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NOTES ON SOME CHELONIANS OF CHINA
(中國陸棲爬類)

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(方柄文)

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NOTES ON SOME CHELONIANS OF CHINA

P. W. FANG*

Metropolitan Museum of Natural History
Academia Sinica

This paper gives an account of the descriptions of ten species of hard and one species of soft-shelled turtles of China. Of them Chinemys megalcephala is firstly described in science. Geoemyda spengleri sinensis Fan and Cyclemys flavomarginata sinensis Hsü are considered as the identical of their typical forms respectively. Geoemyda paracaretta Chang is synonymised with Geoemyda reevesii (Gray). The latter and Cyclemys nigricans (Gray) are generically changed under Chinemys.

Family TESTUDINIDAE

Subfamily EMYDINAE

OCADIA Gray


Neural plates hexagonal, short-sided in front. Plastron extensively united to the carapace by suture, with strong axillary and inguinal butresses, extending to halfway between the marginal and neural plates, the latter anchylosed between the fifth and sixth costal plates; entoplastron intersected by the humerovo-

*Research fellow of the China Foundation for the Promotion of Education and Culture.
pectoral suture. Skull with a bony temporal arch, the quadrato-jugal being in contact with the jugal and postorbital; alveolar surface broad, of upper jaw with a median ridge; choanae between the eyes. Upper surface of head covered with undivided skin. Digits entirely webbed. Tail moderate.

**Distribution**—South China and Formosa.

**Ocadia sinensis** (Gray)

(Fig. 1)


_Emys chinensis_ Gray, Suppl. Cat. Sh. Rept., i, p. 28 (emended name).

_Clemmys sinensis_, Strauch, Chelon. Stud., 1862, p. 32.

_Clemmys bennettii_, Strauch, l. c., and Verth. Schildkr., 1865, p. 72.


**Description of specimen**—A single specimen loaned from the University of Amoy, Fukien; collected from Fuchow, Fukien.

Snout conical, projecting, vertical profile oblique, straight; edges of jaws not denticulated, upper jaw without median or lateral hooks; with a distinct mesial notch; triturating surface of upper jaw with a longitudinal ridge near the inner edge; lower jaw hooked; mandibular symphysis less than length of
Fig. 1. Ocadia sinesis (Gray); A, one part of the newly molting carapace.

eye slit; skin on top of head entirely smooth. Body rather depressed, the depth being more than one-half the width of carapace; carapace tricarinate, a continuous, broad, prominent median one and two discontinuous, narrow, lateral ones; nuchal
broader than long; first vertebral pentagonal (somewhat squarish in Stejneger’s description, 1907), all vertebrae broader than long, broader than the adjacent costals (about as broad as the adjacent costals in Stejneger’s description, 1907); marginals slightly turned up, the posterior corner of each posterior marginal extending slightly beyond the one following; eighth and ninth marginals broadest. Plastron flat, nearly truncate anteriorly, emarginate behind, sharply bent at the bridge; length of hind lobe narrower than its width, subequal to width of bridge; abdominal seam the longest, longer than gular and humeral seams together, the latter being the shortest; pectoral seam slightly longer than femoral which is longer than gular; anal shorter than gular and longer than humeral seam; inguinal subequal to axillary. Toes webbed to base of claws. Tail long, tapering to a point, its length from vent nearly 3.5 in the length of carapace (a little more than one-half the length of carapace in Stejneger’s description, 1907).

Color in formalin, dorsal side of shell dusky umber, the keels somewhat yellowish or buff, each marginal with a dark edged pale spot, its free border with a yellowish margin; underside ochre yellow, each shield with a large dark buff blotch, each marginal and each shield of the bridge with a dark brown ocellus which is usually with small dots of the same color within it; head, neck, limbs and tail bluish olive or rather paler, with numerous fine, dark brown, longitudinal lines and reticulations, but the upper most part of top of head is not lined; jaws pale buff. In the newly molting part of the same specimen, the carapace nearly bluish olive, the keels whitish, narrowly edged with dark brown, each marginal also with an irregular pale area bordered with dark brown, its free border with an inner dark brown and an outer whitish margin; the shields usually densely dotted with dark brown.

**Dimensions**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest length of carapace</td>
<td>104 mm</td>
</tr>
<tr>
<td>Greatest width of carapace</td>
<td>73 &quot;</td>
</tr>
<tr>
<td>Greatest length of plastron</td>
<td>93 &quot;</td>
</tr>
<tr>
<td>Length of hind lobe of plastron</td>
<td>33 &quot;</td>
</tr>
<tr>
<td>Width of hind lobe of plastron</td>
<td>44 &quot;</td>
</tr>
</tbody>
</table>
Gular suture ..................................... 13 "
Humeral suture .................................. 6 "
Pectoral suture .................................. 21 "
Abdominal suture ................................ 22 "
Femoral suture .................................. 18 "
Anal suture ...................................... 11 "
Width of bridge .................................. 18 "
Depth of shell ................................... 41 "
Width of head ................................... 15 "
Length of tail from vent ........................ 29 "
Depth of shell in width of carapace .......... 1.74

Distribution—Formosa; China: Fukien; Canton and Hainan.

Remarks—The tail of this species is apparently shorter in the adult than in the young. Schmidt (1927), upon an examination of twenty four specimens, 58-217 mm. in the carapace length, found that the length of tail are varied from 33-72 mm., about 1.76-3.01 in the carapace length. The lateral keels usually disappear in the adults (Guenther, 1864, length of shell 10 inches; Bouleneger, 1889, length of shell 23 mm.).

CHIENOMYS M. Smith


Neural Plates hexagonal, short-sided in front. Plastron extensively united to the carapace by suture, with long axillary and inguinal peduncles; the latter ankylosed between the fifth and sixth, exceptionally fourth and fifth costal plates; entoplastron intersected by the humero-pectoral suture. Skull with a bony temporal arch, the quadrato-jugal being in contact with the postorbital and the jugal; alveolar surfaces very broad, without median ridge; choanae between the eyes. Skin of posterior
part of head divided into small shields. Digits webbed. Tail short or moderate.

