors are differently grooved in different species. *Geomys bulbivorus* and *umbrinus* have these teeth quite smooth; *borealis* and *talpoides* have a very fine groove close to the inner margin of each upper incisor; *Douglasii* has fine submarginal grooves on all the incisors, viz., next to the inner edges of the upper ones and the outer edges of the under ones; *bursarius* and *Drummondii* have a deep rounded furrow in the middle of the anterior surface of the upper incisors, in addition to the fine inner submarginal one. The under incisors are quite plain in *Drummondii*, and most likely in *bursarius*, also, as no mention is made of their being grooved. In all these species the auditory opening is scarcely perceptibly elevated. *Geomys* or *ascomys mexicanus* of Lichtenstein has short round ears, with a single central furrow in the upper incisors. A variety of this is mentioned in Fischer's synopsis. They are inhabitants of the Mexican uplands, where they lay waste the maize-fields.

* The island of Cuba nourishes another kind of rodent animal with a prehensile tail, named *capromys*.

frequents the islands of the Arctic Sea, the barren grounds, and the Rocky Mountains, down to the 60th parallel. *L. americanus* inhabits the woods from the Gulf of Mexico to their northern limits. *L. virginianus* is found on the prairie lands of the Saskatchewan and Missouri, and it is said also on the Blue Mountains of Pennsylvania; but further investigations are requisite to prove the existence of the same species in such different localities. A "marsh hare" from the southern parts of the United States has been recently described in the *Zoological Proceedings*, and it may be this that Dr. Harlan has associated with the prairie hare under the name of *virginicus*. *Lepus mexicanus* is the name bestowed by Lichtenstein on the "citli" of Hernandez, and *cunicularius* that by which he designates the "tochtli". How far either of these species ranges northwards, or whether they have been compared with the Florida marsh hare we know not. *Lagomys princeps* has its abode on the crests of the Rocky Mountains, where it is probable that other species will be hereafter detected. Lichtenstein tells us that cavys are common in Mexico, and some authors have stated that the common agouti (*dasyprocta acuti*) inhabits the southern extremity of the United States; but F. Cuvier has separated the latter animal by the specific appellation of *carolinensis*. The *lipura hudsonica* of Illiger, or *hyrax hudsonius* of Shaw, must be excluded from the American fauna until we receive satisfactory evidence of its origin.

Ord. EDENTATA.

Dasypus hybridus, DESM.

This small order may be called South American, the whole of the animals composing it belonging to that country, except three or four African or Indian species comprised in the genera *oryctopus* and *manis*. Lichtenstein, at the close of some remarks on the "ayo-tochtli" of Hernandez, says, that the specimens brought home by Deppe accorded exactly with the *tatou mulita* of Azzara, which Cuvier refers to the *dasypus 7-cinctus* of Linnæus. By others the *ayo-tochtli* is considered to be the *d. peba* of Desmarest, and we also find the *mexicanus* of Brisson ranked among the synonyms of *d. Encoubert* of Desmarest. The latter author informs us that the *hybridus* is common in Paraguay and on the Brazilian pampas. It is the only example of an animal of this order that has been ascertained to enter the North American fauna, though Lichtenstein conjectures that a *myrmecophaga* may also be found in Mexico, namely, the *atzca-coyotl* or *tlal-coyotl* of Hernandez.

Ord. PACHYDERMATA.

Dicotyles torquatus, Cuv.

This order is at once remarkable for the magnitude of the animals composing it, the great proportion of extinct species, and the small number which now exist in the New World. Two genera only, comprising four or five species, are known in America, namely, *tapir* and *dicotyles*, both of which belong to the southern zoological province: yet there is one species, the common peccari or *dicotyles torquatus*, which ranges northwards to the Red River, a tributary of the Mississippi, where it was observed by Nuttall; this is probably the *coyametl* of Hernandez. Dr. Harlan states that the tapir is also an inhabitant of Mexico, without quoting his authority; but Dr. Roulin, who has written a very learned and elaborate treatise on this animal, and figured a second American species, is of opinion that the *tapirus americanus* ranges from the 35th degree of south latitude only to the 12th north, while the new species, *t. pinchachus*, is confined to the higher Cordilleras of the Andes, and does not advance further to the north than the 10th degree. The very remarkable resemblance between the scull of the Indian tapir and that of the *palæotherium* has been pointed out both by Cuvier and Dr. Roulin.

Fossil elephants and mastodons occur in North America, and though the present stock of horses, wild and tame, in that country are believed to have had an European origin, fossil bones of horses were found by Captain Beechey under the cliffs of Kotzebue Sound mixed with those of elephants and other animals. There is a considerable resemblance in the kinds of quadrupeds found in the *cocene* gypsum quarries of Paris, named in Cuvier's list—bat, large wolf, fox, coatis, raccoon, genette, dormouse, and squirrel—to those now existing in Mexico. The genette may be represented in tropical America by *bassaris* or *gulo barbara*, and the dormouse by *neotoma;* while the *palæotherium* and other extinct *pachydermata* of Montmartre are allied to the tapir. The other genera are American, but *dicotyles* and the *felidæ*, which form so conspicuous a part of the existing carnivora, do not occur in Cuvier's list.

Ord. RUMINANTIA.

Cervus alces*?, L. Griff. *Cuv. pl.*
„ tarandus*, L.? Edw. 51.
„ strongylocerus, Schreb. 247.
„ macrotis, Rich. *F.B.A.* 20.
„ virginianus, Buff. 12, 44.
„ mexicanus, Gmel. Griff. *Cuv.*
„ leucurus, Dougl. Rich. *F.B.A.*
Cervus nemoralis, H. Smith, Griff. *Cuv.*
Dicranocerus furcifer, Rich. *F.B.A. pl.*
Capra americana, Rich. *F.B.A.*
Ovis montana*?, Id. *l.c.*
Bos americana, Griff. *Cuv. fig.*
„ moschatus, Penn. *Arct. Zool.*

Only two species of this order are common to the old continent and America, and these have the highest northern range, namely, *Cervus alces* and *tarandus*. If the *ovis montana* be, as Cuvier hints, the same with the Siberian argali, it is a third common species. The North American deer are still very imperfectly known, and a revision of the species would well repay the labour of a naturalist who has an opportunity of seeing them in a state of nature; the deer of the Pacific coast in particular require investigation, as they are known only by imperfect descriptions, no figures of them having been published nor specimens brought to Europe*. The reindeer is the most northern ruminating animal, being an inhabitant of Spitzbergen, Greenland, and the remotest arctic islands of America. On the Pacific coast it descends as low as the Columbia river, being, however, much less common there than in New Caledonia. On the Atlantic it exists as far south as New Brunswick, while in the interior its southern limit is the Saskatchewan river. The different varieties of reindeer ought to be compared with each other, and detailed dissections of the American kinds are still wanted. The southern range of the elk is the Bay of Fundy, on the eastern coast, though it is said to have existed formerly as far south as the confluence of the Ohio and Mississippi; but this report is rendered uncertain by the name elk having been applied in different parts of the country to different kinds of deer. It frequents all the wooded districts up to the mouth of the Mackenzie, in the 68th degree of latitude, but very seldom appears in the prairies or barren grounds. The wapiti, or *cervus strongyloceros*, does not travel to any distance from the prairie lands, on both sides of the Rocky Mountains, and not further north than the 54th parallel. *C. macrotis* and *leucurus* frequent the prairies of the Saskatchewan and Missouri, and, according to report, the west side of the Rocky Mountains also. *C. virginianus* is found from Canada to the Gulf of Mexico; *nemoralis* and *mexicanus* inhabit the latter country, the former going southwards to Surinam†. The *antilope furcifer* abounds on the prairies of the Missouri, Saskatchewan, and Columbia, and is believed to range southwards to Mexico. It differs much

* The following is a list of the deer of Columbia and New Caledonia furnished to me by P. W. Dease, Esq., of the Hudson's Bay Company: moose-deer (*c. alces*); rein-deer (*c. tarandus*); red-deer, or wawaskeesh (*c. strongyloceros*); *kinwaithoos*, or long-tailed deer; mule-deer; jumping-deer, or cabree; fallow-deer, or chevreuil. The specific names of the last four have not been satisfactorily ascertained. The *antilope furcifer* is named white-tailed cabree to distinguish it from the jumping-deer, in which neither the tail, nor the rump, is white.

† Lieut.-Colonel H. Smith, in Griffith's Cuvier.

from the true antelopes, and, if it be considered as belonging to a distinct genus (*dicranocerus*), it is the only generic form of this order found in North America which does not exist also in Europe, unless a second be found in *ovibos moschatus*, separated from *bos*. The *capra americana* and *ovis montana* inhabit the Rocky Mountains from Mexico to the northern extremity of the range, and also the maritime Alps of California and New Caledonia, the former confining itself to the higher ridges. The musk-ox is peculiar to the barren lands, travelling in summer over the ice to Parry's Islands; but though it has this high range, it does not exist either in Asia or Greenland. The chief residence of the bison (*bos Americanus*) is on the prairie lands, east of the Rocky Mountains; it frequents the woods also up to the 62nd parallel, but nowhere approaches within 600 miles of Hudson's Bay. Though this animal is at present rarely ever seen to the eastward of the Mississippi, it is said to have formerly frequented Pennsylvania and Kentucky, but the authority for its ever having ranged to the Atlantic coast is by no means good. It does not exist in New Caledonia, though it has crossed the eastern crest of the Rocky Mountains further south, to the headwaters of the south branch of the Columbia; but even in that latitude it does not advance towards the coast, a spur of the Californian Alps* (or "a counterfort" connecting them with the Rocky Mountains), which skirts the Snake River, or south branch of the Columbia, offering apparently an effectual barrier to its further progress westward. In the fur countries it does not go to the eastward of the 97th meridian†.

Ord. CETACEA.

As the cetacea traverse the depths of the ocean in pursuit of their prey, it is highly probable that many species are common to the same parallels of the New and Old World. Those that frequent the Greenland seas are at least entitled to be enumerated among the animals both of Europe and America; and in like manner the *cetacea* of the North Pacific and sea of Kamschatka are common to the latter country and to Asia; but the animals of this order are so imperfectly known that we cannot give the correct geographical distribution of even a single species.

* Named the "Blue Mountains".

† Horned cattle thrive well in America. They were introduced into Upper California about 70 years ago, and in 1827 the Missions, according to Dr. Coulter, possessed upwards of 300,000 head, 60,000 being annually slaughtered to keep down the stock. They are multiplying also very fast on the banks of the Columbia, where they have lately been introduced by the Hudson's Bay Company.

Dr. Harlan enumerates fourteen of the true cetacea as having been detected on the coasts of North America; but on correcting his list, and striking out the synonyms agreeably with the indications in the *Règne Animal*, the number is reduced to ten. Of the herbivorous cetacea two at least enter the North American fauna, viz., the *stellerus borealis*, or *rytina*, which belongs to the Sea of Kamschatka, and a manatee, that frequents the mouths of rivers in East Florida. This species has been named *latirostris* by Dr. Harlan; but Temminck observes that it is "*tres douteuse*," meaning thereby, we suppose, that it is not distinct from one of the ascertained species, *senegalensis* or *americanus*; the latter, which inhabits the tropical coasts, is supposed to go as far north as Mexico.

The following list comprises the cetacea which are enumerated in the *Règne Animal*, Desmarest, Fischer's synopsis, &c., as extending their range to America; but nothing is less certain than their identification with European species bearing the same names.

Manatus americanus, Cuv.
„ *latirostris*, Harlan.
*Rytina borealis**, *Nov. Act. Petr.* 13, 13.
Delphinus delphis*, Lacep. 13, 1.
„ tursio*, Hunt. *Ph. tr.* 1787, 18. (*nisarnac*, Fabr.)
„ *canadensis*, Duhamel, 2, 10, 4.
Phocæna gladiator*, Lacep. 15, 1.
„ communis*, Id. 13, 2.
„ *intermedia*, Harl. *Ac. Sc. Ph.* 6, *fig.*
Delphinapterus leucas*, Scoresb. 14.
Hyperoodon Dalei*, Hunt. *Ph. tr.* 77, 19.
„ *anarnichum**, Fabr.
Monodon monoceros*, Scoresb. 15.
Physeter macrocephalus*, Lacep. 10.
„ tursio*, Bayer, *Nov. Act. Cur.* 3, 1.
Balæna mysticetus*, Scoresb. 12.
„ *nodosa*, Bonnat.
„ physalis*, Id. 2, 2.
„ boops, Id. 3, 2.

Chamisso, in the *Mem. de la Soc. Leopold*, &c., v. 12, has described nine cetaceous animals which frequent the Aleutian islands, founding his species on the figures and reports of the natives. (Vide Less. *Man.*)

We shall conclude our cursory remarks on the *mammalia*, with a list of the most northern species.

Cetacea.
Monodon monoceros. 81¾° N. lat.
Calocephala fœtida. 82¾° N.
Phocæ aliæ.
Trichechus rosmarus. 80¾° N.
Ursus maritimus. 82½° N.
Vulpes lagopus. } 80° N.
Cervus tarandus. }
Georychus Hudsonius. }
Mustela —— ? }
Gulo luscus. } 75° N.
Lupus occidentalis. }
Lepus glacialis. }
Bos moschatus. }
Mustela erminea. 73½° N.
Georychus grœnlandicus. 71° N.
Ursus arctos? } 70° N.
Lutra lataxina. }
Georychus trimucronatus. }
Arvicola rubricatus. }
Sorex palustris. } 67° or 68° N.
„ Forsteri. }
Vespertilio —— ? }
Lepus americanus. }
Fiber zibethicus. }
Cervus alces. }
Felis canadensis. 66° N.
Didelphis virginiana. 44° N.
Dicotyles torquatus. 31° N.
Dasypus hybridus. } *Mexico.*
Pedimana. }

The species noted as reaching the 80th, or a higher parallel, have been observed on Spitzbergen or in the neighbouring seas. We are not aware of any rodent animal having been taken alive in so high a latitude, but the skeleton of a Lemming was found on the ice in 81¾° N. by Sir Edward Parry on his memorable expedition to the northward of Spitzbergen. The same species exists on the most northern American Islands, and some small gnawers might have been supposed to inhabit Spitzbergen from a *mustela* having been seen there by Captain Phipps's people. (*Voyage towards the North Pole in* 1773, p. 58.) The North Georgian or Parry's islands support those marked as reaching 75° N. with the addition of all the Spitzbergen species, except the weasel. We thus see that the orders *carnivora*, *rodentia*, *ruminantia* and *cetacea*, are represented in the most northern known lands or coasts, the *felidæ* reach 66° N., the *marsupiata* 44° N., the *pachydermata* 31° N., and the *edentata* and *quadrumana* to Mexico.

The following table exhibits the number of North American mammalia belonging to each order, and two tables, extracted from Fischer's synopsis, are inserted in a note to furnish the means of comparison; but it is to be observed that Fischer admits many species which still require much elucidation before they can be fully established. Temminck considers that there are about 930 well-determined species of *mammalia*, and 140 doubtful ones. If this estimate be nearly correct, North America nourishes about one-fifth of the known species.

Note.—An (*) *is prefixed to the species whose identity with those of Europe bearing the same names is not fully ascertained.*

Orders, or Families.	Total number of species.	Proper to N. Amer.	Common to other countries.
Carnivora	101		
Cheiroptera	.....	17	
Insectivora	.....	11	
Carnivora	.....	38	2 *7
Amphibia	.....	12	11
Marsupiata	.....	3	
Rodentia	71	70	*1
Edentata	.....	2	
Pachydermata	16	1	
Ruminantia	.....	10	*3
Cetacea	19	5	14
Total	207	169	27 *11

AVES.

The *birds*, having always been objects of interest to collectors and artists, are better known than the other animal productions of North America. Edwards at an early period figured thirty-eight species from Hudson's Bay; the natural history appendices to the recent arctic voyages contain full lists of those which frequent the sea-coasts in the higher latitudes, and the second volume of the *Fauna Boreali-Americana* has made known some new species, which, migrating through the great central valleys of the Mississippi and Mackenzie, or crossing the Rocky Mountains from California, had escaped the notice of the ornithologists of the eastern states *. Good lists are still wanted of the Labrador and Canadian birds, and also local cata-

* *Note.—An* (*) *is prefixed to the doubtful species.*

Ordines et Familiæ in Europa.	In toto.	Proprie.	Cum aliis terris.
Quadrumana	1	.....	1
Carnivora			
Cheiroptera	22 *7	18 *7	4
Insectivora	16 *3	10 *3	6
Carnivora	28 *1	3 *1	26
Amphibia	12 *4	4 *4	7
Rodentia	40 *4	9 *4	31
Edentata	.....	.....	...
Pachydermata	3	.....	3
Ruminantia	14	1	13
Cetacea	20 *3	6 *3	14
	156 *22	51 *22	105

Ordines et Familiæ.	Orbis priscus.						America.						Polynesia.						Patria ignota.	
	In toto.		Proprie.		Cum aliis terris.		In toto.		Proprie.		Cum aliis terris.		In toto.		Proprie.		Cum aliis terris.			
Quadrumana	78	*20	78	*20	...		68	*12	68	*12	...		...		...		...		2	*5
Carnivora, *Cheiropt., Feræ, Bestiæ*	256	*35	225	*31	28	*3	171	*68	140	*64	31	*4	52	*9	45	*8	7	*1	19	*3
Rodentia (*Glires*)	151	*15	144	*15	7		106	*27	99	*27	7		2		2		...		1	
Eden., Pachyd., Rumin. *Bruta, Bellue, Pecora...*	146	*10	144	*10	2		34	*12	32	*12	2		3		3		...		1	*1
Cetacea	45	*3	35	*3	9	3	21	*5	7	*5	14		11	*2	2	*2	9		2	*2
	676	*83	626	*79	46	*6	400	*124	346	*120	54	*4	68	*11	52	*10	16	*1	25	*11

* The natural history of Sir John Ross's first voyage, Sir Edward Parry's third and fourth voyages, Sir John Franklin's first journey, and Captain Back's recent one accompany the respective narratives. Sir Edward Parry's first

logues for various districts of the United States, to contribute towards our knowledge of the geographical distribution of the species; but with regard to the discovery, description, and illustration of the feathered tribes of that country comparatively little remains to be accomplished. When Wilson's admirable work appeared, European ornithology could boast of nothing equal to it*. The Prince of Musignano's highly valuable critical examination of synonyms†, and his publication of new species‡, ably supply what Wilson, cut off in the midst of his career, left incomplete; and the magnificent book of Audubon, now in the course of publication, surpasses every attempt of the kind in any country. Audubon's plates present to us some of the finest specimens of art, and his ornithological biographies convey the observations of a whole life enthusiastically devoted to studying the forms and habits of the feathered inhabitants of the air. It is announced that his forthcoming volume will contain a synopsis arranged in conformity with the recent improvements of science, and also a treatise on the geographical distribution and migration of the species; in short, this grand work will henceforth be the standard of reference for the birds which frequent the Atlantic states from Labrador to the Gulf of Mexico, and eastward to the great prairies.

Of the birds of Russian America and California we have only detached notices by travellers, the Appendix to Capt. Beechey's voyage by Mr. Vigors containing the only scientific list. Upwards of sixty species are therein noticed; but it is to be lamented that the collectors have in many instances omitted to record the places where the specimens were procured, so that even their country is in some instances doubtful§. Lichtenstein's promised Mexican fauna, if it be published, has not yet reached this country, and there is no other work to which we can look for a full enumeration of Mexican birds. One hundred species, however, from that country were character-

and second voyage, and Sir John Ross's second voyage have the natural history appendices published in separate quarto volumes; while the *Fauna Boreali-Americana*, of which three volumes have been published, is intended to supply the place of an appendix to Sir John Franklin's second journey. The appendix to Captain Beechey's voyage, though mostly printed off several years ago, is not yet published.

* Vieillot's "*Oiseaux de l'Amer. septentr.*," Paris, 1807, preceded Wilson's book, but only two volumes have appeared.

† Observations on the nomenclature of Wilson's Ornithology, *Journ. Ac. Sc. Phil.*, iii. *et infra*, 1823.—Genera of North American birds, &c., *Lyc. of Nat. Hist.*, New York, ii. 1826.—Catalogue of birds of the United States, *Maclurian Lyc.*, No. i. Phil., 1827.

‡ Continuation of Wilson's Ornithology, V. Y., 2 vols.

§ Since this report was read, we learn that Professor Nuttall has returned from Upper California with a rich harvest of objects of natural history, and among the rest with thirty species of undescribed birds, which will be included in Audubon's work.

ized by Mr. Swainson in the *Philosophical Magazine* for 1827, and upwards of one hundred and thirty named by Lichtenstein appear in the sale-list of duplicates of the collection made for the Berlin Museum by Herren Deppe and Schiede. As the authors of these two lists do not appear to have been aware of each other's labours, some of the species are probably twice named; and as we have no means of knowing whether many of these Mexican birds pass the tropic, or at least frequent the elevated table-lands, so as properly to enter the North American fauna, all their names are put in italics. The other parts of the lists have been compiled chiefly from Audubon's work; and that I might be enabled to refer to the species which will be comprised in the fourth volume, he has obligingly furnished me with a list of the plates which it will contain. Additions are made from the other works already quoted. The arrangement adopted is that proposed by Mr. Vigors, with Mr. Swainson's alterations. The extreme range of each species as far as ascertained is noted, and the birds which have been actually detected in Mexico or California are distinguished by abbreviations of the names of these countries.

The similarity of the North American ornithology to that of Europe is evinced not only by the identity or close resemblance of the generic forms, but also by a third part of the species being common to the two *faunæ*. Europe is visited by a few of the *meropidæ*, *promeropidæ*, and *struthionidæ*, families which have no members in North America; the *muscicapidæ*, represented in Europe by four species, which go pretty far north, furnish to the American fauna only the *todus viridis* and *psaris cayanus*, which do not ascend higher than Mexico; but this family is amply replaced in America by the *tyrannulæ*, which, though arranged by Mr. Swainson as part of the *laniadæ*, were considered by previous writers as fly-catchers, and scarcely to be separated from the Linnean genus *muscicapa*. North America, on the other hand, enumerates in its fauna certain families not found in Europe, viz., the *trochilidæ*, *psittacidæ*, *rhamphastidæ*, and *trogonidæ*, but none of the two latter groups go so far north as to reach the parallel of the south of Europe. The subjoined table has been constructed to show at a glance the chief points of agreement or difference between the two faunæ, the terms of comparison being assimilated by the omission of the American species which do not attain the 36th parallel of latitude. The number of species which compose the corresponding groups of each fauna often coincide remarkably, and this occurs even in families which have few or no species common to each country. There is a discordance with this remark observable in some families of *dentirostres*, which is perhaps owing to my imperfect arrangement of the species. The agreement between the faunæ is greatest among

the *grallatores* and *natatores*, two thirds of these orders being common to the two, while in the aggregate of the other orders only between one sixth and one seventh are common. As both the waders and water-birds are very migratory, we might be induced to infer that it is from this cause that so many of them are identical on both sides of the Atlantic, but on investigating the habits of the species, we find that several which do not migrate at all, exist in every quarter of the globe, and some owls, which are the most resident birds of prey, inhabit very many distant countries without any appreciable change of form in the species.

Names of Families.	Number of species. In America from 36° N. northwards.	Number of species. In Europe.	Common to both Countries.	Names of Families.	Number of species. In America from 36° N. northwards.	Number of species. In Europe.	Common to both Countries.
Vulturidæ	3	4	...	Promeropidæ	...	1	...
Falconidæ	24	28	10	Trochilidæ	3	...	...
Strigidæ	14	15	9	Columbidæ	3	4	...
Laniadæ	19	5	1?	Phasianidæ	1	1	...
Merulidæ	14	18	3	Tetraonidæ	15	17	3
Sylviadæ	63	75	4	Struthionidæ	...	3	...
Ampelidæ	9	1	1	Tantalidæ	4	1	1
Muscicapidæ	...	4	...	Ardeidæ	11	11	4
Fringillidæ	56	54	8	Scolopacidæ	40	38	24
Sturnidæ	10	3	...	Rallidæ	7	8	1
Corvidæ	10	14	3	Charadriadæ	12	12	6
Picidæ	15	9	2	Anatidæ	40	36	25
Psittacidæ	1	...	...	Colymbidæ	7	8	6
Cuculidæ	2	3	1	Alcadæ*	7	7	7
Certhiadæ	11	6	1	Pelecanidæ	8	6	5
Hirundinidæ	7	7	2	Laridæ	39	38	33
Caprimulgidæ	3	2	...				
Halcyonidæ	1	2	...				
Meropidæ	...	2	...				

* Eight species frequenting the Sea of Kamschatka are excluded.

Obs.—In the following lists species which are common to Europe and America are marked by an *. The range is denoted by degrees of latitude. The references are to plates, and the following abbreviations are used:—

Col., Planches coloriées, Temminck, &c.—*Encl.*, Planches enluminées, &c.—A., *American Ornithology*, by Audubon, &c.—Vig., *Ornithological Appendix to Capt. Beechey's Voyage*, by N. A. Vigors, Esq.—King., *Birds of Patagonia, Zool. Journ.*, by Capt. King, &c.—Sw., Swainson, *Phil. Journ.*—Licht., *Deppe's Sale-List of Birds, &c., Berlin.*—F.B.A., *Fauna Boreali-Americana.*—*Cal.*, *California.*—*Mex.*, *Mexico*, &c.

Mr. Swainson's five genera of *falconidæ* are *falco*, *accipiter*, *aquila*, *cymindis*, and *buteo*, corresponding to the groups denoted by brackets in the succeeding table; and of his five genera of *strigidæ*, the two first, *strix* and *asio*, are indicated by brackets; and the three aberrant ones, *nyctea*, *nyctipetes*, and *surnia*, are each represented by a single North American species.

