

A NEW SPECIES OF EXTINCT TURTLE FROM THE UPPER PLIOCENE OF IDAHO

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Among the fossils obtained by the Smithsonian expedition of 1930 under the direction of the late Dr. J. W. Gidley, exploring in the vicinity of Hagerman, Twin Falls County, Idaho, were two unusually well-preserved emydid turtles. One of these is of more than common interest in having the complete skull, lower jaws, hyoid arch, and much of the appendicular skeleton present. So complete a specimen is a rare occurrence among the extinct *Chelonia*, and an opportunity is presented for comparison with living forms that is seldom offered by fossil remains of these animals.

Except for a slight difference in size the two specimens are structurally in close accord, both pertaining to a new species for which the name *idahoensis* is proposed. They are provisionally referred to the genus *Pseudemys*.

PSEUDEMYS IDAHOENSIS, new species

Type.—U.S.N.M. No. 12059 consists of the nearly complete carapace and plastron; skull, lower jaws, hyoid arch, pectoral and pelvic girdles, 11 caudal vertebrae, incomplete humerus, femora and tibia, and much of an articulated hind foot. Collected by S. R. Wells, 1930.

Paratype.—U.S.N.M. No. 12060 consists of a nearly complete carapace and plastron. Collected by S. R. Wells, May 28, 1930.

Locality.—*Plesippus* Quarry, NW. $\frac{1}{4}$ sec. 16, T. 75, R. 13 E., near Hagerman, Idaho.

Horizon.—Hagerman lake beds, Upper Pliocene.

Description.—Both the type and paratype have suffered somewhat from post-mortem crushing, but otherwise they are in a nearly perfect state of preservation. There is a slight difference in size, and the carapace of the paratype is more distinctly sculptured than that of the type; otherwise the two are in perfect accord.

In outline the carapace (fig. 1) is elongate, broadly truncate in front, with a pointed posterior extremity. As a whole the shell appears to have been moderately elevated.¹

¹ In the descriptive matter to follow, two measurements are given, the first in each instance being of the type, the second, in parentheses, of the paratype.

The greatest length of the carapace is 318 mm (284 mm); the greatest width 220 mm (207 mm). The anterior margin is shallowly excavated at the center, the posterior margin strongly scalloped. The pygal region presents an exaggerated peculiarity of structure where it forms an inverted U-shaped notch covering the tail. This peculiarity causes a prominent posterior projection in the pygal region that is clearly discernible in the illustrations. (Pls. 1, 2.) Certain species of the extant *Graptemys* show a somewhat similar elevation of the pygal, but in none of the available specimens does it reach the extreme development of the fossil.

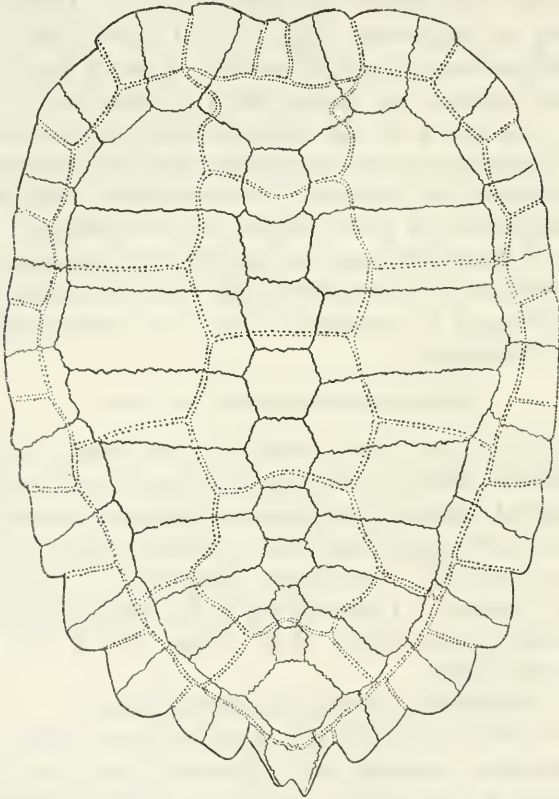


FIGURE 1.—Carapace of *Pseudemys idahoensis*, U.S.N.M. No. 12059
Type. One-third natural size.

