

wrong in asserting that an especial form is necessary for every zone, and that one form would not be sufficient for both places; or may it not have been that the great auk, with a form according to every naturalist of the purest arctic, flourished better in these warm seas, with this form, and owes his extinction to being pushed to where it was not adapted for existence.

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ON A CUB FOUND IN A BEAR'S DEN, JAN. 12, 1880.—BY DR.  
J. BERNARD GILPIN.

ON the 12th January, 1880, Stephen Bradford, an Indian, hunting moose in the County of Digby, Nova Scotia, discovered a bear's den,—seeing the dark skin of the bear beneath the roots of an overturned tree, covered by its mantle of snow. His gun being foul, he exploded many caps, and succeeded in arousing the bear from her hibernation. Before he could discharge the gun, she left her den, and he then tracked her through the forest in the snow for a mile and a half, when she denned again. He returned to camp, cleaned his gun, and returning shot her, for she proved a she bear, in her temporary den. Missing his coat, he returned to the first den, where he recollected throwing it off, and there found a cub dead and frozen. This cub he took to my son, who was in camp at the time, and who sent it to me. Its weight was eleven ounces. It measured, when stretched out, from tip of nose to end of hind toe, between ten and eleven inches. It was covered by very fine close hair, black upon the back and head but bluish slate towards the belly and inside of limbs. The ears were naked; the eyes closed; the tongue exposed, and the jaws slightly open. There were no teeth, but the claws were much developed, and the tail long. From the umbilicus being entirely healed, and no cicatrix upon it, I judged it to be about ten days old. After a careful and measured life-size sketch, it was placed in alcohol. Though we gain nothing new by the possession of this most rare specimen, yet we verify personal observation, and by date, statements which have come down to us since the days of Pallas, and repeated by Richardson, Godman, and Audubon. Allowing the

cub to have been ten or twelve days old when taken, from reasons I have before stated, it puts its birth about the first of January. Our snows rarely fall to any depth before the middle of November, and our bears usually seek their dens about that period for hibernation. The male bear is easily satisfied; behind the root of an upturned tree, a mass of tangled wood, or a hollow cliff in a rock serves him, and the snows soon cover him in his rugged sleep. Not so the female, if parturient. She selects the most obscure and hidden places, lining them oftentimes with layers of spruce fir branches. It is an unquestioned maxim with Indians, that no one has ever taken a she bear with young. This is both owing to the obscurity of her hiding place, and the asserted fact that if disturbed she will always abort. My son in hunting some years ago, came upon many spruce firs with their lower branches torn off and strewed about the snow. His Indian told him it was the work of a she bear lining her den. Hard by they found a crevice in a ridge of rock, which, after ascertaining it had no occupant, he entered, crawling upon hands and feet, with his Indian holding his leg. The interior was a comfortable apartment in which he could sit upright, floored by spruce boughs, and which no tired hunter would refuse as a resting place. But it is not usual to find so comfortable quarters as these. Richardson quoting from Pennant, and Godwin, both attest to the truth of our Indians' assertions regarding the deep privacy of the female in denning. The former saying, in very severe winters many bears migrate south, but no females found amongst them; and the latter asserting that out of many hundreds of males only two females were found, and those not with young. The hard and early winter had prevented the males from obtaining that condition of fat necessary for hibernation and therefore they became what our Indians call wandering bears, never denning. Instinct compelling the female to do so, as well as her being always in the proper condition, when the male is wasted by the September rut. A party with whom I was hunting in 1841, met and killed one of these wandering bears on the first of March. Our Indians also corroborate the assertions of the older naturalists, that though the bear comes

out of winter quarters very fat, it all wastes in a few days. As to the degree of hibernation attained to, Stephen Bradford's narrative is verified by other Indians, and by observation of tame bears. In captivity, especially if well fed and housed, some never hibernate, but sleep much more during the winter. Others you may force into hibernation by want of food, and confining them in a dark cellar. They have been noticed in coming out of their houses into an atmosphere nearly at zero, to be covered by a thick mist of condensed invisible sweat; this is the vapour hanging over their dens in the forest, and conducting the Indian to them. They are never entirely unconscious, being poked by a stick they will growl but relapse immediately again, and it requires much poking to arouse them, as Stephen Bradford's bad powder and dirty gun did in his narrative. Having thus, as one may say, re-verified by personal observation and modern research, what are the recorded facts of the older naturalists as well as the traditions of our Indians, who have never read a book or heard of a naturalist, we may pass to those considerations which the finding of this most rare specimen has drawn our attention to, as regards its condition both within the womb and its nutrition after birth.