Sub-typ., *order* RAPACES. *Sub-typ. fam.* VULTURIDÆ.

Sarcoramphus gryphus, *col.* 103, *Mex.* 35° S.—31° N. BON.
„ papa, *enl.* 428. *Mex.* LICHT. 30° S.—30° N. BON.

Cathartes jota, A. 106. *Mex.* 35° S.—48° N. (*atratus.*)
„ aura, A. 151. *Mex.* 20° S.—54° N.
„ californianus, SHAW, *Nat. Misc.* 301 25° N.—49° N.

Typ. fam. FALCONIDÆ.

Falco peregrinus*, A. 16. 54° S.—74° N.
„ islandicus*, A. 196. 54° N.—74° N.
„ æsalon*, F.B.A. 25. ?—54° N.—?
„ columbarius, A. 92. 25° N.—65° N.
„ temerarius, A. 85. ?—40° N.—?
„ sparverius, A. 142. 54° S. KING.—54° N.
„ *aurantius*, LATH. 5° N.—*Mex.* LICHT.
„ *anthracinus*, LICHT. *Mex.*

Ictinea plumbea, A. 117. 2° N.—35° N. (*mississipiensis*, WILS.)
Accipiter velox, A. 364. *Mex.* LICHT.—51° N.
„ *fringilloides*, VIG. *Mex.*
„ *mexicanus*, SW. *Mex.*
„ Cooperii, A. 36. 29° N.—40° N. (*Stanlei.*)
„ lineatus, A. 56. 35° N.—57° N.
„ hyemalis, A. 71. 29° N.—57° N.?
Astur palumbarius*, A. 141. 29° N.—68° N. (*atricapillus.*)
„ pennsylvanicus, A. 91. 31° N.—46° N.
„ borealis, A. 51. *Mex.* SW. *Cal.* VIG.—58° N.
„ *nitidus*, *col.* 87, 1. 2° N.—*Mex.* LICHT.
„ *magnirostris*, *enl.* 46. 30° S.—*Mex.* LICHT.

Pandion haliætus*, A. 81. 5° N.—60° N. (*americanus*, SW.)
Haliætus leucocephalus*, A. 31 and 126. *Mex.*—62° N.
„ Washingtonii, A. 9. *Kentucky.* 38° N.
Aquila chrysäcta*, A. 181. 36° N.—66° N.
Harpya imperialis, GRIFF. *Cuv.* 25° S.—*Mex.* SW.
Morphnus maculosus, VIEILL. 3. *Mex.*

Polyborus brasiliensis, A. 161. 54° S.—23½° N.
Elanus dispar, A. 352. 25° S.—35° N.
Nauclerus furcatus, A. 82. *Peru.*—38° N.

Buteo vulgaris*, F.B.A. 27. *Mex.* SW. *Cal.* VIG.—58° N.
„ Harlani, A. 86. 30° N.—? N.
„ lagopus*, A. 166. 35° N.—68° N.
„ *pterocles*, *col.* 59. 25° S.—*Mex.* SW.
Circus cyaneus*, A. 356. *Mex.* SW.—68° N.
„ *rutilans*, *col.* 25. 25° S.—*Mex.* SW.

Aber. fam. STRIGIDÆ.

Strix flammea*, A. 171. 20° N.—44° N.
„ nebulosa*, A. 46. 30° N.—53° N.
„ otus*, F.B.A. 40° N.—60° N.
„ mexicana, VIEILL. 20. *Mex.* 25° S.—*U.S.* BON.
„ brachyotus*, A. 372. 25° S.—67° N.
„ Tengmalmi*, A. 375. 54° N.—60° N.
„ *acadica*, F.B.A. 39° N.—50° N.
„ cinerea*, A. 351. 42° N.—68° N. (*lapponica.*)

Strix virginiana, A. 61. 52° S.—68° N.
„ arctica*, F.B.A. 30. ?—54° N.—? (*scandiaca* ? L.)
„ asio, A. 97. 30° S.—45° N.
„ nyctea*, A. 121. 31° N.—75° N.
„ cunicularia, A. 394. 40° S.—40° N.
„ funerea*, A. 362. 39° N.—68° N.

The generic or subgeneric raptorial forms which are peculiar to America are *sarcoramphus*, *cathartes**, *ictinia*, *morphnus*, and *polyborus*: some species of *harpya* and *elanus* inhabit Africa, one of them, *el. melanopterus*, occasionally appearing in the south of Europe. A group of owls, named *nyctipetes* by Mr. Swainson, is also African, one species only being North American, viz., *cunicularia*, or the singular burrowing owl of the prairies. With respect to the distribution of species, no American vulture is common to both sides of the Atlantic, and they all belong more properly to the tropical fauna, being (with the exception perhaps of *cathartes californianus*) merely summer visitors to the north. Indeed, as their food is carrion, their utility in the economy of nature is obviously greatest in the warmer latitudes, where they accordingly abound: none of them go beyond the 54th parallel, and they reach that latitude in the interior prairies only, where the summer-heat is considerable. One European vulture (*fulvus*) ascends to the 51st degree of latitude in Silesia, and another (*percnopterus*) has been occasionally killed in England. Nearly one third of the American *falconidæ* belong also to Europe; several of them, as may be seen by inspecting the preceding table, range from one end of the New World to the other, and some, as *falco peregrinus*, *pandion haliætus*, *aquila chrysaëta*, and *circus cyaneus*, may be said to be cosmopolites. Three of these widely-spread species are types of three of the five generic groups into which Mr. Swainson divides the family. The common buzzard of the fur-countries is identical with the European one; but its winter quarters in America are on the coast of the Pacific, hence it has not hitherto been enumerated among the birds of the United States. *Elanus dispar* so closely resembles *melanopterus* of Africa and southern Europe, that the Prince of Musignano hesitates to agree with Temminck in pronouncing them to be distinct. On the other hand, the goshawk of the New World, though considered by some ornithologists as identical with the European one, is judged by Mr. Swainson to be a peculiar species, for which Wilson's appellation of *atricapillus* ought to be retained; the differences of their plumage are pointed out in Sir William Jardine's edition of Wilson. In the same work, the *nauclerus furcatus* is recorded as having been killed in England. On the authority of the Prince of Musignano, also quoted there, we have considered the *accipiter Stanlei* of Audubon as identical with *Cooperii*. The owls, as we have already noticed, though much less mi-

* *Cathartes*, or *neophron percnopterus*, of the European fauna, is considered by Mr. Swainson to be only a subgeneric form of *vultur*.

gratory than either the vultures or falcons, are even more widely diffused. Two thirds of the North American species are found in Europe, and *flammea*, *otus*, and *brachyotus*, all belonging to the typical genus, are spread over the whole world. As in the case of the *falconidæ*, the species entering the subtypical generic group are mostly confined to particular countries, while the aberrant genus *nyctipetes*, like *cymindis*, is mostly South American, one species only (*cunicularia*) extending from the 40th degree of south latitude by the valley of the Mississippi, to an equal degree north of the equator. Though the American ornithologists have all considered their *strix otus* to be actually the same with the European species, Cuvier says that the one figured by Wilson, 51, fig. 3, (and 19, fig. 1, young), is different, while he considers the *mexicana* (*clamator*, Vieill., *longirostris*, Spix,) to be merely a dark variety of the European bird*. *Strix cinerea* of Latham, Bonaparte, and the *Fauna Boreali-Americana* is identified by Temminck with his *lapponica*.

Typ. ord. INSESSORES.

Sub. typ. tribe, Dentirostres.

Fam. LANIADÆ.

Lanius ludovicianus, A. 57. *Mex.* Licht. Sw. *Cal.* Vig. 23° N.—38° N.
„ excubitor*, A. 192. 32° N.—60° N.
„ excubitorides, F.B.A. 34. ?—54° N.
„ elegans, F.B.A. ?—50° N.
„ nootka, Lath. ?—50° N.
Thamnophilus canadensis, enl. 479. 2. *Canada*? ? (*turdus cirrhatus*, Gm.)
„ *doliatus, enl.* 297. 2. 2° N.—*Mex.* Licht.
Hypothymis mexicana, Licht. *Nov. Gen.*
Saurophagus sulphuratus, enl. 296. 25° S. —Sw. Licht.
Ptiliogonys cinereus, Sw. *Table l. Mex.*
„ *nitens*, Sw. *Mex.*
Tyrannus intrepidus, A. 79. *Mex.* Sw.—57° N.
„ borealis, A. 174. 38° N.—53° N.
„ dominicensis, A. 170. *Mex.* Sw. 20° N.—35° N.
„ cinereus, Vig. *Cal.* 36° N.—38° N.
„ crinitus, A. 129. 23° N.—42° N.
„ verticalis, A. 398. *Arkans.* 36° N.
„ *ferox, enl.* 571. f. 1. 2° N.—*Mex.* Licht.
„ *crassirostris*, Sw. *Mex. table l.*
„ *vociferans*, Sw. *Mex.*
Milvulus savannus, A. 168. 2° N.—40° N.
„ forficatus, A. *App. Mex.*—34° N.

* Though many foreign owls, and, among others, four Australian ones, *castanops*, *personata*, *cyclops*, and *delicatulus*, of Gould, were formerly confounded with *flammea*, causing it to be considered as quite a cosmopolite, its range is actually very extensive, there being no difference, according to Temminck, in the species as existing throughout Europe and Asia, the whole of northern and tropical Africa, and in Japan. The North American barn-owls, he says, differ only in a few darker tints of the plumage; but the South American ones are distinct.

Tyrannula virens, A. 115. *Mex.* Licht. *Cuba.* 29° N.—50° N.
„ fusca, A. 120. *Mex.* Licht.—57° N.
„ acadica, A. 145. *Mex.* Sw.—50° N.
„ Richardsonii, F.B.A. 46, 2. ?—50°—60° N. (*Labrad.* Aud.)
„ Saya, A. 399. *Mex.* Sw.—54° N. *prairies.*
„ pusilla, A. *app. Mex.* Sw.—56° N.
„ coronata, *enl.* 675, 1. *Mex.* Sw. Licht. *Cal.* Vig. 2° N.—38° N.
„ semi-atra, Vig. *Cal.* 38° N.
„ Traillii, A. 45. ?—36° N. *Arkans.*
Tyrannula Selbii, A. 9. *Louis.* ?—32° N.
„ *cayenensis, enl.* 569, 2. 2° N.—*Mex.* Sw. Licht.
„ *affinis,* Sw. *Mex. maritime.*
„ *barbirostris,* Sw. *Mex.*
„ *nigricans,* Sw. *Mex. table l.*
„ *musica,* Sw. *Mex.*
„ *ornata,* Sw. *Mex.*
„ *obscura,* Sw. *Mex.*
„ *despotes,* Licht. *Mex.*
„ *obsoleta,* Licht. *Mex.*
„ *larvata,* Licht. *Mex.*
„ *mesoleuca,* Licht. *Mex.*
„ *atrata,* Licht. *Mex.*
„ *pallida,* Sw. *Mex.*

Fam. MERULIDÆ.

Cinclus americanus, A. 374. *Mex.* Sw.—57° N.
Merula migratoria*, A. 131. *Mex. Cal.*—67° N.
„ aurorea*, Pall. *Kodiak.* 58° N. Temm.
„ Wilsonii, A. 164. 25° N.—57° N.
„ minor*, F.B.A. 36. 25° N.—54° N.
„ mustelina, A. 73. *Mex.* Licht.—50° N.
„ solitaria, F.B.A. 35. 27° N.—50° N.
„ *silens,* F.B.A. *Mex.* Sw. *table l.*
„ *flavirostris,* Sw. *Mex. table l.*
„ *tristis,* Sw. *Mex. table land.*
Orpheus nævius, F.B.A. 38. *Cal. Nootka.* 36° N.—66° N. Vig. Cook.
„ rufus, A. 116. 30° N.—54° N.
„ felivox, A. 128. *Mex.* Licht.—54° N.
„ polyglottus, A. 21. 25° S.—44° N. *Mex.* Sw.
„ leucopterus, Vig. *Cal.* 38° N.
„ *curvirostris, col.* 441. Sw. *Mex.*
*Turdus** *erythrophthalmus,* Licht. *Mex.*
„ *deflexus,* Licht. *Mex.*
„ *helvolus,* Licht. *Mex.*
Myothera obsoleta, A. 400. *Arkans.* 35° N.
Icteria viridis, A. 137. 23° N.—44° N.

Fam. SYLVIADÆ.

Saxicola œnanthe*, *Behr. Str.* ? Vig. *Greenl.* Sabine. (*œnanthoides.*)
Erythaca sialis, A. 113. *Mex.* Licht. *W. Ind.*—48° N. *Sialia Wilsonii.*
„ arctica, *F.B.A.* 39. *New Cal.* 44° N.—68° N.
„ cœruleo-collis, Vig. *Cal.* 38° N.
„ *mexicana,* Sw. *Mex.*
Anthus aquaticus*, *enl.* 661, 2. *Greenl. N. Am.* Tem.
„ ludovicianus, *F.B.A.* 44. 24° N.—63° N. (*ruber,* Gm.)
„ pipiens, A. 80. *N.W. prairies.*
Motacilla leucoptera, Vig. *Calif.*
Parus bicolor*, A. 39. *Greenl.* Lath. 30° N.—70° N.
„ carolinensis, A. 160. 30° N.—36° N.
„ atricapillus, A. 36° N.—65° N.
„ hudsonicus, A. 194. 44°N.—57°N.
Sylvicola vermivora, A. 34. 23° N.—42° N. (*sub g. Vermivora,* Sw.)
„ solitaria, A. 20. *Mex.*—41° N.
„ chrysoptera, A. 15, 2. 23° N.—50° N.
„ protonotaria, A. 3. 23° N.—38° N.
„ rubricapilla, A. 89. 23° N.—55° N.
„ peregrina, A. 154. 23° N.—55° N.
„ celata, A. 178. 24° N.—50° N.
„ Swainsonii, A. 198. 23° N.—33° N.
„ æstiva, A. 95. *Mex.* Sw. 20° N.—68° N.
„ americana, A. 15. *Mex.* Sw.—46° N.
„ autumnalis, A. 88. 23° N.—48° N.

* *Merula* and *orpheus* of Mr. Swainson correspond with *turdus* of authors; the latter name is retained for Lichtenstein's species, as we do not know to which of the former to refer them.

Sylvicola cœrulea, A. 48. *Mex.*—40° N.
„ carbonata, A. 60. *Kentucky.* 38° N.
„ castanea, A. 69. 24° N.—44° N.
„ discolor, A. 14. 23° N.—43° N.
„ formosa, A. 38. *Mex.*—38° N.
„ icterocephala, A. 59. *Trop.*?—*Canada*?.
„ maculosa, A. 50, 123. *Cuba*, Vig.—55° N.
„ pensilis, A. 85. *Cuba.* Vig. *Mex.* Sw. Licht.—36° N.
„ rara, A. 49. ?—43° N.
„ Rathbonia, A. 65. *Mississ.*
„ Childrenii, A. 35. *Louis.*
„ Bachmanii, A. 185. *S. Car.*
„ Blackburniæ, A. 135. *Mex.* Sw. *Cuba.*—54° N.
„ palmarum, Bon. 10, 2. *W. Ind.* 18° N.—48° N.
„ agilis, A. 138. 23° N.—44° N.
„ canadensis, A. 155. *Cuba.* 20° N.—54° N.
„ coronata, A. 153. *Cuba.* Vig. *Mex.* Licht. *Cal.* Vig.—20° N.—56° N.
„ parus, A. 134. 23° N.—52° N.
„ petechia, A. 145. 24° N.—55° N.
„ sphagnosa, A. 148. *W. Ind.*—20° N.—46° N.
„ striata, A. 133. *W. Ind.*—54° N.
„ maritima, A. *App.* ?—40° N.
„ virens, A. 393. *Mex.* Licht.—50° N.
„ tigrina, Wils. 44, 2. ?—45° N.
„ *inornata*, Sw. *Mex.*
„ *petasodes*, Licht. *Mex.*
„ *culicivora*, Licht. *Mex.*
„ varia, A. 90. *Mex.* Sw.—50° N.
„ pinus, A. 140. 24° N.—50° N.
Setophaga ruticilla, A. 40. 2° N.—62° N. *Mex.* Sw.
„ canadensis, A. 103. *Cuba*, Vig.—55° N.
„ Bonapartii, A. 5. 23° N.—34° N.
„ Wilsonii, A. 124. 35° N.—58° N. (*muscicapa pusilla*, Wils.)
Setophaga mitrata, A. 110. 23° N.—52° N. (*cucullata.*)
„ minuta, A. *App.* 23° N.—40° N.
„ *picta*, Sw. *Mex. Zool. Ill.*, 2, 54.
„ *miniata*, Sw. *Mex. table l.*
„ *rubra*, Sw. *Mex. table l.*
„ *rufifrons*, Sw. *Mex.*
Trichas marilandica, A. 23, *Mex.* Sw. *Cal.* Vig.—50° N. (*personata.*)
„ philadelphia, A. *App.* ?—40° N.
„ Roscoe, A. 24. *Mississ.*
Accentor auricapillus, A. 143. *W. Ind. Mex.* Lath. Sw. *table l.*—55° N. (*sub. g. Seiurus*, Sw.)
„ aquaticus, Wils. 23, 5. *F.B.A.* 43. *Mex.* Sw.—64° N.
Culicivora cœrulea, A. 84. *Mex.* Licht.—43° N.
Sylvia calendula, A. 195. 24° N.—70° N. *Greenl.* Bon. (*sub. g. Regulus.*)
„ Cuvierii, A. 55. 40° N. *prairies.*
„ tricolor, A. 183. 23° N.—54° N.
„ trochilus*, *enl.* 651, 1. *N. Am.* Temm.

Fam. AMPELIDÆ.

Bombycilla carolinensis, A. 43. *Mex.* Licht. 2° N.—56° N.
„ garrula*, A. 303. ?—67° N.
Vireo solitarius, A. 23. *Mex.* Licht.—39° N.
„ noveboracensis, A. 63. *Mex.* Licht.—45° N.
„ flavifrons, A. 119. 23° N.—46° N.
„ gilvus, A. 118. 23° N.—46° N.
„ olivaceus, A. 150. *Mex.* Sw.—55° N. (*musc. altiloqua*, Vieil.)
„ Bartramii, *F.B.A. Braz. S. Car. New Caled.*—49° N.
„ Vigorsii, A. 30. *Penns.*

Fam. MUSCICAPIDÆ.

Todus viridis, enl. 585. *W. Ind. Mex.*
Psaris cayanus, enl. 304, 307. 2° N. *Mex.* Licht.

As the food of the raptorial order of birds, though variable in quantity in different localities, must be almost everywhere very similar in quality, it excites no surprise when we discover that many species are common to different quarters of the world, especially those entering the typical and subtypical groups which prey on quadrupeds and birds, taking them alive. But we are led to expect that the distribution of birds which feed on the fruits of the earth, should be influenced in a greater degree by climate, soil, and consequent fertility of the land:

and as temperature, moisture, and richness of vegetation have a manifest connection with the abundance and variety of insects, we look to find the insectivorous birds of the several continents nearly as different as their floras. Mr. Swainson has indeed already remarked that "it is among the insectivorous or soft-billed birds that the principal ornithological features of any extensive region will be traced." These observations receive a general support by a review of the extensive and varied order of *insessores* which in North America form three fifths of the birds; and though the *hirundinidæ*, which are purely insectivorous, exhibit in the table a large proportion of species common to the two continents, there is, as we shall mention again, reason to doubt the identity of the species in the two faunæ. Two or three species of carnivorous *corvidæ* are with more certainty the same on both sides of the Atlantic, and also several hard-billed granivorous birds (*fringillidæ*) that breed in the arctic regions, the physical conditions of which are almost the same in all longitudes, though below 65° N. latitude the aspect of the two continents differs greatly.

Dentirostres.—In the quinarian arrangement of Mr. Vigors, this is one of the five *tribes* into which the *insessores*, or perchers, are divided, each tribe containing five families. Of the *laniadæ*, a normal family of the tribe, only one species stands in our list as common to the new and old continents, and it is so marked in accordance with the opinions of Wilson and Audubon, but contrary to those of Vieillot, Bonaparte, and Swainson. This and the other North American *lanii* are certainly very similar in form to their European congeners, which may be accounted for by their approaching the *rapaces* in their mode of feeding, and being less exclusively insectivorous than the *tyraninæ*, associated with them by Mr. Swainson, which are proper to America. The *merulidæ*, the other normal family of the tribe, contains three American species which have been enumerated in the European fauna, one (*merula migratoria*) because of its occasional appearance in Germany, and the other two, *m. aurorea* and *minor*, on account of the capture of one or two individuals in Saxony and Silesia. Of the numerous family of *sylviadæ* we scarcely know more than one species which has an undisputed right to be marked as common to both sides of the Atlantic. *Saxicola œnanthe*, hitherto detected only in the higher arctic latitudes of America, may prove on further acquaintance to be distinct from the more southern European bird bearing the same name. Indeed Mr. Vigors has named it *œnanthoides*, being led to consider it to be a proper species, more from its distant habitat than from any peculiar character detected in the speci-

mens from Behring's Straits submitted to him: it was found in Davis's Straits by Captain Sabine. Two species of *anthus* existing in America appear to have been confounded under the name of *aquaticus:* one of them identified by Temminck with the European species; the other, having a much more brown under plumage, is figured in the *Fauna Boreali-Americana* under the name of *aquaticus*, but, as the author last-named has observed, it is in reality a distinct species. It was indeed described as such by Latham under the appellation of the Louisiana lark, and the Prince of Musignano in adopting the specific name of *ludovicianus*, was led to deny the existence of the true *aquaticus* in America. Opinions vary as to the identity of *parus atricapillus* with the *palustris* of Europe. The American and European gold-crests (*reguli*) have also been confounded though they are now held to be distinct. It is to be noticed that the *pari* and *reguli* are typical examples of their respective groups, the *parianæ* or titmice-warblers belonging to America chiefly, while the *sylvianæ* are mostly European warblers. Temminck states that the *sylvia trochilus* belonging to his group of *muscivores* or to *regulus* of Cuvier, exists precisely the same in North America as in Europe, but it has not as yet found a place in the works of the North American ornithologists. *Bombycilla garrula* is the only one of the *ampelidæ* which is common to the two continents, and its manners and the extent of its migrations as well as its form and plumage are absolutely the same on both sides of the Atlantic. The *vireones* which feed on insects, or, when these are scarce, on the berries of the *myrica cerifera*, are confined to the New World. Of the *muscicapidæ* several species belong to the European fauna, but there are no typical ones in America agreeably with Mr. Swainson's views of the constituents of the family: within the tropics and in Mexico we find *psaris cayanus*, a typical black-cap, and *todus viridis*, considered by him to be a fissirostral form of the broad-billed fly-catchers.

Typ. Tribe, Conirostres.

Aber. fam. FRINGILLIDÆ.