The surface of the type carapace is undulating but without sculpture, except for faint growth ridgings across the outer ends of the costals. The paratype, however, shows additional sculpturing in the form of faint parallel grooves and ridges that cross the posterior half of the costals at right angles to their sutural borders. Likewise the peripheral surfaces are faintly sculptured. The plastral surfaces are devoid of ornamentation.

The nuchal bone has a length of 56 mm (52 mm), a width of 28 mm (33 mm) in front, and an extreme width of 62.5 mm (52 mm). The free border is acutely edged. The neurals are broad, hexagonal, with the widest end forward. Their dimensions are given in Table 1. The form of both the neurals and vertebrae is clearly shown in the figures.

The total length of the plastron (fig. 2) is 296 mm (274 mm), but on the midline from the front to the apex of the posterior notch it is 279 mm (255 mm). The plastron is shallowly concave in front and deeply notched behind. In proportions and general contour it has

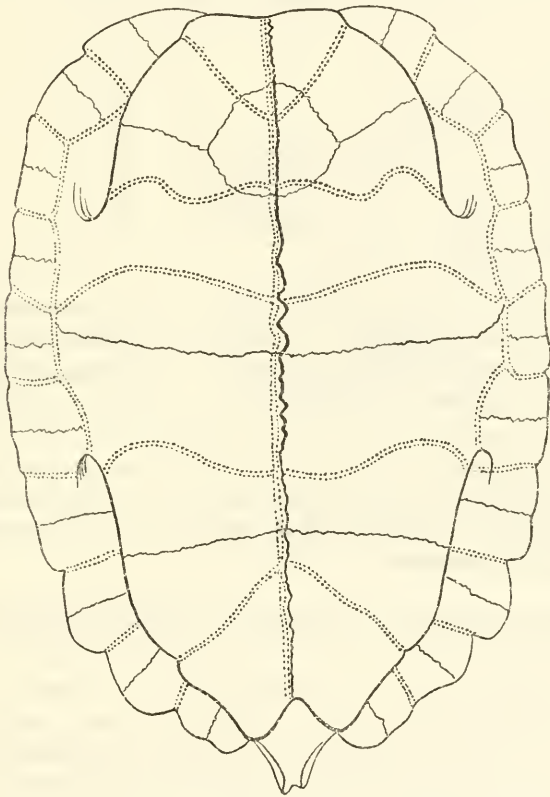


FIGURE 2.—Plastron of *Pseudemys idahoensis*, U.S.N.M. No. 12059
Type. One-third natural size.

a striking resemblance to the plastron of *Graptemys inornata* Loomis.² The anterior lobe has a total length of 86 mm (77 mm) and a width of 130 mm (122 mm). The anterior lip projects slightly beyond the general contour of the lobe and has a width of 65 mm (62 mm). Above it is shallowly spout-shaped.

² Loomis, F. B., Amer. Journ. Sci., ser. 4, vol. 18, p. 429, figs. 10, 11, 1904.

The entoplastron is 46 mm (37 mm) long and 53 mm (45 mm) wide. It is crossed posteriorly by the humero-pectoral sulcus.

The posterior lobe has a greatest width of 134 mm (129 mm) and a length of 100 mm (100 mm). Toward the posterior extremity the lobe narrows rapidly, terminating in a deeply notched end. The edges of the posterior lobe are everywhere sharply edged.

TABLE 1.—*Dimensions of neurals of Pseudemys idahoensis*

No.	Length		Width	
	Type	Paratype	Type	Paratype
	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>
1	31.5	28	26.5	23
2	28	23.5	30	23
3	30	-----	34.5	28.5
4	25	24	31	25
5	26	24	30	24
6	21.5	19	28	23
7	18	18	21	22
8	17	14	14	13

The bridge is 115 mm (95 mm) wide. The gulars extend along the midline for 43 mm (40 mm) and strongly overlap the entoplastron. The humerals meet on the midline for 27 mm (23 mm), the pectorals 46 mm (39 mm), the abdominals 66 mm (66 mm), the femorals 40 mm (34 mm), and the anals 56 mm (50 mm).