**Distribution**—China; Japan; Cochinchina.

**Remarks**—The present genus was proposed by M. A. Smith in 1931. The generic type is *Emys reevesii* Gray. It differs from *Geoclemys* in three principal points: (1), entoplastron is intersected by the humero-pectoral suture in *Chinemys*, but anterior to humero-pectoral suture in *Geoclemys*; (2), quadrato-jugal is in contact with the postorbital and the jugal in *Chinemys*, but separated from postorbital by the jugal in *Geoclemys*; (3) tail moderate in the adult, long in the young in *Chinemys*, but very short, not longer in the young than in the adult is *Geoclemys*.

**Chinemys reevesii** (Gray)


*Geoclemys paracaretta,* Chang, i. c., Vol. V, No. 1, 1929, pp. 1-5 fig., Fuchow.

In 1929, Chang described *Geoclemys paracaretta* based on a single stuffed specimen from Fuchow. It was pointed out to be a form so close to *Chinemys reevesii*, that there are scarcely any distinct characters between them except that his species has five pairs of costal and thirteen pairs of marginal plates instead of four and twelve pairs respectively. It is also said that should his species prove invalid, it may represent an atavistic feature, as it has been stated by Gadow ('20) that it is absolutely certain that the number of the transverse rows of shields was originally much greater than it is now. But judging by an examination of the author's specimen, it reveals that the accidental multiplication of the costal and marginal plates is certainly an abnormal one. The third vertebral plate is also, but incompletely, subdivided at its right half. Similar cases of the multiplication of the plates by subdividing of the shields are frequently found in examination of specimens of hard-shelled turtles of the other species. But in this case it is more binary symmetrical. Indeed such abnormal cases may usually represent the atavistic feature. In conclusion, it is reasonably here,

*This species has also been referred to *Chinemys reevesii* by M. A. Smith in 1931, p. 118.*
Geoclemys papacaretta Chang should be synonymized with Chinemys raevesii (Gray).

Chinemys nigricans* (Gray)  
(Figs. 2-5)

Emys nigricans, part. Gray, Cat. Sh. Rept. i, 1855, p. 20, pl. vi.  

Description—Adult living male, preserved in the Metropolitan Museum of Natural History, Academia Sinica; Wuchow (梧州), Kwangsi; December, 1928; collected by the writer.  
Snout conical, only very slightly projecting; vertical profile only very slightly oblique, straight; edges of jaws not denticulated; upper jaw without median or lateral hooks, no median notch; triturating surface of upper jaw very broad, without any longitudinal ridge; mandibular symphysis subequal to eye slit; skin on top of head smooth, with distinguishable polygonal shields on parietal and auricular regions. Body rather depressed, the depth being slightly more than half the width of carapace. Carapace slightly broader at the median side, emarginate in front and somewhat projecting behind; median keel prominent; lateral keels absent; nuchal longer than broad in the dorsal view, broader and notched behind, broader than long in the ventral view; first vertebral pentagonal, broader in front than behind; all the vertebraIs broader than long, first and fourth subequal, broadest; second and third subequal, fifth broader than second or third; fifth the longest; first longer than second, third or fourth, which are subequal; second costal equal to first vertebral; lateral marginals (3rd-8th) slightly turned up; first marginal broadest, eighth and ninth marginals broader than the others. Plastron flat and nearly smooth, slightly concave in the posterior lobe; sharply bent at bridge; somewhat

*Geoclemys kwangtungensis, described by Pope in 1934, based upon Mell's specimens of Clemmys nigricans from Kwangtung, is apparently identical with this species.
Fig. 2. *Chinemys nigricans* (Gray)—Black phase.
truncate and slightly notched behind; posterior lobe subequal to
to bridge, narrower than opening of the shell, abdominal seam
longest, femoral as long as gular and humeral together, the
latter being shortest; the order of the seams beginning from
the longest: abdominal, femoral, pectoral, gular, anal and
humeral; inguinal twice as long as axillary. Fore-arm with
many large scales on the great part of the anterior and
small part of posterior radio-ulnar region, smaller scales on
the posterior aspect of tibio-tarsal region; toes webbed to base
of the claws. Tail tapering, about one fifth the length of cara­
pace, its ventral side with about twelve pairs of regular, smooth,
squarish scales.

Color of the living specimens: Carapace dark yellow or
greyish, mottled in the center and streaked peripherally with
dark reddish on the costals, dotted with the same color on the
vertebrals and marginals, outer borders of the marginals paler,
horny yellow at some parts of the carapace. Underside of the
shell yellow, irregularly washed with grey and red; the mar­
ginals, axillary, inguinal and parts of the plastral shields con­
sisting the bridge marked with a very large blackish blotch
which is sometimes broaker or irregular in form, usually mixed
with red spots; ventral side of the other marginals blackish,
usually mixed with yellow, the two colors forming a festooned
pattern. Top of head blackish, slightly mottled with pale and
reddish color at the post-temporal and occipital region; dotted
with black and red on the upper side of the neck; side of head,
snout and jaws vermiculated with black and red, whitish at
mandibular symphysis; edges of jaws horny yellow; chin and
throat and ventral and lateral sides of neck bright red, mottled
with black at chin and throat and sides of neck; iris reddish
yellow, with black spots. Fore-limbs and the adjacent skin
bright red, dusky black at the outer-most surface of toes and
webs except the large scales which are still red. Hind-limbs
olive, bright red at its basal portion and some scales of the
limbs; bright red and mottled with dusky at the soft portion.
Tail dark olive, reddish at the ventral, and dotted with red at
the lateral of its basal portion; a red spot before vent.
Fig. 3. Parts of carapace and plastron of *Chinemys nigricans* (Gray), showing the color variation. A. Carapace of red phase; B. plastron of red phase; C. plastron of black phase.
**Dimensions**