Alauda alpestris*, *A.* 200. *Mex.* Sw.—68° N. (*cornuta*, WILS.)
„ *glacialis*, LICHT. *Mex.*
Plectrophanes nivalis*, *A.* 189. 38° N.—75° N. 81° N. *Spitzb.*
„ lapponica*, *A.* 370. 44° N.—70° N. (*calcarata*, TEM.)
„ picta, *F.B.A.* 49. ?—54° N.
Emberiza canadensis, *A.* 188. *Cal.* VIG. 36° N.—60° N.
Emberiza Townsendii, *A.* 369. *Philad.* 40° N.
„ pusilla, *A.* 139. 30° N.—45° N.
„ pallida, *F.B.A.* ?—55° N.
„ socialis, *A.* 104. *Mex.* Sw.—45° N.
„ melodia, *A.* 25. 30° N.—50° N.
„ oonalaschkensis, GM. ?—55° N.
„ *mexicana, enl.* 386. 1. *Mex.*
„ *pusio*, LICHT. *Mex.*

Fringilla palustris, *A.*64. 30°N.—44°N.
„ iliaca, *A.* 108. 30° N.—68° N.
„ leucophrys, *A.* 114. 28° N.—68° N.
„ grammaca, Bon. 5, 3. *Mex.*—40°N. *prairies.* (*strigata*, Sw.)
„ pennsylvanica, *A.* 8. 23° N.—66° N.
„ graminea, *A.*94. 30°N.—57°N.
„ hyemalis*, *A.* 13. *Cal.* Vig.
30° N.—57° N.
„ arctica, Vig. *Cal. Unalasch.* 36° N.—55° N.
„ meruloides, Vig. *Cal.* 37° N.
„ crissalis, Vig. *Cal.* 36°, 38° N.
„ amœna, Bon. 6. f. 5. 37° N. *prairies.*
„ cyanea, *A.* 44. *Mex.* ?—45° N.
„ ciris, *A.* 53, 1. 25° S.—36° N.
„ caudacuta, *A.* 149. 33° N.—44° N.
„ maritima, *A.* 93. 30° N.—44° N.
„ *bimaculata*, Sw. *Mex. table l.*
„ *cinerea*, Sw. *Mex.*
„ *epopœa*, Licht. *Mex.*
„ *rhodocampter*, Licht. *Mex.*
„ *superciliaris*, Licht. *Mex.*
„ *lepida*, L.Licht. *W. Ind. Mex.*
„ *hæmorrhöa*, Licht. *Mex.*
„ *melanoxantha*, Licht. *Mex.*
Pipillo erythrophthalma, *A.* 29. 23° N.—48° N.
„ arctica, *F.B.A.*51,52.?—55°N.
„ *maculata*, Sw. *Mex.*
„ *macronyx*, Sw. *Mex.*
„ *fusca*, Sw. *Mex.*
„ *rufescens*, Sw. *Mex.*
Tanagra mexicana, L. *enl.* 290. 2, 155. 1.
„ *ignicapilla*, Licht. *Mex.*
„ *gnatho*, Licht. *Mex.*
„ *grandis*, Licht. *Mex.*
„ *auricollis*, Licht. *Mex.*
„ *erythromelas*, Licht. *Mex.*
„ *abbas*, Licht. *Mex.*
„ *rutila*, Licht. *Mex.*
„ *celæno*, Licht. *Mex.*
Pyranga æstiva, *A.* 44. *Mex.* Licht. 42° N. (*Phœnisoma*, Sw.)
„ rubra, Wils. 11 f. 3, 4. *Mex.* 49° N.
„ ludoviciana, Wils. 20. 1, 2° N.—42° N. *prairies.*
„ *livida*, Sw. *Mex.*
„ *hepatica*, Sw. *Mex.*
„ *bidentata*, Sw. *Mex.*
Euphone jacarina, *enl.* 224. 3, *Braz. Mex.* Licht.
Euphone tibicen, Licht. *Mex.*
„ rufiventris, Licht. *Braz. Cal.* 25° S.—36° N. (*Saltator*, Vig.)
Tiaris pusilla, Sw. *Mex.*
Spermagra erythrocephala, Sw. *Mex.*
Coccothraustes vespertina, *F. B. A.* 68. 45° N.—54° N.
„ ludovicianus, *A.* 127. *Mex.* Sw. 56° N.
„ cœrulea, *A.*122. *Mex.* Sw. 42°N.
„ cardinalis, *A.* 159. *Mex.* Licht. 23° N.—42° N.
„ ferreo-rostris, Vig. *Cal.* 36° or 38° N.
„ *melanocephala*, Sw. *Mex.*
„ *chrysopelus*, *Zool. pr.* 15. *Mex.* Cuming.
Linaria frontalis, Bon. 6. f. 1. *Mex.* Sw. 38° N. (*Hæmorrhous*, Sw.)
„ purpurea, *A.* 4. 30° N.—55° N.
„ tephrocotis, *F.B.A.* 50. ?—53° N. (*sub. g. Leucosticte.*)
„ borealis*, Vieil. *gal.* 65. Roux, 101. *Greenl. Japan*, Temm. 52° N.—68° N.
„ americana, *A.* 354. ?—44° N.
„ passerina, *A.* 130. 23° N.—45° N.
„ Bachmanii, *A.* 165. ?—35° N.
„ Henslowii, *A.* 70. 30° N.—37°. N.
„ savanna, *A.*109. 30°N.—52° N.
„ Lincolnii, *A.* 193. ? 40° N.—52° N.
Carduelis tristis, *A.* 23. *Mex.*—60° N.
„ pinus, *A.* 180. 32° N.—52° N.
„ psaltria, Bon. 6. f. 3. *Mex.* ?—*R. Platte.*
„ mexicana, Sw. *Mex. U.St.* Aud.
„ *catotl*, Gmel. *Mex.*
Pyrrhula enucleator*, *A.* 358. 50° N.—63° N. (*Corythus*, Cuv.)
„ inornata, Vig. *Cal.* 38° N.
Loxia curvirostra*, *A.*197. 40°N.—57° N.
„ leucoptera*, *A.* 368. 40° N.—68° N.

Typ. fam. Corvidæ.

Corvus corax*, *A.* 101. *Cal.* Vig. 26° N.—74° N.
„ corone*, *A.* 156. 26° N.—55°N.
„ ossifragus, *A.*146. 24°N.—40°N.
„ columbianus, *A.* 397. 46° N. *Pacific.*
„ *mexicanus*, *L. Mex.* Licht.
„ *morio*, Licht. *Mex.*

Pica caudata*, *A.* 358. 40° N.—58° N. *prairies.* (*Corvus pica.*)
„ *peruviana, enl.* 625. *Mex.* Licht.
„ *Beechei,* Vig. *Mex. Montereale.*
„ *Colliei,* Vig. *Mex. San Blas.*
Garrulus Bullockii, *A.* 96. *Mex. Cal.* Bon. 46° N. (*gubernatrix, col.* 436.)
„ floridanus, *A.* 87. 25° N.—31° N. (*Cyanurus,* Sw.)
„ Stelleri, *F.B.A.* 54. *Mex.* Bon. —57° N.
„ cristatus, *A.* 102. 25° N.—56° N.
„ californicus, Vig. *Monterey.* 36° N.
„ *coronatus,* Sw. *Mex.*
„ *azureus, col.* 108. *Mex.* Licht.
„ *formosus,* Sw. *col.* 436. *Mex. Temiscalt.*
„ canadensis, *A.* 107. 42° N.—68° N. (*Dysornithia.*)

Sub-typ. fam. Sturnidæ.

Molothrus pecoris, *A.* 99. *Mex.* Sw. 56° N.
Dolichonyx agripennis, *A.* 54. *Mex.* Sw. —54° N. (*oryzivora,* Sw.)
Agelaius phœniceus, *A.* 67. *Mex.* Sw. *Cal.* Vig.—56° N.
Agelaius xanthocephalus, *A.* 396. *Mex.* —58° N.
„ *mexicanus,* Edw. 243. *Mex.*
„ *longipes,* Sw. *Mex. tabl.*
„ *Bullockii,* Sw. *Mex.*
Sturnella ludoviciana, *A.* 136. *Mex.* Sw. Licht. *Cal.* Vig.—56° N.
„ *holosericea,* Licht. *Mex.*
Xanthornus baltimore, *A.* 12. *Mex.* Sw. Licht.—55° N.
Icterus spurius, *A.* 42. 2° N.—49° N.
„ *mexicanus,* Leach, *Zool. Misc.* 2. *Mex.* Sw.
„ *dominicensis, enl.* 5. 1. *W. Ind. Mex.* Sw.
„ *cucullatus,* Sw. *Mex.*
„ *melanocephalus,* Sw. *Mex.*
„ *crassirostris,* Sw. *Mex.*
„ *gularis,* Licht. *Mex.*
„ *calandra,* Licht. *Mex.*
Cassicus coronatus, Sw. *Mex.*
Quiscalus versicolor, *A.* 7. *W. Ind.* 57° N.
„ major, *A.* 187. *W. Ind. Mex.* 35° N.
„ *dives,* Licht. *Mex.*
„ *palustris,* Sw. *Mex.*
Scolecophagus ferrugineus, *A.* 157. 24° N. —68° N.
„ *mexicanus,* Sw.

Conirostres.—Most of the North American species of this, which is the typical tribe of insessorial birds, belong to the *fringillidæ*, one of the aberrant families. The two normal families also include a tolerable number of species, but the two remaining aberrant families (*musophagidæ* and *buceridæ*) have no members in North America. Among the *fringillidæ* we find one *alauda*, two *plectrophanes*, one *fringilla*, two *linariæ*, one *pyrrhula*, and two *loxiæ*, common to the two countries. In addition to these the *alauda calandra* of the south of Europe is noted in the *Fauna Boreali-Americana* as having been taken at Hudson's Bay, but as the only authority is a specimen in the British Museum of not very certain origin, it is omitted in the preceding list. The perfection of ornithological structure is to be found, according to Mr. Swainson, in the *corvidæ*, the typical family of the *conirostres*, or typical tribe of the insessorial or typical order. The raven, which is a typical example of the genus *corvus*, is common to the four quarters of the world, and most ornithologists consider the carrion crow and the magpie of America to be the same with those of Europe. Mr. Audubon, however, describes the former as a peculiar species under the name of *americanus*, and Mr. Sabine has treated the magpie in a similar manner, though he has not been followed by subsequent writers:—it is certain that he has failed in pointing out any constant or appreciable

differences of plumage, but there is something peculiar in the habits of the American bird which frequents the interior prairie lands, and does not approach the sea coast as in Europe, nor does it go to the north of the 58th parallel, though the European bird extends to Lapland. Further observations are required to prove that the differences in the form and size of the eggs noted in the *Fauna boreali-americana* are constant. The common magpie abounds in Japan, as Temminck informs us. The *sturnidæ* are more numerous in America than in Europe, and are all proper to the country.

Aber. tribe, Scansores.

Typ. fam. PICIDÆ.

Picus principalis, *A.* 66. 25° N.—37°N.
„ tridactylus*, *A.* 132. 40° N.—68° N. (*americanus, arcticus*).
„ pubescens, *A.* 112. 30°N.—58°N.
„ villosus, *A.* 360. *Cal.* VIG. 28° N. 63° N.
„ querulus, *A.* 353. 30° N.—36°N.
„ carolinus, *A.* 391. 19° N.—46°N.
„ varius, *A.* 190. *Mex.* SW.—61° N.
„ formicivorus, *Col.* 451. *Mex.* LICHT. SW. *Calif.* VIG. 36°N.
„ *scapularis*, VIG. *Mex. San Blas.*
„ ? *olegineus*, LICHT. *Mex.*
„ ? *poliocephalus*, LICHT. *Mex.*
„ canus*, EDW. 65. *N. Am.* TEMM.
„ pileatus, *A.* 111. *Mex.* 63° N.
Colaptes auratus, *A.* 37. 25° N.—63° N.
„ mexicanus, VIG. 9. *Mex. Cal.* —49° N. (*collaris*, VIG.)
Melanerpes torquatus, *A.* 395. 30° N.—40° N.
„ erythrocephalus, *A.* 27. 24° N. —50° N.
„ ruber, *Cal.* VIG. *Nootka.* COOK. 2° N.—50° N.
„ ? *aurifrons*, LICHT. *Mex.*
„ *albifrons*, SW. *Mex. Table L.*
„ *elegans*, SW. *Mex. marit.*

Sub-typ. fam. PSITTACIDÆ.

Psittacus melanocephalus, enl. 527. 2° N. —*Mex.*
„ *leucorhynchus*, SW. *Mex.*
„ *autumnalis*, EDW. 164. 2° N. —*Mex.* LICHT.
„ *strenuus*, LICHT. *Mex.*
Plyctolophus mexicanus, GMEL., LICHT.
Macrocercus militaris, VAILL. 4. *Mex. Table L.* SW. *San Blas.* VIG.
„ *pachyrhynchus*, SW. *Mex.*
Macrocercus aracanga, enl. 2. 2° N.—*Mex.* LICHT.
Psittacara carolinensis, *A.* 26. *Mex.* LICHT. —42° N.
„ *guianensis*, SPIX. 25. 2° N.—*Mex.* LICHT. (*Agapornis*, SW.)
„ *pertinax, enl.* 528. 25° S. *Mex.* LICHT.
Psittacula mexicana, GMEL., LICHT.

Aber. fam. RAMPHASTIDÆ.

Pteroglossus pavoninus, Zool. Pr. 34. *Mex.*
Ramphastos pœcilorhynchus, LICHT. *Mex.*

Aber. fam. CUCULIDÆ.

Coccyzus americanus*, *A.* 2. ?—45° N.
„ erythrophthalmus, *A.* 32. ?—45° N.
„ seniculus, *A.* 169. 2° N.—25° N.
„ *mexicanus*, SW. *Table L.*
„ *cayanus, enl.* 211. 2° N.—*Mex.* LICHT.
„ *viaticus*, LICHT. *Mex.*
Crotophaga ani, enl. 182, 1, 2. 2° N.—*Mex.* LICHT.
„ *sulcirostris*, SW. *Mex. Table L.*
Leptostoma longicauda, SW. *Mex.* (*Saurothera californica*, LESS.?)

Aber. fam. CERTHIADÆ.

Troglodytes hyemalis, *A.* 365. 40° N.—46° N. (*Sylv. troglodytes*).
„ furvus, *A.* 83. *Surin.* BON. 5° N. —57°N. (*domestica, aëdon*).
„ americanus, A. 179. 32° N.—46° N.
„ spilurus, VIG. 4. *Calif.*? or *Mex.*?
„ palustris, *A.* 100. 25° N.—55° N. (*Thryothorus*).

Troglodytes Bewickii, *A.* 18. *Louis.*
„ ludovicianus, *A.* 78. 30° N. 42° N. (*carolinianus*).
„ brevirostris, *A.* 175. 26° N.—44° N.
„ *murarius*, Licht. *Mex.*
„ *mexicanus*, Licht. *Mex.*
„ *latifasciatus*, Licht. *Mex.*
Certhia familiaris*, *A.* 392. 30° N.—50° N.

Sitta carolinensis, *A.* 152. *Mex.* Sw. —46° N.
„ canadensis, *A.* 105. 38° N.—52° N.
„ pusilla, *A.* 125. 24° N.—40° N.
„ pygmæa, Vig. 4, 2. *Calif. Monterey.* 36° N.
Xiphorynchus leucogaster, Sw. *Mex.*
„ *flavigaster*, Sw. *Mex.*
Dendrocolaptes pœcilinotus, Wagl. *Mex.* Licht.

We may remark of the scansorial birds in general that they are very numerous on the American continent, and particularly in the intertropical and southern regions, where they find abundant food in the ancient and interminable forests which they inhabit. The North American fauna contains examples of all the five families, the typical group being, however, most plentifully and generally distributed in the middle districts. Three species only of the whole tribe are common to the European and American faunæ, viz. *picus tridactylus**, which is the most northern scansorial bird, and *canus* (*malacolophus*) Sw., which is introduced into our list on the authority of Temminck, who says that it inhabits the north of Europe, Asia, and America: both these belong to the typical family. The third species is *certhia familiaris*, a type of one of the aberrant families. Doubts existed as to the difference between *troglodytes europæus* and *hyemalis*, but they have been abandoned by the latest writers. The European fauna contains no example of the *psittacidæ* or *ramphastidæ*, and in America the *psittacara carolinensis* alone passes the parallel of the south of Europe: a species of parrot reaches the thirty-second degree of latitude in the north of Africa. The *coccyzus americanus* has been recently added to the list of European birds, four individuals having been killed in Great Britain, consequently it attains a higher latitude there by five or six degrees than it does on the other side of the Atlantic. Temminck objecting to the geographical designations of *americanus*, *carolinensis* and *dominicus*, in which this species rejoices, has named it *cinerosus*, being a translation of Buffon's epithet *cendrillard*.

Aber. tribe, Tenuirostres.

Typ. f m. Trochilidæ.

Trochilus rufus, Jard. 6. *Real del Monte*, Sw. 61° N. (*collaris*, Lath.)
„ *montanus*, Less. 33, 54. *Mex.*
„ *platycircus*, Sw. *Mex.*
„ Anna, Less. 74. *Cal.* 30° N.—57° N.

Trochilus *Rivolii*, Less. 4. *Mex.*
„ *melanotus*, Sw. *Mex.*
„ *fulgens*, Sw. *Mex.*
„ *latirostris*, Sw. *Mex.*
„ *bifurcatus*, Sw. *Mex.*
„ *minimus*, Sw. *Mex.*

* Mr. Swainson says the European and American three-toed woodpeckers are distinct species.

Trochilus *tricolor*, Sw. *Mex.*
„ *beryllinus*, Licht. *Mex.*
„ *verticalis*, Licht. *Mex.*
„ *cuculiger*, Licht. *Mex.*
„ *curvipennis*, Licht. *Mex.*
„ *hemileucurus*, Licht. *Mex.*
„ *coruscus*, Licht. *Mex.*
Cynanthus colubris, *A.* 47. *W. Ind.* 57° N.
„ *lucifer*, Less. 5. *Mex.* Sw.
„ *tricolor*, Less. 14. *Mex.*
„ *Dupontii*, Less. *sup.* 1. *Mex.*
„ *thalassinus*, Less. 55, 56, 57. *sup.* 3. *Mex.*
Cynanthus *arsinoe*, Less. *sup.* 28. *Mex.*
Campylopterus Clementiæ, Less. 30. *Mex.*
Lampornis mango, *A.* 184. 25° S.—25° N. *Braz. Mex. Flor.*
„ *gramineus*, Less. *col.* 12. *Mex.*
„ *cœligena*, Less. *tr.* 53. *Mex.*
„ *melanogaster*, Vieill. 75. *Mex.*
„ *punctatus*, Vieill. 8. *Mex.*
„ *holosericeus*, Edw. *W. Ind. Mex.* 4° N.—20° N.
„ *gutturalis*, *enl.* 671. 4° N. *Mex.*

The tenuirostral tribe, containing the five families of *trochilidæ*, *cinnyridæ*, *meliphagidæ*, *paradisidæ*, and *promeropidæ*, is represented in Europe only by the hoopöe, one of the *promeropidæ*, while many *trochilidæ* belong to the North American fauna, of which, however, but three range northwards to European parallels. The alpine structure of Mexico, by producing a succession of various climates within a short space, adapts it admirably to the habitation of the *trochilidæ* which seek their food in the throats of flowers. Mr. Swainson observes, that the vast proportion of suctorial birds inhabiting Australia and the neighbouring groups of islands, is one of the characteristics of that zoological province, the honey-sucking birds forming nearly one-fourth of the New Holland perchers,—for that character belongs not only to the *meliphagidæ*, but also to the little green lories (*trichoglossi*) of the parrot family. The *paradisidæ* are natives of New Guinea which is a portion of the Australian province. The greater prevalence of this form in South America and Australia affords another instance of analogy between their faunæ, in addition to those noticed in our remarks on the mammalia. The *cinnyridæ* and *promeropidæ* inhabit the warmer regions of the old world.

Aber. tribe, Fissirostres.

Aber. Fam. Halcyonidæ.

Alcedo alcyon, *A.* 77. *W. Ind.*—68° N.

Typ. Fam. Hirundinidæ.

Hirundo purpurea, *A.* 22. *Braz.* Sw. 9° S.—67° N.
„ rustica*, *A.* 173. *Mex.* Licht.—68° N. (*rufa*, *americana*).
„ riparia*, *A.* 389. 25° S.—68° N.
„ bicolor, *A.* 98. *Mex.* Licht.—60° N. (*viridis*).
„ fulva, *A.* 68. *W. Ind.* Vieill. *Mex.* Sw.—67° N. (*lunifrons?*)
„ aconalaschkensis, Lath., ?—60° N.
Hirundo thalassina, Sw. *Mex.*
„ *coronata*, Licht. *Mex.*
Chætura pelasgia, *A.* 158. ?—25° N.—50° N.

Sub. typ. fam. Caprimulgidæ.

Caprimulgus vociferus, *A.* 82. ?—25° N.—48° N.
„ carolinensis, *A.* 52. *Mex.*—37° N.
„ virginianus, *A.* 147. ?—25° N.—68° N. (*Chordeiles*, Sw.)
„ *albicollis*, Lath. 4° N.—*Mex.* Licht.

Aber. fam. TROGONIDÆ.

Trogon viridis, enl. 195. 2° N.—*Mex.* LICHT.
„ *glocitans*, LICHT. *Mex.*
„ *pavoninus, col.* 372. *Mex.*
Trogon mexicanus, SW. *Temiscalt.*
„ *resplendens, Zool. pr.* 27. *Mex.*
„ *elegans, Zool. pr. Mex.*
„ *ambiguus, Zool. pr. Mex. Nath. pr.*
„ *Morganii*, SW. *Mex.*
Prionites mexicanus, SW. *Mex. Table L.*

The *meropidæ*, one of the aberrant families of the fissirostral tribe, have no members in America, though two species enter Europe, the rest of the group being confined to the warmer regions of the old continent. The *trogonidæ* again, another aberrant family peculiar to America, though pretty numerous in Mexico, send no species so far north as to reach the United States.* The third aberrant family, the *halcyonidæ*, contains one European species and one North American one. The two normal families are spread over the whole world, and are represented in Europe and North America by nearly an equal number of species, though few are really common to the two countries. The chimney or barn swallow of America is considered by Audubon as the same with that of Europe; though previous authors, relying upon some differences in the colour of the plumage, had named it, as a distinct species, *rufa* or *americana*. The sand-martin (*riparia*) has been described as the same in both continents without much question, but also perhaps without a correct comparison of a sufficient number of specimens from both continents. The interesting species named *fulva* requires further investigation; by Vieillot, who gave it that appellation, it is said to have a forked tail, which form is also attributed to it in the *Fauna boreali-americana*, where Say's appellation of *lunifrons* is adopted: Audubon and the Prince of Musignano, who inspected Say's specimen, describe the tail as square. It remains to be ascertained whether these authors all speak of the same species or not.

Aber. Ord. RASORES.

Aber. fam. CRACIDÆ.

Crax hoazin, ALBIN 32. *Mex.*
Ourax pauxi, enl. 78. 2° N.—*Mex.*
Penelope garrula, WAGLER, *Mex.* LICHT.

Aber. fam. COLUMBIDÆ.

Columba fasciata, BON. 8, 3. *R. Platte.*
„ leucocephala, *A.* 177. *W. Ind. Mex. Floridas.*—25° N.
„ monilis, VIG. 10. *Cal.* 36° N.
Ectopistes migratoria*, *A.* 62. 25° N.—62° N. *Greenl. accid.*
„ carolinensis, *A.* 17. *Mex.* LICHT.—42° N. *L. Super.*
Peristera montana, *A.* 167. 2° N.—25° N.
„ zenaida, *A.* 162. *Cuba.*—25° N.
Peristera jamaicensis, TEM. 10. *Mex.* LICHT.
„ *pusilla*, LICHT. *Mex.*
Geophilus cyanocephalus, *A.* 172. *W. Ind.* —25° N. *Florida.*
Chamœpelia passerina, *A.* 182. *W. Ind.*—32° N. *Cape Hatteras.*
„ *squamosa*, TEM. 59. 25° S.—*Mex.* LICHT.

PHASIANIDÆ *or* PAVONIDÆ.

Meleagris gallopavo, *A.* 1. *Mex.*—44° N.

TETRAONIDÆ.

Tetrao { umbellus, *A.* 41. 32° N.—56° N.
„ { cupido, *A.* 186. 36° N.—46° N.

* Mr. Swainson has recently indicated a *prionites bahamensis*.

Tetrao canadensis, *A.* 176. 44° N.—68° N. *Moist Woods.*
„ Franklinii, *F.B.A.* 61. 50° N.—58° N. *Rocky Mount.*
„ obscurus, *A.* 361. 40° N.—63° N.
„ mutus*, Leach. 67° N.—70° N.
„ rupestris*, *A.* 373. 55° N.—75° N. *Barren Grounds.*
„ leucurus, *F.B.A.* 63. 54° N.—64° N. *Rocky Mount.*
„ saliceti*, Ed. 72. 45° N.—70° N.

Tetrao urophasianus, *A.* 366. 42° N.—48° N. *Prairies of the Columb.*
„ phasianellus, *A.* 367. 36° N.—61° N.
Ortyx virginiana, *A.* 76. *Mex.*—48° N.
„ californica, Shaw. *Mis.* 345. 36° N.—44° N.
„ Douglasii, Vig. 9. *Cal.* 36° N.—42° N.
„ picta, Doug. 38° N.—45° N.
„ *spilogaster, Zool. pr.* 15. *Mex.* Cum.
„ *cristata, enl.* 126. *f.* 2° N.—*Mex.*

The families of *rasores* are capable of being distributed pretty correctly into geographical groups. Thus the *cracidæ* belong to South America, a few species extending northwards to Mexico: one genus (*megapodius*) inhabiting New Guinea, forms another link of connection between the Australian and South American faunæ. The *struthionidæ* belong mostly to the warmer parts of the old continent, one form (the New Holland *emeu*) inhabiting Australia, and another (*rhea*) South America. The *phasianidæ* also have their head quarters in the more southern parts of the old world, one genus only (*meleagris*), composed of two species, being American. The *columbidæ*, on the other hand, are spread generally over the world, though the family contains several well-marked minor geographical groups. The *tetraonidæ* are likewise widely diffused, but chiefly in the colder or temperate regions; and it is to this family that the only rasorial birds common to both continents belong,—they are ptarmigans, inhabiting the most northern districts, (*tetrao mutus, rupestris* and *saliceti*). On comparing this division of the faunæ of North America and Europe with each other we find that the former wants the partridges so common in the temperate parts of the latter, the true pheasants, the genus *otis*, and the *pterocles* and *hemipodii* which have spread to the south of Europe from Africa and Asia; on the other hand it possesses several forms of *columbidæ*, not known in Europe; the magnificent turkey, which for culinary purposes ranks as the chief not only of the *gallinacei* but of the whole feathered race; several singular forms of *tetrao*; and the beautiful californian quails (*ortyx*); besides the Mexican *cracidæ*, which, as they do not go so far north as the southern extremity of Europe, do not fairly come into the comparison. In short, the similarity of this portion of the two *faunæ* is confined to one group of *columbæ*, which does not reach higher than the southern parts of the United States, to the arctic *lagopi*, and to another group of *tetraones*, which includes *canadensis*, but is not generically distinct from the typical grouse.

Aber. Ord. GRALLATORES.

Aber. fam. TANTALIDÆ.

Tantalus loculator, A. 216. 25° S.—38° N. ORD.
Ibis rubra, A. 385. 25° S.—36° N.
,, alba, A. 222. *Mex.* 25° S.—40° N.
,, falcinella*, A. 386. *Mex.*—46° N.
Cancroma cochlearia, enl. 38 & 369. 30° S.—*Mex.* LICHT.
Aramus scolopaceus, A. 381. 2° N.—*U. S.* BON.

Sub-typ. fam. ARDEIDÆ.

