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PART III.

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THE MAMMALS OF BERMUDA.

BY

J. MATTHEW JONES, F. R. S. C.,  
OF FERN LODGE, WATERVILLE, NOVA SCOTIA.

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## THE MAMMALS OF BERMUDA.

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Paucity of species, as regards mammalian life on oceanic islands, is a fact well known to all observers; nor can the circumstance create any degree of surprise when we become cognizant of the complete isolation of such positions from any continent, their small area, and recent origin.

The Bermudas present no exception to this general rule, and therefore the present meagre list will not excite astonishment, especially when their peculiar formation and density of population are taken into account.

### Order CHEIROPTERA.

#### Family VESPERTILIONIDÆ.

#### SCOTOPHILUS NOCTIVAGANS, Lec.

##### *“Silver-haired Bat.”*

Only one specimen of this Bat is known to have occurred in the Bermudas. It was taken alive near Hamilton on the 8th of October, 1850.

Its geographical range on the North American continent extends, according to Allen,\* from the Atlantic coast to the Rocky Mountains, and as far north as the Hudson's Bay Territory.

#### LASIURUS CINEREUS, Allen.

##### *“Hoary Bat.”*

According to the observations of my friend, Mr. J. L. Hurdis, of Southampton, England, who passed fourteen years upon the islands in an official capacity, and during that lengthy period was a close observer of the habits of all animals which came under his notice, only two species of Bat are known to visit the Bermudas, and that usually in the autumn and early months of winter. The present species is observed occasionally at dusk during the autumn months hawking about accord-

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\* Monograph of the Bats of North America. By H. Allen, M. D., asst. surg. U. S. A. p. 41.

ing to its nature in search of insects; but as it is never seen except at that particular season it is clear that it is not a resident, but merely blown across the ocean by those violent northwest gales which also usually bring numbers of birds from the American continent.

The geographical range of this species appears to extend all over the continent of America north of Mexico, extending as far north as Red River Settlement in British North America.

### Order CETACEA.

There are two species of Whales now frequenting the sea surrounding the Bermudas, in spring and early summer, and they are doubtless the same which visited the group in the earliest times of which we possess a record. Jourdan\* has the first account of Whales being observed there in 1610.

“There are also great plentie whales which I conceive are very easie to be killed for they come so usually and ordinarilie to the shore that wee heard them oftentimes in the night abed and have seen many of them neare the shoare in the day time.”

In Smith's “History of Virginia” (1616), we also find mention of Whales at the Bermudas during the months of January, February, and March.

Again, in the “Constitucions and Instructions to Mr. Daniel Tucker now chosen Deputie Gounor for the Somer Islands given by the Gouenor and Companie of the Cittye of London for the said Plantacon” (1616), allusion is made to them.

“As touchinge the whale fishing we would have you observe that we have sent John Headland our chief harpeneere, Henry Hughes his mate, and others of his ginge (gang) to whose assistance we ioyne Mr. Wilmott as skillful in that buisness, with such others to help as you shall appointe thereto. And that you omitt noe tyme at yor first cominge thither to sett upon that worke, consideringe that the whale fishing will be soe neare spent before you shall come thither.”

It is therefore evident from the foregoing statements that one or more species of these marine mammals regularly visited the islands every spring, and we shall now endeavor to identify those species from the descriptions given by early writers, which are fortunately sufficiently expressive to permit of such determination.

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\* A Plain description of the Barmodas, now called Sommer Ilands, with the manner of their discouerie anno 1609. By Sylvanus Jourdan. London, 1613.

## Family BALÆNIDÆ.

EUBALÆNA CISARCTICA, and others.

*Common Whale. Right Whale. Cape Whale. Hump-back, &c.*

The Right Whale is the only species which may be called a regular migrant to the shores of the Bermudas, and its occurrence there opens up a very interesting source of inquiry as to whether the individuals annually visiting the islands really come from the north and return thither, or merely pass their existence in mid-Atlantic, and resort for some reason to the group with their young during the months of February, March, April, May, and June.

