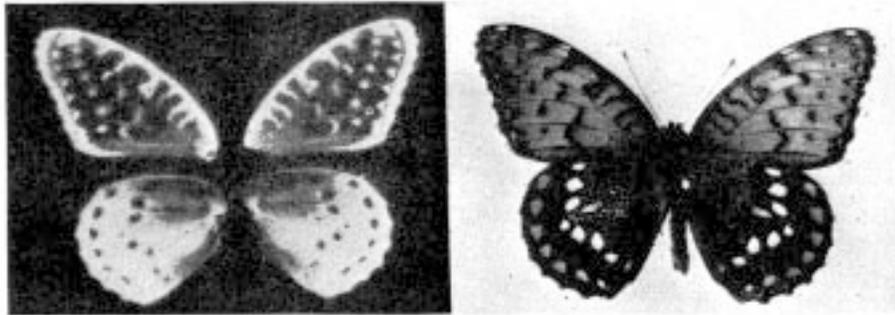


NORTH AMERICAN
BioFortean Review



Research is to see what everybody else has seen,
and to think what nobody else has thought.

— Albert Szent-Gyorgi

North American BioFortean Review

Volume 5, No. 2, Issue #11
July 2003

Editor: Chad Arment, Caa1snake@aol.com

Contents

BioFortean Notes: *Science News Letter*, 1930-1931.

Discovery: The Five-Horned Giraffe

Rumors of an Unknown Vermont Lake Monster: The Lake Bomoseen Cryptid
Dr. Dwight G. Smith and Gary S. Mangiacopra

Report on the Remnant Skin of a Patagonian Ground Sloth
H. Hesketh Prichard

Monsters and Fabulous Animals
W. Winwood Reade

A Few Notes on Reade's Working Materials
Chad Arment

An American Dragon [North America: Pottery]
G. Elliot Smith

Canyon of the Little Horses
Jack Tooker

BioForteana: The Floating Population of the Air

Publication Policy

All original articles are copyright by their respective authors and may not be reprinted without permission of the author. This also pertains to material reprinted here with the permission of the author.

Each issue of the *North American BioFortean Review* is copyright for format and editorial changes.

We strive to honor both U.S. and International copyright laws and will not intentionally reprint full texts which appear to be under copyright in the United States. Any partial usage of copyright material is strictly for the purposes of criticism, comment, education, and research, as allowed by Title 17 of the United States Code (USC Title 17 § 107). We will cite these wherever possible.

Angleworm Big as Snake

If you happen to be in the Philippine mountains some day, and see an angleworm as big as a small snake, colored bright blue with pale yellow spots and bandings, don't blame it on something you have eaten (or drunk) in the last village. It's real, and it's there, although it is a zoological rarity. Dr. M. Michaelson, of Hamburg, Germany, has just reported to the Philippine *Journal of Science* on specimens collected in Luzon some time ago and forwarded to him by a fellow-countryman, W. Schultze, formerly an entomologist at the Bureau of Science in Manila. The specimens when living were over a foot in length and nearly an inch in greatest diameter. They are of a species new to science and have been named *Pheretima ophioides*.

April 25, 1930 — *SNL* 17(472): 264.

Man of Gardar

What manner of man was the Man of Gardar?

Was he a surviving neanderthaloid type, thousands of years out of his time in the Middle Ages? Was he a freak Eskimo, living with the dwindling colony of Norsemen on the unfriendly coast of Greenland in the twelfth or thirteenth century? Or was he a degeneration type arising from the inbreeding of a malnourished group of white men cut off from the rest of the world?

These questions have been roused by the recent discovery in the medieval Christian cemetery at Gardar, southwest Greenland, of a most extraordinary skull, that has many of the characteristics of the low-browed, heavy-jawed Neanderthal race that inhabited mainland Europe scores of millennia ago. The find was made by Prof. F. C. C. Hansen of the University of Copenhagen, and is discussed in the scientific journal *Nature* by Sir Arthur Keith, noted anthropologist.

Sir Arthur is inclined to look upon the strange skull as the result of a disorder of growth, somewhat like the fairly common and distressing type of giantism known as acromegaly. This disease is due to a glandular failure, and frequently results, says Sir Arthur, in the assumption, "in a bizarre form, of all the characteristics of the skulls of ancient fossil man — particularly Neanderthal and Rhodesian characters.

"*Homo gardarensis* must have been the subject of a disorder of growth — the kind of disorder which causes giantism in man, but whereas in most giants growth soon becomes irregular, in *Homo gardarensis* it remained regular."

July 19, 1930 — *SNL* 18(484): 40.

Butterfly Wings Take Own Pictures

Darkness Does Not Stop Mysterious Action

Butterfly wings give off something — either invisible light waves or a gas — that enables them to photograph themselves in the dark. This curious discovery has been made by Austin Clark of the U. S. National Museum, who is now engaged in trying to find out what the mysterious emanation is.

Mr. Clark mounted the wings of butterflies on paper, which was put on the bottom of a plate box to give a flat surface. A fresh plate, emulsion side down, was placed on it, and the sealed box, with light excluded, put away for a week or so.

When developed the plate had a clear picture of the butterfly wings, complete as to detail and relative intensity of color pattern. Black patches were black, orange areas intermediate, and white areas white, so that on the print black areas came out white and white areas black.

Examine 37 Species

The wings of 37 species of butterflies were examined. Some were perfectly preserved specimens reared in the dark from fully fed caterpillars and never exposed to sunlight; others had been taken in sunlight; and still others had been dead more than 30 years. The effect was less apparent in the case of the 30-year-old specimens than in the fresh ones.

The only anomaly found was that the light spots of the common blue swallow-tail came out as if they were black instead of white — a reversibility previously noted in photographing the Parnassides, another group of the swallow-tail family. Color values were the same on films and plates, whereas photographers say that they are usually, but not always, reversed on films in case of gas emanation, tentatively explained as due to interaction between the gas and the film preservative.

Glass Impenetrable

Exposures were made with parts of the wings covered with thin slips of glass, and others with parts covered with cellophane. The latter substance is very transparent to the short wavelengths of light, while glass is not. The glass obliterated on the negative all portions of the wings beneath them, but the cellophane only resulted in a slight dimming of the image, with no alteration of pattern. Hence whatever causes the effect on the plate will not pass a thin cover glass, but will pass through cellophane.

This would seem to lend support to the theory that the effect is due to some kind of light waves rather than to a gas. But when Mr. Clark shielded part of a wing with a bit of thin quartz, which is even more transparent than cellophane to ultraviolet radiation, he found that the quartz blocked off the effect as completely as did glass. This leaves the nature of the cause still in doubt.

August 16, 1930 — *SNL* 18(488): 103.

Rabbits Adopted into Mule Deer Tribe

What is believed to be a unique case of adoption is that of two rabbits into a band of semi-tame mule deer grazing near park headquarters at the Grand Canyon, Arizona. The rabbits even accompany the deer on their nightly rambles through the adjacent forest, leaving with them at sundown and returning with them at daylight.

The rabbits themselves sought adoption when, during the winter, they were attracted to the deer feed yards by hay and barley, and timidly picked up what food they could from the ground. The deer did not object, and the rabbits began to feed alongside them at the grain troughs, and to nibble from the same stalks.

This limited companionship did not satisfy the rabbits, who apparently by this time thought themselves full-fledged members of the herd. Now the rabbits made up to the deer in many ways, bedded alongside them, nestling close. Sometimes they climbed upon their backs and often, standing upon their hindlegs, nosed the faces of the deer.

November 8, 1930 — *SNL* 18(500): 303.

Alaskan 'Prehistoric Animal' Declared Merely Whale

The supposed "prehistoric animal" reported to have been discovered preserved in ice in Alaska is almost certainly a whale. Dr. Barnum Brown of the American Museum of Natural History, New York, has advised Science Service that the reported presence of flippers and the dimensions of the skull indicate the carcass is that of a familiar mammal of the sea. Scientists of the U. S. National Museum, Washington, also express the same opinion.

December 13, 1930 — *SNL* 18(505): 382.

“Giant” Indian Skeletons Turn Out to Be Ordinary

Again a find of allegedly “giant” skeletons in an ancient Indian burial ground turns out to be a lot of perfectly ordinary burials of rather ordinary redmen. Two scientists from the University of Illinois investigated the recently reported find at Edgemont, near East St. Louis, Ill., and have reported to Science Service that there is nothing out of the ordinary about the skeletons at all.

When first discovered by workmen the skeletons had fallen apart somewhat due to the complete decay of the tendons and cartilage connections that had once held the bones together. Not allowing for this false increase in height, the workmen measured the bones as they lay, and reported a race of giants eight or nine feet tall. This failure to allow for the lengthwise shifting of the bones after the decay of all the connecting tissues is the common cause of erroneous reports of “giant skeletons” that get into circulation, explains Dr. A. R. Kelly, University of Illinois anthropologist.

Another unfortunate error made by the workmen was the complete removal of the bones from the positions where they were found, which made it impossible for the anthropologists to confirm the report that the skeletons were found face downward in two convergent lines.

July 11, 1931 — *SNL* 20(535): 31.

First Known Hybrid of Elk and Moose is Killed

The first known specimen of a cross between a moose and an elk was recently killed in the Deerlodge National Forest, in Bear Gulch.

The animal, known to United States forest rangers as “the elk with the funny horns,” associated with elk and grazed like them, but had a body and horns that were half moose and half elk. He was first seen on the Boulder Creek District of the Deerlodge Forest when about three years old, judging from his appearance. When killed, the animal weighed 1,100 pounds.

August 8, 1931 — *SNL* 20(539): 95.

Eagle Takes Bobcat for Aerial Ride and Drops Him

An eagle that has proved its ability to “lick its weight in wildcats” is the boast of Mesa Verde National Park. And the dead wildcat is there to prove it.

Superintendent Marshall Finnan tells the story. A roadbuilding crew of Navajo Indians were startled to see a big eagle swoop down upon a full-grown bobcat, and carry its yowling, spitting prey high into the air. At a height of about 1,800 feet the eagle let go, and the cat crashed down upon the highway, dead.

The Indians rushed to retrieve the wildcat, and at the same time the eagle swooped again, making several attempts to regain possession of its prey. Another party of Indians on the roadway above the scene began to throw rocks at the bird to drive it away. This they succeeded in doing, but unfortunately one of the missiles struck another worker on the head hard enough to put him in the hospital for several days.

Now the mounted skin of the wildcat, with the scars of the eagle’s talons plainly visible, stands on top of a case in the Park museum.

October 17, 1931 — *SNL* 20(549): 249.

Discovery: The Five-horned Giraffe

A New Mammalian Genus

Professor E. Ray Lankester writes from the Natural History Museum, under the date of June 17, to the London *Times*, as follows:

I have this afternoon received and unpacked the case shipped at Mombasa on April 19, containing the skin and two skulls of the remarkable new giraffe-like animal obtained from the Semliki forest by Sir Harry Johnston, and sent by him to me for preservation in the Natural History Department of the British Museum. I write without loss of time to say that the specimens have arrived in perfect safety and they fully and completely bear out Sir Harry Johnston's statements and inferences.

The animal is a giraffe-like creature devoid of horns, with relatively short neck and with color stripes on the limbs, but nowhere showing spots or areolæ like those of the giraffe. Sir Harry Johnston was amply justified in assimilating the animal to the extinct *Helladotherium*, but after an examination of the skulls I am of opinion that the 'Okapi' (the native name by which the new animal is known) cannot be referred to the genus of the *Helladotherium*, but must be placed in a new genus.

I must say that, although the horny hoofs are not present, yet the double bony supports of the hoofs are preserved with the skin, and leave no doubt, even without reference to the accompanying skulls, that the animal which bore the skin was not a horse-like creature, but one with cloven hoofs.

P. S. — The 'five-horned giraffe' recently reported as having been discovered by Sir Harry Johnston is (I am told by Dr. Forsyth Major) due to a misunderstanding of a French translation of Sir Harry Johnston's description of the Okapi as 'une girafe sans cornes' (girafe à cinq cornes).

In connection with the above letter, Sir Harry Johnston has written as follows: Perhaps I may be allowed to correct a slight misapprehension that has arisen owing to a postscript attached to my friend Professor Ray Lankester's letter in *The Times* of June 18. It has been thought by the authorities of the British Museum that the telegram of a press agency from east Africa announcing that my expedition had recently discovered a giraffe with five horns was a misleading variant of the account sent some months ago as to the other discovery made by us in the summer of 1900 of the existence in the forests bordering the Semliki River of a giraffe-like animal, without horns, which has just been named 'Ocapia' by Professor Ray Lankester. Quite independently of this interesting discovery, the credit of which, it must not be forgotten, has to be shared by Mr. Karl Ericsson, of the Congo Free State, who furnished me with a complete specimen, my expedition has been the means of discovering a species or variety of giraffe, which, in the male, possesses five horn cores, instead of the two or three found in other known species of giraffe. Specimens of the five-horned giraffe were shot by Mr. Doggett and myself about five weeks ago in the country lying to the east of Mount Elgon in the northeastern part of the Uganda Protectorate. Of these specimens, two are males and two females. The female has only three horns, while both the male specimens exhibit five horn cores.

In coloration it is my opinion that this species of giraffe differs from those already known. I have in my possession now drawings and photographs confirming these statements, and the four specimens (bones of the head and neck and skins) are on their way to England for presentation to the Natural History Museum.

Until these specimens are in the hands of competent authorities it is rather premature to discuss the worth of the discovery, or the question of its substantiating the existence of a hitherto unknown giraffe.

— From *Science*, July 19, 1901, 14(342): 114-5.

The "Five-horned giraffe" was a new subspecies, now known as the rare Rothschild's Giraffe.

Rumors of an Unknown Vermont Lake Monster: The Lake Bomoseen Cryptid.

Dr. Dwight G. Smith* and Gary S. Mangiacopra**

“Rumor: a statement or report current without known authority for its truth.”
— Webster’s Seventh New Collegiate Dictionary, 1967 edition.

Regarding Rumors:

In our ever continuing quest for information on cryptozoological subjects, at times one is limited by unsustained rumors told second-hand of something that had been told to them by a friend or a family member. Yet without these rumors, the cryptozoologist has nothing else by which he can begin a detail investigation that might support or eliminate the possibility of a cryptid discovery. All rumors must be explored!

A rumor of an unknown cryptid was told to author Mangiacopra by an acquaintance. In August of 2001, one of the residents (age about 40) of Ryders Mobile Park, (in Milford, Connecticut) relayed an interesting story about a Vermont Lake with a lake monster. This story had been told to him by a former family-in-law member, and which he had heard with amused disbelief. The family account goes as this:

It seems that an in-law of his, about 15 years ago (circa 1986), along with his wife were out in their 17-foot-long boat on Lake Bomoseen, Vermont. They were fishing when they claimed that they saw a giant eel longer than their boat swim by them! This giant eel was about 8-9 inches in diameter, and their response was they did not want to fish any more that day and got the hell out of there! They thought they had seen some kind of Loch Ness Monster transplanted into a quiet Vermont lake. Actually, they had no idea of what they had seen. No further details could be remembered by the park resident, except to say that no one in the family could believe their story about a 20-foot giant eel.

The only other information he gave was that the wife had died since the sighting, but the husband was, last he knew, still living in Seymour, Connecticut.

No further information was forthcoming, as it seems that these two witnesses were former in-laws of his first wife, and he did not want to bother contacting them in regards to this Lake Bomoseen encounter.

Just Where Is This Lake?

Lake Bomoseen is located in western Vermont at roughly 73°15' longitude and 43°40' latitude in Rutland county. This lake is the largest lake that lies within the boundary of the state, and is surrounded by rolling hills of the Taconic and Champlain regions. The lake is an important recreational center and has a number of commercial ventures along its shores. Lake Bomoseen is the most heavily developed lake in the lake region of Vermont, an area that extends from Lake Dunmore in the north southward to Lake St. Catherine.

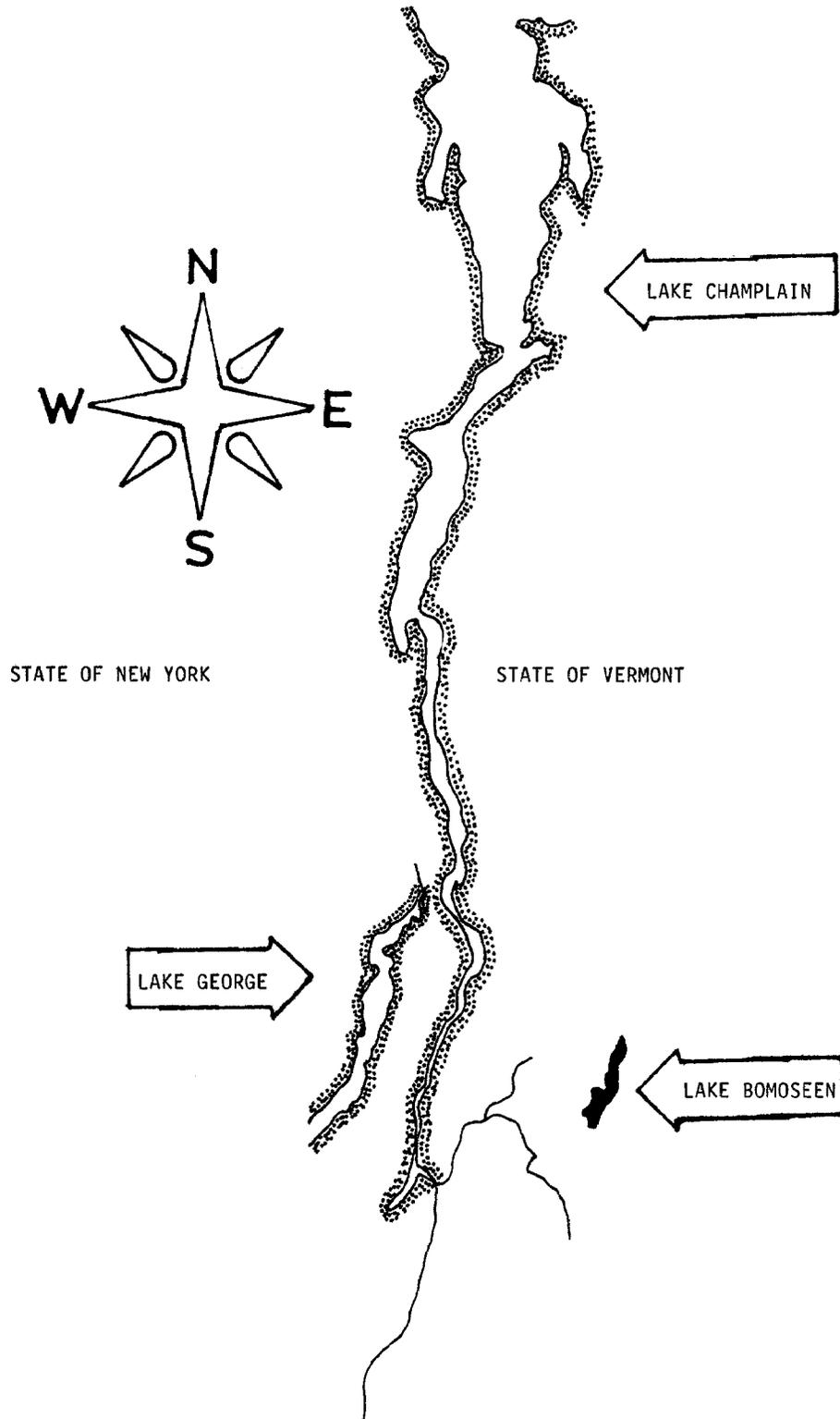
The lake is 9 miles in length and about 2 miles in width at its widest point. The lake area itself is 960 hectares (about 2,370 acres) but it is relatively shallow, averaging about 26.8 feet in depth (8.2 meters) with a maximum depth of 65 feet (19.8 meters) at its deepest point. The watershed of Lake Bomoseen

*Biology Department, Southern Connecticut State University, New Haven, Connecticut;

**Milford, Connecticut.

is about 10,025 hectares (about 24,470 acres) which drain into the lake via five major inlets as well as several minor inlets. The lake empties into the Castleton River which in turn drains into Lake Champlain.