Grus americana, A. 226. *Mex.*—68° N.
Ardea herodias, A. 211. 25° N.—50° N.
,, ludoviciana, A. 217. 24° N.—36° N. *Charlestown.*
,, occidentalis, A. 281. *Flor. keys.* 26° N.
,, candidissima, A. 242. 24° N.—42° N. *Massachusetts.*
,, rufescens, A. 256. *Flor. keys.* 26° N. (*Pealii.*)
,, egretta*, A. 378. *W. Ind. Mex.* 2° N.—43° N. (*alba*).
,, cœrulea, A. 307. *Mex. W. Ind.* 2° N.—44° N.
,, virescens, A. 333. *Mex. W. Ind.* —44° N.
,, lentiginosa, A. 337. 38° N.—58° N. (*minor*).
,, exilis*, A. 210. *W. Ind. Cal.* VIG. 45° N.
,, nycticorax*, A. 236. *Mex.*—46° N.
,, violacea, A. 336. *Mex. W. Ind.*—2° N.—44° N.
Platalea ayaia, A. 321. *Mex.* LICHT. 25° S.—40° N.
Hæmatopus palliatus, A. 223. *Mex.* LICHT. 54° S. KING.—52° N.
,, ostralegus*, WILS. 64, 2. *Cal.* VIG.—50° N.

Typ. fam. SCOLOPACIDÆ.

Numenius longirostris, A. 231. *Mex.* LICHT. *Cal.* VIG.—42° N.
,, borealis, A. 208. *Cal.* VIG. 25° S.—70° N. *Labrad. Coperm. r.*
,, hudsonicus, A. 237. ?—60° N.
,, rufiventris, VIG. *Cal.* 36° N.
Totanus glottis*, A. 269. *W. Ind. Flor. keys.*—25° N.
,, flavipes, A. 288. *Mex.* LICHT. *Cuba.*—68° N.
Totanus melanoleucus, A. 308. *W. Ind.*—60° N. (*vociferus*, WILS.)
,, macularius*, WILS. 59. *Mex.* LICHT.—57° N.
,, Bartramius*, A. 303. ?—55° N.
,, chloropygius, WILS. 58. *Mex.* LICHT. *Cuba.*—68° N.
,, ochropus*, *F.B.A.* ?—58° N.
,, calidris*, *F.B.A.* ?—58° N.
,, fuscus*, *enl.* 875. *N. Am.* TEMM.
,, semipalmatus*, A. 274. 23° N.—56° N.
,, candidus, EDW. 139. ?—58° N.
Recurvirostra americana, A. 318. *Tropics*—63° N.
,, occidentalis, VIG. 12. *Cal.* 38° N.
Limosa fedoa, A. 238. 21° N.—68° N.
,, hudsonica, A. 258. 38° N.—68° N.
,, melanura*, *enl.* 874. *U. S.* BON. *an preced.*?
,, candida, EDW. 139. *enl.* 873. *H. Bay.*
Scolopax minor, A. 268. 26° N.—52° N.
,, Wilsonii*, A. 243. 28° N.—55° N.
,, leucura, *F.B.A. Huds. B.* 57° N.
,, grisea*, A. 335. 50° N.—70° N.
Phalaropus fulicarius*, A. 255. ?—75° N.
,, glacialis, LATH. *Behr. St.* 69½° N.
Lobipes hyperboreus*, A. 215. ?—75° N.
,, Wilsonii, A. 254. *Mex.* SW. *S. Am.*—55° N. (*fimbriatus*, TEM.)
Tringa islandica*, A. 315. ?—75° N.
,, maritima*, A. 284. 40° N.—74° N.
,, Temminckii*, *col.* 41, 1. *Cal.* VIG. *U. S.* BON.
,, minuta*, NAUM, 21, 30. *U. S.* BON.
,, pusilla, A. 320. *Mex.* LICHT. *Nootka.*—68° N.
,, maculosa, VIEILL. *W. Ind.*—*U. S.*
,, rufescens*, A. 265. 30° N.—70° N.
,, subarcuata*, A. 263. ?—39° N. & 41° N.—? (*africana*, LATH.)
,, pygmæa*, NAUM. 10, 22. *U. S.* BON. (*platyrhinca.*)
,, pectoralis*, A. 294. *W. Ind.* 19° N.—?
,, Schinzii*, A. 278. 25° N.—55° N.
,, alpina*, WILS. 56, 2. 57, 3. ?—74° N. (*cinclus, variabilis.*)
,, himantopus, A. 344. ?—60° N.
,, semipalmata*, A. 350. ?—60° N.
,, *Deppii*, LICHT. *Mex.*
Calidris arenaria*, WILS. 59, 4. 63, 3. 30° N.—60° N.

Aber. fam. RALLIDÆ.

Parra jacana, enl. 322. 25° S.—*Mex.*
Rallus virginianus, A. 205. 24° N.—50° N.
„ crepitans, A. 204. 24° N.—41° N.
„ elegans, A. 203. 24° N.—40° N.
Crex noveboracensis, A. 329. ?—57° N.
„ carolinus, A. 233. *Mex.* 25° S.—62° N.
Gallinula chloropus*, A. 244. *Mex. Cal.*—40° N. (*galeata*, BON.)
„ martinica, A. 305. 18° N.—35° N.
Fulica americana, A. 239. *Mex.* LICHT. *Cal.* VIG.—56° N. (*atra*).

Aber. fam. CHARADRIADÆ.

Strepsilas interpres*, A. 304. 24° N.—75° N.
Strepsilas melanocephalus, VIG. *Calif.*?
Charadrius pluvialis*, A. 300. 23° N.—75° N. *Behr. St.*
„ vociferus, A. 225. *W. Ind.*—56° N.
„ Wilsonius, A. 209. 24° N.—44° N.
„ melodus, A. 220. *Cal.* 24° N.—53° N. (*hiaticula*, WILS.)
„ semipalmatus, A. 330. *Cal.* 24° N. 70° N.
Vanellus melanogaster*, A. 334. 26° N.—70° N. (*helveticus*).
„ *Cayenensis, enl.* 836. *Mex.*? VIG.
Himantopus nigricollis, A. 328. ?—44° N.
„ *melanopterus**, *enl.* 878. 25° S.—*Mex.* LICHT. *Brazil, Egypt*, TEM.

The principal forms of the *grallatorial order* are the same in the northern divisions of the two continents; but there are five minor genera, viz., *ciconia*, *glareola*, *porphyrio*, and *cursorius* in Europe, which do not occur in North America; and three in the latter country, namely, *aramus*, *tantalus*, and *parra*, which do not belong to the fauna of Europe. The forms and very many of the species of the typical family (the *scolopacidæ*) are absolutely the same in both countries, and on referring to the table in page 167, it will be seen how nearly the number of species of most of the families correspond on both sides of the Atlantic; the numbers would agree still more exactly in the principal group but for recent refinements in the discrimination of species, by which birds, so closely resembling the common snipe as not to be distinguishable by an ordinary observer, are described as distinct on account of some differences in the tail-feathers. The American coot differs very slightly from the European one, and the constancy of these differences still requires to be established; the latter occurs in India without change of form. The Rev. Mr. Bachman and Mr. Audubon have clearly established the brown crane, *grus canadensis*, to be the young of the great hooping-crane, *grus americana*.

Aber. Ord. NATATORES.

ANATIDÆ.

Phœnicopterus ruber*, WILS. 66, 4. ?—40° N. BON.
Anas clypeata*, A. 327. *Mex.* SW. LICHT. *Cal.* VIG.—70° N.
„ strepera*, A. 348. *Mex.* Sw. 68° N.
„ acuta*, A. 227. *Mex.* SW. *Cal.* VIG.—70° N.
„ urophasianus, VIG. 14. *Cal.*?
„ boschas*, A. 221. *Mex.* LICHT. —68° N.
Anas obscura, A. 302. 25° N.— 45° N.
„ discors, A. 313. *Mex.* LICHT. *Cal.* —58° N.
„ crecca*, A. 228. *Cal.* VIG. 24° N. —70° N.
„ glocitans*, A. 338.
„ americana, A. 345. *Cuba. Cal.* VIG.—68° N. (*Mareca*).
„ sponsa, A. 206. *Mex. Cal.* VIG. 19° S.—54° N.
Somateria mollissima*, A. 246. 39° N.—81° N. *Greenl. Spitzb.*

Somateria spectabilis*, A. 276. 43° N.—81° N. *Greenl. Spitzb.*
Oidemia perspicillata*, A. 317. *Nootka.* 24° N.—72° N.
„ fusca*, Wils. 72. f. 3. 36° N.—72° N.
„ nigra*, Wils. 72. 2. 36° N. ? N.
„ americana, A. 349. *U. S.*—62° N.
Fuligula valisneria, A. 301. *Cal.* 38° N.—68° N.
„ ferina*, A. 322. *Cal.* 38° N.—68° N.
„ marila*, Wils. 69. 5. 38° N.—68° N. *Cal.* Vig.
„ labradora, A. 332. 40° N.—58° N.
„ rufitorques, A. 234. 26° N.—68° N. (*fuligula*, Wils.)
„ rubida, A. 343. 26° N.—58° N.
Clangula vulgaris*, A. 342. 26° N.—68° N. (*clangula*, Auct.)
„ Barrovii, *F.B.A.* A. 70. ?—57° N.
„ albeola, A. 325. *Mex. Cal.* Vig. —68° N. (*bucephala*).
„ histrionica*, A. 297. *Cal.* Vig.—74° N.
Harelda glacialis*, A. 312. 36° N.—75° N.
Mergus cucullatus*, A. 232. 24° N.—68° N.
„ merganser*, A. 331. 38° N.—68° N.
„ serrator*, A. 382. 38° N.—68° N.
„ albellus*, A. 347. 38° N.—? N.
Cygnus buccinator, A. 377. 38° N.—68° N.
„ Bewickii*, A. 387. *Cal.*—75° N.
Anser canadensis, A. 201. 26° N.—70° N.
„ Hutchinsii, A. 277. 45° N.—69° N. *Melville peninsula.*
„ bernicla*, A. 380. 26° N.—73° N.
„ leucopsis*, A. 296. ?—? *U. S.* Bon.
„ segetum*, *enl.* 985. *U. S.* Bon.
„ hyperborea*, A. 376. 26° N.—73° N.

Colymbidæ.

Podiceps carolinensis, A. 248. 26° N.—68° N.
„ cornutus*, A. 259. 26° N.—68° N.
„ cristatus*, A. 292. *Mex.*—68° N.
„ rubricollis*, A. 298. 41° N.—68° N.
Podoa surinamensis, *enl.* 893. 2° N.—40° N. Bon.
Colymbus glacialis*, A. 306. 26° N.—70° N.
„ septentrionalis*, A. 202. 36° N. —74° N.
„ arcticus*, A. 346. ?—70° N.

Alcadæ.

Uria Brunnichii*, A. 245. 42° N.—75° N.
Uria grylle*, A. 219. 37° N.—75° N.
„ troile*, A. 218. 41° N.—61° N.
„ marmorata, Lath. *N.W. coast.* Bon.
„ alle*, A. 339. 39° N.—75° N.
„ brevirostris, Vig. *Kotzebue Sound.*
Mergulus cirrhocephalus, Vig. *Kotzebue Sound.*
Fratercula glacialis, A. 293. *U. S.* Bon. *Kotzebue Sound.* Vig. 70° N.
„ cirrhata, A. 249. 40° S.—70° N. *Kotzebue Sound.* Vig.
„ arctica*, A. 213. 32° N.—? N.
Phaleris cristatella, *col.* 200. 50° N.—70° N. *Aleut. isles?* Vig.
„ psittacula, *Pall. sp.* v. 2. *Sea of Kamtsch.*
Alca torda*, A. 214. 40° N.—57° N.
„ impennis*, A. 341. ?—75° N.
Cerrorhincha occidentalis, Bon. *Behr. St.* Vig.

Pelecanidæ.

Onocrotalus americanus, A. 311. *Mex.* Vig.—61° N.
Pelecanus thajus, S. 40°.—*Mex.* Licht.
Phalacrocorax carbo*, A. 266. 40° N.—53° N.
„ dilophus, A. 257. 33° N.—55° N.
„ floridanus, A. 252. 24° N.—35° N.
„ graculus*, *enl.* 974. 40° N. Bon.
„ cristatus*, *col.* 322. 40° N. Bon.
„ pygmæus*, Pall. *Voy.* 1. *U. S.* Bon.
„ *brasilianus*, Spix. 106. 25° S.—*Mex.* Licht.
Sula fusca, A. 251. *Mex.* Vig. 2° N.—35° N. *Flor. S. Carol.*
„ bassana*, A. 326. 40° N. Bon.
Tachypetes aquilus, A. 271. *Mex.* Vig. 23° S.—40° N. Bon.
Phaeton æthereus, A. 262. 30° S. Less. —25° N. Aud.
Plotus anhinga, Wils. 74. 1 & 2. 25° S. —36° N. (*melanogaster*).

Laridæ.

Sterna hirundo*, A. 309. 38° N.—57° N. (*Wilsonii*, Bon.)
„ arctica*, A. 250. 38° N.—75° N.
„ cantiaca*, A. 279. 24° N.—33° N.
„ Dougalli*, A. 240. ?—26° N.
„ cayana, A. 273. 23° N.—54° N.
„ fuliginosa, A. 235. 49° S.—40° N.
„ nigra*, A. 280. *Mex.*—69° N.
„ aranea*, A. 383. 36° N.—44° N.
„ minuta*, A. 319. ?—44° N.
„ stolida, A. 275. 25° S.—24° N.
„ *galericulata*, *Mex.* Licht.

Larus glaucus*, A. 379. ? N.—75° N.
„ argentatus*, A. 291. 24°N.—75°N.
„ leucopterus*, A. 282. 40°N.—75°N.
„ marinus*, A. 241. 28° N.—56° N.
„ zonorhynchus, A. 212. 36° N.—56° N.
„ canus*, Auct. *U. S.* —64° N.
„ Belcheri, Vig. N. *Pacif. coast.*
„ eburneus*, A. 287. 47°N.—75° N.
„ fuscus*, Frisch. 218. *U. S.* Bon. Tem.
„ tridactylus*, A. 224. 30° N.—74° N.
„ Bonapartii, A. 324. ?—70° N.
„ Franklinii, *F.B.A.* 71. ?—56° N.
„ capistratus*, *Baff. Bay*, Tem. 33° N.—74° N.
„ atricilla*, A. 314. ?—45° N.
„ ridibundus*, Naum. 32, 44. *Greenl. seas.* Tem.
„ minutus*, Falk. *Voy.* 3, 24. *U.S.* Bon. 65° N.
„ Sabinii*, A. 285. *Cal. Behr. St.* Vig. *Spitzb.* 36° N.—80° N.
„ Rossii*, *F.B.A. Newfoundland, Waigatz St. Spitzb., Regt. Inlet.* ?—82° N.

Rhynchops nigra, A. 323. ?—46° N.
Lestris parasiticus*, A. 267. 24° N.—75° N.
„ pomarinus, A. 253. 43°N.—67°N.
„ Richardsonii*, A. 272. 42° N.—75° N. (*parasiticus*, Auct.)
„ cataractes*, *Brit. Zool.* 50, 6. *U. S.* Bon.
„ Buffonii*, *enl.* 762. *U. S.* Bon.
Diomedea exulans, A. 388. 35° S.—*U. S.* Wils. *Cape of Good Hope.*
„ fuliginosa, *col.* 469. *Cal. Aleut. islands*, Vig. 50° S.—50° N.
Procellaria glacialis*, A. 264. *U.S.*—60°N.
„ puffinus*, *enl.* 962. *U.S.*—60°N.
„ *obscura**, *St. degli Ucelli*, 538. *U.S.* Bon.
Thalassidroma Wilsonii*, A. 270. 23° N.—55° N. Bon. (*pelagica*, W.)
„ Leachii*, A. 260. 40° N.—55° N. Bon.
„ pelagica*, A. 340. *U. S.*
„ Bullockii*, *Newfoundland.* Aud.

The *natatores*, like the *cetacea* which they represent, inhabit the waters, the majority seldom coming ashore except for the purpose of nidification; and they are mostly common to the two continents, especially the marine ones. The generic groups are almost entirely the same in the same parallels of latitude; and even where the species are peculiar, there is a surprising uniformity in the numbers of each group, as may be observed on consulting the table in page 167. The common white pelican of America is considered as distinct from the *onocrotalus* of the old world by Mr. Audubon, and some occasional differences in the bill are pointed out in the *Fauna boreali-americana*; but in most other respects the American and European pelicans have a very close resemblance. The breeding plumage of many of the northern gulls is still very imperfectly known, and the exact number of species and their distribution will remain uncertain until some ornithologist, who has the requisite opportunities of observation, accomplishes a revision of the genus. The characters of the black-headed gulls especially require elucidation.

In concluding our remarks on North American ornithology, made chiefly with a view of pointing out its peculiarities, by contrasting it with that of Europe, we may refer the reader to the Prince of Musignano's "*Specchio comparativo*"*, &c.,

* *Specchio comparativo delle Ornitologie di Roma e di Filadelfia, di* C. L. Bonaparte, &c., *estratto dal No.* 33, *del nuovo giornale de' letterati.* Pisa, 1827.

for an excellent comparison of the birds inhabiting the middle parallels of the two zoological provinces.

The following table, which exhibits to an approximate fraction the proportion that each group of birds bears to the whole of the known North American species, will require correction as our knowledge of the ornithology of Mexico and the northern shores of the Pacific improves.

Groups.	No. of sp.	Prop. fr.	Groups.	No. of sp.	Prop. fr.
RAPACES	54	$\frac{1}{13}$	*Fissirostres*	23	$\frac{1}{30}$
Vulturidæ	5	$\frac{1}{138}$	Halcyonidæ	1	$\frac{1}{696}$
Falconidæ	35	$\frac{1}{20}$	Hirundinidæ	9	$\frac{1}{77}$
Strigidæ	14	$\frac{1}{50}$	Caprimulgidæ ..	4	$\frac{1}{174}$
INSESSORES	400	$\frac{7}{8}$	Trogonidæ.....	9	$\frac{1}{77}$
Dentirostres	150	$\frac{3}{11}$	RASORES	33	$\frac{1}{21}$
Laniadæ.....	45	$\frac{1}{15}$	Cracidæ.....	3	$\frac{1}{232}$
Merulidæ	21	$\frac{1}{33}$	Columbidæ	12	$\frac{1}{58}$
Sylviadæ	73	$\frac{2}{19}$	Phasianidæ	1	$\frac{1}{696}$
Ampelidæ	9	$\frac{1}{77}$	Tetraonidæ	17	$\frac{1}{41}$
Muscicapidæ....	2	$\frac{1}{348}$	GRALLATORES	87	$\frac{1}{8}$
Conirostres	134	$\frac{5}{26}$	Tantalidæ	6	$\frac{1}{116}$
Fringillidæ	90	$\frac{2}{15}$	Ardeidæ.....	16	$\frac{2}{87}$
Corvidæ.....	20	$\frac{1}{35}$	Scolopacidæ	45	$\frac{1}{15}$
Sturnidæ	24	$\frac{1}{29}$	Rallidæ.....	9	$\frac{1}{77}$
Scansores	62	$\frac{1}{11}$	Charadriadæ	11	$\frac{1}{63}$
Picidæ	21	$\frac{1}{33}$	NATATORES	122	$\frac{2}{11}$
Psittacidæ.....	12	$\frac{1}{58}$	Anatidæ.....	41	$\frac{1}{17}$
Ramphastidæ....	2	$\frac{1}{348}$	Colymbidæ	8	$\frac{1}{87}$
Cuculidæ	8	$\frac{1}{87}$	Alcadæ	15	$\frac{1}{46}$
Certhiadæ.....	19	$\frac{1}{37}$	Pelecanidæ	14	$\frac{1}{50}$
Tenuirostres.Trochil.	31	$\frac{1}{22}$	Laridæ	44	$\frac{1}{16}$

The whole zoological region of North America being accessible, without much difficulty, to naturalists and collectors, that highly interesting subject, the *migration of birds*, can be studied no where with greater advantage. The American ornithological works do, indeed, abound with scattered facts respecting the periodical flights of some species: and the introduction to the second volume of the *Fauna boreali-americana* contains a few general remarks on this matter; but a paper by the Rev. J. Bachman, published in Silliman's Journal for April, 1836, is the only one written expressly on the migration of North American birds which has come to my knowledge. In this treatise the movements of the feathered tribes in America are noticed

in a very agreeable and popular style; but there is a want of precise numerical data, which we trust Mr. Audubon's forthcoming volume will amply supply; in the mean time the following pages, containing the chief statements made in the works referred to, will give some idea of the question as it now stands.

The primary object of the migration of birds is generally allowed to be the obtaining a due supply of proper food in the various seasons of the year; and it is to be observed that in many cases the parents at the epoch of reproduction, and their callow young, require a very different kind of nourishment from that which the species subsists upon at other times; thus many, if not most of the hard-billed granivorous birds, feed their unfledged brood on soft insects and grubs.

Three lines of route, marked out by the physical features of the land, are pursued by the bands of migrating birds in their course through North America; some species retiring on the approach of winter through the eastern states and the peninsula of Florida to the West Indies; others passing down the great valley of the Mississippi to the Texas and eastern Mexico; and others again keeping to the westward of the Rocky Mountains, and entering the tropical regions by the shores of the Pacific. Some more widely-diffused species pursue all the three routes; while others, hitherto detected only in a single tract in the southerly part of their journey, spread from one side of the continent to the other as they approach their breeding quarters on the confines of the arctic circle. Many birds, and more especially the soft-billed waders, make their flight northwards in the higher latitudes through a different zone of country from that which they traverse on their return southwards, being influenced in this matter by the different conditions of the surface in spring and fall.

The short duration of summer within the arctic circle, taken in connexion with the time necessary to complete the process of incubation, the growth of plumage, and, in the case of the *anatidæ*, the moulting of the parent birds, serves to limit the northern range of the feathered tribes. The waders, which seldom make a nest, and the water-birds, which lay their eggs among their own down, and obtain their food on the sea or open lakes when the land is covered with snow, breed farthest north. The ptarmigans, which breed in very high latitudes, and moult during the season of re-production, migrate only for a short distance, and by easy flights; and, their food moreover being the buds or tips of willows and dwarf birch, can be obtained amidst the snow. When we consider that at the northern extremity of the American continent, and on the islands beyond it, the sum-

mer heat is already on the decline before the country is even partially denuded of its wintry mantle, we should scarcely expect to find any granivorous birds feeding in such high latitudes; but, in fact, by an admirable provision, springing from the peculiar severity of the climate, the snow-buntings and Lapland finches are furnished with food on their first arrival, when the patches of cleared land are scarcely larger than what suffices for the reception of their eggs. In the polar regions, the autumnal frosts set in so severely and suddenly that the process of vegetation is at once arrested, and the grass-culms, instead of whitening and withering as they do more to the southward, are preserved full of sap until the spring, the seeds remaining firmly fixed in their glumes; when the ground is prepared for their reception by the melting snow, the seeds fall, and in a few days, under the influence of continuous light, a brilliant, though short-lived, verdure gladdens the eye. These grass-seeds, then, and the berries of several *vaccineæ*, *empetreæ*, &c., which remain plump and juicy till the spring, yield food to the birds on their first arrival; and by the time that the young are hatched, their wants are supplied by the further melting of the snow liberating the larvæ of many insects. The *natatores*, which feed at sea, find open water early enough for their purpose, and it is interesting to observe how well even the freshwater *anatidæ* (the majority of which breed in high latitudes) are provided for. Long before the ice of the small lakes gives way it is flooded to the depth of several feet with melted snow, that swarms with myriads of the larvæ of gnats and other insects on which the ducks feed. The more herbivorous of the duck-tribe, viz., the geese, feed much on berries in their migrations; in the spring, before the sprouting of the tender grass, which they like, we find their crops filled with the shining, white, dry fruit of the *eleagnus argentea;* and in the autumn, when they cross the barren grounds, they banquet at their halting-places on the juicy berries of the *vaccinium uliginosum, vitis idæa,* or *empetrum nigrum*, which dye their crops a deep purple colour. These and other capabilities of the lands on the confines of the arctic circle account for so many birds entering the arctic fauna. The numbers of the *falconidæ* and *strigidæ* are of course proportioned to the abundance of smaller birds and rodent animals on which they feed.

It may be considered as a general rule, that the number of species of birds which enter the faunæ of successive parallels of latitude, diminishes gradually as we advance from the tropics towards the poles; but if we deduct the *birds of passage* and

accidental visiters, and conclude with some authors that the species properly belonging to a district are only those which breed within its limits, we shall then find that in North America the number of breeding birds increases as we go northwards, up to the 62nd degree of latitude, where the woods begin to thin off. Even on the verge of the barren grounds, near to the arctic circle, as many species breed as in the neighbourhood of Philadelphia, though in the latter locality some birds rear two or more broods in a season, which is not the case in the north. The Prince of Musignano states the number which hatch near Philadelphia, near the 40th parallel, at 113, while fourteen degrees farther north, at Carlton-house, on the Saskatchewan, the number amounts to 149, and the difference would no doubt be greater in favour of the latter place were its ornithology more thoroughly investigated; but all the species included in our estimate were detected in the course of a single spring by Mr. Drummond and myself.

The amount of species which reside the whole year in any one place has no direct relation to the numbers which breed there, but is regulated chiefly by the winter temperatures, or, in Humboldt's phrase, by the course of the isocheimal lines; and it seems evident that it is the diminution of supplies of food, and not the mere sensation of cold, which occasions birds to migrate from the high latitudes on the approach of winter. After the spring movement, the feathered tribes are often exposed in the fur countries to much lower temperatures than had occurred before their departure in autumn; and the eagle and other kinds which soar above the summits of the highest mountains, do not appear to be inconvenienced by the rapid change of climate to which they thus subject themselves. All the birds which feed on winged and terrestrial insects and worms, such as the fly-catchers, vireos, and warblers, must migrate from the northern regions, as well as most of the aquatic and piscivorous tribes, the suctorial tenuirostres, and all the grallatores, which thrust their bills into soft spungy soil in search of food. The wood-peckers, though insectivorous, are more stationary, because the larvæ of the xylophagous beetles, on which they subsist, lodging in trees, are as accessible in winter as in summer; but the *colaptes auratus,* which feeds mostly upon ants, and the *picus varius* quit the snow-clad fur-countries in winter, while they are permanent residents in the more southern districts.