Now, first as to the identification of this species with that so often mentioned by early writers. In the Philosophical Transactions (Royal Society of London) for 1668 appears a communication from Richard Norwood, who was the first person to survey the islands and divide them into shares. It is dated—

“BERMUDA, *June 18, 1667.*

“The killing of whales, it hath been formerly attempted in vain, but within these two or three years, in the spring time and fair weather, they take sometimes one, two, or three in a day. They are less, I hear, than those in Greenland, but more quick and lively; so that if they be struck in deep water they presently make into the deep with such violence that the boat is in danger of being haled down after them if they cut not the rope in time. Therefore they usually strike them in shoal water. They have very good boats for that purpose, manned with six oars, such as they can row forwards or backwards as occasion requir-eth. They row up gently to the whale, and so he will scarcely shun them, and when the harpioneer, standing ready fitted, sees his opportunity, he strikes his harping-iron into the whale about or before the fins rather than towards the tayle. Now, the harping-irons are like those which are usual in England in striking porpoises, but singular good metal, that will not break, but wind, as they say, about a man's hand. To the harping-iron is made fast a strong lythe rope, and into the socket of that iron is put a staff, which, when the whale is struck, comes out of the socket, and so when the whale is something quiet they hale up to him by the rope, and, it may be, strike into him another harping-iron, or lance him with lances in staves till they have killed

him. This I write by relation, for I have not seen any killed myself."

The fact of their capturing the whale in shoal water proclaims it to belong to this species, for the sperm whale, which is the only other cetacean known to visit the Bermudas, is never known to come near shore.

Another communication to the same society from one Richard Stafford, dated at Bermuda, July 16, 1685, also proclaims the identity of this species:

"We have hereabouts very many sorts of fishes. There is amongst them great store of whales, which in March, April, and May, use our coast. I have myself killed many of them. Their females have abundance of milk, which the young ones suck out of the teats that grow by their navel. They have no teeth, but feed on moss growing on the rocks at the bottom during these three months, and at no other season of the year. When it is consumed and gone, the whales go away also. These we kill for their oil."

The Right Whale fishing around the Bermudas appears to have been prosecuted by the islanders with more or less success from these early times until the present, when, owing probably to the more profitable and pleasant pursuit of agriculture, which combines at the same time a security of person quite foreign to that of the whale fisher, as the numerous accidents on record prove, it is not followed with the same ardor which characterized the efforts of the early settlers. Nevertheless we find that almost every year some of these whales are taken; and one season they were so numerous that no less than twenty were taken off the east end of the islands. Cub whales are more commonly taken than adults. These are of all sizes, as announcements in the island papers such as the following, prove:

"A fine whale of the hump-back species, a maiden cub of last year, was captured on Friday morning last (April 22, 1866), by the boats belonging to Mr. Masters' establishment at Port Royal. It was 33 feet long, exceedingly fat, and it is supposed will produce 40 barrels of oil. It was first harpooned, and then shot at three several times with bomb-lances, and though hit each time the third bomb only exploded and caused the almost instant death of the leviathan. This is the first whale that has been captured here for some years." Again: "A cub whale about 22 feet long was captured by the boats of Port Royal on Wednesday last (April 26, 1871). The old whale followed the young one and struck the boat with its tail. It was harpooned but broke the

warp; it bled freely. It came to the shore the next day, but was not captured. The cub will yield about  $5\frac{1}{2}$  barrels of oil."

The adult whales, when struck near shore, often lead their captors a long chase—sometimes as much as 7 or 8 miles out to sea—and even then the warp has to be cut to save the boat. But when taken they amply recompense their lucky captors for their trouble, yielding in some cases from 60 to 70 barrels of oil. When these large whales are towed to shore the vast quantity of blood escaping from their wounds attracts numbers of sharks, some of very large size, which mutilate the body and devour much of the meat. This well-known habit of the sharks is sometimes turned to profitable account by the colored boatmen, who take what is left of the body of a whale, after the process of "flinching" has been gone through, outside the reefs, and let it remain as a bait. Several boats will join in one of these expeditions, having experienced spearmen on board, who, at every opportunity, spear a large shark which, in its turn, is converted into oil which is of particular commercial value.

