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Had Dr. Darwin used the word *action* instead of *diseases*, he would not have so greatly surprised the world by his wonderful catalogue, as he terms his *diseases*; nor would the splitting all the *symptoms*, and constituting out of these so many diseases, now appearing all novelties, have so greatly offended at the onset, the medical reader brought up in the old school. BROWN, DARWIN, and THORNTON, have each formed a *new* system of nosology. Upon the whole, we cannot approve of the *old plan* of *artificial* arrangement, not quite that invented by Linnæus, Vogel, Sauvage, Cullen, &c., nor even that of Dr. BROWN, who divides his diseases into Sthenic and Asthenic, for the facility of comprehension and cure, nor even that of Dr. DARWIN, but that invented by Dr. THORNTON\*, who begins with diseases of the head, and so descends to other parts, dividing these into sthenic and asthenic, and reserving a separate class for contagious diseases, and fevers, or general affections.

[To be continued.]

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XXIII. *Some Account of a Journey to the Frozen Sea, and of the Discovery of the Remains of a Mammoth. By M. MICHAEL ADAMS, of St. Petersburg. Translated from the French †.*

I SHOULD have reason to reproach myself were I to delay any longer the publication of a discovery in Zoology, which is so much the more interesting to be detailed, as it once more presents to our view a species of animal, the existence of which has been a subject of dispute among the most celebrated naturalists.

I was informed at Jakoutsck by M. Popoff, who is at the head of the company of merchants of that town, that they had discovered upon the shores of the Frozen Sea, near the mouth of the river Lena, an animal of an extraordinary size: the flesh, skin and hair were in good preservation, and it was

\* This *System* may be seen in his "Philosophy of Medicine," fourth edition, five volumes, a work which deserves a place in every library.

† For this communication we are indebted to the Right Hon. Sir Joseph Banks, Bart. F. R. S. &c. &c.

supposed

supposed that the fossile production, known by the name of mammoth horns, must have belonged to some animal of this kind.

Mr. Popoff had, at the same time, the goodness to communicate the drawing and description of this animal; I thought proper to send both to the President of the Petersburg Academy. The intelligence of this interesting discovery determined me to hasten my intended journey to the banks of the Lena as far as the Frozen Sea, and I was anxious to save these precious remains, which might perhaps otherwise be lost. My stay at Jakoutsk, therefore, only lasted a few days. I set out on the 7th of June 1806, provided with some indispensable letters of recommendation, some of which were addressed to the servants of the government, and others to merchants, from whom I hoped to derive some advantages. On the 16th of June I arrived in the small town of Schigarsk, and towards the end of the same month I reached Kumak-Surka: from this place I made an excursion, the express object of which was to discover the mammoth. And I shall now give a sketch of my journey.

The contrary winds, which lasted during the whole summer, retarded my departure from Kumak-Surka; this place was then inhabited by 40 or 50 TOUNGOUSE families of the Batouline race. Fishing was their ordinary occupation, and the extreme activity of these people filled me with admiration: the women, old men, and even children, laboured with indefatigable assiduity in laying up provisions for winter. The strongest went a-fishing, the less robust were occupied in cleaning and drying the fish. The whole shores were covered with scaffolding, and the cabins so filled with fish that we could scarcely enter them. An innocent gaiety reigned in every countenance, and all exhibited the utmost activity. The fishermen sang while casting their nets, and others were dancing the Charya, which is a dance peculiar to the country. I cannot sufficiently express the emotions of joy which I felt at the sight of these pleasing scenes.

I was convinced, while upon the spot, that the inhabitants of the North enjoy happiness even in the midst of the frozen regions.

But

But what astonished me still more, was the picturesque view of the opposite side of the *Lena*. This river, which is one of the largest in Siberia, majestically rolls its waters through the mountainous chain of *Verschéjansk*: it is here, near its mouth, entirely devoid of islands, and much narrower, deeper and more rapid than in any place of its course. The mountains here appear in a great variety of forms; they are of a brilliant whiteness, and of a savage and horrid aspect; sometimes they represent immense columns which rise into the clouds, sometimes they resemble the ruins of antient forts, and as if they were parts detached from the mutilated remains of grotesque and gigantic figures.

Further off the horizon is terminated by a chain of high mountains, where eternal snow and ice dart back the rays of the sun.

These landscapes are of exquisite beauty; an expert draughtsman would look in vain for similar views in any other place of Siberia; and I am not astonished that the picturesque situation of *Kumak-Surka* should become the object of a national song, known solely on the shores of the Frozen Sea. I reserve the communication of this curious article until I publish the detailed account of my journey.

