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ERRATA.

Page 6, line 16, for **Ursus americanus kenaiensis** read **Ursus americanus perniger**; see explanation, page 115.

“ 13, “ 5, for **Muntiacus** read **Tragulus**.

“ 13, “ 20, for **Muntiacus** read **Tragulus**.

“ 15, “ 28, for **Arctitis** read **Arctictis**.

“ 16, “ 28, for **Arctitis** read **Arctictis**.

“ 80, Fig. 1, for **Metanopedius** read **Metanopedias**.

“ 94, line 39, for **angulatus** read **angulatus**.

“ 110, “ 10, for **olivaceus** read **olivacea**.

“ 112, “ 9, for “without definite locality, the label having been detached in shipment” read “Vijagua, March, 1909, according to Mr. Richardson’s letter of May 4, 1910.”

“ 178, Fig. 8, for **willoughbyi** read **willoughbyi**.

Plate X, for **nigrum** read **niger**.

**Addendum to Article XX, Volume XXVIII, pp. 197-234, on
‘A Comparison of the Permian Reptiles of North America with those of
South Africa,’ by R. Broom, M. D.**

Note.— 24 June, 1910. Hitherto the only evidence we have had of the digital formula of Therocephalians has been that obtained from the manus of *Theriodesmus phylarchus* Seeley and here there has been some uncertainty as to the number of phalanges. Within the last few days I have received from the Rev. Mr. Whaits the very fragmentary remains of two small skeletons which are almost certainly Therocephalian. Although most of the toe bones are detached, one toe, manifestly a 4th, has the bones in position. When the *Theriodesmus* foot is viewed in the light of the new finds it becomes manifest that the formula is 2, 3, 4, 5, 3, the 2nd phalanx of the 3rd digit and the 2nd and 3rd of the 4th being extremely short. In the Dromosauria, Anomodontia and Cynodontia, the formula is 2, 3, 3, 3, 3. If the Dinocephalia have the same formula as the Therocephalia the difference between them and the Pelycosaurs is probably not much greater than between a tapir and a cat — a matter of tooth, skull and limb specialization.

R. BROOM.

BULLETIN
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Article I.—THE BLACK BEAR OF LABRADOR.

BY J. A. ALLEN.

In 1898 Mr. Outram Bangs¹ described the Black Bear of Labrador as *Ursus americanus sornborgeri*, on the basis of three young adult skulls, apparently all females. The type (No. 7411, coll. E. A. and O. Bangs) was from Okak, the others one each from Hopedale and "Maine" (=Nain). "External characters unknown."

My attention was recently strongly drawn to this alleged form of *Ursus* from Labrador by a skull of a bear killed near Nain by Mr. L. S. Quackenbush, August 8, 1905, and kindly loaned to the American Museum for examination. In a letter Mr. Quackenbush states: "The bear was a male and measured only 49 inches in a straight line from nose to tail; the hind foot from heel to end of longest toe (without claw) was 8 inches long. The fur was black on all parts of the body excepting a small patch of ashy gray over the maxillary region on each side of the snout."

The small size of this skull, and especially the small size of the teeth, coupled with the fact that it was stated to be a *male*, and obviously old, seemed to indicate that *Ursus americanus sornborgeri* was a bear of small size and weak dentition. On applying to Mr. Bangs for the loan of his original material — three skulls — of this subspecies he not only kindly sent me these but also 15 other skulls collected at different points by Mr. Sornborger during the years 1898 and 1900. To my amazement, this series included skulls equalling in size any in a large series from other localities within the United States, and with teeth of the usual size. Indeed, male skulls of Black Bears from Arizona, Oregon, and other parts of the United States, were indistinguishable in any feature from some of the large Labrador skulls.

¹ American Nat., XXXII, July, 1898, pp. 500, 501.

Measurements of 19 Skulls of Ursus americanus from Labrador.