There are some curious habits indulged in by this species of whale, known to the islanders, but perhaps none can be accounted so singular and remarkable as that of the animal leaping completely out of water to the height of several feet. A naval officer has placed on record an instance of this extraordinary circumstance as follows: "While we were lying on our oars, in a cutter belonging to the *Leander*, frigate, in Murray's Anchorage, off Saint George's Island, during the winter of 1802-3, we beheld one of the most extraordinary sights in the world. A whale which had by some means got inside the reef, and was endeavoring to extricate itself from its uncomfortable position, and perhaps provoked at not being able to disentangle itself from the sharp coral reefs, or for some other reason, suddenly made a spring out of the sea. So complete was this enormous leap, that for an instant he was seen fairly up in the air, in a horizontal position, at a distance from the surface, not much short I should think of half his own breadth. His back, therefore, must have been at least twenty feet in perpendicular height over our heads. While in its progress upwards, there really appeared in its spring some touch of the vivacity which belongs to a trout or salmon shooting out of the water. The whale, however, fell back again on the sea, with all the clumsiness imaginable, like a huge log thrown on its broadside; and with such a thundering crash as made all hands stare in astonishment. Total demolition, indeed, must have been the fate of

our party had the whale taken his leap one minute sooner, for he would then have fallen plump on the boat. The waves caused by the splash of the monster spread over half the anchorage, nor, if the *Leander* herself had blown up, could the effect have extended much further."

Scoresby, in his interesting work on the Arctic Whale Fishery, corroborates this curious habit, so that there can be no doubt of its being an indisputable fact.

This whale appears to have been the victim of assault from the Sword-fish (*Xiphias gladius*) and Thresher (*Alopias vulpes*) in days of yore, as as we glean from the pages of an old writer on the Bermudas.\*

"I forbear to speake what a sorte of whales wee have seene hard aboared the shoare followed sometime by the Sword Fish and the Thresher, the sport whereof was not unpleasant. The sword-fish, with his sharpe and needle finne prieking him into the belly when he would sinke and fall into the sea; and when hee startled vppward from his wounds, the Thresher with his large Fins (like Flayles) beating him aboue water. The example whereof giues vs (saith Ouiedus) to vnderstand, that in the selfe same perile and danger doe men liue in this mortall life, wherein is no certaine security neither in high estate nor low."

And this account is borne out by a further statement to the same effect, made by another eye-witness about the same date.

"Whales there are in great store at that time of the yeare when they come in, which time of their comming is in Februarie and tarry till June. Likewise there commeth in two other fishes with them, but such as the whale had rather bee without there companie; one is called a Sword-fish, the other a Threasher; the sword-fish swimmes vnder the whale and prieketh him vppward; the Threasher keepeth aboue him, and with a mightye great thing like vnto a flayle hee so bangeth the whale, that he will roare as though it thundered, and doth giue him such blowes with his weapon that you would thinke it to be a cracke of great shot."

The Right Whale will sometime become playful with its young, tossing it out of water time after time, and it is a somewhat curious fact that they are more prone to indulge in this pastime during bright moonlight nights, coming close in near the edge of the reefs on the south side of the island and exhibiting their exploits within full view of persons on shore.

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\* "Purchas His Pilgrimes," vol. iv, London, 1625. The ninth book, chap. vi: "A true repertory of the wracke, and redemption of Sir Thomas Gates, Knight; vpon, and from the Islands of the Bermudas: his comming to Virginia, and the estate of that Colonie then, and after, vnder the government of the Lord LA WARRÉ, July 15, 1610. Written by WILLIAM STRACHY, Esquire."

Some of the larger whales when captured are found to be infested externally by parasites, among others the well-known cirripede (*Balanus*), which, from the large size some of the specimens attain, must have been *in situ* for a considerable period.

The flesh of this whale, especially that of the cub, is often sold for food, and is considered a treat by the families of the fishermen and laborers, who cannot afford to pay the exorbitant prices demanded by the vendors of butchers' meat and poultry. We cannot, however, coincide with the statements of those who declare it impossible to tell a whale-steak from a beef one, when properly cooked, for the oily nature of the substance cannot wholly be obliterated under any circumstances, and never fails to afford the palate of the most ordinary taster a clew to its origin.

The migrations of this whale,\* as far as the North Atlantic is concerned, are by no means clearly ascertained, as evinced by the statement made by M. F. Maury, who affirms that "the Right Whale does not cross the equator or reach so low a latitude as Bermuda in the West Atlantic, although it does so on the side of Madeira." A very general belief prevails that the heated waters of the Gulf Stream present an impassable barrier to the southward progress of the Right Whale, and it is somewhat strange that although the presence of this species has been known to the inhabitants of the Bermudas ever since the islands were first colonized, as well as to American whalers for many years, its mode of reaching that position has not been properly investigated. The fact of its crossing the Gulf Stream on its southward migration, and also on its return to the north, has been well known to all traders between northern parts and the West Indies ever since commercial intercourse has been established; but we are unaware of any published statements having appeared to such effect until Col. Drummond Hay, President of the Natural History Society of Perthshire, (Scotland), who was quartered with his regiment, the Forty-second Highlanders, for some years upon the islands, and devoted much of his leisure time in investigating their natural history, in a paper on "Migration," which he recently read before his society, thus alluded to the matter: "One especial instance which I will take is that of the Greenland Whale

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\* Owing to the confusion in local nomenclature so prevalent in Bermuda, the writer has failed to discriminate between the Right Whales and Hump-backs and the Bowhead, which never ranges so far south.—EDITOR.