Greatest length of carapace .................................. 197 mm.
Greatest width of carapace .................................. 134 "
Greatest length of plastron .................................. 164 "
Length of hind lobe of plastron .................................. 68 "
Width of hind lobe of plastron .................................. 74 "
Gular suture .................................. 24 "
Humeral suture .................................. 13 "
Pectoral suture .................................. 26 "
Abdominal suture .................................. 42 "
Femoral suture .................................. 34 "
Anal suture .................................. 18 "
Width of bridge .................................. 61 "
Depth of shell .................................. 77 "
Width of head .................................. 41 "
Length of tail from vent .................................. 40 "
Depth of shell in width of carapace .................................. 1.74

**Variations**—Similar to *Chinemys revoeisi* (Gray) the coloration of the present species is subject to great variations. In the four specimens examined, two phases, red and black, are differentiated, and one specimen is intermediate between them in coloration. They are distinguished according to the color of the soft parts. The one described above and one more specimen are the representatives of the red phase. In the animals of this phase, the soft parts, scales of the limbs and jaws are bright red; iris red with black spots; the plastron with more yellow than dark or black, usually mottled with red; the bridge with broken blackish blotches; the ventral sides of marginals black and yellow. In the black phase, only one specimen is the representative, the jaws, head, neck iris, limbs and other soft parts are dark or blackish; chin and throat with two short yellow stripes; the concealed soft parts also more or less yellowish; the plastron dusky yellow with blackish blotches; the

![Fig. 4. Lateral views of heads of *Chinemys nigricans* (Gray), showing the color variation. A. Black phase; B. red phase.](image-url)
bridge and the ventral sides of the marginals entirely black. The coloration of the fourth specimen is intermediate between that of these two phases. Its jaws, head, neck, iris, fore-limbs and its adjacent soft parts are similar to the red phase in color but only less bright red; the pupil surrounded with a yellow circle, mandibular symphysis grayish, hind-limbs and their

Fig. 5. Skull and lower jaw of Chinemys nigricans (Gray) (M. 2257; carapace length 176 mm.).

adjacent soft parts and tail olive yellow to dark olive; plastron yellowish, marked with more dusky, more or less mottled with reddish spots; ventral sides of the marginals and bridge more blackish.
Measurements of specimens of *Chinemys nigricans*

<table>
<thead>
<tr>
<th>Coloration</th>
<th>Red phase</th>
<th>Black phase</th>
<th>Red phase</th>
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<th>Immature</th>
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<tr>
<td>Length</td>
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<td></td>
</tr>
<tr>
<td>Depth of shell in width of carapace</td>
<td></td>
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<td></td>
<td></td>
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<td>Tail from vent</td>
<td>35</td>
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<tr>
<td>Width of head</td>
<td>72</td>
<td>72</td>
<td>72</td>
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<td>72</td>
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<td>Depth of shell</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Width of bridge</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
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<tr>
<td>Anal suture</td>
<td>69</td>
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<td>69</td>
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<td>34</td>
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<tr>
<td>Pectoral suture</td>
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<td>35</td>
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<tr>
<td>Humeral suture</td>
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<td>69</td>
<td>69</td>
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</tr>
<tr>
<td>Gular suture</td>
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</tr>
<tr>
<td>Length of hind lobe</td>
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<td>69</td>
<td>69</td>
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<td>Width of hind lobe</td>
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<td>34</td>
</tr>
<tr>
<td>Length of plastron</td>
<td>34</td>
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<td>34</td>
<td>34</td>
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<tr>
<td>Width of carapace</td>
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<table>
<thead>
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<tr>
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<td>Novosibirsk</td>
<td>1958</td>
<td>Novosibirsk</td>
<td>1959</td>
<td>Novosibirsk</td>
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</table>

| No. of Specimen | M. 2307 | 3 | 3 | 3 | 3 | 3 |
The nuchal is also variable from narrow to broad. This variation seems related to the differences of the coloration. In the reddish specimens the nuchal is usually very narrow, but in the bluish individual it is very broad. While in the form with the intermediate coloration the nuchal is much broader than that of the red phase, but narrower than that of the black phase.

Distribution—Three living and one stiffened specimens from formalin were purchased from the market of Wuchow, Kwangsi. The presence of this form in Canton, Kwangtung or other parts of south China has been reported by former authors.

Remarks—The present specimens are provisionally referred to *Chinemys nigricans* (Gray), which is the typical southern form of *Chinemys* in this country. It differs from the common Reeves' emys in possessing the carapace unis- instead of tricarinate and the head much widened. Gray's original description was based on a dry young specimen from Canton, measuring 2 3/4 inches long and a stuffed one with the shell length 11 cm., probably also from China. The descriptions he made and that given by Boulenger in the Catalogue of Chelonia in the British Museum are apparently based on the specimens of the black phase. The feeble lateral keels are recorded and figured in Gray's works (Gray, 1834, 1844, 1855, 1870). It is suggested by the present writer as the characters of the young. Nuchal is usually described as small or absent, but in our specimens it is constantly present. The snout is slightly projecting and the vertical profile is only slightly oblique from the perpendicular line in the adult than in the immature forms. The cut lines or sculpturations on the shields of the shell are also distinct in the young. The horny parts of the jaws, in comparison with those of *Chinemys reevesii* (Gray), is more well developed.

*Chinemys megalcephala*, sp. nov.

(Figs. 6-7)

Fig. 6. Chinemys megalocephalus, sp. nov. Type.
Description of type—A large living specimen, keeping in the Metropolitan Museum of Natural History, Academia Sinica; collected from hill-sides of the vicinity of Nanking city; 1931.