The course of the winds having at last changed, I thought of pursuing my route, and I had my rein-deer brought across the river. Next day at day-break, I set out accompanied by a *Toungouse* chief, *Ossip Shoumachoff*, and by *Bellkoff*, a merchant of *Schigansk*, and attended by my huntsman, three *Cossacs*, and ten *Toungouses*.

The *Toungouse* chief was the first person who discovered the mammoth, and he was proprietor of the territory through which our route lay. *Bellkoff* the merchant had spent nearly his whole life on the shores of the Frozen Sea. His zeal, and the details he procured me, have the strongest claims to my gratitude: I am even indebted to him for the preservation of my life at a moment of imminent danger.

At first I found great difficulty in sitting upon a rein-deer; for, the saddle being attached by a girth of leather only, it was very insecure, and often occasioned me very disagreeable falls. Besides, my position was very inconvenient for  
want

want of stirrups, which are never used among the Toun-gouses.

On our route we traversed high and rugged mountains, valleys which followed the course of small rivulets, and parched and savage plains, where not a shrub was to be seen. After two days travelling, we at last approached the shores of the Frozen Sea. This place is called by the Toun-gouses Angardam, or *terra firma*. In order to attain the mammoth, it was necessary to traverse another isthmus, called Bykoffskoy-Mys or Tumut. This isthmus, which projects into a spacious gulf, is to the right of the mouth of the Lena, and extends, as I was informed, from South-east to North-east for about 30 or 35 wersts\*. Its name is probably derived from two points in the form of horns, which are at the North extremity of this promontory. The point upon the left hand, which the Russians call by way of eminence Bykoffskoy-Mys, on account of its greater extent, forms three vast gulfs, where we find some settlements of Jakouts: the opposite point, called Maustach on account of the great quantity of floating wood found upon its shores, is one half smaller; its shore is lower, and this district is completely inhabited. The distance from the one point to the other is estimated at four leagues and a half, or 45 wersts. Small hills form the higher part of the peninsula of Tumut; the remainder is occupied by lakes, and all the low grounds are marshy.

The principal lakes are: 1st, Chastirkoöl, which means the lake of geese; 2d, Kourilakoöl; 3d, Bëulgeuniachtachkoöl, the lake of hillocks; 4th, Omoulachkoöl; 5th, Mou-gourdachkoöl, where a particular kind of salmon is found, called tchir; and 6th, Bachofkoöl. The lake No. 4 is the largest, and No. 5 is the deepest of all. The lake No. 6 derives its name from two famous adventurers, Bachoff and Schalauroun, who spent a whole winter on its banks. We still see the ruins of a cabin in which they resided. The history of their unfortunate end is told by M. Sauer in his *Journal of Billings's expedition*.

\* 10 wersts are equal to 6 English geographical miles.

The isthmus we have mentioned is so narrow at some places that the sea may be seen on both sides. The reindeer perform a periodical transmigration every year, during which they abandon these places, in order to proceed by the Frozen Sea towards Borschaya and Uitjansk, and for this purpose they collect in large troops about autumn. In order to hunt these animals with greater prospect of success, the Tougouses have divided the peninsula into cantons, separated by palings. They frighten the deer by loud cries, which they utter all at once, by letting dogs loose at them, and by fans which they attach to the palings, and which are agitated by the wind. The terrified reindeer throw themselves into the water in order to reach some neighbouring island, where they are pursued and killed by the hunters.

On the third day of our journey we pitched our tents a few hundred paces from the mammoth, upon a hillock called Kembisagashaeta, which signifies the stone with the broad side.

Schoumachoff related to me the history of the discovery of the mammoth in nearly the following terms :—

“ The Tougouses, who are a wandering people, seldom remain long in one place. Those who live in the forests often spend ten years and more in traversing the vast regions among the mountains : during this period they never visit their homes. Each family lives in an isolated state from the rest ; the chief takes care of them, and knows no other society. If, after several years absence, two friends meet by chance, they then mutually communicate their adventures, the various success of their hunting, and the quantity of peltry they have acquired. After having spent some days together, and consumed the little provisions they have, they separate cheerfully, charge each other with compliments for their respective friends, and leave it to chance to bring them together again. Such is the way of life of these innocent children of Nature. The Tougouses who inhabit the coast differ from the rest, in having more regularly built houses, and in assembling at certain seasons for fishing and hunting. In winter they inhabit cabins, built close to each other, so as to form small villages.

“ It is to one of these annual excursions of the Toungouses that we are indebted for the discovery of the mammoth. Towards the end of August, when the fishing in the Lena is over, Schoumachoff is in the habit of going along with his brothers to the peninsula of Tumut, where they employ themselves in hunting, and where the fresh fish of the sea furnish them with wholesome and agreeable nourishment.