(*B. mysticetus*), which, with the same regularity as the swallow, comes to Britain, visits the warm seas of the Bermuda Islands, where I have noticed them in large numbers, arriving regularly about the last week of February or beginning of March, and remaining till the beginning of June, and sometimes a little later; those frequenting the shallow waters being the cow-whales with their young, the bulls probably keeping in the deeper waters outside the reefs. While sailing from Bermuda to Nova Scotia, in the month of June, I observed large troops of the blow or true whale, all heading to the north, no doubt on their way from the Bermudas and the warmer seas."

It being, therefore, beyond doubt that the Right Whale does pass through the Gulf Stream on its southern migration to the Bermudas, it becomes an interesting question whether the animal is submitted to a higher degree of temperature while passing through the stream than it is while inhabiting the waters of Bermuda, in which it passes some four months of its existence regularly every year. We are fortunately able to give reliable information upon this subject, having during several voyages between Halifax and the Bermudas (which route, being almost direct north and south, is that traversed by the whales), at different seasons of the year, had excellent opportunities, through the kindness of the commanders of the royal mail steam packets, who are in the habit of taking observations every four hours, of ascertaining the temperature of the Gulf Stream at various positions, and we find that scarcely any difference exists in its temperature as far as regards the months of February and June, the known periods of migration, and that the highest degree of heat of the stream at those periods yet recorded has never exceeded 73°. We have next to look at the temperature of the sea immediately around the Bermudas during the months of February and March, when the whales arrive, and we find that it is generally about 64°, and that of June, when they depart, about 74°; so that it is clear these animals are submitted to a higher degree of temperature for a month or more in the locality they have chosen for a winter resort, than they are during their passage through that supposed impassable barrier of heat, the Gulf Stream. Indeed, it may be said that this whale is capable of bearing a much higher degree of temperature, for in some seasons the maximum of surface temperature at Bermuda during the month of June has reached 78°, so that all statements hitherto made to the effect that the Right or Greenland Whale is unfitted to resist the presence of heat must be considered as wholly incorrect.

It is more than probable that this whale rarely proceeds farther south in the West Atlantic than the latitude of the Bermudas, and that it possibly visits those islands merely for the purpose of bringing forth its young; a theory not unsupported by fact, when we find that the majority of whales taken consist of females and cubs.

### Family PHYSETERIDÆ.

#### PHYSETER MACROCEPHALUS, L.

*Sperm Whale; Spermaceti Whale; Trompe Whale.*

This species can hardly be considered as more than a casual visitant to Bermudian waters, for it is only at intervals of a few years that the islanders have the good fortune to capture one.

The first authentic account we have of this species being found at the Bermudas is in the "Constitucons and Instructions to Mr. Daniel Tucker now chosen Deputie Gounor for the Somer Islands given by the Gouenor and Companie of the Cittye of London for the said Plantacon" (Date 1616).

"Theise kind of whales we understand by their description weh have seen them are called Trompe Whales, at whose places of resort there is ever found greate store of Ambergreece, the oyle will be as hard as tallove, when yt is made, but yet very good for many uses, lett yt be carefully casked up by ytself, without any other whale oyle of other kinds to be mixed with it. Also that kind of whale yieldeth great store of Spermacety weh lyeth in the head, lett that also be carefully reserved by ytself, and put into Caske marked for Spermaceti whither yt be thin or thicke, we will trye it and refine yt when yt shall come hither and doe well observe that puttinge up the oyle the coopers may make the caske very tight, for leakedge by putting Bullrushes into the ioynts, for weh vse we have sent hence store by theise shipp.

"Those Trompe Whales are observed to have noe fins in their throats as some other small whales have, but they have in some of their inward pts great store of Ambergreece congealed, weh they have not as yet cast out, we pray that you have a care that when any whale is opened you would yourselfe attend or cause some other to see yt searched thoroughly, that neither by negligence or fraud we may be deprived of that hope."