Snout conical, almost not projecting; vertical profile nearly forming a perpendicular line; edges of jaws not denticulated; upper jaw without hooks or median notch; triturating surface of upper jaw broad, without any longitudinal ridge; mandibular symphysis slightly longer than eye slit; anterior part of head covered by a large smooth shield on crown and snout, another on each side covering the whole temporal region, and the usual rostro-labial shield; parietal and auricular regions covered by small shields which are polygonal, rounded or irregular in shape. Body moderately depressed, its depth being less than half the length, but considerably more than half the width of the carapace; carapace nearly with parallel sides and three strong keels, shields nearly smooth (eroded), but with some deeply cut concentric lines, radiating lines also present; nuchal small, narrow, more or less emarginate behind, much longer than broad; first vertebral pentagonal, broader in front than in behind, subequal to the other vertebrae and first three costals in width; edges of marginals from third to eighth turned up; post-marginals usually not projecting their corners, so that the posterior outline of the shell is not serrated; first and tenth marginals broadest. Plastron very slightly concave, angularly or roundly notched behind, truncate or slightly emarginate in front, bridge angle rounded, shields nearly smooth or with deeply cut lines; posterior lobe slightly longer than the bridge, nearly as wide as opening of shell; abdominal seam longest, decidedly longer than femoral, longer than gular and humeral together; femoral longer than pectoral; gular seam longer than anal; humeral shortest; inguinal much longer than axillary, usually single on each side. Toes webbed to bases of claws. Tail tapering.

Color in living specimen dark or dark brown above, usually the median keel tinged with black. Shields of under-side blackish brown with most of the seams, edge of hind lobe, and sometimes the ventral border of the bridge edged with buff or greenish; ventral side of marginals bright blackish brown. Head, neck and limbs tawny olive, darker on fore-head and fore-sides...
of limbs, a number of greenish yellow spots or even stripes and vermiculations on side of head, the most peculiar and constant one being the long stripe from postorbital extending hindward along supralateral of neck; jaws edged with pale buff, the lower jaw also somewhat vermiculated with yellow; large scales of limbs usually more or less tinged with yellow or greenish spots in some specimens; basal portion of neck and limbs usually with yellowish round spots.

**Dimensions**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Greatest length of carapace</td>
<td>228 mm.</td>
</tr>
<tr>
<td>Greatest width of carapace</td>
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<tr>
<td>Greatest length of plastron</td>
<td>136</td>
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<tr>
<td>Length of hind lobe of plastron</td>
<td>207</td>
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<tr>
<td>Width of hind lobe of plastron</td>
<td>76</td>
</tr>
<tr>
<td>Gular suture</td>
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<tr>
<td>Humeral suture</td>
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<tr>
<td>Abdominal suture</td>
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<td>Femoral suture</td>
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<tr>
<td>Anal suture</td>
<td>76</td>
</tr>
<tr>
<td>Width of bridge</td>
<td>73</td>
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<tr>
<td>Depth of shell</td>
<td>59</td>
</tr>
<tr>
<td>Width of head</td>
<td>36</td>
</tr>
<tr>
<td>Length of tail from vent</td>
<td>94</td>
</tr>
<tr>
<td>Depth of shell in width of carapace</td>
<td>1.45</td>
</tr>
</tbody>
</table>

**Variations**—In this species, the sides of the carapace are nearly parallel or sometimes the posterior half of the carapace is more widened than its anterior half. This rendered the sides of the carapace becoming more or less divergent hindward. The carapace is usually evenly convex, but in some cases, a transverse zone crossing anterior part of the first vertebral shield obviously concave. Sometimes similar concavities are also found along the postmarginals. The cut lines on the shields are fairly distinct in a few individuals, but in most of them the shields are nearly smooth (eroded). The axillary is usually single but in a few cases a small accessory axillary seems to be present on each side. The body depth is 1.45-1.92 in length of carapace, but two shells of them are apparently much depressed, their depth being 1.17 and 1.18 respectively.

**Distribution**—Nanking.

**Remarks**—This species is saliently differentiated from *Chinemys nigricans* (Gray) in having its carapace distinctly
tricarinate in young and the adult, and also from their different colorations. It is closely related to the common Reeves' emys _Chinemys reevesii_ (Gray). But the former is easily to be distinguished from the latter in having the massive broad head.

![Skull and lower jaw of _Chinemys megalcephala_, sp. nov.](image)

The width of the head is 3.36-4.60 in the carapace length, the average being 4.28. While in _Chinemys reevesii_, according to the measurements taken from sixteen individuals, 30-183 mm. in carapace length, from various localities, the head width is
<table>
<thead>
<tr>
<th>No. of Specimen</th>
<th>Sex</th>
<th>Localilty</th>
<th>When Collected</th>
<th>Condition of Specimen</th>
<th>Length of carapace</th>
<th>Width of carapace</th>
<th>Length of plastron</th>
<th>Width of plastron</th>
<th>Length of hindlimb</th>
<th>Width of hindlimb</th>
<th>Numeral suture</th>
<th>Pectoral suture</th>
<th>Abdominal suture</th>
<th>Anal suture</th>
<th>Width of bridge</th>
<th>Width of head</th>
<th>Depth of shell</th>
<th>Tail from vent</th>
<th>Depth of shell in width</th>
<th>Head width in carapace</th>
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<tbody>
<tr>
<td>M. 2238</td>
<td>♂</td>
<td>Chalkiang near Shao-Chung</td>
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<td>informal</td>
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<td>105</td>
<td>140</td>
<td>67</td>
<td>56</td>
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<tr>
<td>S. 9342</td>
<td>♀</td>
<td>Shao-Chung, Nanking</td>
<td>1928</td>
<td>Stffd.</td>
<td>112</td>
<td>101</td>
<td>72</td>
<td>60</td>
<td>23</td>
<td>11</td>
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<td>♀</td>
<td>Nanking</td>
<td>1933</td>
<td>living</td>
<td>174</td>
<td>111</td>
<td>155</td>
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<td>S. 9341</td>
<td>♂</td>
<td>Shao-Chung, Nanking</td>
<td>1928</td>
<td>Stffd.</td>
<td>175</td>
<td>126</td>
<td>164</td>
<td>74</td>
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<td>1933</td>
<td>living</td>
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<tr>
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<td>—</td>
<td>—</td>
<td>—</td>
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<td>155</td>
<td>212</td>
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<td>—</td>
<td>44</td>
<td>21</td>
<td>78</td>
<td>93</td>
<td>21</td>
<td>1.17</td>
<td>3.93</td>
</tr>
</tbody>
</table>
4.60-6.5, its average being 5.26 in the carapace length. The skulls of these two forms (Figs. 7 & 8) are also distinguishable in the following points: (1) The skull is broader in *megalococephala* and narrower in *reevesii*; (2) the vertical profile of the snout is almost a perpendicular line in *megalococephala*, but oblique in *reevesii*; (3) the horny jaws are very thick in *megalococephala* but thin in *reevesii*; (4) the angle between rami of jaws is greater than 90° in *megalococephala*, but less than 90°.