The only bird seen at Melville Island, in latitude 75° N., during winter was a white one, supposed to be the *strix nyctea,* or it may have been a wandering *falco islandicus,* both these

birds preying on small quadrupeds. In the pools of water which remain open all the year in the arctic seas, the *uria grylle* and *Brunnichii* are to be found at the coldest periods, the *alcadæ*, consequently, are the most northerly winterers. Many individuals, however, of the species just named go far south in the winter season, and it has been observed that the old birds remain nearer the breeding stations, while the young seek their food further afield. This has been ascertained also of birds belonging to other families, and more especially of the *falconidæ* and *laridæ*, probably because their young are more readily known by their peculiar plumage. In the extreme northern parts of the continent the winter residents are the *falco islandicus* and *peregrinus*, *strix nyctea* and *funerea*, and the raven, all birds of prey, the *linaria borealis*, which in the winter time inhabits dwarf birch or willow thickets, and picks up a subsistence from the grass-spikes that overtop the snow, and the ptarmigan, whose mode of feeding has already been alluded to. The *strix lapponica* or *cinerea* and *virginiana*, *corvus canadensis*, *tetrao canadensis*, and *picus tridactylus*, inhabit the woods all the year up to their northern termination. The *tetrao canadensis* feeds on the evergreen leaves of the spruce-fir, and the *corvus canadensis*, which is omnivorous, is one of the few birds which lays up food for times of scarcity. As we proceed farther southwards, to the banks of the Saskatchewan for instance, we find large bands of willow ptarmigan (*tetrao saliceti*), which have left their breeding-quarters in the north to winter there, and the *tetrao phasianellus* and *umbellus*, which are permanent residents, also one or two species of *parus*, some additional woodpeckers, two *loxiæ*, the *pyrrhula enucleator*, the *corvus cristatus*, and two additional owls. The *emberiza nivalis*, which breeds between the 65th and 75th parallels, spends most of the winter on the Saskatchewan, being seldom absent more than two or three weeks in the severest weather, at which time it retires to the confines of the United States.

In the neighbourhood of Philadelphia we find 44 permanently resident birds, and 71 which come from the north to winter there, making together 115 winterers in that locality; in summer the 44 residents are joined by 74 species from the south, which breed in Pennsylvania, making in the aggregate 118 breeders; the rest of the birds enumerated in the Philadelphian fauna by the Prince of Musignano consist of 48 species, which merely pass through the district in spring and fall, on their way from their southern winter-quarters to their breeding-places in the north; the amount of species, residents and visiters, in that district being 281. Dr. Emmons enumerates 241

species in his list of Massachusetts birds, 126 of which breed within the limits of the state*. Out of 208 which were detected by us on the Saskatchewan, 146 species breed there, while the permanent residents and winter visiters do not exceed 25 or 30 species.

The following table, which is compiled from the Prince of Musignano's "*Specchio comparativo*", Dr. Emmons's list, and the *Fauna boreali-americana*, indicates the number of species that breed in three distant localities, the permanent residents, and those which come from the south in summer to breed being included in this number. A second column under each head comprises both the birds of passage and accidental visiters, these two classes not being easily distinguished in the present state of our knowledge of North American ornithology. A few observations on the several families follow the table.

Families.	Philadelphia. Lat. 40° N.		Massachusetts. Lat. 42½° N.		Saskatchewan. Lat. 54° N		Families.	Philadelphia. Lat. 40° N.		Massachusetts. Lat. 42½° N.		Saskatchewan. Lat. 54° N.	
	Breed.	Pass.	Breed.	Pass.	Breed.	Pass.		Breed.	Pass.	Breed.	Pass.	Breed.	Pass.
Vulturidæ	1	1	...	...	...	1	Columbidæ	2	...	1	1	1	...
Falconidæ	5	10	8	12	11	3	Pavonidæ	1	...	1	...	...	...
Strigidæ	3	6	7	3	9	1	Tetraonidæ	2	1	3	...	5	1
Laniadæ	5	2	5	2	8	...	Tantalidæ	...	3	...	1	...	...
Merulidæ	8	...	5	4	6	2	Ardeidæ	8	4	5	2	2	...
Sylviadæ	9	32	15	14	11	3	Scolopacidæ	6	19	7	15	11	14
Ampelidæ	6	1	4	1	3	1	Rallidæ	3	3	2	3	2	...
Fringillidæ	16	16	14	14	15	5	Charadriadæ	4	4	5	3	3	3
Corvidæ	4	...	2	1	6	...							
Sturnidæ	6	1	7	2	8	...	Anatidæ	3	28	2	19	14	16
Picidæ	7	...	6	1	6	...	Colymbidæ	...	6	1	5	6	1
Cuculidæ	2	...	2	...	...	...	Alcadæ†	...	5	...	3	...	...
Certhiadæ	4	4	5	...	2	...	Pelecanidæ	...	7	...	2	3	...
Trochilidæ	1	...	1	...	1	...	Laridæ	4	10	8	4	6	10
Halcyonidæ	1	...	1	...	1	...							
Hirundinidæ	5	...	7	1	4	1							
Caprimulgidæ.	2	...	2	...	2	...							
Normal groups	85	73	91	55	93	17	Aberrant groups	33	90	35	58	53	45

Rapaces.—The *vulturidæ*, as we have already mentioned, belong properly to the warm latitudes. Four of the five which

* List of the birds of Massachusetts, prepared by order of the State Legislature. By Ebenezer Emmons, M.D.

† The inland situation of Cumberland and Carlton-houses on the Saskatchewan excludes the alcadæ from their fauna.

enter North America are accordingly much more abundant to the south of the isthmus of Darien, and one only (*cathartes aura*) breeds as far north on the coast as Pennsylvania; in the interior this species reaches the 54th degree of latitude, but it is not known to breed there. Of the *falconidæ* named in our list, twelve range to South America, or have their head-quarters there, and as many have been detected in Mexico, where they are chiefly winter visiters, while the number that breed on the Saskatchewan is twice as great as in Pennsylvania: only two (*peregrinus* and *islandicus*), and these are of the typical group, winter in the fur-countries. The *strigidæ* are very partially migratory: *otus* and *brachyotus*, the only species which quit the fur-countries in winter, are resident all the year in the United States. Five of the North American owls belong also to the South American fauna.

Insessores, Dentirostres.—With a very few exceptions, confined, or nearly so, to the typical genus *lanius*, all the North American *laniadæ* retire in winter to Mexico, the West Indies, or South America, agreeing in this respect with the fly-catching *sylviadæ*, which they so closely resemble in their manner of taking their prey; the *tyrannulæ* especially are numerous in Mexico. The *merulidæ* wholly quit the fur-countries in winter, and all of them extend their migrations to Mexico, the West Indies, or South America, though detachments of some species, as *merula migratoria*, *orpheus polyglottus*, *rufus*, and *felivox* remain within the United States all the year: South Carolina is stated by the Rev. Mr. Bachman to be the most northerly winter range of the last-mentioned bird. The breeding-range of birds of this genus is very extensive; eight species perform that function in all parts of the United States, most of them going as high as the Saskatchewan. The *merula migratoria* is known to breed from North Carolina to the Arctic Sea; *cinclus americanus* and *orpheus nævius* breed in the higher latitudes only. Mr. Swainson has remarked of the American *sylviadæ* that they have their head-quarters in Mexico, and that while few species migrate towards South America, many go northwards on the approach of summer*. It is true that the Mexican fauna in-

* The Rev. Mr. Bachman, speaking of the neighbourhood of Charlestown, says, "The yellow-crowned warbler (*sylvia coronata*) is the only *sylvia* out of fifty species inhabiting the United States that remains with us in winter; and even this bird could not find subsistence in that season were it not that it almost changes its nature and lives on the fruit of the candle-berry myrtle (*myrica cerifera*). This is also the case with the only fly-catcher that winters in Carolina, viz., the peewee (*tyrannula fusca*), which sometimes fattens on the seeds of the imported tallow-tree (*stylingia cerifera*).

cludes many birds of this family, but many of them are hatched in the higher latitudes, to which, therefore, we consider them as properly belonging. Comparatively a small number spend the winter within the United States, more than half have been ascertained to enter the West India islands or Mexico, yet only one (the *setophaga ruticilla*) is known to pass the isthmus of Darien, so that there are few families in which the distinction between the North and South American faunæ are so evident. Of the few *ampelidæ* which belong to the North American fauna, *bombycilla carolinensis* and *vireo Bartramii* are known to visit South America. *Bombycilla garrula* breeds at the northern extremity of the continent, among the woods which skirt the Mackenzie; but its winter retreats are still unknown, though they are most probably in the Mexican cordilleras.

Insessores, Conirostres.—The *fringillidæ* is another family of which few species pass the isthmus of Darien from the northern continent; the *pyranga ludoviciana*, which attains the 42nd parallel in the interior prairies, and *saltator rufiventris*, which reaches the 36th on the coast of the Pacific, are the only ones common to the United States and South America. The *euphone jacarina*, also, and most probably some other Mexican species, enter the southern fauna. Many of the *fringillidæ* that breed in the high latitudes winter within the United States; some go to Mexico, and a few to the West Indies. The *emberiza nivalis* builds its nest on the most northern lands that have been visited, and the *alauda alpestris* and *emberiza lapponica*, likewise breed on the arctic coasts. The *corvidæ* are comparatively little migratory, and the majority inhabit limited districts of country, though two or three species are very widely distributed; none which enter the North American fauna are known to pass the isthmus of Darien. The *sturnidæ*, on the other hand, form a closer bond of union between the inter-tropical and northern faunæ; nearly all the North American species winter in Mexico or the West Indies, one, the *icterus spurius*, ranging as far south as Cayenne. The southern parts of the United States, however, are within the limits of the winter-quarters of *molothrus pecoris, scolecophagus ferrugineus* and *quiscalus major*, and *versicolor*. As cultivation advances in the fur-countries, the *sturnidæ* attract every year more and more the attention of the settlers on account of the havock they make in the corn-fields; but we are not prepared to assert that the range of this family of birds northwards is determined by the progress of agriculture. I am rather inclined to suppose that some individuals of the different species have always resorted to those latitudes to feed on the wild rice

(*zizania*) and other grass-seeds, but remained unnoticed in the marshes, until the labours of the husbandman providing them a more abundant repast, they made their appearance in the vicinity of the fur-posts. Mr. King, in his narrative of Captain Back's expedition, mentions that a flock of *scolecophagus ferrugineus* continued feeding on the offal of a fishery on Great Slave Lake, lat. 60½°, until late in December.

Insessores, Scansores.—The *picidæ*, or typical family of the *scansores*, are, as we have already mentioned, mostly residentiary, yet some of the species are distributed over forty degrees of latitude. In such cases, many individuals of a species may seek a more southern residence in winter, though the fact cannot be ascertained by consulting ornithological works, in which the migration of a bird is seldom noticed, unless it takes place in large flocks or entirely deserts the district; but it is undoubtedly true that near the northern limits of a resident species, the individuals are more numerous in summer than in winter. None of the North American *picidæ* have been detected in South America. The *cuculidæ* do not go to the northward of the valley of the St. Lawrence, only one species attaining that parallel; the majority of them certainly, perhaps the whole, are common to South America also. The *certhiadæ* abound in Mexico, and none of them go far north. The *troglodytes furvus*, or *aëdon*, which has the highest range, extends also furthest to the south, the species, according to the Prince of Musignano, being precisely the same in Surinam.

Insessores, Tenuirostres.—Of the *trochilidæ*, the only family of the tenuirostral tribe which detaches species northwards from Mexico, the *cynanthus colubris* breeds as high as the 57th parallel, on the eastern declivity of the Rocky mountains. The *trochilus anna*, according to Lesson, goes equally high on the coast of the Pacific, and Eschscholtz informs us that the *trochilus rufus* reaches the 61st degree of latitude on the same shore. The *lampornis mango*, a Brazilian species, has been detected recently on the peninsula of Florida in the 25th parallel, and the Reverend Mr. Bachman supposes that it is attracted thither by certain tubular flowers, lately introduced into the gardens in that quarter. This beautiful family of birds is numerous in Mexico, the physical conditions of that country ensuring them a constant succession of tubular flowers by short migrations from the low *tierras calientes*, which enjoy a tropical heat in winter, to the elevated plains and mountains as spring advances. Lichtenstein informs us that many of the Mexican humming birds pass the summer near the snow line, thus obtaining by a comparatively short flight a change of climate, which

their congeners above-named seek by traversing many degrees of latitude. Captain King observed some humming birds hovering over the *fuschiæ*, which grow plentifully in the Straits of Magalhaes, the ground being at the time covered withsnow.

Insessores, Fissirostres.—The only species of the *halcyonidæ* which enters North America, is universally distributed from Louisiana up to the 68th parallel: its winter being spent in the southern parts of the United States and in the West Indies. Few birds have given rise to more speculation than the swallows. Marvellous stories of their hybernating in caverns or at the bottoms of lakes, were believed even recently by naturalists of reputation, yet there is scarcely a seaman, accustomed to navigate the Mediterranean, who has not seen these birds migrating in large flocks to or from the coast of Africa, accompanied by predacious birds of various kinds. Mr. Audubon has skilfully availed himself of the great facilities which America offers for tracing the migrations of birds, so as to put to rest for ever the question of the hybernation of swallows. From his investigations, we are assured that the *hirundo bicolor* winters in the neighbourhood of New Orleans, where it roosts at night in hollow trees. Mr. Bachman also states, that this bird appears in the neighbourhood of Charlestown in winter after a few successive warm days. The other species winter in Mexico and the West Indies; and the *hirundo purpurea* and *riparia*, which extend in summer to the northern extremity of the continent, have a range southwards to the Brazils; the former it is stated by the Reverend Mr. Bachman breeding in the latter locality during the winter of the northern hemisphere. A conjecture that some species of birds might breed twice in the year in different climates was hazarded in the introduction to the *Fauna boreali-americana*, but I am not aware of any direct testimony to that effect having been adduced prior to the publication of Mr. Bachman's paper. The *caprimulgidæ* winter to the southward of the United States.

Rasores.—This is the least migratory of all the orders of birds, yet the species are in general readily acclimated in latitudes remote from their native haunts, and in fact it is from these birds that man derives the greatest advantage in his domestic economy. Our common poultry were originally brought from warmer regions, and this furnishes another evidence of abundance of proper food being more important than the temperature of the atmosphere in regulating the distribution of the feathered tribes, the dense covering of their bodies protecting them well from the severity of northern winters. There is, however, a limit to the range of each species, and it is found

that poultry thrive best in our climates when their coops are artificially heated in winter. The *tetraonidæ* are comparatively inhabitants of cold countries, and the ptarmigans, which are the most northern of all, are almost the only migratory ones. Most of these birds quit the bleak arctic barren lands in which they are bred, and retire in winter to the verge of the woods, returning, however, very early in spring to their former haunts, or as soon as the decreasing snow has released the tops of the dwarf birches and willows on which they feed, and the crests of a few gravelly banks. The passenger pigeon migrates northwards to the 62nd parallel, after its breeding season in the United States has terminated; through stress of weather individuals have been driven very far north, an instance being recorded by Sir John Ross, of the capture of one on the coast of Greenland. This pigeon visits Carolina in the winter at long and uncertain intervals, its arrival being determined, according to the Reverend Mr. Bachman, not by the severity of the season, but by the scarcity of food to the north: when beech mast is plentiful in Canada, it remains there in immense multitudes all the winter.

The *grallatores* are directly opposed to the *rasores* in being the most migratory order of birds. The *scolopacidæ* and several species of the other families breed in high latitudes, yet they winter within the tropics. In their migrations through the fur countries they pursue different routes in the spring and fall: thus at the time of the northern movement, the lateness of the summer on the coast of Hudson's Bay, and the quantity of ice which hangs on its shores till late in the year, exclude from that quarter the barges, snipes, and curlews which therefore pass by the interior prairies, where the melting snow has rendered the soil soft and spungy. In autumn again the prairies having been exposed to the action of a hot and generally very dry summer, are comparatively arid, but the late thaws on the coast flood the neighbouring flats even in August and September, and it is there accordingly that the soft-billed waders pass a month or six weeks on their way from their arctic breeding stations to the moist intertropical lands. The marshes and sand-banks in the estuaries of Hay, Nelson, Severn, and Moose rivers are resorted to in the fall of the year by immense flocks of strand birds. The following herons are stated by the Reverend Mr. Bachman to breed in Carolina, *ardea herodias, ludoviciana, candidissima, rufescens, cærulea, virescens, nycticorax, violacea*, and *exilis*.

Natatores.—The great majority of North American birds belonging to this order, breed to the north of the valley of the St. Lawrence, and are merely winterers or birds of passage in the middle states. The lakes of Mexico are the chief winter

resort of the *anatidæ*. The *anas boschas* has been found breeding from the lower part of the Mississippi up to the extremity of the continent, but in greatest abundance beyond the 50th parallel; and the *anser canadensis* from the 44th parallel to an equally high latitude, being also however most numerous in the fur countries. The rest of the geese and many of the ducks breed only within the arctic circle. The eider and king-ducks remain at sea in the high latitudes all the winter, the young only going southwards to the coast of Labrador and the United States. No others of the family winter higher than the 50th parallel in America, though several species remain at that season in Europe as high as the 60th degree of latitude.

The Reverend Mr. Bachman has made some observations on the effect of cultivation in influencing the movements of birds, but we think that he goes too far when he attributes the recent discovery of many new species within the limits of the United States solely to the changes produced in the face of the country, for the more general diffusion of accurate ornithological knowledge ought not to be overlooked. Thus among the examples of birds formerly rare but now common in the middle states, he quotes *hirundo lunifrons*, but this, (if identical with *fulva*, which is generally admitted,) was taken by Vieillot on the coast of New York, many years before the history compiled by Governor Clinton supposes it to have reached that state in its gradual advance from the interior; and the aborigines of the more northern countries have no tradition of a time when it did not breed on the perpendicular faces of their rocks. The singularity in its history is, that it should have so very recently begun to quit the rocks and to put itself under the protection of man, by building its nests under the eaves of houses. *Tyrannus borealis* (*muscicapa Cooperii* of Nuttall), *vireo solitarius* and *tringa himantopus*, also newly detected in the United States, breed in the uncultivated wastes of the fur countries.

The migration of the feathered tribes from the "*tierras calientes*" of the Mexican coast to the interior elevated plains and peaks, "*tierras templadas y frias*," presents within a smaller geographical range, as we have noticed in speaking of the humming birds, all the phenomena that take place in the extended flights from the intertropical regions to the arctic solitudes.

REPTILIA.

Catesby figured a portion of the North American animals of this class, but we are indebted to the labours of living naturalists

for the discovery of many more. These are described in the "Philadelphia Journal of Natural Sciences," the "Lyceum of Natural History of New York," "Silliman's Journal," and other periodical works, the chief writers being Messieurs Green, Say, Harlan, and Gilliams. A summary of the whole is contained in a paper by Dr. Harlan, entitled "Genera of North American Reptilia (including Amphibia), and a synopsis of the species," read in 1826 before the Philadelphia Academy, and subsequently reprinted, in a separate form with some alterations. Still more recently Dr. Holbrook of Charlestown has commenced a "North American Herpetology," which is to be completed in four quarto numbers, each containing from 20 to 30 coloured engravings and 200 pages of letter press. Wiegmann has also published a volume of his "*Herpetologia Mexicana*," embracing both *reptilia* and *amphibia*, having previously described many species in the Isis.

The warm, moist atmosphere of tropical America is very favourable to the existence of *reptilia*, which are more numerous there than in any other quarter of the world; and they occur even in North America, in much greater numbers and variety than in Europe. In the present imperfect state of North American herpetology, it would serve little purpose to attempt a formal disquisition on the distribution of the reptiles of that country, or to compare their numbers with those existing in the European zoological province, especially as these tasks may be performed with so much more success, when we become acquainted with the labours of Holbrook and Wiegmann. In the mean time we shall merely offer a few brief remarks. With the exception, perhaps, of one or two species of sea-turtles, none either of the *reptilia* or *amphibia* are common to the New and Old World; and it will be observed that the *reptilia*, though fewer in number in Europe, attain higher latitudes there than in North America. An *emys* inhabits the river Winipec in the latter country in the 50th parallel, but the *emys Europæa* goes some degrees further north in Prussia. The *crocodilus acutus*, which resembles the crocodile of the Nile so closely as to have been even mistaken for it, keeps within the tropics; it is an inhabitant of the West Indies and also of the Spanish Main, but to no great distance from the equator, for Humboldt believes that its northern limit is the peninsula of Yuccatan or the southern part of Mexico. Now, though crocodiles do not in the present day descend the Nile lower than Upper Egypt, they formerly inhabited the Delta at the mouth of that river, lying under the $31\frac{1}{2}^{\circ}$ degree of latitude, where they were wont to pass the three winter months in burrows. In this respect they resemble the

alligator lucius or *Mississippiensis*, which attains the 32½° N. latitude, and in Georgia and Carolina winters in burrows. The *ophidia* swarm in the humid equatorial districts of America, but disappear on the acclivities of the Cordilleras, at an altitude of 6000 feet, and a mean annual temperature of 64° F. In the fur countries they reach the 55th parallel where the mean heat is about the freezing point, but where the temperature of the three summer months, during which only the serpents are visible, is at least 66° F. and very little inferior to the summer heat of the Mexican table lands. In Europe the isothermal line of 32° passes through the North Cape (lat. 71° 10½′ N.), and we find accordingly that some serpents (as the *coluber berus*) reach Norway. In like manner lizards (*lacerta ocellata*) exist in Kamtschatka and Sweden, though none of the saurians pass to the north of the 50th parallel in America. The following is a list of the genera of European and Egyptian reptiles, with the number of species noticed in Mr. Gray's synopsis, or the *Règne animal* given for the purpose of comparison with the subjoined table of North American ones. European reptiles: *Chelonia.*—Testudo 2; cistudo 1; emys 1; trionyx 1; sphargis 3. *Emydosauri.*—Crocodili 2. *Saurii.*—Monitor 2; lacerta 14; psammodromus 1; algyra 1. *Geckotidæ.*—Platydactylus 2; stenodactylus 1; thecodactylus 2; hemidactylus 2. *Iguanidæ.*—Agamæ 6. *Scincidæ.*—Scincus 1; tiliqua 2; anguis 1. *Zonuridæ.*—Ophiosaurus 1. *Ophidia.*—Trigonocephalus 2; vipera 1; berus 2; pelias 1; echis 1; naia 1; tropidonotus 5; coluber 6; coronella 3; dendrophis 1.

Obs.—The following list of American *reptilia* is compiled chiefly from Mr. Gray's synopsis in Griffith's translation of Cuvier, and will appear meagre and inaccurate after the publication of Wiegmann's and Holbrook's works. Species which do not range north of Mexico are in *Italics*.

Ord. I. CHELONIA.

Fam. Testudinidæ.

Testudo polyphemus, Bartr. 18.

Fam. Emydæ.

Cistudo carolina, Holb. 1.
Emys Muhlenbergii, Id. 5.
„ guttata, Schœpf. 31.
„ punctata, Holb. 4.
„ picta, Schœpf. 5.
„ speciosa, Id.
Emys concentrica, Schœpf. 15.
„ reticularia, Daud. 23, 3.
„ vittata,
„ decussata,
„ scripta, Schœpf. 3, 5.
„ serrata,
„ rugosa,
„ Troostii, Holb. 4.
„ Le Sueurii, Gray.
Kinosternon triporcatum, Wieg. 15. *Mex.*
„ *scorpioides*, Shaw, 15. *Mex.*
„ pennsylvanicum, Edw. 287.
„ odoratum, Daud. 24, 3.
Chelydra serpentina, Schœpf. 6.

Fam. Trionychidæ.

Trionyx ferox, Schœpf. 19, 12, 3.
„ muticus, Le Sueur. *Mem. Mus.* 15, 257.

Fam. Chelonidæ.

Sphargis imbricata, Schœpf. 18, a.
„ mydas, Id. 17, 1.
„ caretta, Id. 16.

Ord. II. EMYDOSAURII.

Fam. Crocodilidæ.

Crocodilus rhombifer, Wieg. *W. Ind. Mex.*
Alligator lucius, Cuv. *An. Mus.* X. *Georg. Mississ.*

Ord. III. AMPHISBÆNIÆ.

Chirotes lumbricoides, Lacep. 41. *Mex.*

Ord. IV. SAURII.

Holoderma horridum, Wagler, 2, 18. *Mex.*

Fam. Geckotidæ.

Platydactylus americanus, Gray. *New York.*

Fam. Iguanidæ.