A third specimen, U.S.N.M. No. 12232, consisting of the posterior lobe of the plastron, was collected from this same fossil deposit by N. H. Boss in 1931. Except for its smaller size it is in perfect accord with the type specimens.

TABLE 2.—*Dimensions of vertebral scutes of Pseudemys idahoensis*

No.	Length		Width in front		Greatest width	
	Type	Paratype	Type	Paratype	Type	Paratype
	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>	<i>Mm</i>
1	50	47	67	58.5	67	58.5
2	58	56	53	-----	73.5	-----
3	60	50	58	-----	73	-----
4	58	56	48	-----	71.5	-----
5	50	47.5	33.5	-----	69	-----

The sulci outlining the scutes of the carapace are shallow but plainly impressed. Those between the marginal and costal scutes run along on the peripheral bones a short distance below the costo-peripheral sutures except in front and back, where they deviate outward farther away from the sutures. Posteriorly the sulcus crosses the midline on the anterior end of the pygal, as in *Trachemys hilli*. The form of the scutes is plainly indicated in Figure 1.

Skull.—The skull and articulated lower jaws were found in the matrix within the carapace. (Figs. 3, 4.) They are uncrushed and in beautiful preservation. Seen from above, the outline of the skull expands from the squamosal processes forward to the front of the quadrates. From the posterior ends of the maxillae it converges to the snout, which is squarely truncate. The

interorbital space is moderately wide and flat; posteriorly the upper surface is dished. The length of the skull from the snout to the occipital condyle is 57 mm, to the tip of the crest 70 mm, the width over the auditory chambers 50 mm. The interorbital space is 14 mm wide, the zygomatic arch 11 mm. The orbits are subcircular in outline and look forward and

outward; the antero-posterior diameter is 14 mm, the vertical diameter 12 mm. The nasal opening is 9 mm wide, suboval in outline with the greatest diameter transverse. Choana between the eyes. Alveolar surfaces broad. Width of jaw at symphysis slightly less than horizontal diameter of the orbit.

Little is known of the skull in the extinct Emydidae. In a study of all North American materials of this family, Hay³ found only a single emydid skull, which he provisionally referred to *Echmatemys* sp. The present specimen therefore can not be contrasted with extinct members of this family.

In comparing the skull under consideration with available skulls of recent turtles in the National Museum collection, I find the closest

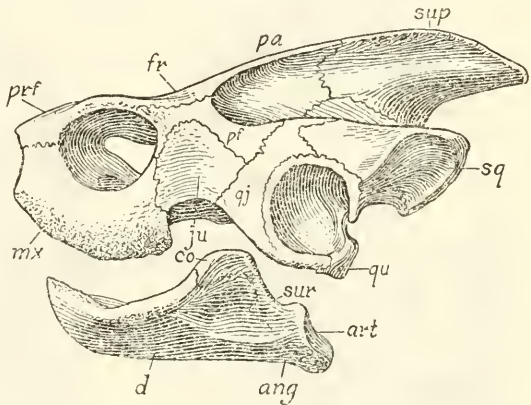


FIGURE 3.—Skull of *Pseudemys idahoensis*, U.S.N.M. No. 12059. Viewed from the left side. Type. *ang*, Angular; *art*, articular; *co*, coranoid process; *d*, dentary; *fr*, frontal; *ju*, jugal; *mx*, maxillary; *pa*, parietal; *pr*, postfrontal; *prf*, prefrontal; *qj*, quadratojugal; *qu*, quadrate; *sq*, squamosal; *sup*, supraoccipital; *sur*, surangular. Natural size