Fig. 8. Skull and lower jaw of *Chinomys reevesii* (Gray). (S. 9339; Carapace length 159 mm.)
in *reevesii*. In habitat, *megalochepala* is usually found in ponds and streams near the hill-sides, but *reevesii* is common in the ponds and rivers or canals of the plain land in Nanking.

**CLEMMYS Ritgen**


*Chersina*, part., Merrem., Tent., 1820, p. 29.


*Calemys*, Agassiz, l. c., p. 443 (type, *C. mühlenbergii*).

*Glyptemys*, Agassiz, l. c., (type, *G. insculpta*).

*Actinemys*, Agassiz, l. c., p. 444 (type, *A. marmorata*).


*Snaeflin*, Gray, Suppl. Cat. Sh. Rept., 1870, p. 3 (type, *S. bealii*).

*Emonnia*, Gray, l. c., p. 38 (type, *E. grayi*).

*Bryma*, Gray, l. c., p. 44 (type, *E. luticeps*).

*Cathaysmys*, Lindholm, Zool. Anz., Bd. 97, Heft. 1/2, 1931, p. 29 (type, *Emys mutica*).

**Genus characters**

*Distribution*—Europe; N. W. Africa; S. W. Asia, China; Japan; N. America.

*The humeropectoral suture in *Emys mutica*, as well as that in the species of *Clemmys*, is intersected by entoplastron. The large scales of limbs are broad and distinctly with their free borders finely serrated. But the latter character cannot be considered as the generic distinction.*
Description—A single adult female specimen, M. 4587, received from the Museum of History, Peiping (北平歷史博物館); probably collected from North China (?).

Snout conical, slightly projecting; vertical profile oblique, straight; edges of jaws not denticulated, upper jaw more or less with a median notch; triturating surface of upper jaw not very broad, smooth; mandibular symphysis much shorter than the eye slit; skin on entire top of head smooth. Body moderately depressed, the depth being more than half the width of carapace. Carapace slightly broader at the region posterior to the bridge, slightly emarginate in front and somewhat projecting in behind, distinctly uncarinate; the vertebral keel strong, extending from middle of first vertebral shield to end of the last; no distinct lateral keels; nuchal small, longer than broad, narrower in front, broader and notched behind; first vertebral pentagonal, broader in front than behind, all the vertebrae broader than long; first broadest; third, fourth and fifth subequal, broader than the second; first longer than the other vertebral shields which are subequal in length; costals broader...
Fig. 9. Clemmys mutica (Cantor) — M. 1587.
than vertebrae, the second one broadest, first subequal to third, broader than the fourth; supracaudals nearly as broad as long, or slightly broader than long, with a distinct notch between them; lateral marginals but little reverted, first subequal to ninth, broadest; alveolae of the shields distinct, situated at the posterior angle; cut lines distinct. Plastron flat, with its front and hind lobes narrowed, the former subtruncate, the latter deeply notched; posterior lobe subequal to bridge, or slightly longer, narrower than its width or opening of the shell; abdominal seam longest, subequal to gular and humeral together, femoral slightly longer than pectoral, humeral shorter than pectoral and slightly longer than gular, anal the shortest; bridge forming an right angle; axillary present, narrow; inguinal small; the shields with distinct cut lines. Fore-arm with many broad scales* in front and a few in behind which are finely serrated at the free border. Toes webbed to bases of claws. Tail tapering, about one fourth the length of carapace (subequal to length of head), its ventral side with about 16 pairs of smoothish scales.

Color in formalin, carapace grayish brown, with dark at some parts; plastron yellowish, each shields with a large squarish black blotch at its areolar angle; bridge with an anterior and a posterior black blotch; underside of marginals yellowish, usually washed with black; head greenish above, a yellowish longitudinal band, bordered with olive brown, commencing from posterior corner of orbit extending hindward along the upper border tympanum to neck where the band being gradually disappeared, another yellowish thin band bordering the lower side of quadratojugal which commences at posteroinferior of orbit and ends at the region below anterior of tympanum; upper jaw greenish olive, edged with yellowish; lower jaw yellowish; neck olive brown on dorsal and lateral, yellowish and somewhat washed with gray at the ventral; limbs olive brown above, with two supralateral pale longitudinal bands along its basal half which are connected and running along the mediodorsal side of its distal half.

*The scales at the same region of Clemmys bealii are more or less triangular and not serrated at the free border.
FANG—SOME CHELONIANS OF CHINA

Dimensions

Greatest length of carapace .................................. 138 mm.
Greatest width of carapace .................................. 102 "
Greatest length of plastron .................................. 130 "
Length of hind lobe of plastron .................................. 48 "
Length of hind lobe of plastron .................................. 48 "
Width of hind lobe of plastron .................................. 64 "
Gular suture .................................. 15 "
Humeral suture .................................. 16 "
Pectoral suture .................................. 25 "
Abdominal suture .................................. 30 "
Femoral suture .................................. 25 "
Anal suture .................................. 11 "
Width of bridge .................................. 47 "
Depth of shell .................................. 60 "
Width of head .................................. 22 "
Length of tail from vent .................................. 32 "
Depth of shell in width of carapace .................................. 1.70

Distribution*—Hainan, Canton; Kwangtung; Yunnan; Chusan, Chekiang; Ningkwo, Anhwei and North China (?).