Locality.	Hope- dale B.	Kippo- kak B.	Okak.	Hope- dale.	Adla- tok B.	Stag Bay	Hope- dale.	Jessu- jaluk.	Hope- dale.	Near Nain.	Adla- tok B.	Kippo- kak B.	Adla- tok B.	Nain.	Nain.	Mako- vick B.	Okak.	Rama.
Number.	7364 M.C.Z.	7365 M.C.Z.	7411 M.C.Z. Type.	7363 M.C.Z.	7354 M.C.Z.	7361 M.C.Z.	7362 M.C.Z.	7359 M.C.Z.	7412 M.C.Z.	274Q	7353 M.C.Z.	7360 M.C.Z.	7357 M.C.Z.	7358 M.C.Z.	7356 M.C.Z.	7366 M.C.Z.	7352 M.C.Z.	7355 M.C.Z.
Sex and age.	Yg. ad. ♂ ?	Yg. ad. ♂ ?	Yg. ad. ♂ ?	Yg. ad. ♂ ?	Yg. ad. ♂ ?	Yg. ad. ♂ ?	Adult ♂ ?	Adult ♀ ?	Adult. ♀ ?	Adult. ♂	Adult. ♀ ?	Old ♀ ?	Adult. ♂	Yg. ad. ♂ ?	Adult. ♂	Adult. ♂ ?	Adult. ♂ ?	Juv. ♂
Total length	212	215	220	224	229	233	238	240	242	242	247	252	265	270	273	275	280	240
Condylabasal length	208	210	221	215	219	222	232	232	232	235	242	233	254	255	260	263	274	237
Palatal length	108	118	115	114	—	116	121	120	—	121	123	119	—	130	133	137	135	120
Zygomatic breadth	105	121	130	127	133	132	143	144	149	146	150	162	142	162	173	159	160	133
Interorbital breadth	47	49	51	48	52	50	61	53	55	59	57.5	65	59.3	62	67	67	66.5	53
Across postorb. proc.	64	68.5	71	63	—	71	80	76	73	81	79	86	79	92	90	89	91	73.2
Mastoid breadth	85	91	100	91	100	97	104	103	106	101	114	114	112	121	123	116	122	100
Palatal breadth at m¹	30	28.5	33	34	31.5	33	38	40	38	37	37	41	37	40	42	41	41.3	88
Length upper tooththrow	83	76	90	89	85	86	92	86	87	86	94	88	99	94	91	100	102	—
Length p¹-m²	53.5	47	54	55	49	48	56	52	50	48.3	56	49	53	53.5	53	55	53	—
Length p¹-m¹	29	25.5	29	30	27	29	31	27	26.5	26	29	26	29	28	27	27	29	37
Length m¹	17	17	17	18	16	16.8	18.5	16	15.2	17	17.5	15	17	17	16.3	18	17.2	21.5
Breadth m¹	12	12	13	14	12	11	13.2	12.5	11.2	11.2	13	12.2	14	13	12.3	13	13	16.3
Breadth m²	24.5	22	25	26	23	24	27	26	25	24	27.	23.5	26	25.5	26.2	27	25	—
Breadth m²	15	13.5	14	15	14.3	13.5	15	14	14	14	15	13.6	15.6	14	15	15	15.5	—
Length of lower jaw	148	148	160	156	157	162	168	166	166	160	175	169	187	178	185	185	191	168
Angle to coronoid	54	61	65	62	63	63	71	69	70	73	66	70	77	79.5	85	86	76	65
Length lower tooththrow	94	90	100	100	96	97	105	101	100	97	105	100	113	108	106	114	115	—
P¹ to m³	59.5	56.5	59	64	55	55	64	61	56.5	53	62	57	63	60	60	62	62.5	—
Length of m²	19	16.5	19	19	17.4	17	20	18.5	17	17	19	17	19.2	19.2	19.2	19	20.5	21.5
Greatest breadth of m²	10.4	10	11	11	10.5	11	12.5	10.5	10	11	12	10.5	12	12	11.5	11	11.5	13
Nasals, gr. length	49	54	52	55	60	59	56	55.5	60	61	58	58	66	63	59	66	72	66.5
Breadth distally	22	18	20	22	24	24	24.8	23	22	21.5	24.3	26	25	25	25	27	28	26
" at prem. sut.	16	16	15.5	18	17.3	16	21	18.5	17.4	20	19	21	22	15	21.5	24	24	19

Unfortunately the sex is indicated for very few of the skulls available in this connection for examination, and in the subjoined table of measurements the Labrador specimens are arranged in the order of size, from left to right, and the sex is provisionally indicated on the basis of size and general appearance of the skull. The total length is the basis of the arrangement, with the exception of a single young skull, obviously male, which is placed at the extreme right of the old males. This skull retains the milk canines and the outer milk incisors, and the last molar, both above and below, had not cut the gum; yet p^4 and m^1 , and p_4-m_2 , are a little above the maximum size for the rest of the series of skulls.