³ Hay, O. P., The fossil turtles of North America. Carnegie Inst. Washington Publ. 75, p. 297, pl. 45, figs. 11-13, 1908.

resemblances to be with the southern *Pseudemys rubriventris*. From this species, however, the fossil is at once distinguished by its larger size, broader pterygoids, less pronounced median alveolar ridge with finer denticulations, wider interorbital space, and squarely truncate nose. The lower jaws are similar in having the lower surface flattened and alveolar surfaces broad all around. The fossil mandible differs in the absence of a median longitudinal ridge and also in having the edge of the mandible nonserrated. Although in U.S.N.M. No. 12059 the beak is notched medially, there is no evidence of cusps on either side, as in *P. rubriventris* or *P. mobiliensis*.

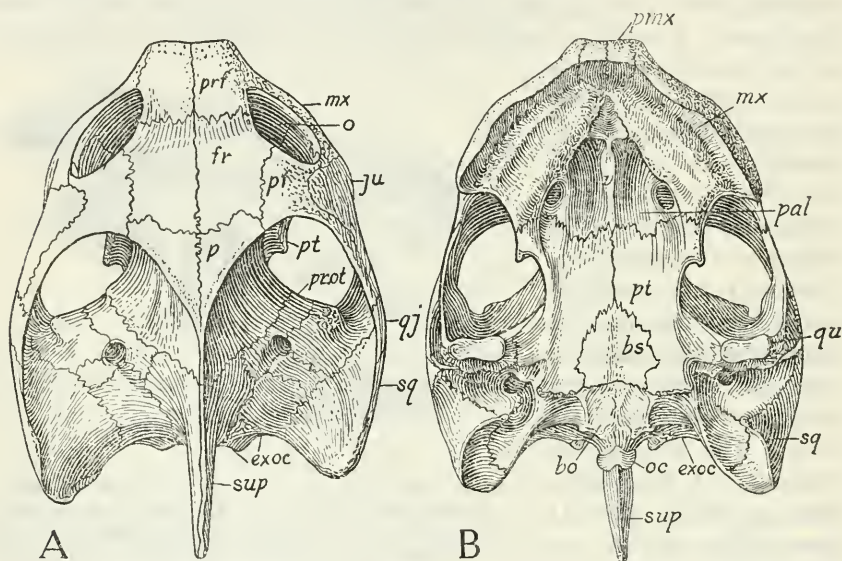


FIGURE 4.—Skull of *Pseudemys idahoensis*, U.S.N.M. No. 12059. Type. A, Superior view; B, inferior view. *bo*, Basiloccipital; *bs*, basisphenoid; *exoc*, exoccipital; *fr*, frontal; *ju*, jugal; *mx*, maxillary; *o*, orbit; *oc*, occipital condyle; *p*, parietal; *pal*, palatine; *pf*, postfrontal; *pmx*, premaxillary; *prf*, prefrontal; *pr. ot.*, pro-otic; *pt*, pterygoid; *qj*, quadratojugal; *qu*, quadrate; *sq*, squamosal; *sup*, supraoccipital; *r*, vomer. Natural size

The hyoid apparatus is well developed. It consists of a more or less oblong flattened basilingual plate, which probably represents the fused ventral ends of the hyoid and branchial arches. Anteriorly it is drawn out to a point behind which there is an ovate opening through the bone on the median line. The second branchial arch is much the larger of the two structures. (See fig. 5.) The posterior or second branchial arch consists of two shortened bars that articulate with the bilobed end of the basilingual plate. So far as I have been able to ascertain this is the first extinct turtle to have the complete hyoid apparatus preserved.

The pectoral and pelvic girdles remain articulated within the carapace, and for that reason they are not available for critical com-

parison. The limb and foot bones do not display any distinguishing characteristics except that they are more robust in their proportions than in extant species of *Pseudemys* of corresponding size. The unguals of the articulated hind foot are elongate, with sharp tips, indicating that the type specimen may be a male.