Remarks—The single specimen described herewith differs from that of Boulenger (1889) in having the carapace apparently not tricarinate, but agrees with Guenther's description (1864) in possessing the unicarinate dorsal shell. In 1927, Schmidt recorded the measurements on nineteen specimens of this species, 65-154 mm. in carapace length, from Hainan. The tail length is 21-50 mm. long. It is about 1/3 the length of carapace. But in our present specimen, it is nearly 1/4 the length of carapace. It is obviously proportionally shorter than those of the Hainan individuals, but it agrees well with Guenther's data in having the tail nearly as long as the head. The axillaries are not recorded in the former authors' descriptions, but it is distinctly present in our specimen. Schmidt (1927) recorded the presence of an additional, irregular, fourth vertebral in a Hainan specimen, A. M. N. H. No. 30155. In our examined specimen, an rounded, additional, shield is found at the bridge region, below the fifth and sixth marginals. In

* A single living male specimen, with the plastron somewhat concave, was recently collected by Mr. K. P. Tang from a pond near Tsing-hsiang-shan ( Ministério), Nanking City. The animal is now keeping in this museum.
coloration, this specimen differs from Guenther’s in having the underside of marginals more or less blackish instead of yellow-

ish, but not so uniform black beneath as described by Schmidt (1927) in a Hainan specimen, A. M. N. H. No. 30154 (juvenil.
In distribution, Schmidt (1927) reported Ningpo and Ningkwo as its most northern record. But the present note is probably may corroborate its far northern distribution.

**CYCLEMYS Bell**


*Kinochelonia*, part., Bell, l. c., p. 302.

*Sternonochelonia*, part., Bell, i. c., p. 305.


**Distribution**—East Indies; southern China.

**Cycolemys flavomarginata** (Gray)

*Cuora trifasciata*, part., Gray, Cat. Sh. Rept., i, 1855, p. 42.


Cystoemys flavomarginata, Gray, Suppl. Cat. Sh. Rept., i, 1870, p. 20 (China, Formosa).
Cyclonys flavomarginata (Gray) was firstly described from Formosa in 1863 under the name Cistoemys flavomarginata. It has also been reported from Southern China* (Guenther 1864. Gray 1870, Boulenger 1889), but there is no definite Chinese habitat to be indicated. In 1930, Hsu exactly pointed out its occurrence in Ku-shan, Tungting Lake, Hunan. He described it under the name Cyclonys flavomarginata sinensis, var. nov. It was considered distinguishable from the Formosan form in the following diagnosis:

"Diagnosis—Differing from the Formosan species, Cyclonys flavomarginata (Gray) in having the anterior end of the plastron obtusely emarginate; each shield of the plastron with deeply cut parallel lines; each marginal of the carapace with its posterior angle slightly overlapping the next plate and the degree of overlapping more pronounced in the case of the posterior third of the shell, so that the outline is somewhat serrated; a small notch between the analis; and tail much shorter."

For the first point given above, it shows that Hsu's variety sinensis is quite different from those specimens described by Boulenger (1889) and Stejneger (1907) which have the plastron rounded in both ends. But in the two specimens at the writer's hands, one of them, M. 2830, agrees well to Boulenger and Stejneger's descriptions, but in the other, M. 2859, the plastron is not only somewhat emarginate or slightly notched in front, but even there is a smaller notch behind.

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*Stejneger 1907, p. 505.
For the second point, Hsiu's variety is characterized in having the plastral shields with deeply cut lines, but in our specimens, M. 2859, the humeral shields are distinctly with some such sculptures in their anterior halves, and a few cut lines also present in other shields along most of the suture. Again, Stejneger found in a Riu Kiu specimen, No. 34076, length of carapace 131 mm., to have the underside entirely smooth and nearly so above. These show well that sculptures of the shields are subject to great variation.

For the third and fourth points, faint indications of the presence of serrations is also found in the posterior third of the carapace in our specimen, M. 2859, and a small notch is also presented in this same individual. These denote that such characters are also inconstant.

Comparison of the tail length from vent in specimens of _Cyclomys flavomarginata_ of different sizes.

<table>
<thead>
<tr>
<th>No. of Specimen</th>
<th>Locality</th>
<th>Measurements given by whom</th>
<th>Length of carapace mm.</th>
<th>Length of tail from vent mm.</th>
<th>Tail length in carapace length</th>
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<tbody>
<tr>
<td>34079</td>
<td>Riu Kiu</td>
<td>L. Stejneger</td>
<td>89</td>
<td>13</td>
<td>6.31</td>
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<td>34079</td>
<td></td>
<td></td>
<td>124</td>
<td>20</td>
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<td>34076</td>
<td></td>
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<td>131</td>
<td>19</td>
<td>6.39</td>
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<tr>
<td>*M 2830</td>
<td>(Shanghai)</td>
<td>P. W. Fang</td>
<td>140</td>
<td>17</td>
<td>8.23</td>
</tr>
<tr>
<td>S 1175</td>
<td>Kun-shan</td>
<td>H. F. Hsu</td>
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<td>18</td>
<td>8.60</td>
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<td>S 1174</td>
<td>Tungting Lake</td>
<td>H. F. Hsu</td>
<td>156</td>
<td>18</td>
<td>8.00</td>
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</table>

For the last point, the length of tail from vent in length of carapace, according to the measurements in the above

*Tail in complete in specimen M. 2869.
table, given by Stejneger, Hsü and the writer, it seems to the writer that it is comparatively long in the younger or smaller and short in the larger specimens. Hsü's specimens are the largest of all, of course, the tail length is the shortest in proportion. Hence the tail length also cannot be considered as the distinct characteristic of his variety.

In conclusion, *Cyclemys flavomarginata sinensis* Hsü is not valid. It cannot be characteristically differentiated from the Formosan form.

The distribution of this animal in China cannot quite be ascertained in the present. The specimen recorded by Gray from China was collected by J. R. Reeves. In Boulenger's Catalogue of Chelonians of the British Museum, this very distribution is followed with a question mark. A single specimen of this species, preserved in the Museum of the North China Branch of the Royal Asiatic Society, Shanghai, is said to be secured from Hwangpu River, Shanghai, in a dead state. It seems not a real local animal. Hsü's specimens of *Cyclemyx flavomarginata sinensis* are told that they were received from the buddhists in the Kun-shan Temple. They are probably imported from outside of the lake, and are domesticated in the pond near the temple a long time ago. This distribution, in fact, seems also not natural. The two specimens preserved in this Museum were brought here two years ago by Mr. K. P. Tang also from Shanghai. In Chen-hwan Temple (##,##,##), Shanghai City, individuals of this species are in great numbers for sale for medicine. It costs about five dollars each. Their sources are said by the sailors to come from some mountainous localities in Szechuan. Mr. K. P. Tang told the writer that this species is actually occurred in Fuchow, Fukien, but it is extraordinarily rare. For about more than fifteen years ago, one single specimen was practically secured from its vicinity.