Iguana tuberculata, Spix. 6, 8. *S. Am. Mex.*
Amblyrhynchus cristatus, Wieg. *Mex.*
Ctenosaura cycluroides, Wieg. *Mex.*
„ cyclura, Cuv. *Carol.*
Cyclura carinata, Harl. *Ph. Ac. Sc.* 4, 15. *Bahamas.*
„ *teres*, Id. *Tampico.*
„ *pectinata*, Wieg. *Mex.*
„ *articulata*, Id. *Mex.*
„ *denticulata*, Id. *Mex.*
Læmanctus longipes, Wieg. *Mex.*
Ophyessa umbra, Daud. *Calif.*
Scelephorus undulatus, Wieg. *U. St.*
„ *torquatus*, Wieg. *Isis*, 21. *Mex.*
„ *formosus*, Wieg. *Mex.*
„ *spinosus*, Id. *Mex.*
„ *horridus*, Id. *Mex.*
„ *grammicus*, Id. *Mex.*
„ *microlepidotus*, Id. *Mex.*
„ *variabilis*, Id. *Mex.*
„ *æneus*, Id. *Mex.*
„ *scalaris*, Id. *Mex.*
„ *pleurostictus*, Id. *Mex.*
Phrynosoma Douglasii, Bell. *Lin. Tr. N. Calif.*
Phrynosoma cornutum, Harl. *Ac. Sc. Ph.* 20. *Western prairies.*
„ *orbiculare*, Wieg. *Mex.*
Chamælopsis Hernandesii, Wieg. *Mex.*
Anolius podargicus, Cat. 66. Holb. 7. *Carol.*
„ bimaculatus, *W. Ind. U. S.*
„ *bullaris*, Lacep. 27. *W. Ind. Mex.*
„ *nebulosus*, Wieg. *Mex.*
„ *læviventris*, Wieg. *Mex.*
„ *biporcatus*, Id. *Mex.*
„ *Schiedii*, Id. *Mex.*

Fam. Teidæ.

Ameiva cæruleocephala, Seba. 91, 3.
„ tessellata, Say. *Long. Exp. Ark.*
„ collaris, Id. *Ark.*
Cnemidophorus undulatus, Wieg. *Mex.*
„ *Deppii*, Id. *Mex.*
„ *Sackii*, Id. *Mex.*
„ *guttatus*, Id. *Mex.*

Fam. Scincidæ.

Tiliqua quinquelineata, Cat. 67. *Mex.* (Wieg.) *Carol.*
„ erythrocephala, Gill. *Ac. Sc. Phil.* 1, 18, 2.
„ lateralis, Say. Holbr. 8. *West. st.*
„ bicolor, Harl. *Ac. Sc. Phil.* 4, 18, 1.
Bipes anguinus, Id. *l. c.* 4, 10. f. 1. *Carol.*
Corythaelus vittatus, Wieg. *Mex.*

Fam. Zonuridæ.

Gerrhonotus Deppii, Wieg. *Is.* 21. *Mex.*
„ *imbricatus*, Id. *l. c. Mex.*
„ *leiocephalus*, Id. *l c. Mex.*
„ *tæniatus*, Id. *l. c. Mex.*
„ *tessellatus*, Id. *l. c. Mex.*
„ *rudicollis*, Id. *l. c. Mex.*
Ophisaurus ventralis, Cat. 59. *U. S.*

Ord. V. OPHIDIA.

Crotalus horridus, Cat. 41. *S. Am. Mex. U. S.*
„ durissus, Spix. 24. *S. Am.*—45° N.
„ miliaris, Cat. 42. *Carol.*
„ tergeminus, Say. *West. st.*
„ confluentis, Id. *R. Mount.*
„ *triseriatus*, Wieg. *Mex.*
Cenchris mockeson, Cat. 45.
Tisiphone Shausii, Gray. *S. Am. Carol.*
Trigonocephalus cacodema, Cat. 44. *Carol.*
Scytale piscivorus, Harl.
„ *cupreus*, Id.
Heterodon constrictor, Cat. 76. *Carol.*

Tropidinotus porcatus, Cat. 46. *Carol.*
„ ordinatus, Cat. 53. *Carol. & R. Mount.*
„ proximus, Say. *Missouri.*
„ parietalis, Id. *Missouri.*
„ fasciatus, Shaw. *S. St.*
„ sirtalis, *Penns.*
„ saurita, Cat. 50. *S. St.*
„ sipedon, Harl. *Mid. St.*
Coluber punctatus, Lin.
„ getulus, Cat. 52. *S. Carol.*
„ obsoletus, Harl.
„ testaceus, Id. *Missouri.*
„ filiformis, Id. *Carol.*
„ flagelliformis, Id. *Carol.*
„ flaviventris, Id. *Missouri.*
„ striatulus, Id. *Carol.*
Coluber amœnus, Harl. *Penns.*
„ rigidus, Id. *S. St.*
„ septemvittatus, Id. *Penns.*
„ coccineus, Id. *Carol.*
„ æstivus, Id. *Carol.*
„ getulus, Id. *Carol.*
„ calligaster, Id. *Missouri.*
„ melanoleucas, Id. *N. Jersey.*
„ eximius, Id. *Penns.*
„ vernalis, Id. *Penns. N. Jers.*
„ cauda-schistosus, Id.
„ doliatus, Id. *Carol.*
„ maculatus, Id. *Louis.*
„ guttatus, Id. *Carol.*
„ molossus, Id. *Carol.*
„ reticularis, Id. *Louis.*
Xenodon punctatum, Latr. *S. Carol.*

AMPHIBIA.

Rana.

Rana pipiens, Cat. *Mid. St.*
„ clamitans, Bosc. *Ditto.*
„ melanota, Raf. *L. Champl.*
„ halecina, Cat. *Penn. & S. St.*
„ flavi-viridis, Harl. *Mid. St.*
„ sylvatica, Id. *Ditto.*
„ palustris, Id. *Ditto.*
„ pumila, Le Conte.
„ gryllus, Holbrook. *Flor. Mid. St.*
„ nigrita, Le Conte.
„ ocellata, Shaw 34. *Mex. Florid.*
Hyla lateralis, Cat. *Surin. Carol.*
„ femoralis, Daud. *S. St.*
„ squirella, Daud. *S. St.*
„ delitescens, Le Conte. *Georgia.*
„ versicolor, Id. *Mid. & S. St.*
Bufo clamosus, Cat. *Ditto.*
„ cognatus, Say. *Long's Exp. Miss.*
„ fuscus, *Penn.*

Salamandra.

Salamandra subviolacea, Cat. 10. *Penn.*
„ tigrina, Green, *New Jers.*
„ rubra, Daud.
„ variolata, Gilliams, *Ac. Sc. Ph.* 1, 18, 1.
„ cylindracea, Harl. *N. Carol.*
„ frontalis, *N. Jers.*
Salamandra fusca, Green. *N. Jers.*
„ dorsalis, Harl. *Carol.*
„ picta, Harl. *Penn.*
„ Beechii, Gray.
„ maculata, Green. *N. Jers.*
„ subfusca, Id. *Ditto.*
„ longicauda, Id. *Ditto.*
„ nigra, Id. *Penn.*
„ flavissima, Harl. *Ditto.*
„ Greenii, Gray.
„ erythronota, Green.
„ cinerea, Green.
„ fasciata, Green.
„ glutinosa, Green. *New Jers.*
„ symmetrica, Harl. *Carol.*
„ cylindracea, Harl. *Carol.*
„ *platydactyla*, Cuv. *Mex.*
Menobranchus lateralis, Harl. *An. Lyc.* 1, 16. *L. Champl. Ohio.*
„ alleghaniensis, Say. *Griff. Cuv. Phyllhydrus pisciformis*, Shaw 140. *Mex.*
Amphiuma means, *An. Lyc.* 1, 22. *Carol. Mex.*
„ tridactylum, Cuv. *Louis.*
Siren lacertina, Lin. *S. St.*
„ intermedia, Le Conte. *S. St.*
„ striatus, Id. *An. Lyc.* 1, 2.
Menopoma gigantea, Harl. *An. Lyc.* 1, 17. *Ohio*

Note.—In the above list, *rana scapularis*, Harl., is considered as the young of *pipiens*, and *rana gryllus* and *dorsalis* of Le Conte as one species. *Salamandra rubriventris*, Green, is considered the same with *rubra; sinciput-albida*, Green, the same with *frontalis; intermixta*, Green, the same with *picta*, and *variegata* of Gray with *platydactylus*. *Salamandra porphyritica*, *Jeffersoniana*, and *cirrhigera* of Harlan's list, being very doubtful species, are omitted.

Our remarks on the *amphibia* will be still more brief than on the reptiles. Some *amphibia* are evidently more capable of enduring extremes of temperature than the *reptilia*, and they exist in higher latitudes; frogs and salamanders reaching the 67th parallel on the Mackenzie, where the mean temperature is not above 7 or 8 degrees of Fahrenheit, and the winter colds sometimes descend to more than 90° below the freezing point. Spallanzani relates that living frogs have been seen in the thermal baths of Pisa, which have a temperature of 115° F. In the fur countries the pools of melting snow swarm with very noisy frogs long before the soil is thawed; the office of reproduction is performed and the pools dried up by the time that the ice of the lakes is dissolved, and before the earth is sufficiently warmed to permit the snakes to crawl forth from their subterranean retreats. The principal genera *rana*, *bufo*, *hyla*, and *salamandra* occur both in Europe and North America. The genera *siren* and *menopoma* belonging to the latter country, are perfectly amphibious, the mature animals possessing both lungs and gills, and respiring at pleasure either air or water. The only analogous animal of the Old World is the *proteus anguinus* of the lakes of Lower Carniola, and the grotto of Adelsberg, between Trieste and Vienna. I observed on the banks of the Mackenzie a very singular looking tadpole which swarmed in a pool of water in the spring. It was about the size of a man's thumb, and its abdomen was greatly distended with fluid, but its integuments were quite transparent, and so tender that they burst on the slightest touch. Circumstances did not admit of my describing it at the time, and the specimens put into spirits were destroyed by accident.

PISCES.

The ichthyology of North America has not hitherto been attended to as it merits, and the distribution of the species through a very large portion of the northern hemisphere is still almost unknown. Catesby, Pennant, and Schœpf are the chief authorities of older date, for the introduction of the American fish into the systems, but the Linnean genera are so ill adapted for the reception of many of the forms peculiar to the New World, and the specific descriptions of the old writers are so brief and indeterminate, that the labours of these naturalists are often altogether unavailable to modern cultivators of science. Le Sueur, the most accurate of recent American ichthyologists, has described many species in the "Journal of the Academy of Sciences of Philadelphia," in the new series of the "Trans-

actions of the Philosophical Society" of the same city, and in the "*Museum d'Histoire Naturelle*" of Paris. Dr. Mitchill published a paper on the New York fish in the first volume of the "Transactions of the Philosophical Society of New York," but his descriptions are almost always imperfect, and often inaccurate, and he has arranged the species without judgement in Linnean genera, so that but for the accompanying figures it would be difficult to recognise the fish he mentions. Rafinesque-Smaltz gave to the world a crude synopsis of the fish of the Ohio, proposing many new genera, but characterising them with so little skill, that there is little chance of their being adopted by future naturalists. His species are printed in the subjoined lists in italic characters, as being doubtful. The third volume of the *Fauna boreali-americana* is devoted to the northern fish, and contains a considerable proportion of the species which inhabit the fresh waters of the fur countries: it is, however, very deficient in marine fish, and even in the fresh water ones of New Caledonia and Canada, owing to the author's attempts to procure specimens from these countries having failed. The admirable *Histoire des Poissons* by Cuvier and Valenciennes embraces all the determinable species noticed by preceding naturalists, but it has not yet advanced beyond the *acanthopterygii*, the untimely death of its great projector having retarded its progress. The arrangement of this work is followed in the subsequent lists of species. In it and in the *Règne animal* 16 families of acanthopterygian fishes are indicated. All these families are represented by a greater or smaller number of species both in Europe and America, with the exception of the *anabasideæ*, none of which exist in the waters of either country; of the *acanthurideæ* which do not occur in Europe; and of the *tænioideæ*, which, as restricted in the *Histoire des Poissons*, have not been detected in America. All the families of *malacopterygii* and *chondropterygii* enter the *faunæ* of both countries, with the exception of the *sauroideæ* of Agassiz, which do not exist in Europe. The only fresh water fish which is unequivocally common to the two continents is the common pike, (*esox lucius*,) and it is curious that this fish is unknown to the westward of the Rocky Mountains, on the very coast that approaches nearest to the old continent. Several other European fresh water fish occur in the lists given by American ichthyologists, but more rigid comparisons are required to sanction their application of the names. Some of the anadromous *salmonoideæ* and *clupeoideæ* are more likely to be common to both sides of the Atlantic, but even these require further investigation. The curiosity of naturalists has been considerably ex-

cited by the noises which certain fishes have the power of making, and some facts are stated in the *Histoire des Poissons* relating to this subject in the chapters devoted to the *cottoideæ*, *sciænoideæ*, &c. Several kinds of fish vulgarly named "grunts" in America, possess this faculty in an extraordinary degree, and the purpose it is intended to serve, and the manner in which the sound is produced, are worthy of investigation by naturalists residing where these fish abound*. Every mariner who has anchored early in the spring on the coasts of South Carolina, Georgia, or Florida, must have been annoyed by a drumming noise, produced in the night, apparently on the bottom of the ship, and loud enough to deprive a stranger of rest, until habit has rendered the sound familiar. This noise is said to be caused by a fish of about six pounds weight beating its tail against the vessel to relieve itself from the pain caused by multitudes of parasitic worms which infest it at that season.

In dividing the ocean into zoological districts to suit our present knowledge of species of fish and their distribution, we have found the nine following divisions to be convenient. European seas,—North American Atlantic and Arctic sea,—Caribbean sea and South American Atlantic,—African Atlantic,—Indian Ocean, Red Sea, and Polynesian Sea,—Australian seas,—Seas of China and Japan,—Sea of Kamtschatka and North-west America,—Pacific coast of South America. In a preceding part of the Report we stated that Mr. Swainson had justly included the North of Africa in the European zoological province, as far as birds were concerned, but the case is different with the fish. The whole of the Mediterranean fish indeed are European, but the fish of the Nile have very little resemblance to those of the European rivers, while the same species often occur on the coast of Senegal and in the Red Sea. The anadromous fish of the Mississippi and its tributaries are very different from those which enter the North American rivers falling into the Atlantic, in the same parallels of latitude.

As in the preceding lists, the species whose names or history are doubtful are printed in italics, as are likewise the Mexican fish which do not range further northwards.

ACANTHOPTERYGII.

Fam. PERCOIDEÆ.

Perca flavescens, Cuv. *New Y.—L. Huron.*
„ serrato-granulata, Cuv. *N. York.*
„ granulata, Cuv. *N. York.*
„ acuta, Cuv. *L. Ontario.*
Perca gracilis, Cuv. *N. York.*
„ *Plumieri*, Cuv. *Bahamas.*
Labrax lineatus, Cuv. *N. York.*
„ *notatus*, *F. B. A. St Lawr.*

* *Vide* Audub. *Orn. Biogr.* 3, p. 199.

Labrax mucronatus, Cuv. *Caribb. S.—N. York.*
„ multilineatus, Cuv. *Wabash r.*
Pomacampsis nigro-punctata, Raf. *Ohio.*
Lucioperca americana, Cuv. 40° N.—58° N.
„ *canadensis*, H. Smith, *Griff. Cuv. St. Lawr.*
Huro nigricans, Cuv. *L. Huron.*
Serranus fascicularis, Cuv. *Braz.—Carol.*
„ morio, Cuv. *N. York.*
„ acutirostris, Cuv. *Carol.—Braz.*
„ ———? Benn. *San Blas. Pacif.*
Centropristes nigricans, Cuv. *N. York.*
„ trifurcus, Cuv. *Carol.*
Grystes salmoides, Cuv. *Wabash. Rivers of Carol.*
Stizostedion salmoneum, Raf. *Ohio.*
Centrarchus æneus, Cuv. *L. Ontario & Huron.*
„ pentacanthus, Cuv. *Carol.*
„ hexacanthus, Cuv. *Carol.*
„ irideus, Cuv. *Carol.*
„ gulosus, Cuv. *L. Pontchartr.*
„ viridis, Cuv. *Ditto.*
Pomotis vulgaris, Cuv. *Philad.—L. Huron.*
„ Ravenelii, Cuv. *Charlestown.*
„ Holbrookii, Cuv. *Carol.*
Pomotis incisor, Cuv. *L. Pontchartr.*
„ gibbosus, Cuv. *Carol.*
„ solis, Cuv. *L. Pontchartr.*
„ Catesbei, Cuv. *Penns.*
Bryttus punctatus, Cuv. *Ohio.*
„ reticulatus, Cuv. *Carol.*
„ unicolor, Cuv. *Carol. Penns.*
Ichthelis cyanella, Raf. *Ohio.*
„ *melanops*, Id. *Ohio.*
„ *erythrops*, Id. *Ohio.*
„ *aurita*, Id. *Ohio.*
„ *megalotis*, Id. *Ohio.*
Pomoxis annularis, Id. *Ohio.*
Aplocentris calliops, Raf. *Ohio.*
Lepibema chrysops, Raf. *Ohio.*
Aphrodederus gibbosus, Lesueur. *L. Pontch. Penns.*
Trichodon Stelleri, Cuv. *Unalasch.* Gilliams.
Holocentrum longipinne, Cuv. *Braz.—Carol.*
Uranoscopus anoplos, Cuv. *Massach.* Smith.
Sphyræna barracuda, Cuv. *Bahamas.*
Polynemus tridigitatus, Cuv. *New Y.* Mitch.
„ approximans, Benn. *San Blas.*
Upeneus punctatus, Cuv. *Caribb. s. Mex.*

Fam. Cottoideæ.

Trigla pini*, Bl. *New Y. Europe.*
Prionotus strigatus, Cuv. *N. York.*
„ carolinus, Cuv. *N. York. Massach.*
„ tribulus, Cuv. *N. York.—Carol.*
Dactylopterus volitans*, Lac. *G. of Mex. Newfound.*
Cottus cognatus, *F. B. A. Arct. Am.—Greenl.?*
„ *gobio*?* Smith. *Massach.*
„ *quadricornis?* Id. *Do.*
„ polaris, Sabine, *Parry's Is.* 75N°.
„ *hexacornis*, *F.B.A.* Polar sea.
„ octodecim spinosus, Mitch. *Virg.—N. York.*
„ groenlandicus, *F.B.A.* 95, 2. *Newf.—Greenl.*
„ polyacanthocephalus, Pall. *Cape St. Elias.* 60° N.
„ scorpioides, Fabr, *Greenl.*
„ *Mitchilli*, Cuv. *N. York.*
„ *æneus*, Mitch. *N. York.*
„ porosus, Cuv. *Baffin's Bay.*
„ pistilliger, Cuv. *Unalaschka.*
Aspidophorus europæus*, Cuv. *Greenl. Mass.* Smith.
Aspidophorus accipenserinus, Cuv. *Unalaschka.*
„ monopterygius, Cuv. *Greenl.*
Hemitripterus americanus, Cuv. *N. York.—Newf.*
Hemilepidotus Tilesii, Cuv. *Unalasch.—Ochotsk.*
„ asper, *F.B.A.* 95, 1. *Columbia R.*
Temnistia ventricosa, Esch. 13. *Norfolk sound Pacif.*
Scorpæna porcus*, L. *N. York.—Europe.*
„ bufo, Cuv. *Braz.—Newf.* Aud.
Sebastes norvegicus*, Cuv. *Newf.—Greenl.*
„ variabilis, Cuv. *Unalasch.*
Blepsias trilobus, Cuv. *N. W. Coast.*
Gasterosteus concinnus, *F.B.A. Arctic Am.*
„ noveboracensis, Cuv. *New Y.*
„ niger, Cuv. *Newf.*
„ biaculeatus, Penn. *New Y.*
„ occidentalis, Cuv. *Newf.*
„ quadracus, Mitch. *N. York.*
„ apeltes, Lesueur, *U. St.*
„ *kakilisak*, Fabr. *Greenl.*

Fam. Sciænoideæ.

Otolithus regalis, Cuv. *Carrib. s.—N. York.*
„ Drummondii, *F.B.A. Texas.*
„ carolinensis, Cuv. *Carol.*
Corvina argyroleuca, Cuv.
„ Richardsonii, *F.B.A.77. L.Huron.*
„ oscula, Cuv. *L. Ontario.*
„ grisea, Le Sueur, *Ac. Sc. Ph.* 2, 251. *Ohio.*
„ multifasciata, Id. *l. c. Florida.*
Lepomis pallida, Raf. *Ohio.*
„ *trifasciata*, Id. *Do.*
„ *flexuolaris*, Id. *Do.*
„ *salmonea*, Id. *Do.*
„ *notata*, Id. *Do.*
„ *ichtheloides*, Id. *Do.*
Leiostoma humeralis, Cuv. *Penns.—N. York.*
„ xanthurus. Cuv. *Carib.s.—Carol.*
Amblodon grunniens, Raf. *Ohio.*
Etheostoma calliura, Raf. *Ohio.*
„ *flabellata*, Id. *Ohio.*
„ *nigra*, Id. *Ohio.*
„ *blennioides*, Id. *Ohio.*
„ *caprodes*, Id. *Ohio.*
„ *fontinalis*, Id. *Ohio.*
Umbrina alburna, Cuv. *G. of Mex.—N. York.*
Pogonias chromis, Cuv. *Montiv.—N. York.*
„ fasciatus, Lacep. *N. York.*
Pogostoma leucops, Raf. *Ohio.*
Micropogon lineatus, Cuv. *Montiv.—N. York.*
„ *undulatus*, Cuv. *G. of Mex.*
Hæmulon arcuatum, Cuv. *Carol.*
„ chrysopteron, Cuv. *N. York.*
Pristipoma fasciatum, Cuv. *N. York.*
„ *rodo*, Cuv. *N. York.*
Lobotes surinamensis, Cuv. *Sur.—N. York.*

Fam. Sparoideæ.

Sargus ovis, Cuv. *G. of Mex.—N. York.*
„ rhomboides, Cuv. *Do. Do.*
Chrysophrys aculeata, Cat. 31, 2. *U. St.*
Pagrus argyrops, Cuv. *Carol. N. York.*
Dentex ———? Benn. *San Blas. Pacif.*

Fam. Mænoideæ.

Gerres aprion, Cuv. *Carib. s. Mex.—Carol.*

Fam. Chætodontoideæ.

Ephippus faber, Cuv. *N. York.*
„ gigas, Cuv. *Do.*
Holocanthus ciliaris, Lacep. *Mex. Carib. s.—Carol.*
Pimelepterus Boscii, Lacep. *Carol.*

Scomberoideæ.

Scomber grex*, } Mitch. *N. York. Mass.*
„ vernalis, }
„ *scomber*, Smith. *Massach.?*
*Thynnus vulgaris**, Cuv. *Mass.?* Smith.
Pelamys sarda, Cuv. *N. York.*
Cybium maculatum, Cuv. *Mex.—Mass.*
Trichiurus lepturus, Cuv. *Braz.—N. York.*
Xiphias gladius, Smith. *Mass.?*
Naucrates ductor*, Cuv. *N. York. Mass. —Eur.*
Elecate atlantica, Cuv. *Braz.—N. York.*
Trachinotus *glaucus*, Cuv. *Carib.s.—Mex.*
„ fusus, Cuv. *Braz.—N. York.* Mitch.
„ argenteus, Cuv. *N. York.*
„ pampanus, Cuv. *Mex.—Carol.*
Notacanthus nasus, Cuv. *Greenland.*
Caranx punctatus, Cuv. *Carib. s.—N. York.*
„ *chrysos*, Cuv. *Massach.?* Smith.
„ *fasciatus*, Cuv. *Mex.*
Argyreyosus vomer, Lacep. *Braz.—N. York.* 35°S.—45° N.
Vomer Brownii, Cuv. *Braz.—N. York.* 35° S.—45° N.
Seriola Boscii, Cuv. *Carolina.*
„ fasciata, Cuv. *Do.*
„ leiarcha, Cuv. *Penns.*
„ zonata, Cuv. *N. York.*
„ cosmopolita, Cuv. *Braz.—New York.*
„ *falcata*, Cuv. *Carib. s.—Mex.*

Seserinus alepidotus, Massach.? Smith.
Temnodon saltator*, Cuv. *Braz.—Mass. —Eur.*
Coryphæna Sueurii, Cuv. *Penns.*
Pteraclis carolinus, Cuv. *Carol.*
Rhombus longipinnis, Cuv. *Carol.—N. York.*
„ cryptosus, Cuv. *N. York.*
Zeus faber, Massach.? Smith.
*Lampris guttatus**, Retz. *Greenl.—Mass.?*

Fam. Acanthuroideæ.

Acanthurus phlebotomus, Cuv. *Carib. s. N. York.*
Acanthurus cæruleus, Cat. 2, 10, 1. *Bahamas.*

Fam. Atherinideæ.

Atherina carolina, Cuv. *Carol.*
„ Boscii, Cuv. *Do.*
„ mænidia, L. *N. York.*
„ *Humboldtiana*, Cuv. *Mex.*
Atherina vomerina, Cuv. *Mex.*
„ *mordax*, Mitch. *N. York.*
„ *viridescens*, Id. *Do.*

Fam. Mugiloideæ.

Mugil Plumieri, C. & V. *Braz.—New York.*
„ albula, L. *N. York.* Mitch. *Mass.* Smith.
Mugil petrosus, C. & V. *Braz.—G. of Mex. N. York.*
Mugil lineatus, Mitch. *N. York.*
„ ———? Benn. *San Blas.*

Fam. Gobioideæ.