That so highly organized an animal as a bear should be able to retain not only his vitality but his animal heat, and his muscular strength for the space of four months, without any food whatever, is sufficiently wonderful, knowing as we do, that in this time, if there be no supply there is no waste, save perhaps of animal heat. But when we consider the female, we find there is waste and no supply. The material for a second life, and its growth, must be taken from an accumulated fund. Taking the middle of September as the time of conception of the individual before us, and allowing she went into winter quarters about the middle of November, she then carried within her a foetus of two months old. This foetus she sustained, and eliminated substance for its growth for six weeks, with no exterior resources, and in a profound torpor. This torpor spreads over all organs of the body, save those of the womb. About the 1st of January, as most certainly is proved by the conditions of

the cub, it must have been born. An atmosphere, saved only by the animal heat of the mother from that without the den, often approaching zero, and a torpid mother, awaits this blind born, feeble offspring. As no personal observation can ever assist us, we may only conjecture that some instinct leads it to the mamma where, like certain marsupials, it retains a firm hold upon the nipple; and now a change comes over the still torpid parent,—the blood that thus far carried nutrition to the foetus must, as it were, change its base,—the circulation of the uterus shrinks and becomes obliterated, whilst that of the mamma must correspondently increase and allow the lacteal glands to secrete milk. And all this performed with no assistance without, but from sources accumulated nearly two months ago. To suppose the parent is roused during parturition scarcely accords with the analogy to the facts which we do know, that is, her torpor during lactation. Besides, modern science has caused, by the use of *anæsthetics*, the whole phenomena of birth to be performed without the knowledge of the parent; and, moreover, the care during lactation, which we know is performed during torpor, is more wonderful. The most wonderful fact is, that no food is taken by the parent during both operations. Dating the birth at the first of January, three and a half long dark months must this torpid mother secrete milk before she emerge into light or procure food for herself. The appearance of the cub at ten days old, its leanness, its weight (eleven ounces), the parent sometimes weighing five hundred pounds, attests that the amount of uterine nourishment it had then received was of the smallest quantity. It was scarcely the size of a pup, one say of six or seven the litter of a bitch weighing thirty or forty pounds. That after birth it receives but little food, and passes the most of its life in semi-torpor, and scarcely grows until the parent emerges, we can only prove by their extreme smallness when found in early Spring. Unfortunately I have no dates to those I have seen at that age, or to a pair of young Polar bears I once saw, in whose instance the retreat must have been doubled in length and severity by the Arctic latitude and ice formed den. We may here remark, that in our bear hibernation destroyed all maternal instinct;

she fled from her cub; it seems probable no maternal duties had bound it to her. Had Stephen Bradford, with his dirty gun, met her in May, he would have been only too happy to have escaped with his life instead of going to camp with her skin.

In its production of young so comparatively small, and in its privacy during parturition, our bear has an affinity to the opossum, our sole North American marsupial, but without the pouch; and from these facts, as well as its hibernation, and its capacity of sustaining life either as a vegetarian or a carnivora, may justly be considered in its Polar or fishing variety one of the first mammals that occupied this continent on rising from its glacial submergence. The Polar variety, but few shades above the walrus, might easily have sustained life for the few short summer months on fish and seals, ere yet the emergence of rock peaks, or swampy terraces; and when a tardy vegetation was clothing these plateaux, and before the herbiferous races appeared, his descendants straying landward thrived upon this vegetable diet, till these races appearing after their natural food had grown for them, allowed him again to become a carnivora. In this struggle of fish, vegetable and flesh life, his prolonged torpidity, perhaps at first much more prolonged in arctic regions, and destined as he advanced to warmer climates to cease, must have been of wonderful use in his struggle for existence.—*Communicated by the Author, Jan. 26, 1880.*

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ART. V.—NOTES ON THE ANATOMY OF A SEAL FROM MAGDALEN ISLANDS.—BY J. SOMMERS, M. D.

(Read Feb. 9, 1880.)

IN bringing to your notice the following points on the anatomy of a seal, I take occasion to express my sincere thanks to the gentleman through whose kindness I have become indebted for the opportunity to conduct an interesting investigation.

The Seal was sent from Magdalen Islands by J. B. F. Painchaud, Esq., to Robt. Morrow, Esq., who conjointly with myself made the dissection. I wish also in this place, and feel that I carry the members of the Institute with me, to express the feelings of regard that I entertain for the spirit which actuated our