**Distribution**—South China; Fukien; Tungting Lake, Hunan; Szechuan; Riu Kiu and Formosa.

**GEOEMYDA Gray**

*Chersina*, part., Merrem., Tent., 1820, p. 29.


Chaibassia, Theobald, Cat. Rept. Brit. Ind., 1876, p. 6 (type, Ch. tricarinata).


Neural plate mostly hexagonal, short-sided behind, or alternately tetragonal and octagonal. Plastron extensively united to the carapace by suture, with short axillary and inguinal butresses, just reaching the first and fifth costal plates respectively; entoplastron intersected by the humeropectoral suture. Skull with a bony temporal arch; alveolar surfaces without median ridge; choanae between the eyes; upper surface of head covered with undivided skin. Digits with or without a short web. Tail short, not longer in the young than in the adult.

Distribution—East Indies; Central and South America.

Geoemyda spengleri (Gmelin)


*Geoemyda, Gray, 1836 and Bouleneger 1889 (type, Emys spinosa) = Geoemyda Stejneger 1902 (type, Emys spinosa).

**The generic characters of Geoemyda given by Fang 1930—characters of Geoemyda Gray 1866 or Geoemyda, Boulenger 1889. The characters are correctly given in this paper.
Testudo serrata, Shaw, Gen. Zool., III, pt. 1, 1802, p. 51, pl. ix, fig. 2.


Clemmys spengleri, Strauch., Chelon. Stud., 1882, p. 82; and Verth. Schildkr., 1866, p. 82.


Geoemyda spengleri japonica, Fan, l. c., p. 148.

Geoemyda spengleri was firstly described with definite locality (China) by Gray in 1834. The specimens described by him and Boulenger are apparently without axillaries. Stejneger, 1907, described a single specimen from Naha, Okinawa. In his specimen the right axillary is distinctly present, while the left one is still wanting as it shown in the figure, pl. XXXII, fig. 2. Judging from the descriptions of many authors it seems that the possessing of a right axillary in Stejneger’s specimen is an accidental case. It cannot be considered as a valid subspecific character to differentiate the Chinese and the Japanese forms as pointed out by Fan in 1931. The order of the plastral shields, according to the lengths of the median seams, is subject to great variations. It is also not subspecifically constant. Therefore, it is reasonable to consider the Kwangsi Geoemyda as the identical with the typical form, and is not separable from the Japanese individuals.

Distribution—Sumatra, Borneo; Riu Kiu; Japan; Kwangsi and (other parts of China?).
Family CHELONIDAE

CHELONIA Latreille


Chelonias, Rafinesque, Specchio Sci. (Palermo), II, No. 9, 1 Sett., 1814, p. 66 (emendation).


Carapace with persisting fontanelles between the costal and marginal plates. Dorsal shields juxtaposed in the young and adult; costal shields four pairs; an intergular and a series of inframarginal shields. Prefrontals one pair. Herbivorous, feeding on algae.

Distribution—Tropical and subtropical seas.

Chelonia mydas (L.)

(Figs. 10 & 11)

Testudo mydas, Linn., S. N. i, 1768, p. 350;—Schoepff, Testud., 1702, p. 73, pl. xvi, fig. 2;—Daud. Rept., ii, 1802, p. 10, pl. xvi, fig. 1.

Testudo cepediana, Daud., I. c., p. 50.
Testudo macropus, Walbaum, Chelonogr. 1872, p. 112.
Testudo viridis, Schneid., Schildkr., 1783, p. 296, pl. —

Chelonia japonica, Schweiger, Prodr. Mon. Chelon., 1814, p. 21;—

Gray, Cat. Sh. Rept., I, 1866.


Caretta caretta, Merrem, Tent., 1820, p. 18.

Caretta esculenta, Merrem, I. c.

Caretta nasiformis, Merrem, I. c.

Caretta thunbergii, Merrem, I. c.

Chelonia mydas japonica, Gray, Syn. Rept., i, 1831, p. 58 (Japan).


Chelonia marmorata, Dum. & Bibr., Erp. Gén., ii, 1835, p. 646, pl. xxiii, fig. 1;—Girard, I. c., p. 455, pl. XXXI, figs. 6-7.

Euchelys macropus, Girard, I. c., p. 448, pl. xxx, figs. 9-11.

Chelonia formosa, Girard, I. c., p. 466, pl. xxxi, figs. 1-4.

Chelonia tenuis, Girard, I. c., p. 469, pl. xxxi, figs. 8.


Chelone virgata, Strauch, I. c., p. 183.
Description—A single, nearly half grown, stiffened specimen, loaned from the Museum of Biology, Chip-bee Institute (福美學校), Chip-bee, near Amoy, Fukien; collected from the sea shore of Chip-bee some years ago.