The lake can be roughly subdivided into four parts, the north basin, the main basin, the south basin, and the south channel which runs over a small hydroelectric dam in Hydeville and from there into the Castleton River.



The north basin is the least developed part of the lake and consequently the most highly prized part of the lake for year-around fishing for bass, perch, trout, and pike.

Notable features of Lake Bomoseen include two islands, one of which — Rabbit Island — features yet another legend. According to the earliest inhabitants, who may have been informed by the Abenaki Indians who regularly visited the lake, Rabbit Island was once the home of giant rabbits with enormous red eyes. In a tradition that has continued for many years, vacationers often take canoe rides around the island in the late evening hours, shining a spotlight amongst the vegetation in hopes of spotting one of these giant rabbits.

Lake Bomoseen is in close proximity at about 8 miles distance to the east of the most southern portion of Lake Champlain. This lake is famed for its own lake cryptid nicknamed “Champ.”

Of the populated settlements, Hubbardton (pop. circa 500) which is at the foremost northern tip of the lake; to the west shore West Castleton; and to the east Bomoseen. The major tourist attraction of the area is an automobile museum.

Any Rumor of Truth to a Lake Cryptid?

At the present time, it has not been established if there are any additional reports by the local inhabitants of sightings of a Lake Bomoseen cryptid. This may be due to the rural nature of the Lake Bomoseen area and lack any large villages around the lake.

Until further reports can be obtained from the Lake Bomoseen region, this lake cryptid must be viewed with a skeptical eye. Still, could this lake be harboring eels large enough to be considered in the lake monster category?

Eels are bony fish that have a long, serpentine body. They are frequently mistaken for snakes because of their serpentine appearance but are actually teleost fish. The American eel is an example of a catadromous fish that inhabits freshwater habitats as an adult but migrates down to the sea to reproduce. Adult American eels, for example, migrate to the Sargasso Sea, where they spawn and die. The eggs hatch into tiny larvae that float in the current, eventually drifting northwards along the eastern coast of North America. When they reach the continental margin they transform into miniature eels that ascend rivers and streams, often returning to their native freshwater streams and lakes that their ancestors had left years before. The young eels will remain in these freshwater streams, rivers, lakes, ponds, and wetlands for a period of 5-20 years, growing larger each year. When the female becomes sexually mature she migrates in the autumn down to the sea where she is joined by the male.

The size of eels varies greatly, but most mature specimens are reported at 5-6 feet with a weight of 10-15 pounds. Larger sizes are certainly possible, especially in land-locked lakes.

Although Lake Bomoseen is situated close to Lake Champlain, a possible relationship to that lake cryptid, “Champ,” is considered at the present time by the authors very unlikely — but not totally out of the question. Nor that what was described as a 17+ foot “giant eel” could be considered a member of this fish species that had obtained such enormous, record-breaking dimensions.

Nevertheless, as this Vermont lake had not previously been mentioned in print elsewhere as possibly containing a lake monster, it is the intention of the authors to bring this rumor to the attention of others. It is hoped that our report may prompt further investigation that will establish the true facts about this very interesting observation.

Report on the Remnant Skin of a Patagonian Ground Sloth

H. Hesketh Prichard, editor

[Edited from *Through the Heart of Patagonia*, 1902, New York: D. Appleton & Co., Appendix A]

The expedition sent out to Patagonia under my charge by Mr. C. Arthur Pearson owed its origin to the discoveries made in that country by Dr. F. P. Moreno of certain remains of an animal, the Pampean *Myloodon* or Giant Ground Sloth, long believed to belong to the category of extinct prehistoric mammals. The marvellous state of preservation of the remains found at Last Hope Inlet seemed to give some ground for the supposition that the animal might possibly have survived to a recent period. Professor Ray Lankester, the Director of the British Museum of Natural History, in commenting upon the chance of the *Myloodon* being still alive in some remote and unknown region of Patagonia, said: "It is quite possible — I don't want to say more than that — that he still exists in some of the mountainous regions of Patagonia." These words from such an authority carried weight, and the question assumed an importance that made it worth all practicable examination. I have in the following pages put the whole case as clearly and as definitely as lies in my power.

To begin with, I give the story of Dr. Moreno's discovery as he himself told it to the Zoological Society, and the description of the remains .by Dr. A. Smith Woodward, LL.D., F.R.S.

I. Account of the Discovery. By Dr. Moreno.

In November 3:897 I paid a visit to that part of the Patagonian territory which adjoins the Cordillera of the Andes, between the 51st and 52nd degrees of South latitude, where certain surveyors, under my direction, were carrying out the preliminary studies connected with the boundary-line between Chile and Argentina, and in the course of this expedition I reached Consuelo Cove, which lies in Last Hope Inlet. In that spot, hung up on a tree, I found a piece of a dried skin, which attracted my attention most strangely, as I could not determine to what class of Mammalia it could belong, more especially because of the resemblance of the small incrustated bones it contained to those of the Pampean *Myloodon*.

On inquiring whence it came, I was informed that it was only a fragment of a large piece of skin which had been discovered two years before, by some Argentine officers, in a cavern which existed in the neighbouring heights. Immediately on receiving this news, I hastened to the spot guided by a sailor who had been present when the original discovery had been made. As, at that moment, I had no means of making more than a few hurried excavations, which gave no further traces of the discovery, I left orders that the search should be continued after my departure; but this once more also failed to give any ultimate results. Nothing could be found but modern remains of small rodents, and these chiefly on or near the surface of the ground. From the most careful inquiries which I set on foot, it appeared that, when the first discovery was made, no bones were found, the skin being half buried in the dust which had accumulated from the gradual falling away of the roof of the cavern, composed of Tertiary Conglomerate. It was only in the broad entrance to the cavern that were found a few human bones, borne thence to the shore of the Cove and afterwards broken up.

As already stated, the skin here presented to you formed but a small part of a larger one. One small piece had been carried off by Dr. Otto Nordenskjöld, and others by officers of the Chilian Navy, who later on had visited the spot. The inhabitants of the locality looked upon it as an interesting curiosity, some of them believing that it was the hide of a cow incrustated with pebbles, and others asserting that it was the skin of a large Seal belonging to a hitherto unknown species.

In Consuelo Cove, I embarked on board a small Argentine transport, which had been placed at my disposal to carry out the study of the western coast as far as Port Montt, in lat. 42°. At this latter place I left the steamer, which then proceeded to make a series of surveys. These lasted until her return to La Plata, at the latter end of July 1898, when she brought back to me the fragment of skin in question.

This is an accurate and true version of the discovery of this skin, which gave rise to the publication of Señor Ameghino's small pamphlet,* in which he gave an account of the discovery of a living representative of the "Gravigrades" of Argentina, distinguishing it by the name of "*Neomylodon listai*."

I have an idea that Señor Ameghino never saw the skin itself, but only some of the small incrustated bones, of which he had obtained possession. The vague form in which he draws up his account compels me to believe this suspicion to be true.

My opinion is that this skin belongs to a genuine Pampean Mylodon, preserved under peculiar circumstances resembling those to which we owe the skin and feathers of the Moa. I have always maintained that the Pampean Edentates, now extinct, disappeared only in the epoch which is called the "historical epoch" of our America. In the province of Buenos Aires, buried chiefly in the humus, I have found remains of *Panochthus*, and others of the same *Mylodon* from the seashore, all of which present the same characteristic marks of preservation as the remains of human beings discovered in the same spot. In this identical layer of the sea-shore, close to the bones I have also found stones polished by the hand of man, and flints cut like those found in the Pampean formation. In 1884, in a cavern near to the Rio de los Patos, in the Cordillera, I discovered some paintings in red ochre, one of which, in my opinion, resembles the *Glyptodon* on account of the shape of the carapace.

Ancient chroniclers inform us that the indigenous inhabitants recorded the existence of a strange, ugly, huge hairy animal which had its abode in the Cordillera to the south of lat. 37°. The Tehuelches and the Gennakens have mentioned similar animals to me, of whose existence their ancestors had transmitted the remembrance; and in the neighbourhood of the Rio Negro, the aged cacique Sinchel, in 1875, pointed out to me a cave, the supposed lair of one of these monsters, called "Ellengassen"; but I must add that none of the many Indians with whom I have conversed in Patagonia have ever referred to the actual existence of animals to which we can attribute the skin in question, nor even of any which answer to the suppositions of Señor Ameghino according to Señor Lista. It is but rarely that a few Otters (*Lutra*) are found in the lakes and rivers of the Andes, as in the neighbourhood of Lake Argentino, in the "Sierra de las Viscachas," and in the regions which I believe Señor Lista visited, there are only a few scarce Chinchillas (*Lagidium*), which have a colouring more dark greyish than those found to the north, and are in every case separated from these by a large extent of country.

The Pampean Edentata have in former days certainly existed as far south as the extreme limit of Patagonia. In 1874, in the bay of Santa Cruz, I met with the remains of a *pelvis* of one of these animals in Pleistocene deposits, and also remains of the mammals which are found in the same formation, such as the *Macrauchenia* and *Auchenia*. It would not be astonishing that the skin of one of these should have been preserved so long, because of the favourable conditions of the spot in which it was found.

The state of preservation of this piece of skin, at first sight, makes it difficult for one to believe it to be of great antiquity; but this is by no means an impossibility, if we consider the conditions of the cave in which it was found, the atmosphere of which is not so damp as one might at first imagine it to be, although it is situated in the woody regions near to the glaciers and lakes. It is well to mention that in 1877, under similar conditions, and in a much smaller cave, scarcely five metres from the waters of Lake Argentino, situated sixty miles more to the north, I discovered a mummified human body painted red, with the head still covered in part with its short hair wonderfully preserved, and wrapped up in a covering made of the skin of a Rhea, and holding in its arms a large feather of the Condor, also painted red; this was all covered up with a layer of grass and dust fallen from the roof of the cave. In another cave in the neighbourhood I discovered a large trunk of a tree, painted with figures in red, black, and yellow. The sides of the rock close to the entrance of the cave were covered with figures, some representing the human hand, others combinations of curved, straight, and circular lines, painted white,

* F. Ameghino, "Première Notice sur le *Neomylodon listai*, un Représentant vivant des anciens Edentés Gravigrades fossiles de l'Argentine" (La Plata, August 1898); translated under the title "An Existing Ground-Sloth in Patagonia," in "Natural Science," vol. xiii (1898), pp. 324-326.

red, yellow, and green. Now, this mummy, which is preserved in the Museum of La Plata, does not belong to any of the actual tribes of Patagonia. Its skull resembles rather one of those more ancient races found in the cemeteries in the valley of the Rio Negro — a most interesting fact, since they belong to types which have completely disappeared from the Patagonian regions, and it is well known that the actual Tehuelches may be considered to have been the last indigenous races which reached the territory of Patagonia. Many a time the Tehuelches have spoken to me of these caves as abodes of the evil “spirits,” and of the enigmatical painted figures they contained: some attributed the latter to these same “spirits,” others to men of other races, of whom they have no recollection. In another cave, four hundred miles farther to the north, in 1880, I discovered other human bodies, more or less mummified and in good preservation, but of a different type, and beside them some painted poles which served to hold up their small tents, the use of which had already disappeared more than three centuries ago; together with the upper part of the skull of a child perfectly scooped out like a cup. And yet the historical Tehuelches, the same as all the indigenous races in the southern extremity of South America, hold their dead in great respect, and never use such drinking-vessels.

These proofs of the favourable conditions of the climate and of the lands near to the Cordillera, which are revealed to us by the preservation of objects undoubtedly dating from very remote epochs, strengthen my opinion that this skin of a huge mammal, which has long since disappeared, may well have been preserved till the present time.

I may add that a further careful search is now being made in the earth forming the floor of the cave, and I hope in due time to have the honour of communicating the results to this Society.

II. Description and Comparison of the Specimen.

By A. Smith Woodward.

(a) *Description.*

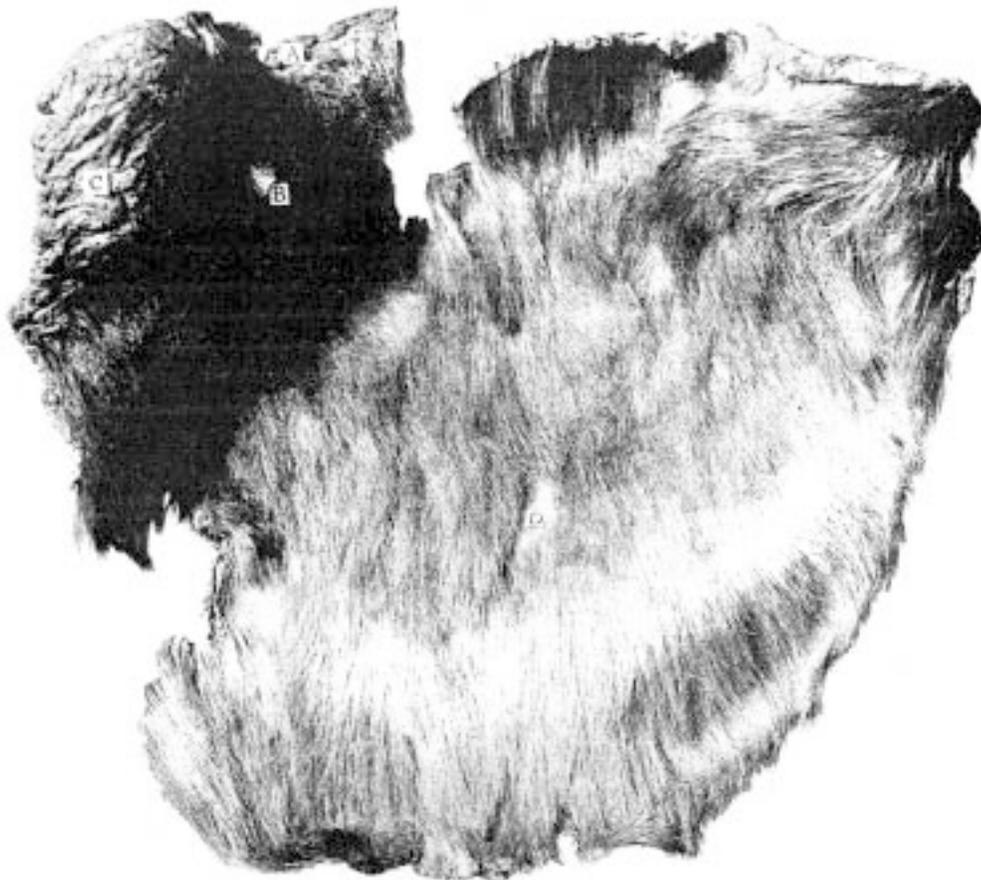
The problematical piece of skin discovered by Dr. Moreno measures approximately 0.48 m. in the direction of the main lie of the hair, while its maximum extent at right angles to this direction is about 0.55 m. The fragment, however, is very irregular in shape; and it has become much distorted in the process of drying, so that the anterior portion, which is directed upwards in the drawing, is bent outwards at a considerable angle to the main part of the specimen which will be claimed to represent the back. The skin, as observed in transverse section, presents a dried, felt-like aspect; but there is a frequent ruddiness, suggestive of blood-stains, while the margin exhibits distinct indications of freshly dried once-fluid matter, which Dr. Vaughan Harley has kindly examined and pronounced to be serum. Its outer face is completely covered with hair, except in the region marked C and above B, where this covering seems to have been comparatively fine and may have been accidentally removed. The inner face of the skin is only intact in a few places, the specimen having contracted and perhaps been somewhat abraded, so that a remarkable armour of small bony tubercles, irregularly arranged and of variable size, is exposed over the greater part of it. At one point there is an irregular rounded hole about 0.02 m. in diameter, which might possibly have been caused by a bullet or a dagger, but in any case was probably pierced when the skin was still fresh. Owing to its direction, this hole is partly obscured by the overhanging hair.

The skin in its dried state varies in thickness in different parts. The average thickness of the flattened portion, which must be referred to the back, is shown by the cleanly-cut right margin of the specimen to be 0.01 m. This is slightly increased towards the posterior (lower) end of the border, while above it the thickness becomes 0.015 m. The latter thickness also seems to be attained in the much-shrivelled corner marked C — a circumstance suggesting bilateral symmetry between at least part of the two anterior outer angles of the specimen. The thinnest portion preserved is the border above B; and the skin must also have been comparatively thin in the region of the accidental notch to the left, considerably below C.

The portion of skin above B is interesting not only from its relative thinness, but also from the occurrence of an apparently natural rounded concavity in the margin. This excavation, which measures

0.05 m. along the curve, is marked by the remains of a thin flexible flap, which is sharply bent outwards, and is covered with short hairs on its outer face. It is especially suggestive of the base of an ear-conch; and if this appearance be not deceptive, it is worthy of note that the dried skin hereabouts and in the region which would have to be interpreted as cheek (C) is much more wrinkled than elsewhere.

As already mentioned, the outer aspect of the skin is completely covered with hair, which is very dense everywhere except on the left anterior corner. Here it seems to have been removed by abrasion. A small patch of hair has also clearly been pulled out near the gap in the left border of the specimen; and close to the middle (where marked D) there is a small hairless depression which may perhaps be interpreted as a wound inflicted and healed during life. The hair is only of one kind, without any trace of under-fur, and it is still very firmly implanted in the skin, without signs of decay. Its arrangement seems to be quite regular, there being no tendency towards its segregation into small groups or bundles. It is of a uniform dirty yellowish or light yellowish-brown colour, and, making due allowance for slight ruffling and distortion of the specimen, it may be described as all lying in one direction, vertically in the photograph, except at the two upturned anterior corners of the specimen, where there is an inclination from the right and left respectively towards the centre. The longest hairs, which usually measure from 0.05 m. to 0.065 m. in length, are observed in the half of the specimen in front of (above) the letter D. Those in the middle of the extreme anterior (upper) border measure from 0.03 m. to 0.05 m. in length, those at the hinder (lower) border about the same; while some of the comparatively small and delicate hairs on the supposed cheek are not longer than 0.01 m. The hairs are stiff; straight, or only very slightly wavy, and all are remarkably tough. Examined under the microscope, their cuticle is observed to be quite smooth, while the much-elongated cells of the cortex are readily distinguishable. Mr. R. H. Burne has kindly made some transverse sections, which prove the hairs to be almost or quite cylindrical, and none of the specimens examined present any trace of a medulla.



Skin of Grypotherium, Outer View. 1/4 nat. size.

The dermal ossicles are very irregular in arrangement, but are to be observed in every part of the specimen, even in the comparatively thin region near the supposed ear. They form everywhere a very compact armour, and some of them are quite closely pressed together; rarely, indeed, there is a shallow groove crossing a specimen, possibly indicating two components which were originally separate. As shown by every part of the cut margin, and especially well in a small section prepared by Prof. Charles Stewart, they are all confined to the lower half of the dermis, never encroaching upon the upper portion in which the hair is implanted. It is also to be observed that, where the inner surface of the skin is intact, the ossicles are completely embedded and only faintly visible through the dry tissue. The exposure of a considerable number of them, as already mentioned, is due to the rupture and partial abrasion of this surface. No tendency to arrangement in parallel lines or bands can be detected; and large and small ossicles seem to be indiscriminately mingled, although of course allowance must be made, in examining sections and the abraded inner view of the skin, for differences in the plane of adjoining sections and varying degrees of exposure by the removal of the soft tissue. The largest ossicles are oblong in shape when viewed from within, and measure approximately 0.015 m. by 0.010 m.; but the majority are much smaller than these. They are very variable and irregular in form; but their inner face is generally convex, sometimes almost pyramidal, while the outer face of the few which have been examined is slightly convex, more or less flattened, without any trace of regular markings.