Of late years very few have been taken. One in May, 1863, of the goodly length of 47 feet was captured, and again on June 19, 1869, an-

other was struck, about 14 miles to the south of David's Head, of the length of 40 feet. One boat alone attacked this whale, and after some difficulty the crew succeeded in killing it and towed it the whole way to Saint George's Whale House, a feat which occupied no less than seventeen hours. It was followed by a large number of sharks, which cut it considerably. This whale appears to dislike the shallow waters within soundings, and therefore has to be sought for almost out of sight of land. Some are captured off the islands occasionally by passing American whalers. Ambergris, the well-known product of this species, is alluded to in the very earliest accounts of the islands.

In the commission of Governor Moore, granted to him by the Bermuda Company on his entering upon his official duties in the year 1612, we find the following:

"Forasmuch as we cannot expect any greate returne of comodities by this shipp, by reason of her short stayer yet we advise and pray you to be as prudent as you may, to send us some fruits of your labors to give encouragement to the adventurers, to make the more speedie and better supplie vnto you, especially of Ambergreece wch wee doubt not but you shall finde readye gathered by those three who were left by the last shipp, or ells by the industrye of suche of yo'r own companie as you shall employe to seek for yt, for whose better encouragement we are contented to allowe for everye once (Troye weight) that you shall receaue from any of them, the some of thirteene shillings fowre pence, but yf you shall finde any man to goe about to conceale yt and appropriate yt to his owne prticular use, then you are to seaze upon yt, as you forfeite to the vndertakers, and infliet such other punishment upon the offenders as the qualitie of these offences shall deserve."

In the Laws of the Bermuda Company enacted in 1622, we find a protective clause concerning this commodity:

"There is likewise and shall be forever reserved to the Company a fifth part of all the Ambergreece that shall be found; and the rest shall be divided equally betweene the finder and the owner of the land where the same is found; save that three shillings four pence upon every ounce of the said Ambergreece shall be allowed to the Governour of the said Islands. And whosoever shall not discover to the said Governour and Sheriffe and some one other of the Councill, the true quantity of the Ambergreece so found, within five days after the finding of the same, shall forfeit his owne intire part to the Company, and be subject to such other punishment as the Generall Court shall award."

Again in "Domestic Correspondence," Jac. I, vol. lxxiv, No. 89, allusion is made to it in a communication from one John Chamberlain to the Right Hon. Sir Dudley Carleton, Kt:

"Oct. 27, 1613.

"From the Bermudas or Sommer-ylands there hath come great store of Ambergreece this yeare, w<sup>ch</sup> is the only commoditie they have thence as yet, but they hope for more hereafter of many kindes, though nothing so rich, and begin to nestle and plant there very handsomely, whereat the Spaniard is nothing pleased but threatens the next yeare to remove them, which advertisement they have by goode meanes and many wayes, but they seeme nothing dismayed therewith, trusting rather to the difficultie of accesse, than to any other strength of theyre owne; the greatest peece of amber in one lump that hath bin heard of was found there this yeare being as bigge as the body of a giant, and answerable or resembling almost in all points sauing for the want of the heade and one arme; but they handled the matter so foolishly that they brake yt in peeces, and the biggest they brought home was not above 168 ounces w<sup>ch</sup> sells better by twelve or fifteen shillings in an ounce than that w<sup>ch</sup> is smaller."

That it was considered at that time to be of particular commercial value we glean from the following threatened punishment to be inflicted on those who dared to buy or sell it on the islands (Date, 1616):

"No Marryner Sayler or any else of what quality or grade so eue<sup>r</sup> belonging to any shippe or shipp nowe here resident or who hereafter shall arrive, may bargayne buy trucke or trade with any member of this Plantacon, man woman or childe for Ambergreece of what quantity so eue<sup>r</sup>, nor for any Ambergreece shall exchange any their provisions whether Butter Cheese Bisket Meale Aquavitoe Oyle any kind of frute or spice or any other prouisions of what qualitie so eue<sup>r</sup> at any tyme or soe long as they shall here remayne from the date of their presents upon payne to lose the Ambergreece soe bought or trucked for, and losse of their wages in England with corporale punishm<sup>te</sup> here to be inflicted upon them, and what so eue<sup>r</sup> pson or psons belonging unto any such shipp or shipp receive or take any the said Ambergreece of or from any pson or psons members of this plantacon privately take the same unto England upon the same p. ill. Nor shall any pson or psons whatsoe<sup>r</sup> of what degree or qualitie soe<sup>n</sup> of their Island dare to sell any Ambergreece or the same to trucke exchange or give away vnto any such for money or such aforesaide prouisions or otherwise to be as aforesaide upon p. ill