Blennius geminatus, Wood. *Ac. Sc. Ph. Carol.*
„ punctatus, Wood. *l. c. Carol.*
Pholis carolinus, C. & V. *Carol.*
Chasmodes Bosquianus, C. & V. *N. York.* Mitch.
„ quadrifasciatus, Wood. *Ac. Sc. Ph. Baltimore.*
„ novemlineatus, Wood. *l. c. Carol.*
Clinus? hentz, Le Sueur. *Carol.*
Gunnellus vulgaris*, C. & V. *Greenl. Eur.*
„ mucronatus, C. & V. *N. York.*— Mitch.
„ punctatus, C. & V. *Newf.—Greenl.*
„ Fabricii, C. & V. *Greenl.—Fabr.*
„ anguillaris, C. & V. *Kamtsch.— N. W. Am.*
„ dolichogaster, C. & V. *Aleut. Isl.*
Gunnellus groenlandicus, C. & V. *Greenl.*
Zoarces labrosus, C. & V. *N. York.* Mitch.
„ fimbriatus, C. & V. *Do.* Id.
„ *Gronovii*, C. & V. *N. Am.*
„ *polaris**, Rich. *Polar seas.*
Anarhichas lupus*, L. *Greenl.—Eur.*
Gobius Boscii, Lac. *Carol. N. York.* Mitch.
Philyprinus dormitator, C. & V. *W. Ind.— Mex.*
Chirus monopterygius, Cuv. *Mem. Pet.* 2, 23, 1. *Unalasch.*
„ decagrammus, Cuv. *l. c.* 2, 22, 2. *C. St. Elias.*
„ octogrammus, Cuv. *l. c.* 2, 23, 2. *Aleut. Is.*
„ superciliosus, Cuv. *l. c.* 2, 23, 3. *Unalasch.*

Fam. Batrachoideæ.

Lophius americanus, C. & V. *Penns.— N. York.* Mitch.
Chironectes lævigatus, C. & V. *Carol.—N. York.* Mitch.
Malthæa vespertilio, C. & V. *Carib. s.— Newf.*
„ cubifrons†, *F. B. A.* 96. *Newf.*— Audub.
Malthæa notata, C. & V. *N. York.*
Batrachus tau, C. & V. *G. of Mex.—N. York.*
„ *Gronovii*, C. & V. *C. of America.*
„ *grunniens*, Schœpf. *N. York.*

† M. Valenciennes considers this species to be identical with one figured by Seba, and named by Cuvier *malthæa nasuta;* but I can scarcely conceive that it could be possible for any painter to err so far as to give a tapering snout to a fish like *cubifrons*, which has nothing like a snout at all, but merely a round tubercle, like a grain of shot in the middle of a square forehead.

Fam. Labroideæ.

Labrus americanus, Bl. *N. York.* Mitch. *Mass.* Sm.
„ *coricus*, Smith. *Mass.*
„ *pallidus*, Mitch. *N. York.*
„ *hiatula*, L. *Carol.* Garden.
Cheilinus radiatus, Bl. Schn. 56. *U. St.*
Lachnolaimus suillus, Cat. 2, 15. *Baham.*
Crenilabrus burgall, Mitch. 3, 2. *N. York.*
„ *merula*, Smith. *Massach.*
„ *exoletus*, L. ? *Greenl.* ? Fabr.
Xirichthys psittacus, Cuv. *Carol.*
„ lineatus, Cuv. *Do.*
Scarus Catesbei, Cat. 2, 29. *Bahamas.*
„ *cæruleus*, Cat. 2, 13. *Do.*

Fam. Fistularoideæ.

Fistularia tabacaria, Bl. 387, 1. *N. York. Mass.*
„ serrata, Cat. 2, 17. *Baham. U. S.*
Fistularia neo-choracensis, Mitch. 3, 8. *N. York.*

Percoideæ.—Of 500 species belonging to this family, which are described in the *Histoire des Poissons*, two-thirds inhabit the Indian Ocean, Red Sea, and warmer latitudes of the Pacific; 49 belong to the Mediterranean and eastern side of the North Atlantic, and 118 have been detected on the American side of that sea. The North American fauna embraces one-ninth of the species composing the family, all, with the slight exceptions we shall mention, peculiar to that country, not one of them ranging to Europe. The exceptions are *holocentrum longipinne*, which goes as far north on the American side as Carolina, but crosses the Atlantic within the tropics to Ascension and St. Helena; and *trichodon Stelleri*, which is found both on the Asiatic and American shores of the sea of Kamtschatka. The last-named fish is the most northerly of the known American *percoideæ;* and the *lucioperca Americana*, which inhabits fresh waters up to the 58th parallel, stands next to it in that respect. The *perca vulgaris* being an inhabitant of the Siberian rivers, which fall into the Icy sea, is one of the most northerly of the family, though the very nearly allied American species have not hitherto been detected in a higher latitude than the 45th. With respect to the *distribution of generic forms*, Europe nourishes nine, which are not known to exist in North America, viz. *lates, apogon, pomatomus, aspro, acerina, polyprion, trachinus, sphyræna*, and *paralepis;* and North America ten, which are not found in Europe, viz. *huro, centropristes, grystes, centrarchus, pomotis, bryttus, aphrodederus, trichodon, holocentrum*, and *polynemus*, besides the doubtful genera proposed by M. Rafinesque: only five are common to the two faunæ, viz. *perca, labrax, lucioperca, serranus* and *uranoscopus*. *Grystes*, containing only two described species, forms another link connecting the American and Australian faunæ; one of the species

inhabiting the rivers of Carolina, and the other those of New South Wales. There is a greater variety of forms, as well as a greater number of species of fresh water percoideæ in North America than in any other quarter of the globe; indeed no other quarter possesses such an extent of fresh waters.

Cottoideæ.—This being a more northern family than the preceding one, we find, as in the higher orders of animals, a greater proportion of its generic forms common to the New and Old World;—the condition of the waters as well as of the land and atmosphere of the arctic regions of the two hemispheres is more alike than in the more temperate parallels. *Prionotus* and *hemitripterus* are the only two cottoid genera which frequent the Atlantic coasts of America, and do not also occur in Europe. On the north-west coast, however, there are three genera which are unknown in the European seas, viz. *hemilepidotus*, *blepsias*, and *temnistia*. The Mediterranean produces *peristedion* and *hoplostethus*, of which no species has been detected on the American coast. Five genera are common to both sides of the North Atlantic, as are also several species, viz. *trigla pini*, *dactylopterus volitans*, *aspidophorus europæus*, *scorpæna porcus*, and *sebastes norvegicus*, all marine fish; there are moreover some fresh water *cotti* and *gasterostei* in America, which are with great difficulty distinguishable from their European representatives. The family contains in all about 170 species, of which one-fifth are North American, and between one-fifth and one-sixth European.

Sciænoideæ.—The fish of this family, more closely related to the *percoideæ* by external form than the preceding, are also intimately connected with them by internal structure. The *sciænoideæ* are more American than either of the preceding families, one-third of the genera being proper to the Atlantic coast of that continent, and several of the remaining genera being represented there by one or more species. There are also four or five times as many species in the North American seas as in Europe; while the intertropical seas nourish four-fifths of the whole family. None are common to both sides of the Atlantic. Several of the American *sciænoideæ* make a remarkable grunting noise in the water, which is thought by Cuvier to be connected with the cavernous recesses in the skulls of fish of this family. The noise made by several of the *cottoideæ* when handled is evidently produced by the sudden escape of a quantity of air from their distended branchial membranes. The total number of ascertained species of the family is about 260.

Sparoideæ.—This family, of which 150 species are known,

has few representatives in North America, their number not exceeding one-thirtieth of the whole, while the European seas nourish nearly one-fifth; the majority of the species, as in most other acanthopterygian families, belong to the Indian and South Seas.

Mænoideæ.—Of this very small family, comprising only 42 species, about one half belong to the Indian and Polynesian seas, one fourth frequent the seas of Europe, and only one species, *gerres aprion*, has been detected on the shores of Carolina, to which it ranges from between the tropics.

Chætodontoideæ.—This family, named also *squammipennæ*, contains about 150 species, of which the greater part are inhabitants of the Indian and Polynesian seas. One species only (*brama Raii*) frequents the European coasts, while four are North American, and one seventh of the whole exist on the Atlantic coasts of North and South America. The *pempheris mexicanus* is found at Acapulco; the remaining species of that genus inhabit the tropical, Pacific, and Indian oceans.

The next family in Cuvier's arrangement is that of the *anabasideæ* or *polyacanthoideæ*, containing only 40 species, all of which belong to Southern Asia, except a *spirobranchus*, which inhabits the rivers of the Cape of Good Hope.

The preceding acanthopterygian families, with the addition of the *fistularoideæ*, hereafter mentioned, and the *platessoideæ*, anged by Cuvier with the *malacopterygii*, constitute Agassiz's order Ctenoidei, so named from the pectinated laminæ of their scales. About 1400 recent ctenoideans have been described.

Scomberoideæ.—This family, included by Agassiz in his order Cycloidei, is, next to the *percoideæ*, the most numerous of Cuvier's *acanthopterygii*, the described species amounting to more than 320. The *scomberoideæ*, more than any other group of fish of equal magnitude, affect the surface of the ocean especially in the warm latitudes, and a considerable number of the species roam from one side of the Atlantic to the other, among which are the *scomber grex*, *pelamys sarda*, *trichiurus lepturus*, *elecate atlantica*, *lichia glauca*, *caranx carangus*, and *nomeus Mauritii*. Of sixteen genera, actually ascertained to be North American, only seven enter the European fauna, viz., *scomber*, *pelamys*, *naucrates*, *caranx*, *seriola*, *temnodon*, and *coryphæna*; but five of the remainder occur also on the African shores of the Atlantic, viz., *cybium*, *trichiurus*, *elecate*, *trachinotus*, *temnodon*, and *vomer*, leaving only two of the North American genera peculiar to the western side of the Atlantic, viz., *argyryosus* and *rhombus*. The forms peculiar to

Europe are, *lepidopus*, *astrodermus*, *luvarus*, *seserinus*, and perhaps *lampris*; while its seas nourish also *thynnus*, *auxis*, *xiphias*, *tetrapturus*, *lichia*, *mastacemblus*, *scyris*, *gallichthys*, *lampugus*, *centrolophus*, *stromateus*, and *zeus*, common to other seas, and some of these to tropical America. Two or three of these are enumerated by Dr. Smith in his list of Massachusetts fish; but as he has not given any details by which we can judge of the correctness of his nomenclature, they are put in italics in the foregoing table. *Scomber grex* and *temnodon saltator* have a most extensive range from the Cape of Good Hope across the Atlantic to the coasts of the United States. The latter is also known eastward to Madagascar and along the whole western coast of Africa to the Mediterranean and Egypt, while the former is scarcely distinguishable from the Mediterranean *scomber pneumatophorus*. There are several of the *scomberoideæ* which, inhabiting only the middle longitudes of the Atlantic, belong as much to the New as to the Old World: they pursue the flying-fish over the Atlantic wastes as the herds of wolves do the bison on the prairies of America.

Acanthuroideæ.—Of this family about ninety species are known, inhabiting the warmer districts of the ocean and feeding on fuci, being furnished with cutting-teeth instead of prehensile ones, like those of most other fish. Except three species which frequent the Caribbean Sea, the family belongs to the Polynesian and Indian oceans and the Red Sea; one species follows the gulf-stream to New York, another reaches the Bahamas: none visit Europe.

Atherina.—This isolated genus contains about thirty species, of which six or seven are European, and five, exclusive of two or three doubtful ones, have been described as North American, but none are common to both sides of the Atlantic.

Mugiloideæ.—Of four generic forms which belong to this family, three are peculiar to the intertropical seas, while the typical one, *mugil*, is known in all the temperate as well as in the warmer districts of the ocean. None of the species cross the Atlantic, but some of them have a considerable range coastways; thus, two of the American mullets extend from the Brazils to New York, while the *mugil capito* ranges from Norway to the Mediterranean. The genus contains fifty-three described species, the whole family about sixty; several are confined to fresh waters.

Gobioides.—This family contains nearly 300 species, of which about one half are inhabitants of the Indian and Polynesian seas; sixty exist in the European waters, and eighteen or nineteen on the American side of the northern Atlantic,

there being only forty-two known on the whole eastern coast of both North and South America. The North American and European genera are mostly the same; yet among the former we have *chasmodes* and *philyprinus* which range from within the tropics to the United States, but do not visit Europe; while *tripterygion* and *calliomymus* of the Mediterranean and British Channel are unknown in the American seas. The only species perhaps common to both countries are those which frequent the Greenland seas. Dr. Smith, indeed, enumerates *anarrhichas lupus* among the fish of Massachusetts, but his determination of the species must be considered as doubtful until we have some evidence of a proper comparison having been instituted between American and European examples. The *gunnellus vulgaris* is also described as a Labrador fish in the *Fauna Boreali-Americana*, on the authority of a single injured specimen which differed slightly from the English fish. *Zoarces polaris*, according to Capt. James Ross, is the most northern known fish, having been taken on the ice to the north of Spitzbergen, or within nine degrees of the pole; it ranges westward to Regent's Inlet.

Batrachoideæ.—The only species of this family which exists in Europe is the well known *lophius piscatorius*, while the North American seas contain four out of five of the generic forms and seven or more species, there being about fifty in the family. Sixteen belong to the Caribbean Sea and South American Atlantic, and the comparatively small proportion of fifteen have been detected in the Indian and Polynesian seas.

Labroideæ.—As the publication of the *Histoire des Poissons*, the only trustworthy guide for general ichthyology, has advanced no further than the *batrachoideæ*, our observations on the succeeding families must necessarily be imperfect, and we shall therefore make them as brief as possible; indeed, our American lists cannot be otherwise than very defective, being founded on Cuvier's notes in the *Règne Animal*, relating almost solely to figured species. We have ventured to enumerate only thirteen *labroideæ* as inhabitants of the North American seas, and the nomenclature of fully one half of these is doubtful. The European seas nourish about fifty species belonging to the genera *labrus*, *julis*, *crenilabrus*, *coricus*, *xirichthys*, *chromis*, and *scarus*.

Fistularoideæ.—The members of this small family are mostly denizens of the warmer seas. One species only is well known as European, viz., the *centriscus scolopax*, which is common enough in the Mediterranean, but rare in the Atlantic, though it has been found as far north as Mount's Bay. This family

closes the list of Cuvier's acanthopterygian fishes. The total number of described species belonging to the order amounts nearly to 2400.

Ord. MALACOPTERYGII ABDOMINALES.

Fam. CYPRINOIDEÆ.

Barbus, spec. novæ, Cuv. *Reg. An.*
Abramis balteatus, *F.B.A.* 3. 301. *Columb. R.*
„ *Smithii*, Id. 3. 110. *St. Lawrence.*
„ *chrysopterus*, Smith, *Massach.*
Labeo cyprinus, Le Sueur, *Ac. Sc. Ph.*
„ maxilingua, Id. *l. c. Maryland.*
„ ? *macropterus*, Raf. *Ac. Sc. Ph.* 1.
„ ? *annulatus*, Id. *l. c.* 17. 4. *N. York.*
„ ? *nigrescens*, Id. *l. c. L. Champl.*
Catastomus gibbosus, Le Sueur, *l. c. Connect. R.*
„ tuberculatus, Id. *l. c. Penns.*
„ macrolepidotus, Id. *Delaware R.*
„ aureolus, Id. *L. Erie.*
„ communis, Id. *Delaware R.*
„ longirostris, Id. *Vermont.*
„ nigricans, Id. *L. Erie.*
„ maculosus, Id. *Maryland.*
„ elongatus, Id. *Ohio.*
„ vittatus, Id. *Penns.*
„ Dusquesnii, Id. *Ohio.*
„ Bostoniensis, Id. *N. Engl.*
„ oblongus, Id. *N. York.*
„ sucetta, Id. *S. Carol.*
„ teres, Lacep. v. 15. 2. *N. York.*
„ Hudsonius, Forst. *Ph. Tr.* 63. 6. *F.B.A* 46° N.—68° N.
„ Forsterianus, *F.B.A.* Back's *Voy. fig.* 48° N.—68° N.
„ reticulatus, Id. Back's *Voy. fig.* 40° N.—50° N.
„ *anisurus*, Raf. *Ohio.*
„ *anisopterus*, Id. *do.*
„ *bubalus*, Id. *do.*
„ *niger*, Id. *do.*
„ *carpio*, Id. *do.*
„ *velifer*, Id. *do.*
„ *xanthopus*, Id. *do.*
„ *melanops*, Id. *do.*
„ *melanotus*, Id. *do.*
„ *fasciolaris*, Id. *do.*
„ *erythrurus*, Id. *do.*
„ *flexuosus*, Id. *do.*
„ *megastomus*, Id. *do.*
Cycleptes nigrescens, Raf. *Ohio.*
Leuciscus gracilis, *F.B.A.* 78. *Saskat. R.*
„ chrysoleucus, Mitch. 40° N.—46° N.
„ caurinus, *F.B.A.* 3. 304. *Columb.*
„ oregonensis, Id. 3. 305. *do.*
„ *species novæ*, Cuv. *Reg. An.*
„ *atronasus*, Mitch. *N. York. Mass.*
Semotilus dorsalis, Raf. *Ohio.*
„ *cephalus*, Id. *do.*
„ *diplemia*, Id. *do.*
„ *notatus*, Id. *do.*
Minnilus dinemus, Id. *do.*
„ *notatus*, Id. *do.*
„ *microstomus*, Id. *do.*
Luxilus erythrogaster, Id. *do.*
„ *chrysocephalus*, Id. *do.*
„ *Kentuckiensis*, Id. *do.*
„ *interruptus*, Id. *do.*
Rutilus plargyrus, Id. *do.*
„ *compressus*, Id. *do.*
„ *amblops*, Id. *do.*
„ *melanurus*, Id. *do.*
„ *anomalus*, Id. *do.*
„ *ruber*, Id. *do.*
Pimephales promelas, Id. *do.*
Hypentelium macropterum, Id. *do.*
Hydrargyra diaphana, Le Sueur, *Ac. Sc. Ph. Saratoga lake.*
„ *multifasciata*, Id. *l. c. do.*
„ *ornata*, Id. *l. c. Delaware R.*
„ *nigrofasciata*, Id. *l. c. Rhode Is.*
Pœcilia multilineata, Le Sueur, *l. c. Florida.*
„ Schneideri, Valenc. *Obs. Zool.*
Lebias ellipsoidea, Le Sueur, *l. c. Arkansas R.*
Fundulus fasciatus, Valenc. *l. c. N. York.*
„ cœnicolus, Id. *l. c. N. York.*
Molinesia latipinna, Le Sueur, *l. c. N. Orleans.*
Cyprinodon flavulus, Valenc. *l. c. N. York.*
„ ovinus, Mitch. *N. York.*

Fam. Esocidæ.

Esox lucius*, *L.* 38° N.—68° N. East of Rocky M. only.
„ estor, Le Sueur, *Ac. Sc. Ph. L. Erie & Huron.*
„ reticulatus, Id. *l. c. Connect. R.*
„ phaleratus, Id. *l. c. Florida.*
„ niger, Id. *l. c. L. Saratoga.*
„ *vittatus*, Raf. *Ohio.*
„ *salmoneus*, Id. *do.*
Belone —? Smith, *Massach.*
Scomberesox equirostris, Le Sueur, *Massach.*
Scomberesox scutellatus, Le Sueur, *Newfoundland.*
Sarchirus vittatus, Raf. *Ohio.*
„ *argenteus*, Id. *do.*
Exocœtus exiliens, Bl. 397. *Trop. seas.—N Y. & Pacif.*
„ furcatus, Mitch. *G. of Mex.—N. York.*
„ comatus, Id. *N. York.*
„ mesogaster, Id. *do.—Massach.* Smith.
„ volitans, Bl. 398. *Trop. seas, Atl. & Pacif.*—30° N.

Fam. Siluroideæ.

Bagrus marinus, Mitch. *N. York.*
„ ? *hornpout*, Smith, *Massach.*—?
„ —? Benn. *Mazatl. Pacif.*
Pimelodus catus, Cat. 2, 23. *U. S.*
„ albidus, Le Sueur, *Mem. Mus. U. S.*
„ nebulosus, Id. *l. c. do.*
„ æneus, Id. *l. c. do.*
„ cauda furcata, Id. *l. c. do.*
„ nigricans, Id. *L. Erie.*
„ natalis, Id. *U. S.*
„ insigne, Id. *U. S.*
„ cænosus, *F.B.A.* 3, 122. *L. Huron.*
„ *borealis*, Id. *Saskatch. R.*
„ *maculatus*, Raf. *Ohio.*
Pimelodus cærulescens, Raf. *Ohio.*
„ *pallidus*, Id. *do.*
„ *argyrus*, Id. *do.*
„ *viscosus*, Id. *do.*
„ *nebulosus*, Id. *do.*
„ *cupreus*, Id. *do.*
„ *lividus*, Id. *do.*
„ *melas*, Id. *do.*
„ *xanthocephalus*, Id. *do.*
„ *limosus*, Id. *do.*
Pylodictis limosus, Id. *do.*
Noturus flavus, Id. *do.*
Doras costatus, Cat. *Sup.* 9. *U. S.*
Callichthys —? Bl. 397, 1. *do.*
Aspredo lævis, Seba, 29, 9, 10. *do.*

Fam. Salmonoideæ.

Salmo salar*, *F.B.A. Connect. R.* to *Labr.*
„ Scouleri, Id. 93. *New Caled.*
„ Rossii, Id. 80, 85, 2. *Arct. sea.*
„ *Hearnii*, Id. *do.*
„ alipes, Id. 81, 86, 1. *do.*
„ nitidus, Id. 82, 1. 86, 2. 52° N.—72° N.
„ Hoodii, Id. 82, 2. 83, 2. 87, 1. 52° N.—72° N.
„ fontinalis, Id. 82, 1. 87, 2. *N. York.—L. Huron.*
„ namaycush, Id. 79, 85, 1. 44° N.—68° N.
„ *quinnat*, Id. *Columb. R.*
„ *Gairdneri*, Id. *do.*
„ *paucidens*, Id. *do.*
„ *tsuppitch*, Id. *do.*
„ *Clarkii*, Id. *do.*
„ *carpio*, Fabr. *Grecnl.*
„ *alpinus*, Id. *do.*
„ *stagnalis*, Id. *do.*
„ *rivalis*, Id. *do.*
„ *alleghaniensis*, Raf. *Ohio.*
Salmo nigrescens, Raf. *Ohio.*
Stenodus Mackenzii, *F.B.A.* 84, 94, 1. Back's *voy. Mack. R.*
*Osmerus eperlanus**, Arted. *Massach.—St. Lawr.*
Mallotus villosus, Cuv. *Arct. S.—Newf. & Kamtsch.*
„ pacificus, *F.B.A. Columb. R.*
Coregonus albus, Id. 89, 2. 94, 2. 44° N.—72° N.
„ tullibee, Id. 50° N.—54° N.
„ Artedi, Le Sueur, *Ac. Sc. Ph. L. Erie.*
„ lucidus, *F.B.A.* 90, 1. *Gr. Bear L.*
„ harengus, Id. 90, 2. *L. Huron.*
„ quadrilateralis, Id. 89, 1. 60° N.—72° N.
„ labradoricus, Id. *G. of St. Lawrence.*
Thymallus signifer, *F.B.A.* 88. 62° N.—68° N.
„ *thymalloides*, Id. *lat.* 64½° N.
Saurus mexicanus, Cuv. *L. of Mex.*

Fam. Clupeoideæ.

Clupea *harengus**, Auct. 40° N.—75° N. *Pacif. Atl. & Arct. Seas.*
„ *humeralis*, Cuv. *G. of Mex.*
„ fasciata, Le Sueur, *Ac. Sc. Ph. Penns.*
„ elongata, Id. *Marble head.*
„ *halec*, Mitch. *N. York.*
„ *pusilla*, Id. *do.*
„ *parvula*, Id. *do.*
„ *indigena*, Id. *do.*
„ *vittata*, Id. *do.*
„ *cærulea*, Id. *do.*
Alosa vernalis, Mitch. v. 9. *N. York, Mass.*
„ æstivalis, Id. *N. York.*
„ menhaden, Id. v. 7. *do. Massach.*
„ matowaka, Id. v. 8. *do.*
„ *alosa**, Id. *N. York. Mass.*
„ *mediocris*, Id. *do.*
„ *minima*, Smith, *Massach.*
Pomolobus chrysochloris, Raf. *Ohio.*
Dorosoma notata, Raf. *Ohio.*
Notemigonus auratus, Id. *do.*
Chatoëssus oglina, Le Sueur, *Ac. Sc. Ph. Rhode Is.*
„ Cepedianus, Id. *l. c. Pennsylv.*
„ *thrissa*, Cuv. *G. of Mex.*
„ *notata*, Id. *do.*
Engraulis sadina, Mitch. *N. York.*
„ *encrasicholus**, Bl. 302. *Greenl.* Fabr.
„ *edentulus*, Cuv. *G. of Mex.*
Elops saurus, Lacep. v. 398. *W. Ind.—Carol. Calif.* Benn.
Butirinus vulpes, Cat. 1, 2. *Braz.—U. S.*
Hiodon tergisus, Le Sueur, *l. c. L. Erie. Ohio.*
„ clodalis, Id. *Ohio.*
„ *chrysopsis, F.B.A.* 91, 3. 52° N. —54° N.
„ *vernalis*, Raf. *do.*
„ *heterurus*, Id. *do.*
„ *alosoides*, Id. *do.*
Amia calva, Bl. Schn. 80. *Carol.*
„ *ocellicauda, F.B.A. L. Huron.*

Fam. Sauroideæ. (Agassiz.)