In microscopical structure the dermal ossicles are of much interest, and I have examined both horizontal and vertical sections, one of the former kindly prepared by Prof. Charles Stewart. The tissue is traversed in all directions by a dense mass of interlacing bundles of connective-tissue fibres, which exhibit an entirely irregular disposition, except quite at the periphery of the ossicle. Here they are less dense, and are arranged in such a manner as to form at least one darkened zone concentric with the margin in the comparatively translucent border. Occasionally, not nor at all points, the fibres in this



Skin of Grypotherium, Inner View. 1/4 nat. size.

peripheral area may be observed to radiate regularly outwards. Numerous small vascular canals, frequently branching, are cut in various directions; and the bony tissue, which is developed in every part of the ossicle, exhibits abundant lacunæ. Nearly everywhere, except in the narrow peripheral area just mentioned, it is easy to recognise the bony laminæ arranged in Haversian systems round the canals; and most of the lacunæ between these laminæ are excessively elongated, with very numerous branching canaliculi, which extend at right angles to their longer axis. Near the margin of the ossicle, especially in its more translucent parts, the bone-lacunæ are less elongated, more irregular in shape, and apparently not arranged in any definite order. There is no clear evidence of bony laminæ concentric with the outer margin, though appearances are sometimes suggestive of this arrangement. A vertical section of an ossicle presents exactly the same features as the horizontal section now described. It is thus evident that the vascular canals with their Haversian systems of bone have no definite direction, but are disposed in an entirely irregular manner.

Taking into consideration all characters, and making comparisons with the aid of my friend Mr. W. E. de Winton, I am inclined to regard the fragmentary specimen as the skin of the neck and shoulder-region with part of the left cheek. The apparent bilateral symmetry between at least part of the thickened anterior outer angles of the specimen has already been noted; and if this observation be well founded, the middle line of the back extends vertically down the middle of the photograph, p. 306. If the rounded notch above B be the base of the external ear, as seems probable, the thick wrinkled skin (C) with fine short hair still further to the left must be the cheek. The ear and cheek on the right side have been removed; but at the base of the outwardly-turned angle on this side of the specimen there are the very long hairs which occupy a similar position on the left. It thus seems possible to estimate the transverse measurement between the ears as from 0.25 m. to 0.30 m., which corresponds with a tentative estimate of the same distance in *Myiodon robustus* based on a skull in the British Museum.

(b) *Comparisons and General Conclusions.*

The skin now described differs from that of all known terrestrial Mammalia, except certain Edentata, in the presence of a bony dermal armour. There can therefore be little doubt that the specimen has been rightly referred to a member of this typically South American order. Even among the Edentates, however, the fragment now under consideration is unique in one respect; for all the ossicles are buried deeply in the lower half of the thickened dermis and the hairs are implanted in every part of its upper half, whereas all the forms of bony armour hitherto described in this order reach the outer surface of the dermis and are merely invested with horny epidermis. This is the case, as is well known, in the common existing Armadillos, in which the hair is only implanted in the dermis between the separate parts of the armour. Even in the unique and remarkable skin of an Armadillo from Northern Brazil, described by Milne-Edwards under the name of *Scleropleura bruneti*,* the bony plates and tubercles are still covered only by epidermis, although most of them are reduced to small nodules and might well have sunk more deeply into the abnormally hairy skin. There is also reason to believe that in the gigantic extinct Armadillos of the family Glyptodontidæ the same arrangement of dermal structures prevailed; for one specimen of *Panochthus tuberculatus* obtained by Dr. Moreno for the La Plata Museum actually shows the dried horny epidermis in direct contact with the underlying bone, and seems to prove that the numerous perforations in the Glyptodont dermal armour were not for the implantation of hairs (as once supposed), but for the passage of blood-vessels to the base of the epidermal layer. Similarly, among the extinct Ground-Sloths of the family Mylodontidæ dermal ossicles have been found with the remains of *Cœlodon* † and various forms (perhaps different subgenera) of *Myiodon*, but the only examples of this armour yet definitely described ‡ exhibit a conspicuously sculptured outer flattened face, and it thus seems clear that Burmeister was correct in describing them as originally

* A. Milne-Edwards, "Note sur une nouvelle Espèce de Tatou à cuirasse incomplète (*Scleropleura bruneti*)," *Nouv. Arch. Mus.* vol. vii. (1871), pp. 177-179, pl. xii.

† P. W. Lund, *K. Dansk. Vidensk. Selsk. Afhandl.* vol. viii. (1841), p. 85 (footnote).

‡ H. Burmeister, *Anales Mus. Publico Buenos Aires*, vol. i. (1864-69), p. 173, pl. v. Fig. 8.

reaching the upper surface of the dermis and only covered externally by a thickened epidermis. It is, however, to be noted that Burmeister himself actually observed armour of this kind covering only the lumbar region of the trunk. He believed that the other parts of the animal were similarly armoured, because he had found “the same ossicles” on the digits of the manus, where they were “generally smaller and more spherical”; but he unfortunately omits to make any explicit statement as to the presence or absence of the characteristic external ornamentation on the latter.

The omission just mentioned is especially unfortunate, because on careful comparison it is evident that the irregular disposition of the small ossicles in the piece of skin now under consideration is most closely paralleled in the dermal armour of the extinct *Myiodon*, as already observed by Drs. Moreno and Ameghino. There is obviously no approach in this specimen to the definite and symmetrical arrangement of the armour such as is exhibited both by the existing Armadillos and the extinct Glyptodonts. There are, then, two possibilities. Either the dermal armour of *Myiodon* varied in different parts of the body, being sculptured and covered only by epidermis in the lumbar region, while less developed, not sculptured but completely buried in the dermis in the comparatively flexible neck and shoulder region — in which case Dr. Moreno may be correct in referring the problematical specimen to *Myiodon*; or the dermal ossicles of this extinct genus may have been uniform throughout, only differing in size and sparseness or compactness — in which case Dr. Ameghino is justified in proposing to recognise a distinct genus, *Neomyiodon*.

To decide between these two possibilities, it is necessary to wait for additional information concerning the anterior dorsal armour of *Myiodon* as precise as that published by Burmeister in reference to the lumbar shield. Meanwhile it must suffice to compare the microscopical structure of the ossicles from the new skin with that of the small sculptured tubercles of undoubted *Myiodon*. It must be remembered that the specimen has been buried in the Pampa Formation for a long period, and that the oxides of iron and manganese have infiltrated the margin of the bone, rendering the structure of its outer border more conspicuous than that of its central portion. It must also be noted that some of the manganese has assumed its familiar “dendritic” aspect, in this respect presenting appearances not due to original structure. The calcified interlacing fibres of connective tissue are as abundant here as in the ossicle of the so-called *Neomyiodon*; but in a very wide peripheral area they exhibit a marked radial disposition, nearly everywhere extending in bundles at right angles to the border. Rather large vascular canals, infiltrated with the oxides of iron and manganese, are observed in places, often bifurcated and usually bordered by a transparent zone free from the connective-tissue fibres. Well-developed bone-lacunæ are very abundant, many exhibiting short branching canaliculi, and most of the others very irregular in shape, evidently furnished with canaliculi which cannot be seen from lack of infiltration. The lacunæ are never much elongated, and are not arranged in distinctly differentiated Haversian systems in any part of the section; while the only regular disposition of the bony laminæ is traceable near the circumference, where the lacunæ are frequently arranged or clustered in parallel zones concentric with the border. A vertical section of one of the same specimens shows the connective-tissue fibres radiating outwards towards the lateral margins, but not directly towards the upper sculptured face. There are no bony laminæ clearly parallel with the latter face, and at least one vascular canal in transverse section seems to be the centre of a Haversian system.

The histological structure of the ossicles in the skin now under consideration thus resembles that of the sculptured tubercles of *Myiodon* in all essential features, but differs in two noteworthy respects. In the ossicles of the so-called *Neomyiodon*, as already described, the fibres of connective tissue do not exhibit much definite radiation towards the lateral margin; while the bony tissue at most points is disposed in definite Haversian systems. There is thus enough discrepancy to justify the suspicion that the new and the old specimens do not belong to the same animal. In fact, so far as the differentiation of the dermal bone is concerned, the so-called *Neomyiodon* is precisely intermediate between *Myiodon* and the existing Armadillo (*Dasypus*); sections of the scutes of the latter animal, both in the Royal College of Surgeons and in the British Museum, showing that in this genus nearly the whole of the osseous tissue is arranged in Haversian systems, although abundant interlacing connective-tissue fibres are still entangled in it, at least near the border

If the characteristic dermal armature does not suffice for the definite expression of an opinion as to the precise affinities of the specimen, a still less satisfactory result can be expected from a comparison

of the hair. For, in the first place, no hair has hitherto been discovered in association with the skeleton of any extinct Ground-Sloth; while, secondly, the hairy covering of a mammal is perhaps that part of its organisation most readily adapted to the immediate circumstances of its life. So far as their endoskeleton is concerned, the extinct Mylodonts and their allies are precisely intermediate between the existing Sloths and Anteaters; they combine “the head and dentition of the former with the structure of the vertebral column, limbs, and tail of the latter.” * It might therefore be supposed that the hair of this extinct group would exhibit some of the peculiarities of that in one or other of its nearest surviving relatives. The epidermal covering of the piece of skin now described, however, entirely lacks the under-fur which is so thick in the Sloths; while the structure of each individual hair, with its smooth cuticle and lack of a medulla, is strikingly different from that observed both in the Sloths and Anteaters, and identical with that of the hair in the surviving Armadillos. The large hair in the Sloths and *Tamandua* exhibits a conspicuously scaly cuticle; while that of *Myrmecophaga* is remarkable for its very large medulla. All these animals now live in the tropics, either in forests or swamps, whereas the Patagonian animal must have existed under circumstances much like those under which the Armadillos still survive. Hence the characters of the hair of the so-called *Neomyodon* may be of no great importance in determining the affinities of the animal, but may represent a special adaptation to its immediate environment.

Finally, there is the question of the antiquity of the problematical skin. On two occasions I have examined the mummified remains of the extinct Mammoth and Rhinoceros from Siberia in the Imperial Academy of Sciences at St. Petersburg; I have also carefully studied the remains of the neck and legs of the Moa from a cavern in New Zealand, now in the British Museum. Compared with these shrivelled and dried specimens, the piece of skin from Patagonia has a remarkably fresh and modern aspect; and I should unhesitatingly express the opinion that it belonged to an animal killed shortly before Dr. Moreno recognised its interest, had he not been able to give so circumstantial an account of its discovery and strengthened his point of view by recording the occurrence of a human mummy of an extinct race in another cavern in the same district. The presence of an abundant covering of dried serum on one cut border of the skin is alone suggestive of grave doubts as to the antiquity of the specimen; but Dr. Vaughan Harley tells me that similar dried serum has been observed several times among the remains of the Egyptian mummies, and there seems thus to be no limit to the length of time for which it can be preserved, provided it is removed from all contact with moisture. I may add that I have searched in vain in the writings of Ramon Lista (so far as they are represented in the Library of the Royal Geographical Society) for some reference to the statement which the late traveller made verbally to Dr. Ameghino; and as the piece of skin now described certainly represents an animal almost gigantic in size compared with the Old-World Pangolin, I fear it cannot be claimed to belong to Lista's problematical quadruped, whatever that may prove to be.

The final result of these brief considerations is therefore rather disappointing. There are difficulties in either of the two possible hypotheses. We have a piece of skin quite large enough to have belonged to the extinct *Myodon*; but unfortunately it cannot be directly compared with the dermal armour of that genus, because it seems to belong to the neck-region, while the only dermal tubercles of a Mylodont hitherto definitely made known are referable to the lumbar region. If it does belong to *Myodon*, as Dr. Moreno maintains, it implies either that this genus survived in Patagonia to a comparatively recent date, or that the circumstances of preservation were unique in the cavern where the specimen was discovered. On the other hand, if it belongs to a distinct and existing genus, as Dr. Ameghino maintains — and as most of the characters of the specimen itself would at first sight suggest — it is indeed strange that so large and remarkable a quadruped should have hitherto escaped detection in a country which has been so frequently visited by scientific explorers.

[P.S. — At the reading of this paper Prof. Ray Lankester remarked that he should regard the characters of the hair as specially important, and would not be surprised if the problematical piece of skin proved to belong to an unknown type of Armadillo. This possibility had occurred to me, but I had hesitated to mention it on account of the considerable discrepancy observable between the arrangement of the

* Flower and Lydekker, “Introduction to the Study of Mammals,” p. 183.

bony armour in *Neomylodon* and that in the known Glyptodonts and the unique Brazilian Armadillo (*Scleropleura*), which happen to exhibit an incompletely developed (incipient or vestigial) shield. In each of the latter cases, the armour is not subdivided into a compact mass of irregular ossicles, but consists of well-separated elements which could only become continuous by the addition of a considerable extent of bone round their margins, or by the special development of smaller intervening ossicles.

Since the paper was read, I have had the privilege of studying Dr. Einar Lönnberg's valuable description of the pieces of the problematical skin mentioned by Dr. Moreno as having been taken to Upsala by Dr. Otto Nordenskjöld.* It appears that with the skin was found the epidermal sheath of a large unknown claw, which may have belonged to the same animal. This specimen proves to be different from that of any existing Sloth, Anteater, or Armadillo, and is considered by Dr. Lönnberg to belong probably to the hind foot of a Mylodont, which did not walk on the exterior, lateral surfaces of the toes to the same extent as *Mylodon*. In a section of the skin provisionally ascribed to the leg, he observes that the small ossicles are very irregular, and shows two instances in which two are placed one above the other. In microscopical sections of the ossicles, however, he does not find the distinct Haversian systems of bone so conspicuous in my slides; and hence he fails to remark the differences between the structure of the armour in *Neomylodon* and *Mylodon*, which seem to me to be particularly noteworthy. His so-called "pigment cellules" in *Mylodon* are the dendritic infiltrations of oxide of manganese and stains of oxide of iron, to which I have made special reference. His observations as to the absence of a medulla in the hair confirm my own: but I have not seen any evidence of the suspected loss or disintegration of the hair-cuticle. Finally, Dr. Lönnberg has boiled a piece of the skin, thereby extracting glue, "which proves that the collagen and gelatinous substances are perfectly preserved." The latter observation confirms the evidence of the serum recorded above, and indicates that if the specimen is "of any considerable age, it must have been very well protected against moisture and bacteria." — A. S. W.]

III. Description of Additional Discoveries.

By A. Smith Woodward.**

Last February, when presenting to the Zoological Society an account of the skin of a Ground-Sloth discovered in a cavern in Southern Patagonia, Dr. Moreno mentioned that further excavations were being made in the hope of finding other remains of the same animal. The task referred to was undertaken by Dr. Rudolph Hauthal, geologist of the La Plata Museum, who met with complete success.† He not only found another piece of skin, but also various broken bones of more than one individual of a large species of Ground-Sloth in a remarkably fresh state of preservation. Moreover, he discovered teeth of an extinct horse and portions of limb-bones of a large feline carnivore, in association with these remains; he likewise met with traces of fire, which clearly occurred in the same deposits as the so-called *Neomylodon*. All these remains were found beneath the dry earth on the floor of an enormous chamber which seemed to have been artificially enclosed by rude walls. In one spot they were scattered through a thick deposit of excrement of some gigantic herbivore, evidently the Ground-Sloth itself; in another spot they were associated with an extensive accumulation of cut hay. Dr. Hauthal and his colleagues, indeed, concluded that the cavern was an old corral in which the Ground-Sloths had been kept and fed by man.

* E. Lönnberg, "On some Remains of '*Neomylodon listai*,' Ameghino, brought home by the Swedish Expedition to Tierra del Fuego, 1895-1897," *Wissensch. Ergebn. schwedisch. Exped. Magellanslând. unter Leitung v. Otto Nordenskjöld*, vol. ii. pp. 149-170, pls. xii.-xiv. (1899).

** "On some Remains of *Grypotherium (Neomylodon) listai* and associated Mammals from a Cavern near Consuelo Cove, Last Hope Inlet, Patagonia." *Proc. Zool. Soc.*, 1900, pp. 64-79, pls. v.-ix.

† R. Hauthal, S. Roth, and R. Lehmann-Nitsche, "El Mamifero Misterioso de la Patagonia, *Grypotherium domesticum*," *Revista Mus. La Plata*, vol. ix. pp. 409-474, pls. i.-v. (1899). — F. P. Moreno, "Note on the Discovery of *Miolania* and of *Glossotherium, (Neomylodon)* in Patagonia," *Geol. Mag.* [4] vol. vi. pp. 385-388 (1899).

As the result of these explorations, Dr. Moreno has now the gratification of exhibiting to the Society complete proof that the piece of skin described on the former occasion belongs to a genuine Pampean Ground-Sloth, not *Mylodon* itself, but a very closely related genus *Grypotherium*, of which skulls are already known from Pampean deposits in the Province of Buenos Aires.‡ The collection which we now have the privilege of examining distinctly supports his contention that the large quadruped in question belongs to an extinct fauna, though contemporary with man.

The discovery is thus unique in the history of palæontology, on account of the remarkably fresh state of preservation of all the remains. Some of the new specimens exhibit no indication whatever of having been buried. Many of the bones retain their original whitish colour, apparently without any loss of gelatine; while both these and other bones, which have evidently been entombed in brownish dust, bear numerous remnants not only of the dried periosteum, but also of shrivelled muscles, ligaments, and cartilages. Very few of the bones are fossilised, in the ordinary sense of the term.

An admirable brief description of this collection has already been published (*op. cit.*) by Dr. Roth, who was the first to recognise the generic identity of *Neomylodon* with *Grypotherium*. Some of the specimens, however, are worthy of a more detailed examination; and Dr. Moreno has kindly entrusted them to me for study in connection with the collections in the British Museum and the Royal College of Surgeons. The following notes, supplementing Dr. Roth's original memoir, are the result of this further investigation.

I. Remains of *Grypotherium listai*.

Number of Individuals.

Among the fragmentary bones of the Ground-Sloth, it is easy to recognise evidence of three individuals, which do not differ much in size. There are three distinct examples of the occiput and fragments of the dentigerous portion of three mandibles. It is also noteworthy that the three malar bones preserved are all different in shape, while three corresponding fragments of the acromial process of the scapula differ in size. One portion of maxilla seems to represent a fourth individual, being probably too small for either of the skulls to which the occiputs belong. Finally, as Dr. Roth has pointed out, one shaft of a humerus, which appears to be the bone of an adult, belongs to a much smaller animal than is indicated by any other specimen in the collection.

Remains of three individuals are thus recognisable with certainty; two others can probably be distinguished; while some of the fragments may even belong to a sixth specimen. It must also be noted that other portions of jaws are said to have been discovered by E. Nordenskjöld.*

Skull and Mandible.

The largest portion of cranium (No. 1) is not stained in any way, and does not retain a trace of the material in which it was buried in any hollow or crevice. It does not appear to have been damaged during excavation, but exhibits fractures which were almost certainly made when the animal was freshly killed. The cranial roof near the occipital region is battered in four places, though the injuries do not affect the braincase itself; while the right occipital condyle is partly removed by a sharp, clean cut. There can, indeed, be no doubt that the animal was killed and cut to pieces by man.

‡ J. Reinhardt, "Beskrivelse af Hovedskallen af et Kæmpedovendyr, *Grypotherium darwini*, fra La Plata-Landenes plejstocene Dannelser," K. Dansk. Vidensk. Selsk. Skr. [5] vol. xii. (1879), pp. 353-380, pls. i. ii. — H. Burmeister, "Atlas de la Description physique de la République Argentine," sect. ii. (1881), p. 119, woodc. (*Mylodon darwini*). — R. Lydekker, "The Extinct Edentates of Argentina," Anales Mus. La Plata — Paleont. Argentina, vol. iii. pt. 2 (1894), p. 85, pl. liv.