“ In 1799, he had caused to be built for his women, some cabins upon the shores of the lake Onroul; and he himself coasted along the sea shore for the purpose of searching for some mammoth horns. One day he perceived in the midst of a rock of ice an unformed block, which did not at all resemble the floating pieces of wood usually found there. In order to examine it more closely, he clambered up the rock and examined this new object all around; but he could not ascertain what it was. The year following he discovered in the same spot, the carcase of a sea-cow (*Trichecus Rosmarus*). He perceived at the same time that the mass he had formerly seen was freer from the ice, and by the side of it he remarked two similar pieces, which he afterwards found were the feet of the mammoth. About the close of the next summer, the entire flank of the animal and one of the tusks had distinctly come out from under the ice. Upon his return to the shores of the lake Onroul, he communicated this extraordinary discovery to his wife and some of his friends; but their manner of regarding the subject overwhelmed him with grief. The old men related on this occasion, that they had heard their forefathers say that a similar monster had formerly shown itself in the same peninsula, and that the whole family of the person who discovered it had become extinct in a very short time. The mammoth, in consequence of this, was unanimously regarded as auguring a future calamity, and the Toungouse chief felt so much inquietude from it, that he felt dangerously ill; but becoming well again, his first ideas suggested to him the profit he might gain by selling the tusks of this animal, which were of an extraordinary size and beauty. He therefore gave orders to conceal carefully the place where the mammoth was, and to remove all strangers from it under various pretexts, charging

at the same time some trusty dependents not to suffer any part of this treasure to be carried away.

“But the summer being colder and more windy than usual, kept the mammoth sunk in the ice, which scarcely melted at all that season. At last, about the end of the fifth year afterwards, the ardent desires of Schoumachoff were happily accomplished: the ice which inclosed the mammoth having partly melted, the level became sloped, and this enormous mass, pushed forward by its own weight, fell over upon its side on a sand-bank. Of this two Toungouses were witnesses who accompanied me in my journey. In the month of March 1804, Schoumachoff came to his mammoth, and having got his horns cut off, he changed them with Baltounoff the merchant for merchandise of the value of 50 roubles. On this occasion a drawing of the animal was made, but it was very incorrect; they described it with pointed ears, very small eyes, horses’ hoofs, and a bristly mane along the whole of his back; so that the drawing represented something between a pig and an elephant.”

Two years afterwards, being the seventh from the discovery of the mammoth, a fortunate circumstance occasioned my visit to these distant and desert regions, and I congratulate myself upon having it in my power to ascertain and verify a fact, which would otherwise be thought so improbable.

I found the mammoth still upon the same spot, but completely mutilated. The prejudices against it having been dissipated, because the Toungouse chief had recovered his health, the carcase of the mammoth might be approached without any obstacle: the proprietor was content with the profit he had already derived from it, and the Jakouts of the neighbourhood tore off the flesh, with which they fed their dogs. Ferocious animals—white bears of the north pole, gluttons, wolves, and foxes—preyed upon it also, and their burrows were seen in the neighbourhood. The skeleton, almost completely unfleshed, was entire, with the exception of one of the fore feet. The spondyle, from the head to the os coccygis, a shoulder-blade, the pelvis, and the remains of the three extremities, were still tightly attached by the



nerves of the joints, and by strips of skin on the exterior side of the carcase. The head was covered with a dry skin ; one of the ears, well preserved, was furnished with a tuft of bristles. All these parts must necessarily have suffered by a carriage of 11,000 wersts. The eyes, however, are preserved, and we can still distinguish the ball of the left eye. The tip of the under lip has been eaten away, and the upper part, being destroyed, exhibited the teeth. The brain was still within the cranium, but it appeared dry.

The parts least damaged are a fore foot and a hind one ; they are covered with skin, and have still the sole attached. According to the assertion of the Toungouse chief, the animal had been so large and well fed, that its belly hung down below the knee joints. This mammoth is a male, with a long mane at his neck, but it has no tail and no trunk. The skin, three-fourths of which are in my possession, is of a deep gray, and covered with a reddish hair and black bristles. The humidity of the soil where the animal has lain so long, has made the bristles lose some part of their elasticity. The entire carcase, the bones of which I collected upon the spot, is 4 archines and a half high by 7 long, from the tip of the nose to the coccyx\* ; without however comprehending the two horns, each of which is a toise and a half long, and both together weigh 10 pouds†. The head alone weighs eleven pouds and a half.