to lye in Irons 48 hours w<sup>th</sup> addicon of such other severe punishm<sup>te</sup> as shalbe inflicted upon them. And what soeu<sup>r</sup> pson or psons that shall at any tyme fynde any Ambergreece and not within the space of tenne dayes bringe or sende the same to the Governo<sup>r</sup> or give notice thereof vnto him where he or thay shall receive content after the rate of the moitie of the halfe the Ambergreece eu<sup>y</sup> ounce shall not only lose the profit for finding thereof But also undergoe the aforesaid punishment with severity of Justice w<sup>ch</sup> in that case shall surely be executed.”

The weight of the several pieces of ambergris found at different times since the islands were settled appears to have varied greatly. In 1611 one is recorded of the enormous bulk of 80 pounds; in 1620, one of eight ounces; in 1625, one of nine ounces; in 1626, one of 2 ounces, and another the same year of 19½ ounces. Of late years it appears to have been rarely found.

## Order INSECTIVORA.

### Family SORICIDÆ.

#### SOREX ———?

During one of our first visits to the islands several years ago we captured what we believed to be a member of this family, but the specimen was unfortunately lost. During our last visit, in the winter of 1876–77, we gave chase to what we were almost positive was a specimen, running on the side of a by-road in Devonshire parish, but it proved too nimble and escaped. The peculiar dark velvety look of the fur and the small size of the animal was quite sufficient to distinguish it from a common mouse. We have, moreover, received the testimony of reliable persons as to a mouse of this description being occasionally caught, so we think it admissible to register the unknown under its generic name.

## Order RODENTIA.

### Family MURIDÆ.

#### MUS DECUMANUS, Pallas.

#### “Norway Rat”; “Brown Rat.”

*Mus decumanus*, Pallas, Glires, 1778, 91.—Schreber, Säugt. IV, 645; tab. clxxviii.—Keyserling und Blasius, Eur. Wirb. I, 1842, 36.—De Kay, N. Y. Zool. I, 1842, 80.—Wagner, Suppl. Schreb. III, 1843, i.—Burmeister, Thiere Brasiliens, I, 1854, 152.—Aud. and Bach, N. Am. Quad. II, 1851, 22, pl. liv.

*Mus norvegicus*, Erxleben, Syst. An. I, 1776, 381.

The introduction of rats upon an oceanic island at a period anterior to its occupation by man can only be due to the arrival, or destruction,

of a vessel containing such animals upon its shores; and in the case of the Bermudas, which are known to have been the last resting place of many a craft long before they came into the possession of the English, there can be no doubt as to the means by which they obtained a footing upon those isles, so far distant from the nearest land.

As the Norway Rat, which it appears belonged originally to the warmer regions of Central Asia, was introduced into the western countries of Europe so late as the middle of the eighteenth century,\* it clearly could not have been the species that overrun the Bermudas, according to Smith, more than a century before.† Most probably it came to the islands in some of the vessels sent out by the Bermuda Company from England laden with stores for the colonists, about the end of the eighteenth century.

In some of the older houses, especially near the sea, this rat is very troublesome, consuming almost every article it can find, even to the bedclothes of the occupants as they lie asleep, and instances are recorded where children have been seriously bitten during repose at night. This rat is also common in the marshes, where it swims and dives with facility. The old and full-grown specimens are called "beagles" by the islanders.

#### MUS RATTUS, L.

##### "Black Rat."

*Mus rattus*, Lin. Syst. Nat. I, 1766.—De Kay, N. Y. Zool. I, 1842, 79.—Aud. and Bach. N. Amer. Quad. I, 1849, 189, pl. xxiii.—Giebel, Säugth. 1855, 555.

*Mus americanus*, De Kay, N. Y. Zool. I, 1842, 81, pl. xxi, f. 2.

*Mus nigricans*, Raf. Am. Month. Mag. III, 1818, 446.

This species, which was once so abundant all over Europe and North America, and probably equally so before the introduction of the common house-rat into the Bermudas, is now so scarce that it may be almost said to be extinct.