Beginning at the left of the table the first nine skulls are almost unquestionably female; the first is the youngest, but has all of the teeth fully developed, and was undoubtedly sexually mature. The next five, although older as well as larger, are still young adults, while the five following are middle-aged adults. Although one of them (No. 2742 in the table) is sexed by a trustworthy collector as male, in general size and in the size of the teeth it is indistinguishable from the others provisionally indicated as female. (It is much older than the next one in the series (No. 7353), but is smaller and has much smaller teeth.) The next three are middle-aged adults, which grade in size up to No. 7352, a young adult skull, presumably male; and this falls little below the size of the next four, which steadily increase in size to the maximum, although only No. 7360 is really an *old* skull, as shown by the obliteration of sutures and the greatly worn teeth; it is absolutely indeterminate as to sex. It is small for a male, but very large for a female.

In most species of *Ursus* the male is supposed to average much larger than the female, with a much broader rostrum and larger teeth, especially the canines, and it is generally considered safe to distinguish the sexes* in the case of skulls unmarked for sex, on this basis. In this series of bear skulls from Labrador, however, I find it quite impossible satisfactorily to discriminate between males and females. Referring again to the table of measurements, and beginning at the left, the second skull (No. 7365) is considerably older than the first (No. 7364), and is also larger in general dimensions, but its tooththrow is shorter and the individual teeth are much smaller than in the first, in which the teeth are approximately of the size of those of the average for the series. The largest teeth are not restricted to the largest skulls.

Much of the differentiation shown in the size of the skull in this series is obviously due to age, but much also to individual variation, and a large but unknown amount to sex. Individual variation is especially manifest in the size and form of m^2 , which varies greatly in skulls otherwise similar in general size and form. This tooth varies in length, in specimens that seem un-

Measurements of Skulls of Ursus americanus and U. a. kenaiensis.

Locality	Near Homer, Kenai Pen., Alaska.																
	1997	1998	Mogollon Mts., Ariz.	?	48	?	47	?	49	?	Duluth, Minn.	16708	17790	17792	16706	16705	17791
Number																	
Sex	Old ♂	Old ♂	Ad. ♂	Ad. ♂	Ad. ♂	Old ♂	Old ♂	Old ♂	Old ♂	Ad. ♂	Old ♂	Ad. ♀	Ad. ♂	♂ yg.	Ad. ♀	Ad. ♂	Ad. ♂
Total length	304	298	277	278	277		304	264	285	285	296	250	253	255	274	277	292
Condylolbasal length	287	280	265	265	260		289	255	260	268	275	—	240	246	262	260	267
Palatal length	141	141	140	132	133		153	130	136	135	143	129	126	126	133	133	140
Zygomatic breadth	170	185	150	145	153		186	155	182	176	176	145	141	151.5	145	154	174
Interorbital breadth	71.5	81.5	58	64	59		77	64	65	72	67	51	57	56	61	63	71
Breadth at postorb. proc.	103	109	81	84	89		109	84	92	97	96	73	80	85	80	87	101
Mastoid breadth	140	143	120	107	123		140	121	133	128	130	108	115	113.5	115	117	135
Palatal breadth at m ¹	42	42	36.5	39	42		46	42	45	43	42	38	38	39	38	40	39.5
Length of upper toothrow	99	104	97	96	97		109	96	97	99	—	91	92.5	94	96	99	98
Length of p ⁴ -m ²	55	58	54	52.5	58		54	55.2	54	53.5	56	49	53.5	52	52	51	52.5
" " p ⁴ -m ¹	30	30	29.5	28	30		28.5	28	28	29	31	26	30	29	28.5	28.5	28
" " m ¹	17	19	17.5	17	18.5		17	17.3	17.5	17	13	16	17.5	17	17.2	17	16
Breadth of m ¹	13	15	13	13	13.7		14.5	13.5	12	13.5	13	12.5	13.2	14	14	14	13.3
Length of m ¹	26.5	27.5	24	25	28		25	27	27	25.5	27	24	24.5	23.5	24.5	24.1	26.5
Breadth of m ²	14.5	15	15	14	15		15	15	14	15	15.5	14	15.5	15	14.7	12.2	15
Nasals, gr. length	73	76	69	65.5	63		73	62	68	70	80	57	67	68	75	68	70
Breadth distally	34.5	36	27	31	23		37	23.5	—	29	29	24.3	23	25	25	24	32
" " at prem. sut.	21	26	21	26	22		27	22	20.5	24	28	16	21	21	19	20	22