Remarks.—Although in skull structure the type has its closest resemblances with *P. rubriventris*, the palatal surfaces of the jaws are so unlike that when considered in conjunction with differences found in the shells the question of their generic identity is raised. The alveolar surface of the mandible is much more like that of *Graptemys pulchra*, but the pointed skull and lack of palatal ridges at once distinguish this form from the extinct species. I call attention to these differences in the palate for the reason that both paleontologists and herpetologists

have made much use of these characters in the classification of the turtles, but an examination of a considerable series of recent skulls shows that there is much variation in the palatal structure and that they can not therefore always be relied upon to furnish hard and fast diagnostic characters. The present species can hardly belong to *Graptemys* or *Trachemys* as defined by Hay, and for the present I shall refer it to the genus *Pseudemys*, although the specimen is not entirely in accord with that genus as we understand it to-day. If correct in this assignment it is the most ancient occurrence of *Pseudemys* yet recorded.

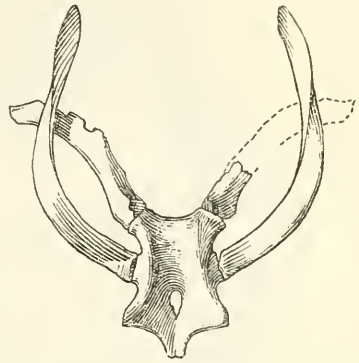
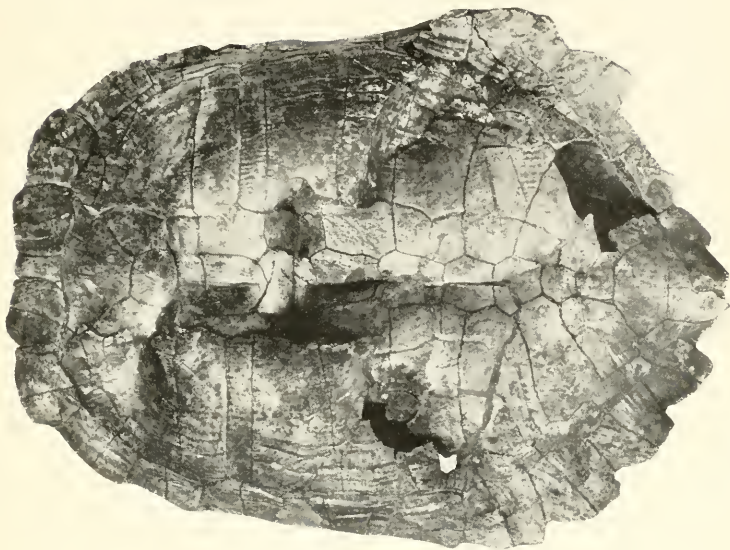


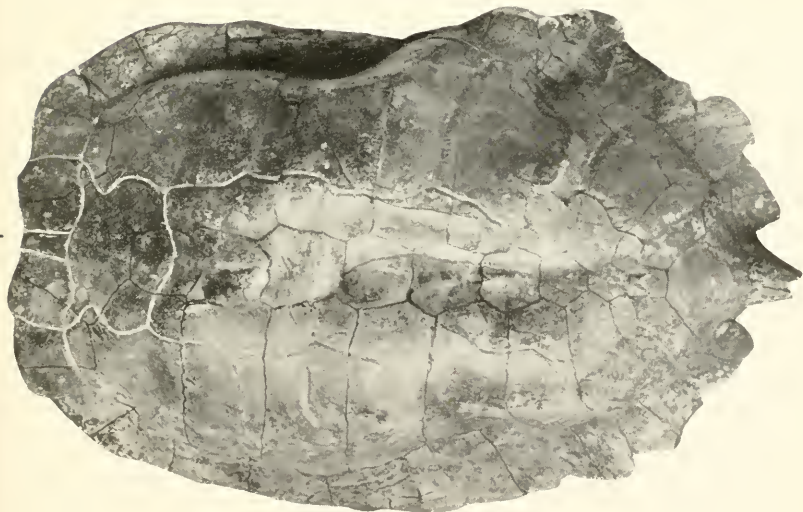
FIGURE 5.—Hyoid of *Pseudemys idahoensis*, U. S. N. M. No. 12059. Type. Superior view. Natural size