* R Hauthal, *op. cit.* p. 4.

This skull is evidently that of an adult animal, all the sutures in the hinder region being closed. The inner wall of the temporal fossa is much flattened, without any irregular convexities, but marked with the characteristic reticulately-decussating, fine ridges of bone, and studded with adherent patches of muscle-fibre. The upper border of the fossa is a remarkably sharp edge, while the narrow flattened cranial roof is only marked by a faint longitudinal median furrow and by a diminutive tuft of fibre in a small median pit near the occipital edge.* The fractures exhibit the very large cancellated chambers surrounding the brain-case dorso-laterally; while a median longitudinal section shows both these cells and others in the basi-sphenoid. The basi-cranial axis is nearly straight, inclining a little upwards in front. The anterior condyloid foramina piercing the basi-occipital are remarkably large, as usual; the basi-sphenoid is very long and narrow, flattened mesially on its lower face, but with one slight median prominence near its hinder end; the presphenoid forms a short acute rostrum, above which there are remains of the vomer. The hinder ends of the pterygoids are shown to be inflated with large cancellæ, but the sides of the base of the skull are somewhat obscured by the dried soft parts. The mastoid process of the periotic, with its articular facette for the stylohyal, seems to be rather smaller than in *Mylodon*. The tympanic bone is preserved on the right side, though wanting on the left. It is an irregular curved plate only slightly bullate, but forming a complete floor to the tympanic cavity. As usual in *Edentata*, it is not produced into an auditory meatus.

The right maxilla (No. 4) is in precisely the same state of preservation as the specimen just described, and probably belongs to the same skull. Its anterior margin is perfectly preserved, indicating that the facial region is very short in front of the anterior end of the zygomatic arch, which is pierced by a rather large suborbital canal. Its upper border proves that the nasal region was raised into a slightly convex dome; while its antero-superior angle is not rounded as in *Mylodon*, but curves upwards and forwards and ends in a point as in *Grypotherium*. At the oral border there are the shattered bases of four teeth.

A fragment of the nasal region (No. 13) may also have belonged to the same skull, but its state of preservation is a little different from that of the two specimens just described. It has clearly been buried in a powdery deposit, which has stained it brown; but the enveloping dust must have been extremely dry, for fragments of cartilage adhere to it, as well preserved as in the nasal chamber of the cranium itself (No. 1). It also bears traces of the integument.

Judging by the figures of the skull of *Grypotherium* published by Reinhardt (*loc. cit.*), this specimen seems to have occupied an anterior position in the nasal region. It is thus of great interest, because the three known skulls of *Grypotherium* leave the precise nature of the bony arcade separating the nasal openings undecided. According to Reinhardt, the nasal bones terminate as in *Mylodon*, and the arcade is an element interposed between them and the premaxillæ. According to Burmeister, the nasals themselves extend forwards and constitute the greater part, if not the whole, of the problematical bar. The fragment now under consideration is clearly in favour of the latter interpretation. Its lower thickened end is a massive bone, not bilaterally symmetrical, and not showing any trace of a median suture. Its inferior face is irregular and roughened, and can scarcely be regarded as an articular facette. Its upper portion consists of a pair of bones separated by a very well-marked median longitudinal suture. These are not thickened at their contracted upper end, where they have evidently been broken, and are not quite bilaterally symmetrical. They doubtless fuse at their lower end with the problematical azygous bone already mentioned, but the arrangement is obscured by the enveloping soft parts. A pair of bones, which may be regarded as nasals, thus extend forwards in a narrow arch to a point just above the anterior end of the premaxillæ; while the massive bone effecting a union between the two normal pairs of elements is probably an ossification in the internasal septum. It is interesting to note that there is an incipient trace of a similar forward production of the nasals in the genus *Scelidotherium*; while there is sometimes an ossification of the internasal septum in *Megatherium***.

* See S. Roth, *op. cit.* pl. ii. Fig. I.

** R Lydekker, *Anales Mus. La Plata — Paleont. Argentina*, vol. iii. pt. 2 (1894), p. 73, pl. xlv. Fig. I.

The three specimens now described, when placed approximately in their natural positions, afford a very satisfactory idea of the form and proportions of the skull when complete. The malar bone is the only important part to be added; but unfortunately it is impossible to decide which of the three specimens of this element in the collection belongs to the individual now under consideration. As already mentioned, these three bones are all different in the shape and proportions of the hinder bifurcated end. They are all very fresh in appearance, but have been stained reddish-brown by the earth in which they must have been buried.

The hinder portion of the second skull already mentioned (No. 2) comprises the occiput and brain-case as far forward as the front of the cerebral hemispheres. It is much battered and broken, and in quite as fresh a state as the cranium already described, with a considerable investment of dried soft parts on its base. It is only very slightly smaller than No. 1, but is of interest as exhibiting some of the sutures, besides a roundness and smoothness indicative of immaturity. The supraoccipital is shown to be very large; a small median point of it enters the foramen magnum, while the suture separating it from the parietals and squamosals extends along the rounded lambdoidal ridge. The horizontally extended suture between the squamosal and parietal on the inner wall of the temporal fossa is seen in the position where Owen determined it to occur in *Mylodon*.^{*} Both tympanics are preserved, but they are more obscured by soft parts than in No. 1.

To this cranium probably belongs a detached portion of the left side of the facial region (No. 5), in a similar state of preservation and slightly smaller than the maxilla (No. 4). The suture between the frontal and the maxilla still persists, while the oral border is preserved farther forward than in the last-mentioned specimen, showing a fragment of the much-reduced premaxilla united with the maxilla on a jagged suture.

The third imperfect occiput is about as large as the immature specimen No. 2, but does not exhibit any features worthy of special note.

The largest and most important portions of the mandible are Nos. 9 and 11, which evidently belong to the right and left rami of one and the same jaw. They are much broken and are in the same fresh condition as the skulls, with traces of the periosteum and even considerable portions of the soft parts of the gum. The right ramus is preserved sufficiently far forwards to show that there was no caniniform tooth in front of the series of four ordinary molars. Judging by the extent of the latter series, the specimen probably belongs to the same individual as the skull No. 1.

Another portion of a mandibular ramus (No. 10) of the left side is slightly smaller than the last and may well have belonged to the immature individual No. 2. It is similarly quite fresh in appearance, and bears the shrivelled remains of the gum. It is interesting as exhibiting the two posterior molars slightly different in shape from those of the former mandible. In this specimen the longer axis of the third molar is oblique, whereas in No. 9 it is coincident with the axis of the mandible; while in the former the fourth molar is not so long in proportion to its width as in the latter. Such slight differences, however, cannot be regarded in the *Edentata* as more than individual variations.

Brain-cavity and Cerebral Nerves.

By the kind permission of Dr. Moreno, the cranium No. 1 has been vertically bisected to display the character of the cranial cavity and the nerve-foramina. An instructive plaster-cast of the cavity has thus been made by Mr. C. Barlow, the Formatore of the British Museum.

The olfactory lobes are shown to have been well developed, projecting a little in front of the cerebral hemispheres. These hemispheres are together somewhat longer than broad, slightly broader behind than in front, and a little constricted in the middle. They do not overlap the cerebellum, which is relatively

^{*} R. Owen, "Description of the Skeleton of an Extinct Gigantic Sloth, *Mylodon robustus*, Owen" (1842), p. 18.

large. The origins of the nerves are very imperfectly shown in the cast; only their exits from the cranial cavity are clear. The most interesting are the optic and trigeminal nerves, which pass out of the cranial cavity at first by a common exit, which is soon subdivided by a bony partition into two canals, the former no less than 0.08 m., the latter 0.045 m. in length. The fourth, seventh, eighth and twelfth nerves are also recognisable on the cast; and one prominence of plaster has filled the foramen lacerum posterius.

Compared with the brains of *Myiodon* and *Scelidothorium*, so far as known from casts of the cranial cavity, * that of *Grypothorium* is observed to be more elongated, with less divergent and prominent olfactory lobes, less constricted cerebral hemispheres, and a larger cerebellum. In the form and proportions of the cerebrum and cerebellum, it similarly differs from *Megatherium*.† The cerebral hemispheres of the existing *Choloepus didactylus* and *Bradypus tridactylus*‡ are more tapering forward, and their cerebellum is relatively smaller than in *Grypothorium*.

Auditory Ossicles.

The auditory ossicles were preserved in the tympanic cavities of both skulls, Nos. 1 and 2, being retained by the dried soft parts. They were detected by Prof. Charles Stewart, who kindly extracted them, with great skill, from both sides of each skull. Comparing these ossicles with the fine collection in the Royal College of Surgeons, they prove to be closely similar to those of all the existing Sloths, but most nearly resembling those of *Choloepus didactylus*. The malleus is bent exactly as in the latter species, and is of similar shape. As observed by Prof. Stewart, it is remarkable in articulating with the incus not only by the head, but also by a diminutive lower facet, which is in contact with a small faceted process on the anterior arm of the incus. A feeble indication of the same secondary articulation is also observable in *Choloepus*; but it is curiously absent in the second specimen of *Grypothorium*. The two divergent arms of the incus are equal in length, as usual in the Sloths. The stapes is only very slightly perforated in both specimens; while a small circular disc firmly fixed to the incus represents the orbicular bone in the second skull. The auditory ossicles of *Grypothorium*, therefore, are very different from those of *Myrmecophaga*, in which the malleus is less sharply bent, the incus has divergent arms of unequal length, and the stapes exhibits a large perforation.**

Vertebræ and Limb-bones.

Nearly all the remains of vertebræ and limb-bones are in the same state of preservation as the portions of skull and mandible already described, with adherent cartilage and traces of muscles and ligaments. With some of the ungual phalanges there are also well-preserved examples of the epidermal sheath. As already remarked by Roth, the edges of one sheath probably belonging to the fourth digit of the manus, are quite sharp, and indicate that if the animal walked on its fore feet it resembled *Myrmecophaga* in the peculiar twist of the manus.

All the specimens in this series seem to have been accurately determined and sufficiently described by Roth. It is only necessary to emphasise the fact that the two shafts of humerus with abraded, not sharply broken, ends have a much more fossilised appearance than any other specimen in the collection, and are deeply stained throughout by ferruginous matter. The small shaft, No. 22,

* P. Gervais, "Mémoire sur les Formes Cérébrales propres aux Édentés vivants et fossiles," *Nouv. Arch. Mus.*, vol. xv. (1869), p. 39, pl. iv. Figs. 1, 2.

† P. Gervais, *loc. cit.* p. 39, pl. v.

‡ *Ibid.* p. 38, pl. iv. Figs. 3, 4

** J. Hyrtl, "Vergleichend-anatomische Untersuchungen über das innere Gehörorgan des Menschen und der Säugethiere." (1845). p. 135, pl. v. Fig. 6.

certainly seems to have belonged to an adult animal, as remarked by Roth, and it was probably much smaller than any individual indicated by the other remains.

Skin and Hair.

The new piece of skin, which is stated by Hauthal to have been found in the deposit of excrement, is not quite so well preserved as the original piece. It is much folded in an irregular manner; and the hair, which is yellower than in the previous specimen, is preserved only in patches on the outer face. It must have been stripped from the body of the animal by man; but the only distinct marks of tools, which were evidently made when the skin was fresh, are a few indents and small pits on the outer face. The indents must have been made by oblique thrusts of a stick, or a small, blunt, chisel-shaped instrument. The small pittings are nearer the middle of the specimen and less conspicuous. A vacuity in the skin seems to be due to accidental tearing or to a thrust after it was dry: it may even have been caused by the fallen blocks of stone found lying upon it.

The specimen, as preserved, measures about a metre across in one direction by 93 centimetres in another direction. As already observed by Roth, its irregular folding makes the determination of its position on the trunk very difficult; but I am convinced that its state of preservation is not sufficiently good to justify an attempt to unfold the skin by the ordinary method of steaming. Taking all facts into consideration, Roth seems to be correct in ascribing it to the right flank and the posterosuperior part of one of the limbs. It most probably belongs to the fore limb, as Roth supposes; but there is no clear proof that it is not referable to the hind-quarters.

The original situation of the piece of skin being thus determined, it is interesting to observe the disposition of the ossicles in the lower layer. Owing to abrasion, contraction, and partial disintegration, they are conspicuous in most parts of the specimen. They are very irregular in shape and size, and closely compacted together, as in the previous specimen. It is, however, to be noted that in some parts there is a distinct tendency to arrangement in regular, straight, parallel rows. The long axes of the elongated ossicles are nearly always coincident with the direction of these rows. They are especially well shown on the middle of the flank; and, as might be expected, the rows are here disposed vertically, parallel with the ribs.

In some parts of the skin the ossicles are exposed on their outer face; but appearances render it almost certain that this exposure is due to the disintegration and abrasion of the specimen. In one patch thus uncovered by the removal of the soft parts, the ossicles are seen to form a closely arranged, flattened pavement; and their outer face is much more conspicuously marked by pittings than that of any ossicle extracted from the first discovered piece of skin. In fact, as Roth remarks, the pitting is here quite similar to that observable on many ossicles dug up in association with the fossil skeletons of *Mylodon*; though it does not form so regular a reticulate pattern as that of the dermal ossicles of *Mylodon* in the British Museum figured on the former occasion.*

Another interesting feature of the new piece of skin consists in the dwindling and even total absence of the ossicles towards the ventral border. A section along the edge exhibits only two diminutive nodules of bone in a length of 0.1 m.; while another similar section taken vertically from the skin of the limb shows no trace of ossicles, except perhaps two little specks. It must, however, be noted that the limb was not entirely destitute of armour; for on the border the bones are as well developed and conspicuous as on the middle of the flank. In the newly-cut sections the skin has a translucent aspect, showing that it is merely dried and not tanned in any way.

The hair on the new specimen varies in length from 0.07 m. or 0.10 m. to 0.15 m. or 0.22 m. It is thus longer than that of the previous piece of skin. Masses of still longer hairs — some 0.30 m. in length — were found detached among the excrement, and these are also believed by Roth to belong to the

* *P. Z. S.* 1899, pl. XV. Figs. 4-6.

same animal. His determination is probably correct; for, when examined microscopically, these long hairs are observed to have a perfectly smooth cuticle, while some transverse sections (kindly made by Mr. R. H. Burne) demonstrate the complete absence of a medulla, exactly as in the short hairs. The latter feature proves that they cannot be referred either to the horse or to the guanaco.

Excrement.

The large cylindrical pieces of excrement, which may be referred to *Grypotherium* without any hesitation, have already been described and figured by Dr. Roth. They consist of irregular discoids of herbaceous matter closely pressed together, the largest measuring no less than 0.18 m. in diameter. Mr. Spencer Moore has kindly examined them from the botanist's point of view and reports that they are composed "in large part apparently of grasses, as the haulms, leaf-sheaths, fragments of leaves, &c., of these plants are frequent in the mass. A spikelet, almost entire, of what seems to be a species of *Poa*, and the flowering glume of another grass, probably avenaceous, have also been found. Besides these there are at least two dicotyledonous plants, one herbaceous and the other almost certainly so, the latter having a slender greatly sclerotised stem. Unfortunately, as no leaves have hitherto been observed attached to the fragments of stem, their affinities are altogether doubtful. There are numerous silicious particles in the excrement, and there are many pieces of the underground parts of the plants, suggesting that they have been pulled out of the ground. A few pieces of stems are sharply cut, not bruised or torn at the end." The latter fact is especially important in connection with Dr. Hauthal's discovery of cut hay in the cavern, and his theory that the *Grypotherium* was kept in captivity and fed by man.

Generic and Specific Determination.

The fortunate discovery of all parts of the skull and dentition renders the generic determination of this Ground-Sloth now quite certain. The teeth show that it belongs to the family Mylodontidæ; the presence of only four instead of five upper molars separates it from the genera *Myiodon*, *Lestodon*, and *Scelidotherium*; the forward production of the nasals and the ossification of part of the internarial septum place it definitely in the allied genus *Grypotherium*, as originally diagnosed by Reinhardt. The only question needing consideration is, whether the fragment of cranium described by Owen in 1840 as the type of the genus *Glossotherium* is really identical with that subsequently described by Reinhardt under the name of *Grypotherium darwini*, as now seems to be commonly believed.

Darwin's original specimen, on which the genus *Glossotherium* of Owen was founded, is preserved in the Museum of the Royal College of Surgeons. It has thus been possible to compare it directly with the undoubted cranium of *Grypotherium* from the Patagonian cavern. The specimen is merely the left half of the hinder part of the cranium, and is therefore very inadequate for discussion; but several features seem worthy of note. Compared with the new skull No. 1, the fragment named *Glossotherium* has (i.) the inner wall of the temporal fossa less flattened, (ii.) the digastric fossa deeper in proportion to its width, (iii.) the hinder border of the inflated pterygoid vertical, instead of sloping downwards and forwards, (iv.) a much larger and deeper pit for the articulation of the stylohyal, and (v.) a longer canal penetrating the base of the occipital condyle for the passage of the hypoglossal nerve. In all these respects the so-called *Glossotherium* agrees much more closely with the typical *Myiodon*; and Owen was probably correct in 1842 when he expressed the opinion that the two are at least generically identical.†

* R. Owen, "The Zoology of the Voyage of H.M.S. Beagle. — Part I. Fossil Mammalia" (1840), p. 57, pl. xvi.

† R. Owen, "Description of the Skeleton of an Extinct Gigantic Sloth, *Myiodon robustus*, Owen" (1842), p. 154, foot-note.

I am therefore of opinion that *Grypotherium* is the correct generic name for the Ground-Sloth from the Patagonian cavern, while *Glossotherium* must be relegated to the synonymy of *Mylodon*.

The specific determination of the new specimens is more difficult. As remarked by Roth, only two species of *Grypotherium* seem to be already known from the Pampa formation — *G. darwini* by three skulls* and *G. bonaerense* solely by a maxilla.† The portions of skull and dentition now under discussion indicate an animal much larger than *G. bonaerense* (assuming the original maxilla to be that of an adult); while they are considerably smaller than any known specimen of *G. darwini*. Moreover, the nasal arcade now described is narrower and more concave on its outer face than that of *G. darwini*, as already observed by Roth. It thus seems very probable that the animal from the Patagonian cavern represents a distinct species, which must bear the name of *G. listai*: This specific name was given by Ameghino to a fragment of the first-discovered piece of skin, and the curious argument which leads Roth to propose the substitution of a new name for it does not affect its validity.

It may be added that Dr. Erland Nordenskjöld has recently compared his specimens from the Patagonian cavern with the skull of *Grypotherium darwini* at Copenhagen, and finds no specific difference.‡ No particulars however, have yet been published.

2. Associated Mammalian Remains.

Felis, sp.

A feline carnivore larger than the existing Jaguar (*Felis onca*), but about the same size as an average Tiger (*F. tigris*), is represented in the collection by the distal half of a right humerus (No. 44), a left fourth metatarsal (No. 46), and the distal end of another metatarsal (No. 47). These bones have evidently been buried in dust, but are in the same fresh state of preservation as those of *Grypotherium*.

Careful comparison of these bones shows that they are undoubtedly feline; and there is no difficulty in determining that they belong to *Felis* rather than to the extinct *Machærodus*. A humerus of *M. neogæus*, from a Brazilian cavern, now in the British Museum (No. 18972 *b*), is readily distinguished from the new Patagonian humerus by the remarkable lateral compression of its shaft and the much greater downward extension of its prominent and sharp deltoid ridge. The humerus in all the large species of *Felis*, on the other hand, only differs from the fossil now under discussion in very small particulars. In fact, the humerus and metatarsals of the existing *Felis onca* are essentially identical with the bones from the Patagonian cavern, except that they are rather smaller. I am therefore inclined to regard the newly discovered remains as indicating a comparatively large variety of *F. onca*, which once lived in the temperate regions of Patagonia, beyond the present range of this species. Such an occurrence would be a precise parallel to that of the Cave-Lion in Europe. It is well known that nearly all the remains of *F. leo* found in the Pleistocene formations of the temperate parts of the Old World indicate animals of somewhat larger size than any surviving in the warmer regions to which the species is now confined.**

It may be noted that bones of the Jaguar of ordinary dimensions have been recorded from the Pampa formation of the Province of Buenos Aires.††

* Described respectively by Reinhardt, Burmeister, and Lydekker, *loc. cit.*

† F. Ameghino, "Contribucion al Conocimiento de los Mamiferos de la Republica Argentina." (1889), p. 738, pl. xlv. Fig. 8.