Lepisosteus osseus, L. *U. S.*
„ huronensis, *F.B.A. L. Huron.*
„ gracilis, Agass. *Zool. Pr.*
„ *longirostris*, Raf. *Ohio.*
„ *oxyurus*, Id. *do.*
Lepisosteus albus, Raf. *Ohio.*
„ *platostomus*, Id. *do.*
„ *ferox*, Id. *do.*
„ spatula, Lacep. 5, 6, 2. *Ohio.*
Litholepis adamantinus, ? Raf. *Ohio.*

The second division of the fish, according to Cuvier's arrangement, or the Malacopterygii, includes the bulk of Agassiz's Cycloidei, together with some families belonging to the other orders of the latter naturalist, as the *siluroidei* and *sauroidei* which rank with his Ganoidei, and the *platessoideæ* or *pleuronectoideæ* which he places among his Ctenoideæ: on the other hand, we have already noticed that Agassiz's Ctenoideæ include the *scomberoideæ, atherinæ, mugiloideæ*, and *labroideæ*, considered by Cuvier as Acanthopterygians.

The Malacopterygii abdominales embrace the greater part of the fresh water fish, and though few species are common to Europe and North America, there is much similarity between the generic forms existing in the waters of the two continents. As the lakes and rivers, however, occupy more space in proportion to the land in North America than in any other quarter of the world, so the number and variety of fresh water fish is greater than in Europe, or any other extra-tropical country.

Cyprinoideæ.—Europe nourishes 32 species of this family: it possesses, in common with America, the forms of *barbus*, *abramis*, and *leuciscus*; *labeo*, existing in the Nile, is also American; *cyprinus*, *gobio*, *tinca*, and *cobitis*, which are European, have not yet been proved to exist on the other side of the Atlantic: while North America possesses *catastomus*, *hydrargyra*, *pœcilia*, *lebias*, *fundulus*, *molinesia* and *cyprinodon*, unknown to European waters, besides the uncertain genera proposed by M. Rafinesque.

Esocidæ.—The fresh waters of America contain a greater number of species of this family than those of Europe, the only one in fact in the latter country being the common pike or *esox lucius*, which exists also abundantly in North America, though it is confined to the eastern side of the Rocky Mountains. North Africa is more productive, the Nile producing many *mormyri*, and the Mediterranean yielding a single species each of *alocephalus*, *microstoma*, *stomias*, and *chauliodus*, forms which have not been detected on the western side of the Atlantic. *Belone*, *scomberesox* and *exocœtus*, are common to both sides of that sea, and it is highly probable that some of the *hemiramphi* of the Caribbean sea may follow the gulf stream further north: one was taken this year on the coast of Cornwall*.

Siluroideæ.—Though a considerable number of fish of this family have been already discovered in North America only one is known in Europe, viz., the *silurus glanis*, which inhabits the rivers of Europe as far north as Sweden and Norway, as well as those of Asia and North Africa. The *pimelodus borealis*, the most northerly of the family in America, goes no higher than the 54th parallel. The waters of Egypt nourish many species of *silurus*, *schilbus*, *bagrus*, *pimelodus*, *synodontis*, *clarias*, and *malapterurus*.

Salmonoideæ.—Upwards of thirty described species of this family belong to Europe, which possesses all the generic forms mentioned in our North American list, with the exception of *stenodus*†, and the addition of *argentina* and *scopelus*, found in the Mediterranean. Egypt produces two or three other forms, one of them, *mylctes*, being common also to tropical America. Some of the *salmonoideæ* are the most northerly of fresh water fish. Several of the trouts of North-west America are probably identical with Kamtschatka species, to which other names had been previously given. This point, with many others, will

* Yarrell, *Br. Fishes*, p. 397.

† This genus or sub-genus, which differs from the other *salmones* in the teeth, was first named in the Appendix to Captain Back's narrative of his journey to the mouth of the Thleweechoh.

doubtless be cleared up in the ensuing volumes of the *Histoire des Poissons*. The identity of the *salmo salar* itself on both sides of the Atlantic has not been satisfactorily settled, and some interesting facts in the history of the fish as an inhabitant of Lake Ontario require to be ascertained; for instance, whether it descends to the sea after spawning, or whether, like the salmon of Lakes Wenern and Wettern, in Sweden, it passes its whole life in fresh water†, recruiting in the depths of the lake, and spawning in the feeding streams. The truth of the report, that none of the salmon which ascend the Columbia, or the rivers of New Caledonia, return again to the sea, deserves to be inquired into:—the same thing has been asserted of the salmon of Northern Asia.

Clupeoideæ.—This family is also more numerous in North America than in Europe, the latter country yielding only nine or ten species belonging to the genera *clupea*, *alosa*, and *engraulis*. *Hiodon*, a genus peculiar to America, has much affinity to the *salmonoideæ*.

Sauroideæ.—This family contains only two existing genera, *lepisosteus*, peculiar to America, and *polypterus* to Africa‡.

Ord. MALACOPTERYGII SUB-BRACHIALES.

Fam. Gadoideæ.

Gadus morrhua*, L. *Polar s. Newf. N. York. S. of Kamtsch.*
„ *callarias**, L. *N. York*, Mitch. *Greenl.* Fabr.
„ *rupestris*, Smith, *N. York. Massach.*
„ *arenosus*, Id. *do. do.*
„ *tomcodus*, Mitch. *do. do.* Smith.
„ *æglefinus*, Penn. *do.* Mitch.
„ *fasciatus*, Id. *do.* Mitch. *Massach.* Sm.
„ *blennoides*, Mitch. *do.*
„ *barbatus**, Bl. 166. *Massach.* Sm.
„ *Fabricii*, *F.B.A. Greenl.* Fabr.
„ *ogac*, Id. *Greenl.* Fabr.
„ *luscus**, Penn. *S. of Kamtsch.* Tiles.
„ macrocephalus, Tiles. *M. Petr.* 2, 16. *S. of Kamts.*
„ gracilis, Id. 18. *do.*
Merlangus carbonarius*, Bl. 66. *Davis' S. Pacif.*
Merlangus polaris, Sabine, *Parry's App. Polar s. Spitz.*
„ *vulgaris**, Smith, *Massach.*
„ *albidus*, Mitch. *N. York.*
„ *purpureus*, Id. *do.*
„ *pollachius**, Smith, *Massach.*
Merluccius asellus*, Bl. 164. *N. York.—Newf.*
Lota maculosa, Le Sueur, *Ac. Sc. Ph. L. Erie.*—68° N.
„ compressa, Id. *l. c. Connect. R.*
Brosmius flavescens, Id. *M. Mus.* 5, 16.2. *Newf.*
„ *vulgaris**, Penn. *Massach.* Smith.
„ *lub**, *Mem. Stockh.* 15,8. *Greenl.*
Phycis chuss, Schœpf. *N. York.*
„ *tenuis*, Mitch. *N. York.*
„ *punctatus*, Id. *F.B.A.* 3, 253. *N. York, Nova Scotia.*
Raniceps blennoides, Smith, *Massach.*
Macrourus rupestris*, Bl. 26. *Greenl. North s.*

† Nilsson, *Pisces Scand.*

‡ The Ganoidei of Agassiz are composed of the *sauroideæ*, *lepidoideæ* (fossil), *pycnodontes*, *plectognathi*, *lophobranchii*, *goniodontes*, *siluroideæ*, and *sturionideæ*.

Fam. Pleuronectoideæ.

Platessa plana, Mitch. *N. York.*
„ stellata, Pall. *Polar s. S. of Kamtsch.*
„ *dentata*, L. *N. York*, Schœpf.
„ *americana*, Schœpf. *Rhode Is.*
„ *melanogaster*, Mitch. *N. York.*
„ *oblonga*, Id. *do.*
*Hippoglossus communis**, Bl. 47. *N. York. Mass.* Sm. *Pacif.* Eschscholtz.
Rhombus argus, Cat. 27. *Bahamas. U.St.*
„ *glacialis*, Pall. *Awatska. Polar s.*
„ *maximus**, Smith, *Massach.*
„ *aquosus*, Mitch. *N. York.*
*Solea vulgaris**, Penn. *Massach.* Smith.
Achirus lineatus, Sloane, 346, *Carib. s. N. York.* Mitch.
„ plagiurus, L. *Carib. s.—Carol.*

Fam. Discoboli.

*Cyclopterus lumpus**, Bl. 90. *N. York.—Greenl. Eur.*
„ *minutus*, Pall. *Mass.* Smith.—*Greenl.* Ross.
Cyclopterus spinosus, Fabr. *Greenl.*
„ *ventricosus*, Pall. *S. of Kamtsch.*
*Liparis communis**, Artedi, *Eur. Polar s.*
„ *gelatinosus*, Pall. *S. of Kamtsch.*

Fam. Echeneideæ.

Echeneis remora*, Bl. 172. *N. York. Mass. Pacif.*
„ naucrates*, Id. 171. *Massach. Newf. Pacif.*
Echeneis species aliæ, U. S. Pacif. Benn.

Malacopterygii sub-brachiales.—Most of the fish of this order feed on or near the bottom, and a very considerable number of the species are common to both sides of the Atlantic, particularly in the higher latitudes, where they abound. It does not appear that their general diffusion ought to be attributed to migration from their native haunts, but rather that in this respect they are analogous to the owls, which, though mostly stationary birds, yet include a greater proportion of species common to the Old and New Worlds than even the most migratory families. Several of the *scomberoideæ* which feed on the surface have been previously noted as traversing many degrees of longitude in the Atlantic, but the existence of the ground-feeding *gadoideæ* in very distant localities must be attributed to a different cause, as it is not probable that any of them wander out of soundings, or ever approach the mid-seas.

Gadoideæ.—About twenty-one species of this family frequent the European seas, most of which, and all the generic forms, have been enumerated by authors as existing also on the North American coast. More exact comparisons will probably diminish the number of species supposed to be common to the two countries, but still a sufficient number will remain to justify the preceding remarks.

Pleuronectoideæ.—Upwards of thirty-six species of flat-fish belong to Europe, two or three of which, and all the generic forms, except *monochir*, occur in the lists of American ichthyo-

logists. Many more will doubtless be detected hereafter on the coasts of Nova Scotia, Newfoundland, and Labrador.

Discoboli.—About eight species of this family, belonging to the genera *lepadogaster, gobiesox, cyclopterus*, and *liparis* have been described as European. The American *discoboli* are almost entirely unknown.

Echeneideæ.—The singular fish belonging to this family, though they swim rapidly for a short time, do not appear capable of long-continued exertion. The necessity for this is indeed obviated by the adhesive apparatus on the head, by which they can attach themselves to the larger fishes, and especially to the sharks. In this way they are carried about, and are always at hand to feed on any morsels that may be detached when the monster closes his saw-like teeth on his prey. They also stick to the bottoms of ships, being attracted by the greasy washings of the coppers thrown overboard by the cook, and thus they are often carried beyond the warmer seas in which they are produced. The two species which are best known have been taken on both sides of the Atlantic, as well as in the Pacific. They range occasionally northwards to England and the banks of Newfoundland.

Ord. MALACOPTERYGII APODES.

Fam. Anguilliformes.

Muræna rostrata, Le Sueur, *L. Cayuga* and *Seneka.*
„ bostoniensis, Id. *Massach.*
„ serpentina, Id. *Long. Is.*
„ argentea, Id. *Boston Bay.*
„ macrocephala, Id. *Saratoga.*
„ *vulgaris**, Smith, *Mass. N. York.* Mit.
„ *conger**, Mitch. *Surinam, do. do.*
„ *oceanica*, Id. *N. York.*
„ *laticauda*, Raf. *Ohio.*
„ *aterrima*, Id. *do.*
Muræna xanthomelas, Raf. *Ohio.*
„ *lutea*, Id. *do.*
„ *helæna*, Cat. 20. *Bahamas.*
Murænophis moringa, Cat. 21. *do.*
„ *meleagris*, Mitch. *U. S.*
Saccopharynx ampullaceus, Harwood, *Ph. Tr. Davis' Straits.*
„ chordatus, Mitch. 52° *N. lat.*
Ammodytes lancea*, Cuv. *Greenl.* Fabr.
„ *tobianus**, Penn. *N. York. Newf.*
Ophidium *stigma*, Benn. *Kotzebue Sound.*

Anguilliformes.—From 25 to 30 species belonging to the single family forming this order have been detected in the European Seas. They are arranged by Cuvier in the genera *anguilla, conger, ophisurus, muræna, sphagebranchus, leptocephalus, ophidium* and *ammodytes*. The Nile supports another generic form named *gymnarchus*. One of the species of *saccopharynx* having been caught in mid-seas belongs as much to Europe as to America. The members of the family existing in the American waters are very imperfectly known.

Ord. LOPHOBRANCHII.

Sygnathus typhle, Bl. 91, 1. *N. York, Mass.* Mitch. Sm.

Sygnathus acus, Bl. 91, 2. *U. S.* Penn.
Hippocampus brevirostris? N. York. Mitch.

Of this order, consisting, like the preceding one, of only one natural family, there are about 15 European species. The American naturalists have mentioned the same generic forms as existing in their seas, but no correct details of the species of the northern part of the New World have yet been published.

Ord. PLECTOGNATHI.

Fam. Gymnodontes.

Diodon punctatus, Bl. 125, 126. *Braz.*—*N. York.* Schœpf.
„ rivulatus, Cuv. *N. York.* Mitch. 6, 3.
„ pilosus, Mitch. 6, 4. *N. York.*
Tetraodon geometricus, Cat. 28. *Bah.*—*U. S.*
„ *lineatus*, Bl. 141. *New York.* Schœpf.
Tetraodon *hispidus*, Schœpf. *N. York.*
„ turgidus, Mitch. 6, 5. *do. Massach.*
„ lævigatus, Will. I. 2.
„ curvus, Mitch. *N. York.*
„ mathematicus, Id. *do.*
„ lagocephalus, Cat. 28. *Virg.*
Orthagoriscus mola, Bl. Schn. *U. S.*
„ *brevis*, Mitch. *N. York.*

Fam. Scleroderмata.

Balistes tomentosus, L. Seba, 24, 18. *U. S.*
„ vetula, Bl. 150, Cat. 22. *Bahamas.—U.S.*
„ hispidus, L. Seba, 24, 2. *U. S.*
„ monoceros, Cat. 19. *Bah. Mass.* Smith.
„ sufflamen, Mitch. 6, 2. *N. York.*
Balistes aurantiacus, Mitch. 6, 1. *New York.*
„ *broccus*, Id. *N. York.*
Ostracion triqueter, Bl. 130. *Mass.* Sm.
„ *bicaudalis*, Smith. *Mass.*
„ quadricornis, Bl. 134. *U. S.*

Gymnodontes.—This family of *plectognathi* belongs chiefly to the warmer seas, and the species have not yet been satisfactorily discriminated, especially the American ones. The *tetraodon Pennanti*, Yarr., (termed by Pennant *lævigatus* and *lagocephalus*,) and *orthagoriscus mola* and *oblongus* extend northwards to the English coast. The *tetraodon lineatus* inhabits the Nile. This species, and several others which exist on the eastern side of the Atlantic, occur in the lists of American ichthyologists; but in the absence both of good descriptions and figures there is reason to fear that much error exists in their determinations.

Sclerodermata.—This family also abounds within the Tropics, haunting coral banks and other rocky places. Many frequent the shores of the Bahamas, the Florida Keys and the Bermudas, but the species have not been fully described. The *balistes capriscus* of the Mediterranean and British Channel is the only European one.

Ord. CHONDROPTERYGII ELEUTHEROPOMI.

Fam. Sturionideæ.

Acipenser transmontanus, *F.B.A.* 97. *f.* 2. *Columb. R.*
„ rupertianus, *F.B.A.* 97, 1. *Saskatch. R.*—50° N.—55° N.
„ brevirostris, Le Sueur, *Am. Phil. Tr.* N.S. *Delaware R.*
„ maculosus, Id. *Ohio.*
„ oxyrhynchus, Mitch. *Delaw. N. York.*
Acipenser rubicundus, Le Sueur, *l. c.* 12. *Canada lakes.*
„ *platyrhynchus*, Raf. *Ohio.*
„ *serotinus*, Id. *Ohio.*
„ *ohiensis*, Id. *Ohio.*
„ *macrostomus*, Id. *Ohio.*
Platirostra edentula, Le Sueur. *Ohio.*
Polyodon folium, Lac. 13, 3. *Ohio, Mississ.*

Fam. Chimæroideæ.

Chimæra Collæi, Bann. *N. Pacif.*
Elephant fish, Vancouver. *Straits of Da Fuca.*

Sturionideæ.—The western European waters produce only one species of this family, but several exist abundantly in the Danube and other rivers flowing into the Black Sea, and also in the rivers of Northern Asia. The species are still more numerous and various in North America and the Mississippi, and its tributaries nourish some curious forms found nowhere else. We are chiefly indebted to M. Le Sueur for our knowledge of the sturgeons of the United States, but a monograph of the family is much needed, the species both of the Old and New Worlds are as yet but badly determined.

Chimæroideæ.—Only two species of this family have been figured, viz., the *chimæra monstrosa*, an inhabitant of the North Atlantic, and the *callorhynchus antarcticus* frequenting the southern parts of the Atlantic and Pacific. On Captain Beechey's voyage at least two others were discovered, one on the coast of Chili, and another, named by Mr. Bennett *chimæra Collicei*, in the Bay of Monterey. Vancouver took one in the Straits of Juan da Fuca, but he has given no description of it whatever whereby we may judge of the species.

Ord. CHONDROPTERYGII TREMATOPNEONTES,

(*Placoidei*, Agassiz.)

Fam. Selachiideæ.

Scyllium Edwardsii, Cuv., Edw. 289.
„ *canis*, Mitch. *N. York.*
„ *canicula*, Smith. *Mass.*
„ *catulus*, Id. *Mass.*
Carcharias obscurus, Le Sueur, *Ac. Sc. Ph.* 9.
Carcharias littoralis, Le Sueur, *N. York. Mass.*
„ terræ-novæ, F. B. A. 3, 289. *Newf.*
„ *vulgaris*, Belon, 60. *N. York. Mass.* Penn. Mit. Sm.
„ *vulpes*, Sm. *Mass. N. York.*
„ *glaucus*, Mitch. *N. York. Mass.*

Carcharias punctatus, Mitch. *N. York.*
Selache maximus, Id. *N. York. Mass.*
„ *Americanus.* Id. *N. York.*
Somniosus brevipinna, Le Sueur, *Ac. Sc. Ph. Mass.*
Zygæna malleus, Valen. *Mass. N. York.*
„ tiburo, Penn. Sm. *Mass.*
Squatina Dumerilii, Le Sueur, *l. c.* 1, 10.
Pristis antiquorum, Cuv. *U. S. Penn.*

Fam. Raiideæ.

Torpedo sp.— Benn. *Monterey.*
„ — ? Mitch. *N. York.*
Raia Sayii, Le Sueur, *N. Jersey.*
„ Desmarestii, Id. *Florida.*
„ eglanteria, Id. *Carolina.*
„ Chantenay, Id. *Pennsylv.*
„ *fullonica*, Fabr. *Greenland.*
„ *ocellata*, Mitch. *N. York.*
„ *diaphana*, Id. *Do.*
„ *centroura*, Id. *Do.*
„ *bonasus*, Id. *N. York.*
Raia batis, Smith. *Massach.*
„ *clavata*, Id. *Do.*
Trygon sabinum, Cuv. *Florida.*
„ micrura, Cuv. *N. Jersey.* Le Sueur.
Myliobatis Fremenvillii, Le Sueur. *Rhode Id.*
„ quadriloba, Cuv. *N. Jersey.* Le Sueur.
„ narinari, Marcgr. *San Blas.* Benn.
Cephaloptera mobular, Duh. 17. *Delaware.* Le Sueur.
„ vampirus, Mitch., Penn. *N. York.*

Fam. Cyclostomata.

Petromyzon tridentatus, F. B. A. 3, 293. *Columb. R.*
„ *fluvialis*, Id. & Mitch. *N. York, Mack. R.*
Petromyzon marinus, Mitch. *N. York, Mass.*
„ *niger*, Raf. *Ohio.*

Selachiideæ.—The European seas nourish about thirty members of this family, belonging to the genera *scyllium, carcharias, lamna, galeus, mustelus, notidanus, selache, spinax, centrina, scymnus, zygæna, squatina*, and *pristis*. The sharks of the American seas have been very imperfectly investigated; but since the food provided for them is much the same as on the east side of the Atlantic, we may expect to find them exhibiting the same generic forms, and their analogy to the birds and beasts of prey would also lead us to the same conclusion.

Raiideæ.—Cuvier, in speaking of the Rays, observes that no confidence whatever can be reposed on the synonymy of Artedi, Linnæus, and Bloch, since these authors have taken their specific characters chiefly from the number of spines, which vary with the age and sex of the individual. Hence as the Linnæan names have been imposed on many of the American rays, our list is without doubt erroneous as well as defective. About twenty species have been described as inhabitants of the European seas; they are distributed by Cuvier into the following genera; *rhinobatis, torpedo, raia, trygon, myliobates*, and *cephaloptera*.

Cyclostomata.—Of this family, which contains the most simply organised fishes, the European seas nourish only about seven species belonging to the genera *petromyzon, gasterobranchus, ammocœtus*, and *amphioxus* (Yarrell), but there is reason to believe that the family is more numerous in the American waters. The *petromyzon tridentatus* which inhabits the estu-

ary of the Columbia, resembles *p. Planeri* in its fringed lips, and *fluviatilis* in the strength and form of its teeth, but not in their arrangement. Lampreys exist in the Mackenzie river which joins the Arctic sea in the 68th parallel.

The preceding report occupies a greater portion of the Socity's valuable volume than I could have wished, but I was unable to compress it further without departing entirely from the plan that I have adopted. The list of species, though they might have been omitted had the paper referred only to a country like Europe, whose natural productions are fully enumerated in accessible treatises, are in fact essential to a view of the present state of our knowledge of the ferine inhabitants of a continent which confessedly nourishes many species still undescribed; and being moreover the *data* for our remarks on the geographical distribution of animal forms, they are necessary to enable the naturalist to judge of the value of the statements collected from the various authors referred to, and of the opinions offered upon them. The comparison between the *faunæ* of North America and Europe which runs throughout the paper, contributes to indicate not only the variations of animal life in different localities, and in different circumstances, under the same parallels of latitude, but also, though more obscurely and merely by analogy, the tribes of animals of which new species will be most probably hereafter detected in North America.

Zoology, as Cuvier has remarked, is now and must continue to be for many years, a science of observation only, and not of calculation; and no general principles hitherto established will enable us to say what are the aboriginal inhabitants of any quarter of the world. It seemed therefore hopeless to attempt to elicit the laws of the distribution of animal life from results yielded by a fauna so very imperfectly investigated as that of North America; consequently in the preceding report, the ranges of the species have been generally stated, as recorded by observers, and without any reference to the opinions which have been heretofore advanced by theoretical writers. Buffon hazarded the remark that none of the animals of the Old World exist in the New, except the few which are capable of propagating in the high northern latitudes. Temminck adduces circumstances which favour a modern opinion almost directly opposed to Buffon's; namely, that all the genera which people the earth (a small number belonging to the polar regions only excepted) are to be found in the equatorial zone, or at least within the tropics; and that the genera are spread abroad by means of analogues or species possessing exactly similar generic cha-

racters, which range in the same parallels of latitude, through all the degrees of longitude, and that notwithstanding the barrier which a wide ocean may be supposed to interpose*. The comprehensiveness of this law will evidently be modified by the number of generic divisions admitted by naturalists, and it will be scarcely tenable if the geographical groups of species be raised to generic rank as has been of late frequently done.

The report includes only the VERTEBRATA, but the fourth volume of the *Fauna Boreali-Americana*, by the Reverend William Kirby, now in the press, will give a complete review of the present state of North American ENTOMOLOGY. Almost all that is known of the CRUSTACEÆ, MOLLUSCÆ, and ZOOPHYTA of that country, is owing to the labours of Messrs. Say and Le Sueur, whose original papers are contained in the Journal of the Academy of Sciences of Philadelphia, so often quoted. Dr. S. G. Morton, in an able synopsis of the organic remains of the cretaceous group of the United States, lately republished from Silliman's Journal, gives the following list of recent shells common to the European and American coasts of the Atlantic.

Purpura lapillus.
Buccinum undatum.
Natica carena.
Fusus islandicus.
Cyprina islandica.
Saxicava rugosa.
Lucina divaricata.
Pholas crispata.
" costata.
Solen ensis.
Mya arenaria.
Mytilus edulis.
Modiola papuana.
Mactra deaurata.
Spirorbis nautuloides.
Thracia convexa.
Solecurtus fragilis.
Glycimeris siliqua.
Cardium groenlandicum.
" islandicum.
Strigilla carnaria.
Tellina punicea.
Pecten islandicus.
Balanus ovularis.

A list of the fresh-water shells of the fur countries occurs in the third volume of the *Fauna Boreali-Americana*.

EMENDANDA.

In page 168, line 9, for 85, read 75. The same error occurs in Audubon's Ornithological Biography, vol. i. p. 381.

Mr. Swainson's 2d vol. of the Natural History of Birds having been published while this paper was passing through the press, we followed it in making some changes in the arrangements of the *grallatores*, in consequence of which the following alterations require to be made in the columns of numbers of the table in page 177. *Tantalidæ* 5, 1, 1. *Ardeidæ*, 14, 14, 4. *Scolopacidæ*, 45, 37, 24. *Rallidæ*, 7, 7, 1. *Charadriadæ*, 8, 11, 3.

We have followed the common practice in arranging the phalaropes with the *scolopacidæ*; but they are, as Temminck has remarked, decidedly natatorial in their habits; and we may add, resemble the ducks in their under plumage and bills: on the other hand, the flamingo is, as Dr. Smith has observed, a true wader in its manners, and has been classed as such by all ornithologists except Mr. Swainson. *Vide* SWAINS. BIRDS, ii. p. 190.

* *Monogr.* &c.