#### MUS TECTORUM, Savi.

##### "Tree Rat."

*Mus tectorum*, Savi. "Nuovi Giornale di Lett. 1825."—Bonaparte, Fauna Italica, plate.—Keys & Blasius, Europ. Wirb. 1842, 36.—Wagner, Suppl. Schreb. III, 1843, 405.—Burmeister, Thiere Brasiliens, I, 1854, 154.—Giebel, Zoologie, 1855, 555.

*Mus alexandrinus*, "Geoffr. Desc. de l'Égypte."

*Mus flaviventris*, "Licht. Brants Minzen, 108."

\* Baird, Mammals of North America, p. 439.

† Smith, History of Virginia, p. 137.

*Mus infuscatus*, "Wagner, Suppl. Schreb. III, 1843, 445."

*Mus setosus*, "Lund, Bras. Dyr."

? *Mus rattus*, var. Aud. & Bach. N. Amer. Quad. I, 1849, 191, 194, pl. xxiii.

*Mus americanus*, "Lebr., Thes. II, 30; tab. xxix."—Erseleben, Syst. An. I, 1776, 385.—  
Leconte, Pr. A. N. Sc. Phil. VI, 1853, 414.

*Rat d'Amérique*, "Brisson, Reg. An. I, 172."

The earliest account of this rat, as inhabiting the Bermudas, is about the year 1615 when, from the following instructions sent out by the Bermuda Company in London to Governor Tucker, we infer that it existed there:

"Wee have sent you yellow ratsbane in fyne powder to kill ratts to be mixed with oatemealè and laid in shells on the ground wesoever they haunt, weh lett not be neglected nor any other meanes to traps snares and whatsoever else to sestroye them utterlye yf yt be possible least they mutliplie upon you and devour all yor fruits and plants."

In Capt. John Smith's History of Virginia it is stated that in the year 1618 a vessel laden with grain was wrecked on the reefs, and that numbers of rats escaped from her and landed on the islands to the great detriment of the plantation. The account is as follows:

"But the great God of heaven being angry, caused such an increase of silly rats in the space of two years so to abound, before they regarded them, that they filled not onely those places where they first were landed, but swimming from place to place, spread themselves into all parts of the countrey, insomuch that there was no iland but it was pestered with them; and some fishes have been taken with rats in their bellies, which they caught in swimming from ile to ile; their nests had almost in every tree, and in most places their burrowes in the ground like conies; they spared not the fruits of the plants, or trees, nor the very plants themselves, but ate them up. When they had set their corne, the rats would come by troupes in the night and scratch it out of the ground. If by diligent watch any escaped till it came to earing, it should then very hardly escape them; and they became noysome even to the very persons of men. They vsed all the diligence they could for the destroying of them, nourishing cats both wilde and tame, for that purpose; they vsed ratsbane, and many times set fire on the woods that oft run half a mile before it was extinct every man was enioyned to set twelve traps, and some of their own accord have set neare an hundred, which they euer visited twice or thrice in a night; they also trained up their dogges to hunt them, wherein they became so expert that a good dog in two or three hours would kill forty or fifty. Many other devices

they used to destroy them, but could not prevaile, finding them still increasing against them; nay they so devoured the fruits of the earth that they were destitute of bread for a yeare or two; so that when they had it afterwards, they were so wained from it, they easily neglected to eat it with their meat. Besides, they endeauoured so much for the planting tobacco for present gaine, that they neglected many things might more have prevailed for their good, which caused amongst them much weakness and mortality, since the beginning of this vermine.

“At last it pleased God, but by what meanes it is not well known, to take them away; in so much that the wilde cats and many dogs that lived on them were famished, and many of them leaving the woods came down to their homes, and to such places where they use to garbish their fish, and became tame. Some have attributed the destruction of them to the increase of wild cats, but that is not likely they should be so suddenly increased rather at that time, than four years before; and the chief occasion of this supposition was because they saw some companies of them leave the woods, and slew themselves for want of food; others by the coldnesse of winter which notwithstanding is neuer so great there, as with us in Mareh, except it be in the wind; besides the rats wanted not the feathers of young birds and chickens which they daily killed, and Palmetto mosse to builde themselves warm nests out of the wind; as usually they did; neither doth it appeare that the cold was so mortal to them, seeing they would ordinarily swimme from place to place, and bee very fat even in the midst of winter. It remaineth then, that as God doth sometimes effect his will without subordinate and secondary causes, so we need not doubt, but that in the speedy increase of this vermine, as also by the preservation of so many of them by such weake meanes as they then enjoyed, and especially in the so sudden remoual of this great annoyance, there was ioyned with and besides the ordinary and manifest meanes, a more mediate and secret work of God.”