‡ E. Nordenskjöld, "La Grotte du *Glossotherium* (*Neomylodon*) en Patagonie," *Comptes Rendus*, vol. cxxix. (1899), p. 1217.

** Dawkins and Sanford, "The British Pleistocene Mammalia" (*Palaeont. Soc.*, 1869), p. 150.

†† F. Ameghino, "Contribucion al Conocimiento de los Mamiferos de la Republica Argentina." (1889), p. 342.

Arctotherium, sp.

With the bones of *Felis* just noticed, Roth provisionally associates the imperfect distal end of a remarkably large right femur. He is thus induced to suppose that the carnivore represented by the fragments will prove to be a new genus and species of the Felidæ. He suggests for it the name of *Iemisch listai*, on the assumption that it is the mysterious quadruped which Ameghino states is known to the natives as the Iemisch.

A comparison of the distal end of the femur in question with the femora of Felidæ in the British Museum seems to prove conclusively that it cannot be referred even to the same family. Its width across the condyles is much greater, compared with its antero-posterior diameter, than that observed in any feline. Moreover, the pit for the tendon of the popliteus muscle below the external condyle is unusually deep. In both these respects the bone closely resembles the distal end of the femur of a Bear. I have been therefore led to compare it with the corresponding part of the extinct Bear of the Pampean formation, *Arctotherium*.

Fortunately, the fine and nearly complete skeleton of *Arctotherium bonaerense* in the Bravard Collection in the British Museum comprises the right femur and enables direct comparison to be made. The fragment lacks the inner condyle; but enough of the trochlea remains to show its broad and gently-rounded form, with a wide and deep intertrochlear notch, precisely as in *Arctotherium*. It has the same development of the external condyle as in the latter, while the fossa for the popliteal tendon is equally deep, only slightly differing in shape. In fact, there is very little discrepancy, except in its smaller size; and species of *Arctotherium* smaller than *A. bonaerense* are already known both from the Pampa formation of Argentina* and the caverns of Brazil.†

The fragment just described has evidently been severed from the rest of the bone by a sharp, clean cut made by man; and Dr. Hauthal is quite certain that this was not done by one of his workmen during excavation (*op. cit.* p. 59). At least one medium-sized species of *Arctotherium* must therefore have survived until the human period in Southern Patagonia.‡

Onohippidium saldiasi.

A horse is represented in the collection by an upper molar, a fragment of premaxilla with two incisors, an imperfect atlas and two well-preserved hoofs apparently of a foetus or perhaps of a newly-born animal. Of these remains only the upper molar is capable of satisfactory determination.

This tooth is the second upper molar of the left side, and has been exhaustively compared with corresponding teeth by Dr. Roth, who gives a good series of figures. It is readily distinguished from the homologous molar in the genus *Equus* by the peculiar form of its two inner columns — a fact which I have been able to verify by the examination of an extensive series of specimens, both recent and fossil, in the British Museum. Further comparison, indeed, shows that it must be referred to the extinct Pampean genus *Onohippidium*.§ Dr. Roth assigns it, apparently quite rightly, to the same species as a maxilla from the Pampean formation of the Province of Buenos Aires, for which he proposes the name of *Onohippidium saldiasi*.

* F. Ameghino, *op. cit.* (1889), p. 317.

† H. Winge, "Jordfundne og nulevende Rovdyr (Carnivora) fra Lagoa Santa, Minas Geraes, Brasilien" (E. Museo Lundii, 1895), p. 31.

‡ Dr. Moreno has lately received reports of bear-like tracks in remote parts of the Cordillera, which he thinks may imply that a species of *Arctotherium* still lives in Patagonia.

§ F. P. Moreno, "Revista Mus. La Plata," vol. ii. (1891), p. 56, R Lydekker, "Anales Mus. La Plata — Paleont. Argentina," vol. ii. pt. 3 (1893), p. 77, pl. xxix.

Large Extinct Rodent.

The proximal end of the femur of a large rodent has already been recognised by Roth, and compared with the extinct *Megamys*. It cannot be more exactly determined.

Existing Species.

One imperfect fragment of pelvis and sacrum seems to belong to a puma (*Felis concolor*) of rather large size; but it is not sufficient for precise determination.

The small mandibular ramus of a musteline referred by Dr. Roth to *Mephitis suffocans*, does not pertain to this genus and species. Mr. Oldfield Thomas determines it to belong to the rare *Lyncodon patagonicus*, which still lives in Patagonia and has not hitherto been found fossil. A slightly larger extinct species of the same genus has been described by Ameghino on the evidence of a skull from the Pampean formation near Lujan, in the Province of Buenos Aires.*

A cranium, some vertebræ, and a tibia and fibula appear to represent the existing *Ctenomys magellanicus*, as noted by Roth.

The remains of the Guanaco (*Lama huanacos*) do not present any features worthy of special remark.

Man is represented by a diseased scapula and by two bone awls, which are clearly made from the tibia of a species of *Canis* intermediate in size between *C. jubatus* and *C. magellanicus*.

3. Relative Age of the Remains.

As the result of Dr. Roth's researches, supplemented by the additional observations now recorded, it is evident that the majority of the mammalian remains from the cavern near Last Hope Inlet belong to the extinct fauna which occurs in the Pampean formation of more northern regions. To this category are referable the genera *Grypotherium*, *Onohippidium*, *Megamys*, and *Arctotherium*; also *Macrauchenia*, which is said to have been discovered in the same deposit on the floor of the cave by Dr. E. Nordenskjöld. The large *Felis* likewise probably belongs to the same series. Remains of mammals of the existing fauna, on the other hand, are comparatively few and insignificant, referable to the genera *Ctenomys*, *Cervus*, *Lama*, *Lyncodon*, and *Felis*.

Although Dr. Hauthal's explorations were rather hurried and Dr. Nordenskjöld's results have only been published hitherto in abstract,** their account of the deposits on the floor of the cavern seem to confirm the suspicion that the remains of these two faunas were introduced at two successive periods. According to Hauthal, the remains of the Guanaco were found along with fragmentary bones of Deer, shells of *Mytilus chorus*, branches of trees, and dried leaves, in the superficial dust of the cavern near the outer wall. The skin of *Grypotherium* and all the other remains of this and the associated Pampean genera were discovered in the deeper layer of excrement and cut hay between the mound and the inner wall of the cavern. According to Nordenskjöld, three distinct strata can be recognised on the floor of the cavern as follows:

- A. A thin surface layer, containing ashes, shells, and bones of recent animals broken by man.
- B. A middle layer, containing numerous branches of trees and dried leaves, with remains of *Lama*

* F. Ameghino, *op. cit.* (1889), p. 324.

** E. Nordenskjöld, "LaGrotte du *Glossotherium* (*Neomyiodon*) en Patagonie," *Comptes Rendus*, vol. cxxix. (1899), pp. 1216, 1217.

and the extinct horse, *Onohippidium*. Said to be probably the stratum in which the original piece of skin was found.

C. A bottom layer, usually about a metre in thickness, without any traces of branches or leaves, but only dried herbs. Remains of *Grypotherium* numerous and confined to this stratum, associated with its excrement and hair, also with remains of a large variety of *Felis onca*, *Macrauchenia*, and *Onohippidium*.

It is unfortunate that the question of the contemporaneity of the various bones cannot be tested by the ingenious method of chemical analysis which has been applied with success to similar problems by M. Adolphe Carnot in France. The French chemist has shown that when bones are buried in ordinary sediments they undergo changes which gradually cause the percentage of contained fluorine to increase. According to him, the longer a bone has been buried, the greater is the percentage of fluorine found in it on analysis. In one case † he examined the scapula of a deer and a human tibia, discovered together in fluvial sand near Billancourt (Seine); he found that the former had seven or eight times its usual percentage of fluorine, while the human bone did not differ in any respect from the normal in this constituent. He therefore concluded that the latter bone was not of the same age as the former, but had been introduced comparatively recently by burial. In this and the other recorded cases, however, it is to be observed that the sediment was of a uniform character and admitted of free percolation of water. In the Patagonian cavern, on the contrary, the bones occur partly in dust, partly in dried herbage, partly in dried excrement, and partly in the burnt residue of the same. Moreover, they must always have been subjected to intense dryness, and the usual process of chemical alteration cannot have taken place.

Considering all circumstances, I think that, even without chemical evidence, zoologists and geologists cannot fail now to agree with Dr. Moreno and his colleagues of the La Plata Museum, that the remarkably preserved *Grypotherium* from the Patagonian cavern belongs to the extinct Pampean fauna of South America, and need not be searched for in the unexplored wilds of that continent. If we accept the confirmatory evidence afforded by Mr. Spencer Moore, we can also hardly refuse to believe that this great Ground-Sloth was actually kept and fed by an early race of man.

IV. Note Concerning Tehuelche Legends.

By Hesketh Prichard.

I now proceed to give the testimony of Dr. F. Ameghino, whose brother Carlos was well acquainted with the country and who early gave it as his opinion that the animal, which is named the *Neomylodon listai*, was still living in Patagonia. In support of his opinion he adduced tales which Carlos Ameghino had gathered from the Indians, who roam the pampas, of a vast mysterious beast said by them to haunt the distant lagoons and forests of the unexplored regions near the Andes. These stories had, moreover, been confirmed in Dr. Ameghino's opinion by the experience of the late well-known geographer and traveller, Señor Ramon Lista, who verbally told both Dr. Ameghino and his brother that he had seen and fired at a mysterious creature, which, however, disappeared in the brushwood and could not afterwards be traced. He described it as being covered with reddish-grey hair, and he believed it to be a pangolin or scaly-anteater.* Taking all things into consideration, Dr. Ameghino announced his conviction that the mysterious animal referred to was the last representative of a group, long believed extinct, related to the *Mylodon*.

† A. Carnot, "Sur une Application de l'Analyse chimique pour fixer l'Age d'Ossements humains préhistoriques," *Comptes Rendus*, vol. cxv. (1892), pp. 337-339.

* Pangolins, armadillos, and sloths are more or less related.

According to Dr. Ameghino the Indians had bestowed upon the mysterious animal the name of *lemisch*. Nothing would induce them to penetrate into the supposed haunts of this monster. It was described as amphibious, equally at home on land or in the water; in remote mountain recesses it lurked in caves, or had its lairs by the shores of lonely lagoons and rivers, or at times lay in wait among the lower passes of the Cordillera. In habits it was nocturnal, and its strength so great that it could seize a horse in its claws, and hold itself down to the bottoms of the lakes! The head was supposed to be short and without external ears, but showing enormous dog-teeth: the feet short and bearlike, armed with formidable claws united by a swimming membrane; the long tail, tapering and prehensile, the hair hard and of a uniform yellowish-brown. In size it far exceeded any creature they knew of, its legs, though short, being almost as great in girth as its body. It followed, naturally that narratives of personal experiences and encounters with this terrific animal were varied.

These data, it must be confessed, were bewildering. In fact, as described by the Indians the *lemisch* was scientifically absurd; but the Indian is like a child in many ways and would naturally endow a creature he feared with extraordinary attributes.

I will quote here an extract from Winwood Reade's "Savage Africa," one of the finest books of travel ever written.

"It must be laid down as a general principle that man can originate nothing; that lies are always truths embellished, distorted, or turned inside out. There are other facts beside those which lie on the surface, and it is the duty of the traveller and the historian to sift and wash the gold-grains of truth from the dirt of fable.... It is true that some of the ancient myths have been sobered down to natural beings. The men with dogs; heads of whom Herodotus speaks are the barking baboons which I saw in Senegal: the men with their head under their shoulders, their eyes in their breast, are the ill-formed negroes, whose shoulders are shrugged up, and whose heads drop on their breasts: the mermaids of the Arab tales are the sea-cows of the African rivers, which have feminine dugs and a face almost human in expression: the huge serpent which opposed the army of Regulus is now well known as the python: the burning mountains which Hanno saw, and the sounds of the lutes which were believed to proceed from the strife of the elements, are only caused by the poor negroes burning the grass of their hill-tops: the music being that of their flutes, as I have heard it often in those long and silent African nights far away.

"Incredulity has now become so vulgar a folly, that one is almost tempted, out of simple hatred for a fashion, to run into the opposite extreme. However, I shall content myself with citing evidence respecting certain unknown, fabulous and monstrous animals of Africa, without committing myself to an opinion one way or the other; preserving only my conviction that there is always a basis of truth to the most fantastic fables, and that, by rejecting without inquiry that which appears incredible, one throws away ore in which others might have found a jewel. A traveller should believe nothing, for he will find himself so often deceived: and he should disbelieve nothing, for he will see so many wonderful things; he should doubt, he should investigate, and then, perhaps, he may discover."

It was in this spirit that I set out for the interior of Patagonia. Although the legends of the Indians were manifestly to a large extent the result of imaginative exaggeration, yet I hoped to find a substratum of fact below these fancies. After thorough examination, however, I am obliged to say that I found none. The Indians not only never enter the Cordillera but avoid the very neighbourhood of the mountains. The rumours of the *lemisch* and the stories concerning it, which, in print, had assumed a fairly definite form, I found nebulous in the extreme when investigated on the spot.

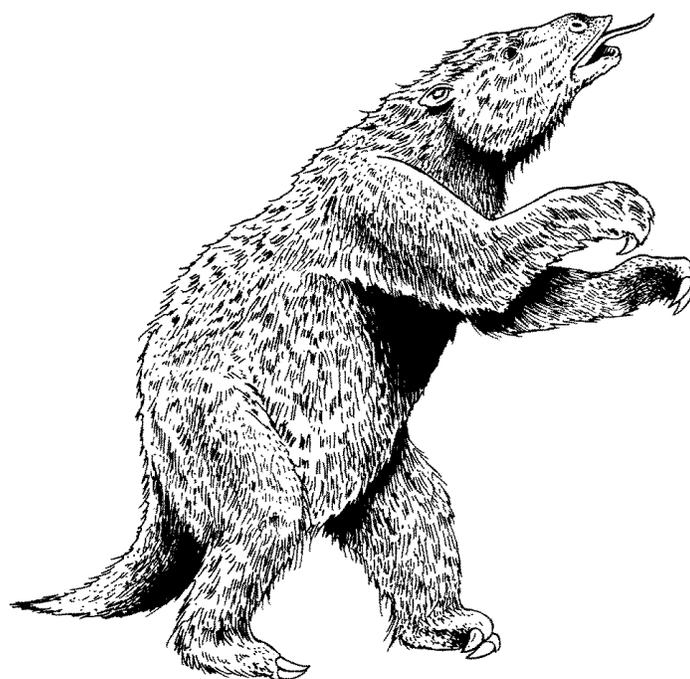
Finally, after much investigation I came to the conclusion that the Indian legends in all probability refer to some large species of otter. Musters, in his book "At Home with the Patagonians," makes mention of an animal much feared by the tribe with whom he travelled, which they called "water-tiger," and which they said lived in a rapid and deep river near to Nahuel-huapi, a lake the name of which lends colour to the tale, for it means Tigers' Island. Musters says he himself saw two ostriches, that, being considered in too poor a condition to be worth taking to camp for food, were left on the bank of the river referred to, torn and partly devoured when on the following day he and his party revisited the spot. Tracks of an animal were also plainly visible leading down into the water.

Compare this with a story told me by Mr. Von Plaaten Hallermund. He described the case of a mule which had fallen over a precipice in the vicinity of the River Deseado. When on the following day the peorees climbed down to salve its cargo, they found the animal on the edge of the water half eaten, and in its neighbourhood were tracks strange to them. "Like those of a puma, yet not those of a puma," as they said.

The manager of Messrs. Braun and Blanchard's store at Santa Cruz gave me a description of a skin brought in by Indians which, though not a puma-skin, was quite as large as the skin of the common silver-grey puma generally is. I myself saw a very large otter in the River Senguerr, but unluckily had not my rifle with me, and although I returned as quickly with it as I could, all trace of the otter had vanished.

Taking into consideration the amphibious nature attributed by the Indians to the Lemisch, there seems to be little reason to doubt that the real animal underlying the rumours of a mysterious monster is a subspecies of the large Brazilian otter (*Lutra brasiliensis*).

To return to the possible survival of the Mylodon, as far as our travels led us both north and south on the eastern side of the Cordillera, we could discover no trace whatever either by hearsay or from the evidence of our own experience to warrant the supposition that it continues to exist to the present day. But there are hundreds of square miles of dense forest still unexplored along the whole length of the Patagonian Andes, and I do not undertake to declare positively that no such animal exists in some unknown and hidden spot among their recesses. Roughly speaking, there are many thousand square miles of snowy summits, ravines, high plateaus and valleys in this region. The task of finding a final answer to the Mylodon problem on the drag-net principle of passing to and fro throughout the whole district would be so gigantic and prolonged where the natural difficulties are great, as to be practically impossible. Such an answer must be left to time and the slow process of things. In the meanwhile I can merely state my own conviction that the odds are very heavily against the chances of such a survival. The probable habitat of the Mylodon would naturally be the forests. I penetrated these in more than one direction, and one of the most striking characteristics of the forests was the absence of animal life, evidence of which grew less and less the farther we forced our way into their depths. It is a matter of common knowledge that, where the larger forms of life are to be found, there also a liberal catalogue of lesser creatures co-exist. The conditions which favour the life of the greater favour also the existence of the less. This is presumptive evidence only, and though it has certainly influenced my own conclusions, I do not wish to force it upon others. I have stated the case as fairly as I can, and I leave my readers to form their own opinions.



Monsters and Fabulous Animals

W. Winwood Reade

[Edited from *Savage Africa*, 1864, New York: Harper & Bros.]

It must be laid down as a certain principle that man can originate nothing; that lies are always truths embellished, distorted, or turned inside out. There are other facts besides those which lie on the surface, and it is the duty of the traveler and historian to sift and wash the gold-grains of truth from the dirt of fable.

It was a saying of the ancients that Africa is always affording something new. As in the days of Pliny and Herodotus, so now it still remains *par excellence* the land of mystery and of romance. It is true that some of the ancient myths have been sobered down to natural beings. The men with dogs' heads, of whom Herodotus speaks, are the barking baboons which I saw in the Senegal; the men with their heads under their shoulders, their eyes in their breast, are the ill-formed negroes, whose shoulders are shrugged up, and whose heads drop on their breasts; the mermaids of the Arab tales are the sea-cows of the African rivers, which have feminine dugs, and a face almost human in expression; the huge serpent which opposed the army of Regulus is now well known as the python; the burning mountains which Hanno saw, and the sounds as of lutes which were believed to proceed from the strife of the elements, are only caused by the poor negroes burning the grass on their hill-tops; the music being that of their flutes, as I have heard it often in those long and silent African nights far away.

But those who have studied African literature must confess that we know little more respecting the natural productions of this country than the ancients did. Many of the stories of Herodotus, which in the last century were ridiculed as absurd, have been endorsed by the experience of recent travelers. Is it not possible that some of those accounts which we still regard as fabulous may yet be cited against us by another generation?