questionably of the same sex, from 22 to 27 mm., or about 20% of the mean. While these variations are evident from the table of measurements, they are far more impressive when the actual teeth are compared, since the shape of the tooth varies as much as the size, especially in the development of the 'heel' portion. This is usually about one-third the length of the tooth, but may be only one-fourth as long. The relation of width to length is also markedly variable.

Three skulls obtained at Rupert House, James Bay, by Mr. Alanson Skinner, in 1908, now in the Department of Anthropology of the American Museum, are of medium size for mature adults, and in general size and in the size and character of the teeth and other parts of the skull are not distinguishable from skulls of corresponding age from the Labrador coast region. They were obtained from the Indians and are without further data.

Variations due to age are an increased widening of the zygomatic arches, and their heavier ossification and squarer posterior angle; the broadening of the rostral and interorbital regions, and the increased mastoid breadth, through the development of the mastoid processes and adjoining parts; and usually the marked building up of the frontal region at and just behind the proximal part of the nasals.

Marked individual variation is shown, as would be expected, in the size and form of the nasals, independently of the general form of the skull. In the table three measurements are given of the nasals — total length, breadth at the front border, and width at the proximal end of the premaxillaries. In most specimens the nasals taper gradually posteriorly from the anterior border and abruptly end in a rounded border; in some instances the posterior border is square, or abruptly truncate or even slightly emarginate on the median line; in rarer instances they terminate in a long V-shaped point.

The material available from other localities, while limited and unsatisfactory, shows that Black Bear skulls from the Mogollon Mountains, Arizona, Fort Klamath, Oregon, Duluth, Minnesota, and from the eastern United States,¹ are in no feature distinctively different from skulls of corresponding age from Labrador. It thus appears that if *U. a. sornborgeri* is to be distinguished as a local race, it must be recognized on the basis of other characters than those afforded by the skull. Such characters are thus far unknown.²

¹ Three specimens in the Hays collection, without definite locality, are presumably from the Adirondacks, New York.

² Since this article was put in type I have received a letter from Mr. Bangs in which he states that he has reached the same conclusions as those recorded above respecting the invalidity of *Ursus americanus sornborgeri*, and the impossibility of distinguishing the sex of the Labrador bear skulls here under review. He also refers to his 'List of the Mammals of Labrador' in Dr. Grenfell's 'Labrador, the Country and the People' (just published), where (p. 467) he synonymizes *Ursus americanus sornborgeri* with *U. americanus*.

A series of six adult skulls (4 males and 2 females) from the Kenai Peninsula, Alaska, differ slightly from those from Labrador (a series of 24) and elsewhere, in the breadth of the skull being much less in proportion to its length, and hence through the long, narrow form of the skull, in comparison with skulls of *U. americanus* from numerous other localities. This is especially evident in the orbital and rostral portions of the skull, including the palatal breadth. The length of the toothrow is also less and the teeth appreciably smaller. These differences range from 8 to 10 per cent, and are reasonably constant, when the normally wide range of individual variation in cranial characters is considered. In addition to this, the pelage of the Kenai Peninsula Black Bears is intensely black, the blackness usually extending to the base of the pelage, in contrast with the lighter color of the dark phase of the Black Bear from other localities and the proximally more restricted extent of the black in the under fur. From present indications the Kenai Black Bear seems entitled to recognition as a subspecies, and may be called ***Ursus americanus kenaiensis***, with No. 17790, ♂ ad., from Homer, Kenai Peninsula, Alaska, as type.

The following table gives measurements of 6 skulls from the Kenai Peninsula in comparison with 10 from other parts of the United States.