From this description it is evident that the amazing horde of rats which overran the islands at this early date were tree rats which at the present day usually construct their nests in trees, as they appear to have done two centuries and a half ago. But the question may arise, how could so vast a horde suddenly, as it were, come into being, for if we are to place any confidence in the accounts given by Jourdan not a rat was to be seen some five years previous. It certainly appears somewhat mysterious, and we cannot but think that rats existed on the islands

many years before the wreck of Sir George Somers' vessel, which is so graphically described in the work referred to. And it is, moreover, very probable that the tree or roof rat, which was an Old World species originally from Egypt and Nubia, from which it was taken to Italy and Spain,\* was introduced into the Bermudas by the several wrecks of Spanish vessels which during the sixteenth century were evidently cast upon them. Many of these vessels were possibly cast away on the western reefs, as are most of the vessels voyaging from the West Indies to Europe at the present day. In this case the rats would have landed on the shores of Somerset parish, which face these reefs, and finding ample food for some years for their wants, would have had no occasion to migrate to other parts of the group. But after a lapse of a few years, taking into consideration the fecundity of the race in a genial climate, and the absence of all enemies, their numbers would increase so prodigiously that all available food would be consumed and a migration rendered absolutely necessary. Thus would occur the sudden invasion made upon the crops and stores of the early settlers who were established at the east end of the islands, for by the natural instinct granted to all animals, the position of food in plenty would soon be discovered, especially by these starving creatures.

The tree rat is very fond of fruits, and will climb up and do great damage, especially to crops of oranges. We have reason to believe that it is this species which is also so destructive to the root crop. In common with the brown rat, they will frequent stables for the purpose of procuring the oats or Indian corn given to the horses, but while the latter species generally makes its exit when surprised by holes in the floor, the former takes to the roof and escapes by the opening under the eaves. It builds its nests either in the dilapidated roofs of old houses or outhouses, or in trees. In the latter case it chooses various positions, but generally one which enables it to rest secure from the effects of the heavy gales of wind which are of frequent occurrence. We have found them as high as 20 feet from the ground, situate in an angle formed by the bole of an aged cedar and a lateral branch of the same; also within a few feet of the ground, in the fork of a branch of cedar. Again, in a low bush in a swamp, a few feet above the stagnant water. The nests which occur in the cedars are composed entirely of the bark of the same trees, called "bass" by the islanders; the long, coarse strips outside, while within, the substance gets finer and finer.

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\* Baird, Mammals of North America.

In other situations, as the shrub we have mentioned, the nest is composed outwardly of leaves of that shrub, with softer vegetable material within. In most cases the nest is generally spherical and about a foot in diameter. Whenever we have surprised the tenants of these nests unawares, we have always observed the young, about half or three parts grown, escape, but no old ones.

It was not until the year 1872 that we were enabled, through the kindness of Prof. S. F. Baird, satisfactorily to identify the species, as in common with the native inhabitants, we had always considered it as merely a variety of the brown rat; but in that year, having secured two half-grown young from a nest, and perceiving a marked difference in the color, especially of the under parts, we forwarded one to the Smithsonian Institution for Professor Baird's opinion, who at once recognized it as the white-bellied or roof rat of the Southern States.

#### MUS MUSCULUS, L.

##### *Common Mouse.*

The common mouse is very abundant throughout the islands, but more especially so where surrounding circumstances favor its support and increase. In all dwellings and their outhouses it is to be found; but usually where rats are numerous the mice are scarce; for there is no doubt that the smaller members of the tribe suffer greatly from the continued attacks of the larger ones. They are particularly numerous about planting land, and do much damage to the root crops, as well as to the Indian corn. We have observed them even in the center of the marshes where the ground was more or less covered by water, at the roots of the tall sedges, making their way over the prostrate stems. It can swim well when occasion requires, and has no doubt by this means introduced itself into many situations where its occurrence could not otherwise be satisfactorily accounted for. We have been informed that light-colored mice have been seen in different places, which the observers have supposed to differ from the common species; but our own investigations, which have extended over several years in almost every part of the group, do not allow us to concur in the supposition.

As a somewhat curious circumstance we may state that the common domestic fowl of the island will sometimes seize a mouse and eat it.