Incredulity has now become so vulgar a folly, that one is almost tempted, out of simple hatred for a fashion, to run into the opposite extreme. However, I shall content myself with citing evidence respecting certain unknown, fabulous, and monstrous animals of Africa, without committing myself to an opinion one way or the other, preserving only my conviction that there is always a basis of truth to the most fantastic fables, and that, by rejecting without inquiry that which appears incredible, one throws away ore in which others might have found a jewel. A traveler should believe nothing, for he will find himself so often deceived; and he should disbelieve nothing, for he will see so many wonderful things: he should doubt; he should investigate; and then he may perhaps discover.

Many curious animals are made mention of by the old authors as existing in Africa — of an animal near Sierra Leone “which had a stone in his forehead, which gives him light to feed by, but, as soon as he hears the least noise, he covers it with a film or skin to prevent being discovered”; of a water-ox which resembles a buffalo, having hooped feet, but which is amphibious like the hippopotamus; of white monkeys, winged dragons, and great sea-serpents.

One can easily understand that the animal with the glow-worm development is only some variety of the cat kind, whose eyes are remarkably powerful at night. The water-ox is probably some buffalo, which, like the water-buck of Southern Africa, spends most of the day wallowing in the rivers. The white monkeys, which are often mentioned by the early voyagers, and of which I was given a detailed account in the Muni country, are probably albinos, like those which are found among buffaloes, elephants, and, indeed, most animals. As for the winged dragons, it is not impossible that such an animal exists, as we have the type preserved in the *draco volans*, a little lizard with a membrane like a bat's wing; but it is, to say the least of it, very improbable.

The flying squirrel exists in Equatorial Africa; and I believe that I have been the first to see this curious little animal in that country. An antelope striped like a zebra is said to exist in Central Africa. But the most curious type existing in Africa is that of the sloth, which has always been supposed to be peculiar to the New World.

Barbot mentions the *entigiengio*, a small creature very curiously streaked, slender-bodied, with a fine tail and legs. "It never comes upon the earth; for the very touch thereof proves mortal to it, therefore keeps to the trees, and has always twenty black-haired creatures called *embis* attending it; that is, ten before and ten behind. They take the ten first in snares, and then the ten behind make their escape, by which means the animal, bereaved of its guard, is also taken. The skin of this little beast bears such a value that none but the kings may wear it."

This would appear to be a distorted account of a sloth, and the following description by Artus of Dantzic, and Bosman, two of the most reliable authorities on Africa, satisfactorily proves the existence of this animal: "Here is a creature by the natives called *Potto*, but known to the Dutch by the name of sluggard, a whole day being little enough for it to advance ten steps forward.

"Some writers affirm that, when this Creature has climbed up a Tree, he does not leave it till he has not only eaten up the Fruit, but Leaves also; then descending fat, and in very good Case, in order to get up into another Tree; But, before he can compass this, he becomes as poor and lean as possible; and if the Trees be high or at any Distance, and he meets with nothing on his Journey, he inevitably dies with Hunger betwixt one Tree and another. But the Author will not undertake for the Truth of this Story, though the Negroes seem to believe something like it."

This creature, according to Bosman, is so horribly ugly that he does not believe any thing in the world can come up to it. "Its fore feet are very like Hands, the Head most disproportionally large. When very young, it is of a pale mouse colour, and the Skin smooth; But when old it is red, and covered with a sort-of Hair as thick-set as Flocks of Wool." Bosman knew nothing more of this animal than that it is impossible to look on it without horror, and that it has nothing very particular but its hideous form.*

The existence of the *roc* of Marco Polo and the "Arabian Nights" is now proved by the discovery of an immense egg in a semi-fossil state in Madagascar. This egg (a cast of which is in the British Museum) must have been emitted by a bird double the size of the ostrich. At present it would appear to be confined to that island; but I find in Father Lobo's account of Abyssinia a description of this bird. He not only repeats the exaggerated tales of the natives, who declare that it can carry away an elephant in its talons, but, like Marco Polo, he asserts that he had actually seen one of its feathers, although he had not seen the bird itself. "*In aliquibus autem regionibus vidi pennas alœ istuis avis prodigosœ, licet avem non viderim. Penna illa prout ex forma colligebatur, erat ex mediocribus longitudine 28 palmorum, latitudine 3.*"

And in the narrative of the Lascar Isuf's voyage in Eastern Africa, in Ehrman's "Collection," is a description of the *pyon*, a bird ten feet in height.

Of all animals which have been classed as fabulous, the unicorn is the most remarkable, since to this very day it is impossible for a careful writer to make a positive assertion respecting its existence.

The ancients compared their *monoceros* to a horse with a stag's head, which proves that they had seen an animal very different from the rhinoceros. They also distinctly name the *unicorn-ass*, an animal of great size, swift of foot, solitary in his habits, and having a horn striped with white, black, and brown.

Garcias, a writer of the sixteenth century, relates that the Portuguese navigators saw, between the Cape of Good Hope and Cape Corrientes, an animal having the head and mane of a horse, with one movable horn. In this same region Sparmann and Barrow saw representations of a one horned animal. The rocks of Camdebo and Bambo are covered with them — a curious fact, setting zoology aside; for

* Since writing the above I have been informed by Dr. Gray that specimens of these animals have been brought to England; that they are not true sloths, having lemur-like teeth; and that perfect specimens from Guinea would be gladly received by naturalists.

it proves the ancient connection of Caffraria with Asia; the unicorn, among the Persians and Hebrews, being the symbol of kingly power. It is with this meaning delineated on the monuments of Persepolis, and on the royal arms of Great Britain.

The Dutch colonists also, according to Voight, affirmed that they had seen these animals alive, and that they resembled the quagga, while the horn adhered only to the skin.

According to Merolla, the real unicorn is extinct; though I shall quote better authority to prove that it is living than that upon which he makes his assertion. "Here," he says, writing of Angola, "is also the unicorn, called by the Congolans *abada*, whose medicinal virtue, being sufficiently known, needs not to be taken notice of. These unicorns are very different from those commonly mentioned by authors; and, if you will believe what I have heard say, there are none of that sort now to be found. A Theatine missionary to the East Indies told me, at his return from Goa, he had endeavored to get one of these last; but, whatever diligence he used, he could by no means obtain it. He added, moreover, that he had heard several of the Eastern people, especially the Chinese authorities, say that, according to their computations, those unicorns all died the same day that our Savior died. What allusion these can have to our Savior may probably be from their chastity; but I must leave all to my good reader, who will condemn and approve, as he thinks fit."

In the fifteenth century, Barthema, or Verdomanus, who preceded Burckhardt and Burton in a pilgrimage to Mecca, gives a minute account of two unicorns which he saw there.

"By the side of the temple there is a large court inclosed by walls, where we saw a unicorn, which they showed us as a curiosity; and not without reason. For the larger one had the form of a colt eighteen months old, a horn in the middle of his forehead the length of three spans. The lesser one was the size of a colt a twelvemonth old, with his horn about four cubits long. The color of this animal was a dark gray, having a head like a stag, the head tolerably long, with a little thin hair hanging on the side; the legs long and graceful, like those of a deer. These two animals were given to the Sultan of Mecca (as a most rich and precious gift) by a king of Ethiopia, who wished to negotiate for peace."

The next authority is that of a Portuguese who had lived some time in Abyssinia, and is quoted by Father Tellez.

"It is certain that the unicorn is not to be confounded with the *abada*, about which they usually dispute; this one may see by the difference of their names, as well as by the difference of their body and parts, and it would appear by the *abada* which we have seen, and by the unicorn which we have seen painted. The latter has a long straight horn of admirable virtue; the *abada* has two crooked horns, which are not so sovereign, although they will serve as antidotes against poison. The country of the unicorn, which is an animal of Africa, where only it is known, is the province of Agoa, in the kingdom of Damotes, although it is occasionally seen in more distant places. This animal is as large as a fine horse, is a dark bay color, the mane and tail black, short, and thin, though in other parts of the province observed to be longer and thicker. On the forehead there is a beautiful horn five palms long, as they are usually painted, the color being nearly white. They live in woods and retired thickets, sometimes coming out into the plains, where they are not often seen, because they are timid animals, not numerous, and easily hidden in the wood. The most barbarous people in the world have them, and perhaps eat them like other animals.

"A missionary who was my companion, and who had spent some time in that province, having been told that they had found this renowned animal, did all that he could to get one. The natives brought him a very young one, but it was so delicate that it died in a few days.

"A Portuguese captain, a man of years and good credit, and held in great esteem by the princes of this empire, under whom he serves, told me this story about unicorns. He said that once, as he was returning from the army with twenty other Portuguese soldiers, and they were resting one morning in a little valley encircled by very thick trees, getting ready their breakfast while their horses grazed on the rich pasture, scarcely were they seated when there sprang out of the thickest part of the wood a beautiful horse of the same shape and color that I have described. He came so rapidly that he did not

observe the people till he was quite among them; then he was startled, began to tremble, and suddenly bounded back, leaving, however, sufficient time to the spectators to see and observe him with pleasure. The knowledge which I have of this captain induces me to relate this as an undoubted fact.

“In another part of the same province, where it is stony and mountainous, people have often seen this animal feeding among several others of different kinds. This is the most remote part of the province; that is why exiles are usually sent there by the emperor. It is bounded by high mountains, below which are vast plains and forests inhabited by various kinds of wild beasts. To this place a tyrannical emperor named *Adamas-Segued* sent without cause several Portuguese, who, from the tops of the mountains, saw the unicorn feeding in the plains below, the distance not being so great but that they could observe distinctly that it was like a fine Spanish jennet, having a horn in his forehead.

“These testimonies, especially that of the good old man, John Gabriel, with what the missionary, my companion, affirmed also of his own knowledge, confirm me in the belief that this celebrated animal is found in the province, and that young ones are born and bred there.”

The latest traveler who has spoken of the unicorn is Dr. Baikie, who, when I was in Africa, had started on an incursion after this animal, the existence of which he must therefore have credited, and could only have done so upon reliable authority. That such an animal has existed, there can, I think, be little doubt; it is possible that he is extinct; but more probable that, flying from firearms (which, it must always be remembered, are used by tribes whom white men have never visited), he has concealed himself in those vast forest-wastes of Central Africa which are uninhabited and unexplored.

There are few works in the natural history of our race in which some reference is not made to the legends of tailed men, which are rejected by all writers (excepting Lord Monboddo) with more or less disdain. I shall now collect the evidence upon these beings in a more perfect manner than has hitherto been done, and shall add thereto the rumors which I heard on the same subject during my travels in Africa.

Blumenbach (*De G. H. Var. Nat.*, sect. iii., § 76) proved that a certain engraving of a tailed man had the sketch of a monkey for its origin. Martini, in his version of Buffon, took it from Linnæus, who took it from Aldrovandus, who took it from Gesner, who took it from a German description of the Holy Land, “*Reyss in des Gelbolte Land*,” Mentz, 1486, in which work a quadrumanous monkey is represented, and which, humanized a little by each of its borrowers, had been gradually transformed into a human being.

In the same manner, there can be no doubt that many of the accounts of tailed men have been simply descriptions of monkeys, which passed from mouth to mouth, and have gone through the same gradations per tongue as the drawing alluded to per pencil. But the reader will find that, in the mass of evidence which I shall bring before him, there is a unity and an appearance of truth which will stagger, if it will not convince.

The tailed men of the ancients, like their dog-faced men, were certainly baboons, with the exception of one race described by Pausanias (*lib. ii., cap. 3*). The account which he gives of these he received from a sailor named Euphemus. This man, upon a voyage to Italy, was driven by a storm into the Atlantic Ocean, and was obliged to anchor off a group of islands known to the sailors by the name of the Islands of Satyrs. These were inhabited by men with tails, some of whom wanted to come on board the ship, but the sailors would not allow them; and as they knew it was some women they had in the ship whom they wanted, in order to satisfy them they gave them a barbarian woman that they had on board, whom they used not only in the natural way, but in every other way possible. They had tails, he said, not much less than the tails of horses, but they made no use of speech.

The early European mariners to the East Indies speak continually of men with tails. Koepling relates that he had actually seen them in the Nicobar Islands.

Barchewitz, a German traveler, in the sixth chapter of his voyages, gives an account of a tailed girl whom he saw in the Moluccas.

Hesse, who went to Sumatra in 1680, describes a woman with a short tail like a goat in the island of Formosa.

Strauss, a Dutchman, who visited Formosa in 1650, describes a native with a tail a foot long and covered with hair, whom he saw burnt alive for murder. He concludes his description with these words: "That this man had a tail I saw as distinctly as I saw that he had a head."

Gemelli Carreri and Le Gentil mention similar cases in the Philippines, especially in the island of Mindero, on hearsay evidence

Falk and Rytschkow relate that such *kuirukli*, or tailed people, are to be found only in Turkestan, and that this caudal prolongation is very slight.

Captain Samuel Turner, in his embassy to Thibet, 1806, gives the following passage in his interview with the Daïb Raja:

"He told me of wonders for which I claim no other credit than that of repeating with fidelity the story of my author. In the same range of mountains north of Assam, he informed me that there was a species of human beings with short straight tails, which, according to report, were extremely inconvenient to them, as they were inflexible; in consequence of which, they were obliged to dig holes in the ground before they could attempt to sit down."

Purchas, writing of the Philippine Islands, says, "Lambri, the next kingdom, hath in it some men with tayles like dogges, a span long." And of Sumatra: "They say that there are certain people there called *Daragui Dara*, which have tayles like to sheepe."

The great Harvey also published an account which he had received from a surgeon lately returned from the East Indies, and whom he knew to be a man of strict veracity. This surgeon related that a tailed race existed in the island of Borneo, and that he had himself seen a girl who had a thick fleshy tail a span long: *intra clunes reflexa, quæ anum et pudenda operiebat, usque adeo velari ea loca Natura voluit.*

It is only lately that we have heard of tailed men in Africa. On the Egyptian monuments, it is true, the negroes are frequently represented with tails, which our best authorities have always regarded as caricatures. It is very probable, however, that such caricatures, if they are nothing more, had been suggested by such accounts of an interior tribe as those which follow.

M. de Castelnau is well known to men of science. He was selected as chief of the expedition sent out by the French government to explore the central parts of South America. He crossed the continent from Rio de Janeiro to Lima, returning by the Amazon to Pera in the years 1843-47.

M. de Castelnau having found at Bahia a great number of intelligent negro slaves, many of whom could read and write Arabic, and who were acquainted with the interior of Central Africa, was induced to examine them for the purpose of acquiring geographical information respecting these unknown regions.

One of these slaves, Mahammah, was remarkable for his intelligence, and had made extensive journeys. As a naturalist, H. de Castelnau could form a correct judgment of the truth of his descriptions, and had always found him careful and exact; till one day he spoke of the Niam-Niams, or tailed men, whom he declared that he had seen. In spite of M. de Castelnau's incredulity, he maintained the truth of his assertions, entered into minute details, and brought a dozen negroes from Soudan who also pretended that they had seen these tailed men. M. de Castelnau attached little importance to these statements till his return to France, when he learned that another traveler had heard similar stories in Arabia, and had even succeeded (it was said) in seeing a tailed man. M. de Castelnau therefore determined to publish the results of his researches, without asserting the reality of a fact which appears to be in opposition to the principles of zoology.

Evidence of Mahammah.

“Mahammah served in an expedition which the Sultan of Kano sent against the Niam-Niams. The Haoussa army was mostly composed of cavalry. They bivouacked nine nights in dense forests, through which they had frequently to cut a road for their horses, and in which they did not see a human being. On leaving the forest they climbed high mountains, and a few days afterward discovered a group of the wild Niam-Niams. These people were asleep in the sun; the Haoussas crept softly up to them and killed them all. They had tails about forty *centimètres* in length, and from two to three in diameter. This organ is without hair. Among the corpses were those of women formed in the same manner; they were all quite naked. The following days they met several other bands of the same kind of people: some were eating human flesh, and the heads of three men were still roasting at the fire, suspended on sticks stuck in the ground. Mahammah was in the vanguard, and saw many of these people killed; he examined the bodies, measured the tails, and does not understand how their existence can be doubted.

“These Niam-Niams live in the holes of rocks, but some of them build miserable huts of straw. The Haoussas were frequently attacked by these people, and killed great numbers of them; they are of a deep black color, and their teeth are filed; they are not tattooed; they make fire by means of a stone which they find in their country. They used clubs, arrows, and assegais. In battle they utter savage cries. They cultivate rice, maize, and some other fruits and grains unknown to the Haoussas; they are fine men, and their hair is woolly.

“The chief of the Niam-Niams asked for quarter, but the King of Kano killed all they found, *because they had tails*, and because he supposed that nobody would buy them as slaves. They had little oxen without horns, and large sheep and goats; their country is rocky and mountainous: the name of Niam-Niams is also given to another cannibal tribe, but which have no tails. The men go naked also, but the women wear a leaf before the waist.

“Adam, from Haoussa, had heard of the tailed men, but had never seen them. Karo, from Bernou, described the Niam-Niams as wearing a piece of wood in the lobe of the ear, and their women as wearing it in the lip. He said that they were cannibals. Mammaron, from Bernou, had heard of tailed men inhabiting the mountains, but had not seen them. So Allah, from the country of Adamah, had seen children brought as curiosities from the country of the Niam-Niams. They had tails; he had seen and touched them. They were about as long and as big as his finger; and the children might be eight or ten years old.

“Mahammad, from Haoussa, had left his country fifty years before. New-comers had told him that since his departure a new race of tailed savages had been discovered in the mountains to the south.

“Griss, from Haoussa, had witnessed the cannibalism of the Niam-Niams, but had not seen those with tails, although he had heard of them.

“Neidassara, from Haoussa, had served against the Niam-Niams, and had killed several. They had tails. When children were born they had tails about two inches long. He had seen a man who had one about seventy *centimètres* in length. Generally they were about eighteen inches long, and an inch and a half in diameter. These people are like negroes in other respects. They are cannibals. The tail has no movement; and they have seats to sit down, in which a hole has been pierced for the tail to pass through. Neidassara made this campaign under the command of the Sultan of Kano in person. The expedition brought back three Niam-Niams as prisoners to Kano. They excited great curiosity, but the sultan ordered them to be clothed. It was the first time that any of their lives had been spared.”

I make no comment on this evidence, abstracted from *Renseignements sur l'Afrique Centrale, et sur une Nation d'hommes à queue, par Francis de Castelnau*; but refer the reader to that work for geographical information which appears to be valuable, but for which I can find no space here. I will only add the rumors and in one case the trustworthy evidence, which I heard during my visit to Western Africa.

The natives of Equatorial Africa not only assert the existence of a tailed people, but of a hoofed or cloven-footed race. Captain Lawlin, who had traded during twenty years in the Camma country,

believed that such creatures existed in the interior. When Mr. Mackey first visited the Fans, they crowded round him to look at his boots; for at first they believed that he belonged to the hooped tribe of which they had heard so often, and which they said inhabited a country to the northeast of them.

Mr. Sparrhawk, an American trader who was well acquainted with the Congo, said that he had frequently been told of a tailed people living in the interior. He had spoken about it to a native who had traveled a considerable distance in the interior, and who was called the king of the slave-dealers. He answered, with some reluctance, that of course he knew that he (Sparrhawk) only wished to laugh at him. But such people did exist; and as the slave dealers always refused to buy them, they had sometimes been brought down to the markets with their tails cut off as close as possible, but with the stumps visible.

When I was at Ngumbi, Etia told me of a people in the interior who went with their heels forward and their toes backward, like the *σπτοδοδακλυλοι* of the ancients, which were said to inhabit India, and like those of whom Humboldt heard in South America.

He also told me of a people that had feet like a deer, and assured me that he had himself seen one of them, who was on a visit from his own country, which was far away, and he treated with great reverence, because it was thought that his race was under the protection of the spirits. This hooped man was very short, but like a negro in all other respects, and had a language of his own. I was struck with the indifferent tone with which Etia gave me this account: there was none of that warmth of voice and gesture which usually accompanies native exaggeration. I asked him if he did not think it very wonderful that such a being should exist. He said that he did not think it more wonderful than white men. I told him, laughing, that I did not believe that he had seen such a man as that. He answered, laconically, that when he had told the Bush-people he had seen white men they would not believe him.