The principal object of my care was to separate the bones, to arrange them and place them in safety: this was done with the most scrupulous nicety, and I had the satisfaction of finding the other shoulder-blade, which lay in a hole. I afterwards caused the skin to be stripped from the side upon which the animal had lain ; it was very well preserved. This skin was of such an extraordinary weight, that ten persons who were employed to carry it to the sea side, in order to stretch it on floating wood, moved it with great difficulty. After this operation I caused the ground to be dug in various places in order to see if there were any bones around, but

\* An archine is a little more than two feet English measure.

† A poud is 40 pounds.

chiefly

chiefly for the purpose of collecting all the bristles which the white bears might have trodden into the wet ground on devouring the flesh. This operation was attended with difficulty, as we wanted the necessary instruments for digging the ground: I succeeded however in procuring in this manner more than one poud weight of bristles. In a few days our labour was ended, and I found myself in possession of a treasure, which amply recompensed me for the fatigues and dangers of the journey, and even for the expenses I had incurred.

The place where I found the mammoth is about 60 paces distant from the shore; and from the fracture of the ice from which it slid it is about 100 paces distant. This fracture occupies the middle precisely between the two points of the isthmus, and is three wersts long, and even in the place where the mammoth was, this rock has a perpendicular elevation of 30 or 40 toises. Its substance is a clear ice, but of a nauseous taste; it inclines towards the sea; its summit is covered with a bed of moss and friable earth half an archine in thickness. During the heat of the month of July a part of this crust melts, but the other remains frozen.

Curiosity prompted me to ascend two other hillocks equally distant from the sea; they were of the same composition, and also a little covered with moss. At intervals I saw pieces of wood of an enormous size, and of all the species produced in Siberia; and also mammoth horns in great quantities frozen between the fissures of the rocks. They appeared to be of an astonishing freshness.

It is as curious as it is difficult to explain how all these things are to be found collected here. The inhabitants of the coast call this kind of wood *Adamsobina*, and distinguish it from the floating wood, which descending the great rivers of Siberia falls into the ocean, and is afterwards heaped upon the shores of the Frozen Sea. This last kind they call *Noahsobina*. I have seen in great thaws, large pieces of earth detach themselves from the hillocks, mix with the water, and form thick and muddy torrents which roll slowly towards the sea. This earth forms in different places lumps, which sink in among the ice. The block of ice where the mam-

moth was found, was from 35 to 40 toises high; and, according to the account of the Toungouses, the animal when first discovered was seven toises from the surface of the ice.

The whole shore was as it were covered with the most variegated and beautiful plants produced on the shores of the Frozen Sea; but they were only two inches high. Around the carcase we saw a multitude of other plants, such as the *Cineraria aquatica* and some species of *Pedicularis*, not yet known in natural history.

While waiting for the boats from Terra Firma, for which I had sent some Cossacs, we exerted all our endeavours to erect a monument to perpetuate the memory of this discovery and of my visit. We raised, according to the custom of these countries, two crosses with analogous inscriptions. The one was upon the rock of ice, 40 paces from the shelf from which this mammoth had slid, and the other was upon the very spot where we found it. Each of these crosses is 6 French toises high, and constructed in a manner solid enough to brave the severity of many ages. The Toungouses have given to the one the name of the cross of the Ambassador, and to the other that of the cross of the Mammoth. The eminence itself received the name of Selichaëta or Mammoth mountain. This last will perhaps some day or other afford some traveller the means of calculating with sufficient precision how much the mountains of ice lose annually or their primitive height.

I made two additional excursions for the purpose of acquiring some more precise notions upon the nature of this peninsula, and my discoveries in zoology and botany perfectly answered my expectations. I found a great quantity of amber upon the shores; but in no piece whatever could I discover the least trace of any marine production. I should, perhaps, attribute this to the proximity of the river, and perhaps also to the depth of the sea, or abruptness of the shore. I had occasion to examine more closely the effects of the flux and reflux: this has escaped M. Sauer, who saw nothing of it at the mouth of the Colima.

Our Cossacs not having arrived in time with the boat, I

was

was obliged to return to the continent with my rein-deer, without waiting for them. The vessel, in the mean time, had cast anchor in the bay of Borchaya, three hundred wersts from the isthmus where I was. We arrived without any accident, after a journey of eight days. A week afterwards I had the satisfaction to see the mammoth arrive. Our first care was to separate, by boiling, the nerves and flesh from the bones; the skeleton was then packed, and placed at the bottom of the hold. When we arrived at Jakoutska, I had the good fortune to purchase the tusks of the mammoth; and thence I dispatched the whole for St. Petersburg.