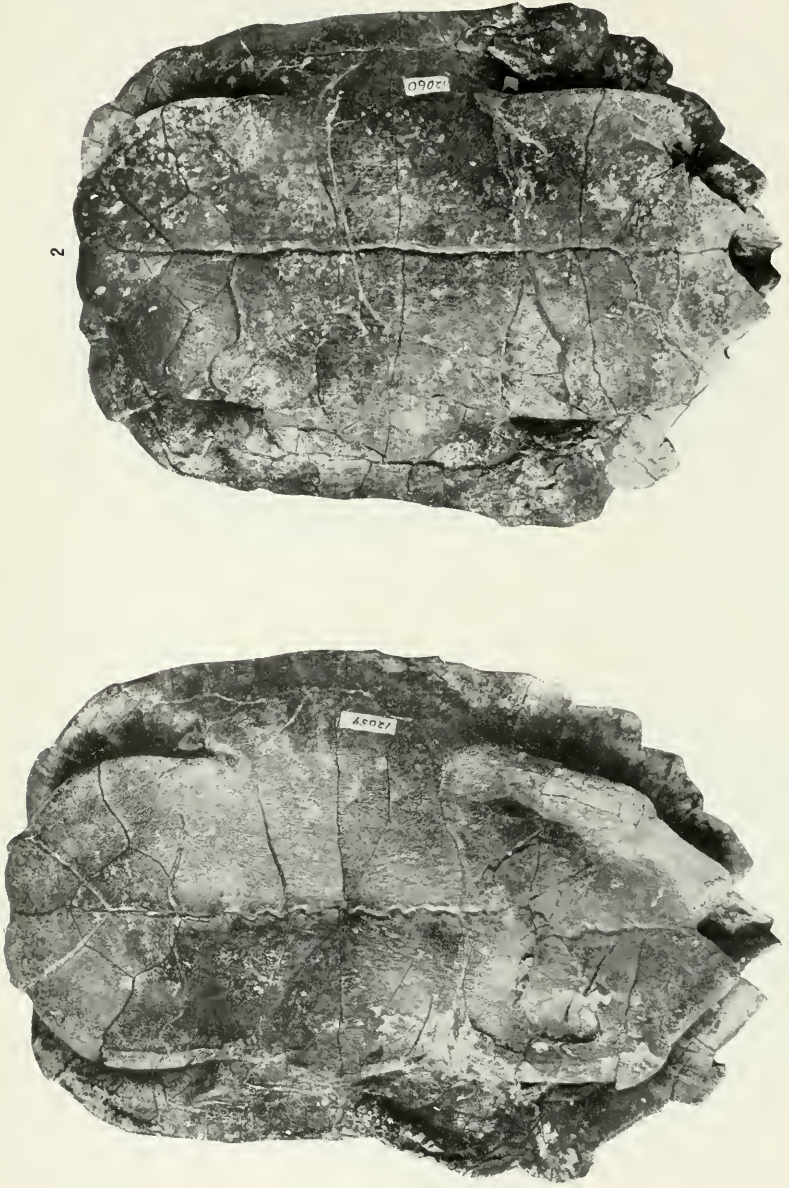
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PSEUDEMYYS IDAHOENSIS, NEW SPECIES

1, U.S.N.M. No. 12059. Type. Carapace viewed from above. 2, U.S.N.M. No. 12060. Paratype. Carapace viewed from above. Both about one-third natural size.





PSEUDEMYS IDAHOENSIS, NEW SPECIES
1, U.S.N.M. No. 12059. Type. Plastron viewed from below. 2, U.S.N.M. No. 12060. Paratype. Plastron viewed from below. Both about one-third natural size.



PSEUDEMYX IDAHOENSIS, NEW SPECIES

U.S.N.M. No. 12059. Type. Shell viewed from the left side. About one-half natural size.