Such evidence as that of negroes and of old voyagers it may be easy enough to reject. But I was told by the captain of a trader, and, as far as I could judge, a most trustworthy man, that he had seen a woman at Masarado, near Cape Palmas, who had a tail. He described it as short, and without any hair — apparently a prolongation of the spine. She spoke a language; and the Coast natives said that she came from the Bush, where there was a tribe of them. This captain's name, I believe, was Neill; he was an *employé* of the house of King and Co., at Bristol. I must own that I find it very difficult to reject the testimony of a person who gave it to me in so exact and moderate a manner. Finally, a *sous-officier*, whom I met in Senegal, told me, without my having mentioned the subject, that two of his comrades in Algeria, having made an exploration into the interior, had also seen a people having tails short and smooth, as already described.

Whether such a race exist or not is of no importance in comparative anthropology. It is simply a question of pathology. This tail appears to be merely the external prolongation of the vertebral column, which in every individual, male or female, forms a tail of from two to three inches long. We are, therefore, tailed animals. These Niam-Niams and Philippine Islanders are animals with a fuller caudal development, that is all.

This tail is an organic peculiarity, which has been perpetuated by hereditary transmission. That children have been born with tails is a recognized fact in pathology, and instances have been quoted by Aldrovandus, Schenckius, and others. It is also well known that monstrosities can be perpetuated; for what, after all, is a monstrosity but that which in the lower kingdoms is termed a variety? and varieties can form a race. In 1731 the porcupine man was brought before the notice of the Royal Society. That monstrosity has been perpetuated; for the porcupine family is existing in its third generation. Similar cases might be instanced of six-fingered families. It will easily be understood that, in Europe, intermarriage with others would gradually extinguish such a character; but in a savage community, such a brood of monsters would be exiled, and breeding in-and-in would procreate a race.

There are, perhaps, few who know that a tribe of tailed men once existed in Kent, and became so notorious in Europe that it was at one time popularly believed that the whole nation were *homines caudati*.

There is an account of them in Bulwer's "Man Transformed, or the Artificial Changeling:" a very curious old work; the passage I will quote at length:

“When Augustine the monke, being sent by Gregory the Great, came to preach the Gospell unto the English nation at Rochester, the vulgar, in derision of the Holy man, pin’d fishe’s tails upon his garment, or, as some say, threw them at him; whereupon Augustine prayed to God that their children might be borne with Tailles, and it pleased God to confirme his Doctrine by inflicting this punishment upon the Posterity of that incredulous people; so that these Kentish Long-tailes proceeded not from the influence of Heaven, but from a miracle. And although *Antonius Neirembergensis* thinks that this punishment endured but for a time, and that this Miracle is now ceased, yet I am informed by an ingenious and honest Gentleman of good worth, who professed that he had read in some of our Chronicles, or other author whose name he could not very well remember, that there is at this day (1653) a Family in Kent who have to Surname the name of a village very neare Rochester, whereof all that are descended have a Taile, insomuch that you may know any one to be rightly descended of that Family by having a Taile; yet I must suspect some failing in my friend’s memory, because I find in Debrío his disquisition of Magick, that the originall of the Kentish Long-tailes was after this manner. ‘Thomas Becket, Arch-Bishop of Canterbury, being in disgrace with Henry the Second, and riding through Stroud, near Rochester, the inhabitants, to put an affront upon him, cut off his Horse’s Taile, which ever since was entailed upon them, insomuch as you may know a man of Stroud by his long Taile.’ And to make it a little more credible, that the Rumpbone among bruitish and strong-dockt nations doth often sprout out with such an excrescence or beastly emanation, I am informed by an honest young man of Captaine Morris’s company, in Lieutenant-Generall Ireton’s Regiment, that at Cashell, in the county of Tipperary, in the province of Munster, in Carrick Patrick Church, seated on a hill or rock, stormed by the Lord Trichequine, and where there were neare seven hundred put to the sword, and none saved but the Mayor’s wife and his Son, there were found among the slaine of the Irish, when they were stripped, divers that had Tailles near a quarter of a yard long; the Relator, being very diffident of the truth of this story, after enquiry was ensured of the certainty thereof by forty Souldiers, that testified upon their oath that they were eye witnesses, being present at the action. It is reported, also, that in Spain there is another such tailed nation.”

A Few Notes on Reade’s Working Material

Chad Arment

The previous article contains several areas for potential research, but it can be difficult to locate early original materials. Here are a few comments on some of Reade’s quoted sources.

Father Jerome Lobo’s [1596-1678] *A Voyage to Abyssinia* was translated by Samuel Johnson and is readily available in reprinted and etext form.

“Ehrman” is Theophil Friedrich Ehrmann [1762-1811], a journalist who collected and published early travel writers from around the world. Most of his collections are apparently only available in German, and Reade does not give a good citation for the particular volume he used. I have not been able to determine who “Isuf” is, but the reference to a tall bird suggests some similarity to an African bird that Karl Shuker noted in his appendix to Heuvelmans’ checklist of cryptids.

Sir Thomas Browne’s *Pseudodoxia Epidemica* [1646], available online and in reprints, mentions both Garcias ab Horto’s *Dell’Historia de i semplici aromati* [1589], and Lodovico Barthema Vartomannus’ *Itinerario* [1510].

Portuguese Padre Balthazar Tellez (1595-1675) compiled traveller’s reports into *Historia general de Ethiopia Alta ...* [1660].

Scottish explorer William Balfour Baikie (1824-1864) wrote several books on languages and contributed to a book on natural history collecting for travellers. In 1856, he published his *Narrative of an Exploring Voyage up the Rivers Kwóra and Binue (Commonly Known as the Niger and Tsádda) in 1854*. He died in Africa while preparing another manuscript. It would be very interesting to determine where his papers might still be, if they survived.

An American Dragon [North America: Pottery]

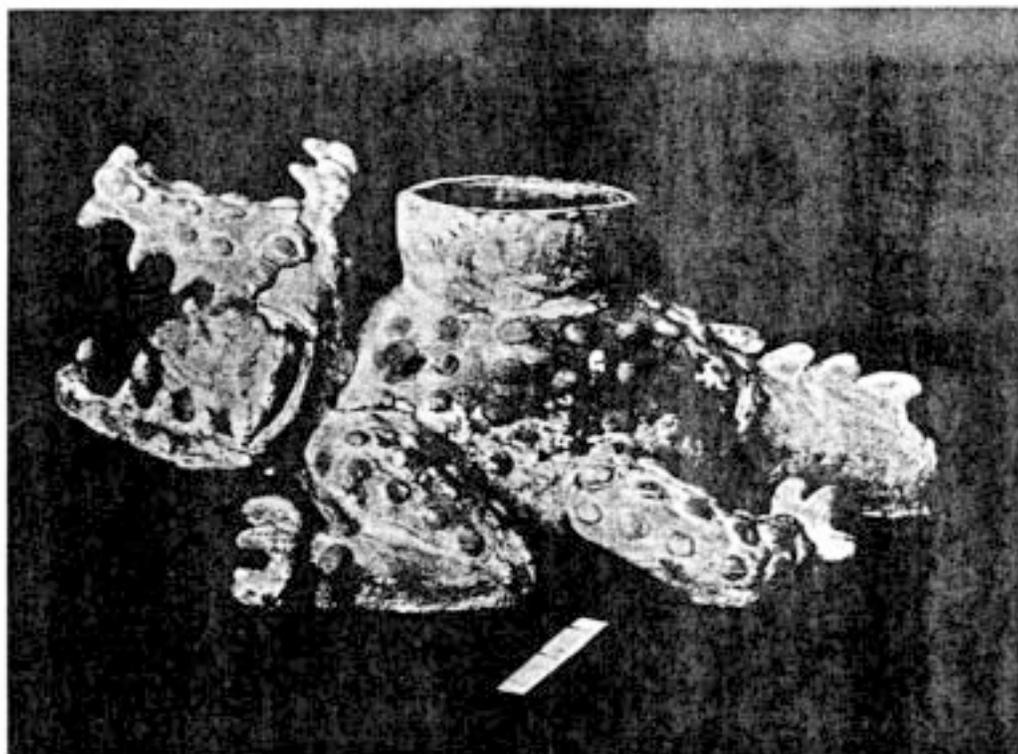
G. Elliot Smith

[Edited from *Man*, No. 89, November 1918, pp. 161-166.]

Among the remarkable collection of Maya pottery in the Liverpool Free Public Museums which Mr. Thomas Gann, M.R.C.S., obtained during the course of his excavations in the mounds of Northern Honduras,* there is a peculiarly interesting object (Plate L) which Mr. Gann does not mention or represent in his series of illustrations. Yet Dr. Joseph A. Clubb, the curator of the Liverpool Museums, who called my attention to the specimen and kindly obtained for me the accompanying photograph of it, tells me that it was found at Santa Rita along with the specimens described by Mr. Gann, to which it presents obvious affinities.

It represents an alligator or crocodile, and a human face protrudes between the jaws of the open mouth. The head of the beast is equipped with such inappropriate appendages as deer's horns, which, though stunted, strictly conform to the stereotyped American way of representing antlers.† To the surface of the skin a series of elliptical (and in some cases circular) pieces of clay have been applied. Like all the other objects in the collection, the model was in the form of a hollow vessel with a large round opening upon the animal's back.

The maximum length of the specimen in its present condition (two spines have been broken off the tip of the tail) is 34.6 cm.; the maximum breadth (across the arms) is 20.3 cm., and the maximum height is 13.3 cm., of which 3.9 cm. consists of the cylindrical tube upon the crocodile's back, the



* Thomas Gann: "Mounds in Northern Honduras," *19th Ann. Rep. Bureau of American Ethnology*, (1897-98). Part II. Washington, 1900, p. 661.

† E. Seler: "Die Tierbilder der mexikanischen und der Maya-Handschriften," *Zeitsch. f. Ethnologie*, Bd. 41, 1909, p. 414. G. G. MacCurdy: "A Study of Chiriquian Antiquities," *Memoirs of the Connecticut Academy of Arts and Sciences*, Vol. III, March 1911, p. 202, Fig. 342.

diameter of which is 8.9 cm. The fore limbs are provided with five toes and the hind limbs with four toes each. The antlers have three prongs. The human face is painted light blue, but the crocodile's palate is coloured brick red. Some of the elliptical elevations upon the creature show traces of blue paint. Bracelets and anklets are represented by series of hemispherical masses of clay.

The forms of several different animals are represented in the collection: tigers, turtles, sharks, as well as "alligators" (crocodiles), and human beings. Referring to "the alligator-like animal" (as well as its surrogates, the double-headed "alligator" and the turtle), Mr. Gann says: "it was intended to represent the Aztec Cipactli, a mythic animal at times taking the form of a swordfish, a shark, an alligator or an iguana"; but somewhat rashly, as the following discussion will show, adds the speculation that "it symbolizes the earth, and as in other cases, is often represented with a human head between the jaws to signify that all flesh returns to its original earth, and to death." (Footnote to p. 684.)

This suggestion is very wide of the mark, for the human head in the mouth belongs to the Rain God *Chac (Tlaloc)* and the animal-form, or his skin-covering, was nothing more than his traditional *camouflage*.

The crocodile in Japan, Indonesia, and India is perhaps the commonest form of the *makara*, which we can regard as a larval form of the real dragon, and in India the direct descendant of the Babylonian "goat-fish," the Capricornus of the Zodiac. One of the most interesting features of the American *makara* we are now studying is that it is equipped with such distinctive features of the Chinese and Japanese dragon as deer's antlers. The spotted decoration of the body is of exceptional interest. I have already called attention to the fact that the elephant-headed god, the Maya *Chac* and the Aztec *Tlaloc*, was the American representative of the Vedic god *Indra*.* It was, in fact, a form of the Indian god somewhat modified by Cambodian and Indonesian, and especially locally by a variety of American influences.

In India, *Indra* had assumed many of the attributes of the gods *Soma* and *Varuna*, which were diversely specialised forms of the Babylonian *Ea (Marduk)* and the Egyptian *Osiris (Horus)*: "In his aspect of Moon, 'the lord of stars,' [*Soma*] has the antelope as his symbol. In fact, one of the names given to the Moon by the early Indians was 'mriga-piplu,' or marked like an antelope," in reference to the spotted appearance of the moon.† "The Sanskrit name for the fifth Nakshatra or lunar mansion over which *Soma* presides is 'mriga-siras,' or the 'deer-headed.'"‡

Dr. Gladys Davis has collected the evidence in substantiation of the claim that the Phrygian *Dionysos* was derived from the early Aryan god *Soma (Haoma)*, who came into being somewhere in the neighbourhood of the Gates of *Zagros*. He was, in fact, *Ea (Marduk)*, who passed through the Gates and became specialised as a highland deity. Miss Davis mentions an Orphic fragment preserved by *Macrobius* which refers to the star-aspect of *Dionysos*, and "explains the significance of the $\nu\epsilon\beta\rho\iota\xi$ or fawn-skin worn by the god and his followers." The dappled appearance of the skin is supposed to symbolise the star-strewn sky,§ and is further regarded by *Orpheus* as representing the connection of *Dionysos* with the Sun. Here he tells how the god—

* *Nature*, January 27th, 1916.

† It was primarily due to a confusion of the attributes of the moon and the sky, the spotted appearance being originally a graphic representation of the star-spangled sky when the first deities were devised by man and the Great Mother was identified in turn with a cow and the moon. But the human mind displays an instinctive tendency to integrate even the most diverse incidents in its experience; no gap is too great to be bridged by this process; hence primitive man solved the problem of the Great Mother's apparently incompatible homologies by making "the cow jump over the moon" and become the sky. Hence the Great Mother and her cow avatar were represented star-spangled, as the sow was in the *Ægean* (*Schliemann, Ilios*, p. 616), and the deer (antelope or rabbit) in Asia and America.

‡ Gladys Davis: *The Asiatic Dionysos*, 1914, pp. 202 and 203.

§ As the star-spangled skin of the Divine Cow *Hathor* (and perhaps also of the Mycenaean Pig) represents the sky.

“First dons a robe like to its glittering rays
And bright as fire, then o’er his shoulder casts
The dappled fawn-skin garb of goodly width,
Dotted with countless circles to portray
The stars inlaid in Heaven’s hallowed vault.”

—(*Macrobius*, Sat. I, 18.)

But not only Soma and Dionysos. but also their American representative *Chac*, wore “the dappled fawn-skin dotted with countless circles to portray the stars” in the pottery figure we are considering. But why should a crocodile be spangled with the antelope’s “countless circles”?

It must be remembered that at the time when Ea (Marduk) was passing into the northern highlands to become the Aryan Soma (Haoma) or his spotted antelope, his other *avatar*, represented by a monster compounded of Ea’s fish and antelope — the so-called “goat-fish” or Capricornus — was also being carried to India, where it became the *makara*. Not only did the *makara* assume protean forms, such as the “goat-fish,” “tiger-fish,” and “elephant-fish” among many others,[¶] but it also became confused with the crocodile and the *nāga*. The identification of the crocodile with the antelope-fish* provides the reason for embellishing the American *makara*, with the spots of the antelope. In India the *makara* is the vehicle of Varuna, and the god was also identified with the monster, as Soma was with the antelope. In America both gods and their respective symbols are merged together in the spotted *makara*, as sometimes occurs also in India.[‡]

When the Babylonian cults made their influence felt, directly or indirectly, in Asia Minor and the Mediterranean area. the antelope of Ea was often replaced by the deer of Dionysos and Artemis. The horns of the dragon into which the “goat-fish” developed were transformed from those of an antelope into those of a deer by the time the dragon reached China and Japan.[‡] It is possible, if not probable, that the idea of this composite monster (which certainly reached Eastern Asia from Babylonia) was transmitted to China by the overland route (*via* Turkestan, the Tian Shan line, past Lob Nor, to Shensi).

The influence of China and Japan in Indonesia in the early centuries of the Christian era was probably responsible for giving deer’s horns to the *makara* (which Indonesia had acquired directly from India) while it was being conveyed east towards America. Hence the American dragon displays the results of a blending in Indonesia of the diversely specialised Indian and Chinese modifications of the original Babylonian antelope-fish of Ea (Marduk).

In a Japanese dragon-story, which was certainly inspired by certain Indonesian legends,[§] the dragon has a crocodile-form and is called a *wani*. In these myths the *wani* may be the hero’s vehicle, as the *makara* was Varuna’s, or the hero or heroine of the tale may be transformed into a *wani*. The literature relating to these mythical crocodiles is discussed by Dr. M. W. de Visser. | |

[¶] See A. Cunningham: *Report Arch. Survey of India*, Vol. III, Plates IX and XXIX; and compare with William Hayes Ward, *Cylinder Seals of Western Asia*, p. 384, where the “goat fish” is shown as the vehicle of the Babylonian Ea, as the *makara* in India is the vehicle of Varuna.

* In parts of Africa the dragon is an antelope (Frobenius, *The Voice of Africa*, 1913, Vol. II. p. 467. inter alia).

‡ Cunningham, *op. cit.*, Plate XXIX.

‡ It is not surprising to find the deer itself (as well as composite monsters) playing a considerable part in the mythology of America. Seler states: “Der Hirsch ist in hervorragendem Masse ein mythologisches Tier. Er repräsentiert das Heer der Sterne, die, vom Morgensterne gejagt, von Osten nach Westen getrieben werden.”

§ F. W. K Müller: “Mythe der Kei-Insulaner und Verwandter,” *Zeitsch. f. Ethnologie*, Bd. XXV (1893), p. 533.

| | The Dragon in China and Japan,” *Verhandelingen der Koninklijke Akademie van Wetenschappen te Amsterdam*, Afd Letterkunde, Deel XIII, No. 2, 1913, pp. 139-142.

He quotes the following statement from Aston's *Shinto*: "There can be little doubt that the *wani* is really the Chinese dragon. It is frequently so represented in Japanese pictures. I have before me a print which shows Toyotama-hiko and his daughter *with dragons' heads appearing over their human ones*. This shows that he was conceived, not only as a Lord of Dragons, but as a dragon himself" (de Visser, p. 141). De Visser makes the following comment on Aston's statement: "We are here not so much on *Chinese*, as on *Indian* territory. . . . 'The dragon's heads appearing over the human one' form quite an Indian motive, transferred to China, and from there to Korea and Japan" (p. 142). The pottery figures from Honduras, as well as many statues from Central America, show that this conception spread, not only to Eastern Asia, but also across the Pacific to America. Among the many ways in which the *nāga* is represented in India, there is one in which the upper part of the god is shown as a human head with a snake's head above it. In Babylonia Ea was represented as a man wearing a fish's skin with the head above his own. The god and the animal whose skin he wore were identified the one with the other. In the Honduras figure, both the human figure and the crocodile represent the Rain God, *Chac*.

That the *makara*-like whale-dragon of the Old World was transferred to America is also shown by the remarkable Maya story, translated by Juan Martínez Hernández,* in which the reference to a "female whale with alligator's feet" recalls the pictures on the Buddhist railing at Mathura (circa 70 B.C.-70 A.D.); whereas the exploits associated with this monster are equally definitely a travesty of Indra's famous achievement in overcoming the demon Vritra.

The world-wide stories of the Whale-dragon have been collated by Frobenius.†

In his *Study of Chiriquian Antiquities*‡ MacCurdy gives an interesting account of a class of Chiriquian pottery which Holmes called "the alligator group," although, for the reasons clearly set forth by MacCurdy, the animal depicted was probably *Crocodilus Americanus, var-acutus*, and not the alligator (*Alligator punctulatus*), which has a shorter muzzle. In the ancient Mexican picture-writing also it was the crocodile that was figured as *cipactli* (op. cit., p. 126).