A question of some magnitude remains to be resolved:—Are the mammoth and elephant animals of the same species, as asserted by Buffon, Pallas, Isbrand Ides, Gmelin, and, above all, Daubenton? or should we, in preference, rely upon the opinion of M. Cuvier, who asserts that the mammoth occupies the second place among the extinct species of animals? As I do not intend, in this place, to make an exact comparison of the skeletons of a mammoth and an elephant, I shall content myself with relating here some characteristic marks which distinguish the two species: I reserve for a particular memoir some more detailed observations upon this subject. I shall here recapitulate the motives which induced me to adopt the opinion of M. Cuvier.

1. If the writers whom I have mentioned have actually made, as I suppose, zootomical comparisons, they have been able to do so very incompletely, and upon detached pieces; for neither the head, nor the whole vertebræ, nor the feet of the mammoth covered with flesh and hair, and furnished with the sole, have ever yet been examined, when collected together, by any writer.

The presence of the coccyx, which finishes the vertebral column, convinces me that the animal has had a very short and thick tail, like its feet: besides, its being every where covered with bristles induces me to think that they cannot be those of an ordinary elephant.

2. The teeth of the mammoth are harder, heavier, and

more twisted in a different direction than the teeth of an elephant. Ivory-turners, who have wrought upon these two substances, say that the mammoth's horn, by its colour and inferior density, differs considerably from ivory. I have seen some of them which formed in their curvature three fourths of a circle; and at Jakoutsk, another of the length of two toises and a half, and which were an archine thick near the root, and weighed seven pouds. It is to be remarked, that the point of the tusks on the exterior side is always more or less worn down: this enables the inhabitants of the Frozen Sea to distinguish the right from the left tusk.

The mammoth is covered with a very thick hair through the whole body, and has a long mane upon its neck. Even admitting that I doubted the stories of my travelling companions, it is nevertheless evident that the bristles of the length of an archine, which were also found upon the head, the ears, and the neck of the animal, must necessarily have belonged either to the mane or to the tail. Schoumachoff maintains that he never saw any trunk belonging to the animal, but it is probable that it was carried off by wild beasts; for it would be inconceivable that the mammoth could eat with so small a snout, and with such enormous tusks, if we do not allow it to have had a trunk. The mammoth, according to these indications, would consequently belong to the elephant species, and M. Blumenbach, in his system, actually calls it *Elephas primævus*.

To conclude:—The mammoth in my possession is quite different from that found near New York, which, from the description given in the Journal called the *Museum des Wundervollen*, had carnivorous teeth\*. M. Cuvier has proved in a most satisfactory manner, that the mammoth is a particular species of antediluvian animals.

Another question still remains to be decided. Has the mammoth originally inhabited the countries of the pole, or those of the tropics? The thick hair with which this animal is covered seems to indicate, that it belonged to the

\* See Philosophical Magazine, vol. xiv. p. 162. 228. 332.

northern regions ;—to this it does not seem reasonable to start objections, although several writers have done so : but what remains inexplicable is, to ascertain, How came the mammoth to be buried in the ice ? Perhaps the peninsula of Tumut has been slowly formed. In course of time a general inundation must have covered all the north part of the globe, and caused the death of this animal ; which, after having floated for some time among the masses of ice, was finally driven by a gust of wind upon the sand-bank not far from the shore. The sea, upon afterwards retiring within its limits, must have buried the body of the mammoth. But of what use are all these hypotheses, even if they had a high degree of probability ?—How can we reconcile facts which seem so contrary ? Two years ago similar relics were found in the environs of Kirengsk, upon the banks of the Lena, at a greater distance from the sea, and they had fallen into the bed of the river : others have been found in provinces further south from the Wolga ; and they have been discovered in Germany and in Spain. These are just so many incontestable proofs of a general deluge. We must believe that the country of the mammoth was of immense extent : but I shall not at present prosecute inquiries which might lead us into a labyrinth of hypotheses : I shall merely add, that it appears incontestable to me that there has existed a world of a very antient date ; and Cuvier, without intending it, gives evident proofs of this in his system, by the twenty-four species of animals, the races of which are extinct. In the mean time I beg the indulgence of the curious reader in the perusal of this essay. I purpose giving the osteology of the mammoth with all that precision which Camper has devoted to a similar work.

MICHAEL ADAMS\*.

Petersburgh,  
Aug. 20, 1807.

\* The author of the above essay offers his skeleton for sale, and means to employ the money it shall produce to him, in a journey towards the north pole, and particularly in visiting the island of Ljachow, or Sichow, which, from information received in his late journey, he believes to be a part of the continent of North America.