MacCurdy is puzzled to explain "the appearance of a long crest that is attached to the back of the neck, the meaning of which is not clear" (p. 127). Comparison with the Honduras pottery suggests that this appendage is merely the vestigial remains of the deer's horns of the dragon, conventionalised in the characteristically Babylonian fashion as a single crook-like spur proceeding backwards above the neck (compare his figures 208 and 209, p. 127, with the dragon on the Ishtar Gate at Babylon — L. W. King's *History of Babylonia and Assyria*).

In some of the Honduras specimens the crocodile is given a second head, which is fixed to the end of its tail, in strict conformity with the principles of dragon-construction in the Old World.§

I do not think that MacCurdy's account of the mechanism of conventionalisation of the Chiriquian crocodile gives adequate recognition to the complexity of the process.

The essential factor in the conventionalisation has been the blending of several different conceptions. The design of the crocodile itself is already embellished with vestigial structures that reveal its origin in the Old World. To this is added the effects of the blending in Chiriqui with locally developed designs, as well as with those which have been introduced from abroad, not only in association with the *makara*, but also independently of it. I think the sagging of the body of the Chiriquian crocodile may have been the result of the use of animal forms for *metate*-designs described elsewhere in MacCurdy's report.¶

* "La Creación del Mundo Segun los Mayas," Páginas Inéditas del MS. De Chumayel, *International Congress of Americanists, Proceedings of the XVIII Session*, London, 1912, p. 164.

† *Das Zeitalter des Sonnengottes*, Berlin, 1904.

‡ George Grant MacCurdy: *Memoirs of the Connecticut Academy of Arts and Sciences*, Vol. III., March, 1911, p. 125, et seq.

§ See Budge's *Gods of the Egyptians*, Vol. I.

¶ See Plate III

Every stage in the process of blending of the crocodile and the pot is seen in the Chiriquian series, and the completed stage is revealed in the Honduras specimen with which this note is especially concerned.

It is important to remember that the conception of the Great Mother as a water-pot, which was widely accepted in the Old World (in Egypt, || the Mediterranean area, ** Western Europe, †† India, ‡‡ Indonesia, Eastern Asia, and Oceania §§), was blended in the Ægean area with another of her forms, the octopus; and in the so-called “owl-shaped vases” found in such profusion by Schliemann, we find the “Mother Pot” represented as a jar in the form of a highly conventionalised octopus which is also a woman, whose pudendum is sometimes embellished with a swastika or a volute, two other symbols which Houssay claims as conventionalisations of the octopus.* Similar elements of culture were being mingled in Chiriqui; and it is interesting to compare the compound formed by the American designers of essentially the same ingredients as their Mincan and Mycenaean forerunners used to make their cultural mixture several centuries earlier. For the Chiriquians not only received the suggestions of making such objects from the Old World, but also learned the principles of mingling the motives which inspired them.

I have already referred to the widespread conception of the earliest goddess as a bowl. In conformity with the confusion between the moon-goddess of Egypt and the moon-gods of Aryan India and Persia, it is not surprising to find the god Soma represented as a golden bowl. † The moon itself was regarded in India as a bowl with a spotted antelope or rabbit in it, ‡ or as an animal-shaped vessel.

This Indian conception of the moon also spread to China. Ancient Chinese embroideries represent the moon as a hare pounding medicinal herbs in a mortar under a cassia tree. § In this form the hare is probably the representative of the Egyptian Hathor, whose priestesses pounded the materials for the elixir of life.

This idea also was carried across the Pacific in Pre-Columbian times. In ancient Mexican codices the moon is represented as a bowl in which a hare or rabbit, spotted in the characteristic Indian way, is pounding the Agave plant to make the sacred drink, *pulque*.

In Mexico the Pulque God was in many respects like the Indian Soma, or the Greek Dionysos; and there is no doubt that the American god was derived from the Vedic drink-god. The Pulque God was not only the moon, but was also known as the “Four Hundred Rabbits.” ¶

|| F. Ll. Griffith: “A Collection of Hieroglyphics,” *Arch. Survey of Egypt*, 1898, p. 3; also §§.

** Schliemann, *op. cit.*; also §§.

†† The Holy Grail story; also §§.

‡‡ Bishop Whitehead: “The Village Deities of Southern India,” *Madras Government Museum Bulletin*, Vol. V, No. 3. 1907, where the seven goddesses are represented by seven pots.

§§ In my *Evolution of the Dragon* I have discussed the origin of the Mother Pot.

* Frédéric Houssay: “Les Theories de la Genèse à Mycènes et le sens zoologique de certains symboles du culte d’Aphrodite,” *Revue Archéologique*, 3rd Series. XXVI, 1895, p. 24.

† Davis, *op. cit.*, p. 239.

‡ In another Indian legend a celestial being, an emanation of Brahma, brings down from heaven in a golden vessel the food of the gods — pyassa, compounded of rice and milk, both of them “givers of life.” Wives who eat this fertilising mixture give birth to sons who are incarnations of Vishnu, and overcome the king of the demons.

§ De Gubernatis, *Myth. des Plantes*, Tome II, p. 50; John Steele, *The I-Li*. London, 1917. represents (Vol. I, plate facing p. 144) a deer-shaped tally-holder from China, with striking analogies to the Honduras pot.

¶ Seler: *Codex Vaticanus*, Vol. I., p. 167. In his account of this god, Seler quotes from an ancient document describing how four male demons killed the Great Mother, the mother of all the gods and demons, and thereby formed the institution of human sacrifice. They took her heart out and presented it to the sun . . . in this way giving him eternal life, and that, if he did not die, all persons drinking wine must die; but the death of this Ometochtli was like the sleep of one drunk, and afterwards he recovered and became fresh and well. This is a curious blend of the Egyptian story of the Destruction of Mankind and the Babylonian legend of Tiamat.

Kunike reproduces a remarkable “Mexican Saga” (Sabagun VII, 2), which explains the present diminution of the moon’s brightness by the statement that the gods fling a rabbit in the face of the moon, || which originally shone as brilliantly as the sun. He states that the “Sanskrit Indians” have the same legend, and that the Japanese and the Indians of Central Brazil refer to the rabbit in the moon.*

I have already referred to the confusion of sex that occurred when many attributes of the Egyptian female moon-god were acquired by the Indian drink-god Soma. A remarkable illustration of this confusion is provided by the Mexican god Xipe, who carries the characteristic sistrum of Hathor.† Kunike says: “Das Kaninchen ist also der Mond und die Pulquegötter sind Mondgötter, auch sie hängen wie Xipe (als Mond-und Vegetationsgott) mit den Ideen der Lebensmittelfülle unmittelbar zusammen” (p. 927).

As in Egypt, so also in Mexico, the moon is represented as an eye. When represented as a bowl the latter may simply be a part of the conventional eye-design (see Kunike, Fig. 9, p. 926); or it may be a real bowl containing a rabbit, a seashell or a flint knife, three of the diverse forms which the Great Mother assumes in the Old World, the rabbit (or its surrogates, the antelope, the gazelle, or the deer) being her good or evil *avatar*, the shell her original form, and the flint-knife also an animate form of the goddess as well as the original thunder-weapon. Thus we find upon the shores of the New World a confused jumble of beliefs and fancies that began to drift across the Pacific from the Old World more than twenty centuries ago. As we examine the pictures in the ancient Maya and Aztec codices, a never-ending feeling of amazement is awakened as one after another almost every incident in the mythology of India, Babylonia, and Egypt, the legends of their gods and demons, the history of their dragons and thunder-weapons, make their appearance, flung together in kaleidoscopic confusion, and elaborated with childish directness and barbaric luxuriance of embellishment, into new combinations and distinctively American designs.

No one who conscientiously studies the mythology of the Old World and appreciates the fortuitous circumstances which determined the arbitrary forms assumed by many of the beliefs and ideas can refuse to admit that the confused mosaic of the identical elements of culture in America must have come from the other side of the Pacific, and for the most part received the impress of Indian civilisation before the fragments were rearranged and built up again into a new pattern in Mexico and Central America.

In my book of Rylands lectures on “The Evolution of the Dragon,” I have discussed at greater length the general problems mentioned here. It was only after the relevant chapter of the book was in printed proof that I learned of the existence of this pottery figure in Liverpool, which affords a most remarkable demonstration of the existence of such a mythical creature as the development of my argument had previously led me to expect to find in America.

|| Elsewhere I have referred to the remarkable practice of the Pyramid Age in Egypt of offering the fore-limb torn from a living calf as a blood offering, and of the survival of this custom in a modified form among the Dravidian people of India at the present day. In Babylonia Eabani is said to have torn a limb from the Celestial Urus and to have thrown it in the face of Ishtar (Maspero, *Dawn of Civilization*, p. 582). Is the story of the flinging of the rabbit in the face of the moon (the Great Mother) a garbled version of this ancient legend?

* Hugo Kunike: “Einige grundsätzliche Bemerkungen über Sonne, Mond and Sterne in alten Mexiko,” *Zeitschrift für Ethnologie*, Bd. 43, 1911, p. 926.

† Joyce: *Mexican Archaeology*, p. 40.

Canyon of the Little Horses

Jack Tooker

[From San Francisco, CA, *Examiner*, February 25, 1940, Sunday, American Weekly Magazine, pp. 8-9.]

In the Grand Canyon of northern Arizona, world-famous for its scenic wonders and mysteries of natural history, lives a herd of Lilliputian horses.

Few people know about them, and the Indians claim that I am the only white man ever to enter their almost impregnable natural prison. They are perhaps the smallest horses in existence, descendants of normal horses of Arabian stock, imported to the southwestern territory some four hundred years ago by the Spaniards.

One hundred and two years ago an Indian whose only name we ever knew was Supai Smiley, left three normal-sized horses — a pinto stallion, a buckskin mare and her colt — in a canyon for safe keeping until he could return for them.

The only entrance or exit to the place, at the time, was a steep, rocky trail. When Smiley finally returned for the horses, he found that the trail leading into the canyon was a sheer wall, at the base of which the horses were trapped beyond recovery. A fault slide had destroyed the only trail that a horse could climb, in or out. This canyon, one of thousands of small canyons that make up the Grand Canyon system, has been the home of the descendants of those horses ever since.

Hemmed in by great walls on all sides, the offspring of Supai Smiley's three horses had room enough to multiply. But scantiness at times of food and water, inbreeding and possibly confinement to some extent, stunted them, and as the years passed, and generation after generation was born, they became smaller and smaller.

The Indians came to call the place the Canyon of the Little Horses, and since it was a canyon within many canyons, and almost inaccessible to most whites, its secret remained hidden from all but a few adventurous natives who dared to scale its walls.

Old Smiley, as we called him at Grand Canyon, was in the earlier years of his long life a captain of scouts for several American generals when the West was mostly Indian territory. I knew him well during many of the last years of his life.

Several times he made me promise never to divulge any of his secrets or retell any of his stories until he had passed on. Consequently, it was not until after his death that I was surprised to find that some of his strange tales were apparently true, and one of those tales was the story of how the Little Horses were imprisoned in the Grand Canyon.

When the first white men explored the Southwest they found many albinos among the Pueblo tribe from which the Supai originated. As a young man Smiley fell in love with one of these "blondes" of his race and married her. She was later stolen by Apaches. But Smiley rescued her and they managed to escape on a pinto stallion and a buckskin mare stolen from the Apache camp.

He wrapped his wife, who was soon to become a mother, in a bearskin robe and rode all night in a raging blizzard, at last reaching an encampment of friendly Hopis.

Shortly afterwards his child was born and as soon as mother and baby were able to travel he set out to find his own people.

When the going became too rough for the stallion and the mare, he turned them loose, along with a recently foaled colt, in what is now the Canyon of the Little Horses, and went on afoot with his family.

That, in brief, was Old Smiley's story. When he first told it to me it was an Indian secret. Smiley and a few other Indians of his age knew that the trapping of the horses was due to natural causes. But most of the Indians believed that the gods had imprisoned the horses there for some hidden purpose and would be angry if white men discovered them.

But Old Smiley trusted me and was willing I go and see them for myself, provided I took no one with me and did not photograph the horses.

And so one morning, I set out on a sure-footed mule, with light camping equipment, and eventually found the old trail that Smiley had described. It was fully as bad as I expected. To descend it I would have to shake hands with the devil every foot of the way. With a coil of rope around my waist, I started down, taking as straight a course as possible.

Finally, I located the cottonwood tree where Smiley had told me there was water, and where the Little Horses would come to drink. But when I decided to drop off I found my sixty feet of rope lacked more than eight feet of reaching the level at the foot of a sheer wall. Hanging at the very end, my feet were still a yard or more from the level, but I was impatient, and let go without considering how I could reach my rope again.

At the spring I found many horse tracks. I hid myself about forty yards from the spring, careful not to be downwind so the animals could not scent me.

Seven horses came in a little later, led by a pinto stallion about the size of a Shetland pony. Some of the mares were much smaller, and there were two horses not much larger than dogs.

All afternoon I watched them come and go, counting forty-one in all. Many were freaks, with small bodies and heads as large as those of normal horses. Others had long bodies like dachshunds, while some had small bodies and heads and seemed to be all legs. But the majority had short legs in proportion to their size, and all had long manes and tails. There were blacks, bays, buckskins, pintos and sorrels with long white manes and tails.

When I had at last looked to my satisfaction at the amazing proof that Smiley's story was true, I moved up nearer the animals at the spring. But they were as shy as deer and soon discovered me, taking flight as fast as their short legs could carry them, manes and tails flying as they leaped the rocky ledges.

Back at the end of my rope, I built a rock wall high enough to reach it, and started the long climb out.

After that Smiley and I seldom mentioned the Little Horses even when alone together, and outsiders never learned about them until after the old Indian's death in August, 1929 (government records show him to have been about 110 years old).

At last I was free to take pictures of the Little Horses. But it was nearly a year after Old Smiley died before I was able to make a second trip into the Canyon of the Little Horses. Sixteen years had passed since my first trip. I took my camera, food and water, and drove my car as far as I could, walking the rest of the way.

This time I found a much easier route down into the canyon, though I had to use a rope most of the way. At the cottonwoods I not only found horse tracks as before, but lion tracks as well, and on looking around, I found two kills — carcasses of the larger horses which had been killed by mountain lions.

The first herd came in about nine in the morning. There were nineteen. I did not get very near them, since they got my wind and took flight.

There were eight in the next bunch, which I was able to corner. I took several exposures of them, and then tried to rope one. But the larger horses were in the way. My rope fell on a bay mare about the size of a police dog, and the two smallest scampered away like rabbits with the rest.

After petting my catch, I tied her up and took several pictures, then released her.

Back at the Grand Canyon, when we tried to develop these pictures, we found them almost totally blank. Investigations revealed that in some way, while going down into the canyon, the camera had been damaged.

In March I began laying plans for an extensive trip into the Canyon of the Little Horses. For thirty days I tried to get one or two white men to go with me. I wanted particularly to secure an expert photographer, for the light in the Grand Canyon is baffling, and I am only an amateur with a camera. But no one fancied such a difficult trip, and in the end I had to be satisfied with two Supai Indians, Watahomigee and a boy named J. Hanaige.

April 23rd found us on top the gray wall, looking down into the prison of the Little Horses. Fastening one end of a long rope to the trunk of a cedar tree, I swung over the edge and slid down, the supplies following me and then the Indians.

It was late afternoon when we camped near the spring, which is located in a V-shaped boxed canyon. The sun was still shining on the north wall of the canyon, but we were in the shadows. About sundown eight little horses came in to drink, led by an old black stallion that had a slim body and unusually long legs. He was the only horse I had seen with such long legs. As soon as they were in the boxed canyon, we closed in. They were wilder than deer, the wildest things I have ever seen. They tried to climb the sheer walls, and I feared they would all commit suicide.

When the dust settled we had two, the black stallion and a four-year-old mare. Their teeth proved their age, together with their muscular development. The mare was four and the stallion was at least thirty years old.

The body of the stallion was so slender that I could span him at the flanks with my two hands, and he was mean.

It was too late to take photographs, but I snapped one or two shots of the little mare, and believing others would come in, I turned her loose, keeping the stallion for photographs in the morning. Being short of ropes, we tied the stallion to the end of the line we had used in descending into the canyon, the other end of which was still fastened to the tree on the ledge above.

Next morning our stallion was gone with part of our rope, and we were trapped like rats in a well. The horse has sawed through the rope by whetting it back and forth on the rocks above.

I began looking around for a place to climb out, but the Indians did not fancy the idea and suggested that we go to the Supai Indian village at the far end of the canyon, a long and dangerous route, but possible. After breakfast, we set out westward, and after trailing about two hours, we sighted all eight of the horses we had first seen. They were out on a barren, rocky point, drinking from the potholes which had filled with water from rain or melting snow. We cornered them on a point with ledge after ledge below. But before we could get near enough for a picture, they all disappeared over the edge.

We ran up and looked down over a precipice. Below were the black stallion, a white mare and a blue-spotted filly, lying dead on the rocks. The other five had jumped from ledge to ledge like mountain sheep and escaped.

[Ed. Note — This story was kindly forwarded by Gary Mangiacopra. The photocopy does not preserve the story's original title. This is an interesting addendum to the previous NABR article concerning little horse folklore in the Grand Canyon.]

BioForteana:

The Floating Population of the Air

T. D. A. Cockerell, Boulder, Colorado

In my recent studies of the biota of the islands off the coast of Southern California I have found that the endemic insects appear to be mainly confined to certain groups, especially the more or less bulky Tenebrionid beetles, which can not fly. Excluding the species certainly or probably introduced by man, there is still a very large population of flying insects, as well as spiders, quite identical with species of the mainland. It might at first appear that these species were very constant in their characters, with little tendency to form distinct races or species when isolated. The true explanation, however, appears to be that they are constantly arriving through the air. The floating population of the air has not been sufficiently understood in the past, but the essential facts are admirably presented by Mr. P. A. Glick in his recently published work on "The Distribution of Insects, Spiders and Mites in the Air" (U. S. Department of Agriculture, Technical Bulletin 673, May, 1939). In this paper full details are given of the collections made by aeroplane in Louisiana and Durango, Mexico, the specimens secured having been carefully sorted and so far as possible identified. The work at Tallulah, Louisiana, involved 1,314 aeroplane flights, during which the insect traps were in operation for 1,007 hours. There were 44 flights in Durango, Mexico. In Louisiana, by day, 24,559 insects and arachnids were taken in 51,178 minutes. By night, 3,955 were taken in 6,790 minutes. Two hundred and twenty-five were taken in 2,455 minutes at altitudes over 5,000 feet; one spider at 15,000 feet. In Mexico, 1,294 specimens were taken in 2,120 minutes. There were numerous small wingless forms, carried upward by the air currents. All the various aspects of the work and its significance are most ably discussed by Mr. Glick, the bulletin extending to 150 pages. It is evident that the islands must be constantly receiving insects, spiders, and also spores and some seeds, through the air. Only a very small percentage of these can survive, but the constant supply enables the available environments to be populated, so that even recently introduced plants are often infested as they would be on the mainland. Thus at the Rancho Escondido, Sta. Catalina, I found the cocklebur, *Xanthium spinosum*, swarming with the trypetid fly which attacks it elsewhere. The introduced *Diaspis* scale of the prickly pear, at the same place, was infested by chalcidoid parasites. At the present time, the manner of arrival of the various species can only be guessed, but if the very numerous planes constantly flying about the islands could be utilized (with no inconvenience to the service or the pilots) for studies like those of Mr. Glick, we should soon have a mass of positive information. We may leave it to mathematicians to calculate, on the basis of the work done, the probable number of insects in the air, but the figure must be surprisingly large. There is also another aspect of the matter, which I have not seen referred to. The sea in the vicinity of the coasts (how far out, we do not know) must be constantly receiving a rain of small arthropods, which must represent a not inconsiderable food supply for the marine animals.

[From *Science*, vol. 90, no. 2337, Oct. 13, 1939, pp. 353-354.]