Snout very short, somewhat rounded, vertical profile curved; jaws not hooked; horny sheath of upper jaw with feebly denticulated edge and striated inner surface, of lower jaw with strongly denticulated edge; alveolar surface of upper jaw with two denticulated strong ridges; symphyses of lower jaw short, much shorter than eye slit; top of head covered with large smooth regular shields: one pair of parietals, one large isodiametric fronto-parietal, one smaller, more or less elongate frontal, one pair of large, elongate prefrontals, which is more than twice as wide as long, two large supraoculars at each side, lateral to the frontal; one series of three, large temporals diminishing in size hindward; some small shields at nuchal region. The side also covered with shields: the orbit is bordered with series of minute shields of supra- and infra-ciliaries; a series of four postero- and infra-oculars; a group of more than ten moderate sized auriculars. The upper jaw covered with a very large rostral shield and small upper labials; the lower jaw covered with a single large mental and two large, elongate, and some small lower labials; other small shields present at chin and throat and anterior dorsal side of neck. Body depressed, its depth being much less than half the width of the
Fig. 10. *Chelonia mydas* (L.) Carapace length 812 mm (half-grown).
Carapace. Carapace subtextiform, broader at middle, slightly emarginate in nuchal region; anterior half of the carapace more or less rounded, the posterior half somewhat broadly elliptical; median keel present; dorsal shields juxtaposed; posterior marginal more or less serrated; nuchal very short and broad, about 1/4 as long as wide; five vertebrals, first much broader than long, all narrower than costals; costals four pairs; marginals 22; two supracaudals; all the shields smooth; persisting fontanelles between costal and marginal plates being clearly located through the horny shields. Plastron smooth, rounded at both ends, broadly concave along its median line; posterior lobe less than half the length of bridge, much narrower than opening of the shell; a single intergular with its posterior half incompletely separated with a short suture; the order of the seams from the longest: anal, abdominal, femoral, gular, pectoral, humeral; a series of four broad inframarginals, below fifth to eighth marginal plates; few small shields at the axillary region; a series of about six small shields bordering gular and pectoral; two or more small shields at the inguinal region. Limbs paddle-shaped, each provided with a well developed and a very rudimental claw; all covered with juxtaposed shields and scales; fore-arm elongate; hind limb short and broad. Tail very short, about 21 times in the carapace length.

Color of the mounted specimen chestnut on carapace, varied with yellow and rayed with brown; pale chestnut on head and fore-limbs, somewhat deeper on hind limbs and tail; limbs margined with yellow at some parts. Lower side generally yellow, somewhat brownish at basal caudal region and dark brown at the phalangeal portions of the hind-limbs.

**Dimensions**

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
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<tr>
<td>Greatest length of carapace</td>
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</tr>
<tr>
<td>Greatest width of carapace</td>
<td>297 &quot;</td>
</tr>
<tr>
<td>Greatest length of plastron</td>
<td>200 &quot;</td>
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<tr>
<td>Length of hind lobe of plastron</td>
<td>53 &quot;</td>
</tr>
<tr>
<td>Greatest width of hind lobe of plastron</td>
<td>80 &quot;</td>
</tr>
<tr>
<td>Gular suture</td>
<td>46 &quot;</td>
</tr>
<tr>
<td>Humeral suture</td>
<td>33 &quot;</td>
</tr>
<tr>
<td>Pectoral suture</td>
<td>37 &quot;</td>
</tr>
</tbody>
</table>


Abdominal suture ...................................... 48 "
Femoral suture ...................................... 43 "
Anal suture ........................................ 54 "
Width of bridge ..................................... 162 "
Depth of shell ....................................... 102 "
Width of head ........................................ 49 "
Length of fore-limb .................................. 183 "
Length of hind-limb .................................. 98 "
Length of tail from vent .............................. 15 "
Depth of shell in width of carapace ............... 2.91 "

*Distribution*—Widely distributed in the tropical and subtropical seas; Formosa; Hainan and Fukien, China.

*Remarks*—Specimens of *Chelonia* from the Atlantic, Pacific and Indian Oceans were treated as a single species by Boulenger in 1889. But Agassiz (1835), Guenther (1864), Garman (1884) and Stenjeger (1907) agree well in considering that the Atlantic form is only referable to *Chelonia mydas* (L). While the Pacific and the Indian Oceans forms should be referred to *Chelonia japonica* (Thunberg) (=*Chelonia virgata* Schweiger). The difficulty for the differentiation of these species of *Chelonia*, as pointed out by Guenther (1864), arises chiefly from two circumstances: first, from the great changes to which the form of the carapace and of the single shield is subject during the different periods of the life in animals which attain to so large a size as the turtles. Secondly, it is impossible to have good series of specimens from various seas and oceans with the native localities ascertained for comparison. The coloration of this species is also variable to a wide extent. It may be dark brown, spotted or marbled with yellowish in the adult carapace. In 1889, Boulenger try to unite these two allied species into *Chelonia mydas* (L.) basing on a great series of specimens from Atlantic as well as from Pacific and Indian Oceans, preserved in the British Museum. This combination is reasonable, for there is no distinct and constant character given by the former authors. Cantor (in Gray's Cat. Sh. Rept. i, 1865, p. 75) gives the constant distinction, in all ages, between *Chelonia mydas* and *Chelonia virgata* (=*Chelonia japonica*) basing on the relative breadth of the width in length of the fronto-nasal shield (=prefrontal). It was stated, in *Chelonia virgata*, the breadth is only one third of the length, whereas
in *Chelonia midas*, it is one half. But in our specimen, and also the young specimen in the figures given in Stejneger's *Herpetology of Japan*, the breadth of prefrontal is apparently less.

![Dorsal view of an adult carapace of *Chelonia mydas* (L). Carapace length 1130 mm. (adult).](image)
than one half and greater than one third of its length. This character, in fact, is also not a valid character for the specific differentiation.

The present specimen agrees well with Gray's short description of a half grown specimen of *Chelonia virgata* (Gray 1855) in the general form of the carapace and also in coloration. But, in comparison with figure of a young form, 45 mm. in carapace length, in Stejneger's Herpetology of Japan, it seems that his young specimen is distinctly with the snout projecting and the vertebral shields broader than the costals.

An adult shell preserved in the Shanghai Museum was reported by Stanley in 1914. Another adult carapace, 1130 mm. long, preserved in the West Lake Museum of Chekiang Province, Hanchow, collected from Ling Island, Paracel I. & Reefs (西沙群岛), has been examined by the writer. Its general shape, the form of the shields of the carapace, and the color almost resemble those of the adult *Caretta olivacea* (Eschscholtz). The costals are much broader than the vertebrae. Judging by comparing the figure of a young 45mm. in carapace length, in Stejneger's Herpetology of Japan, the present described specimen, and the adult preserved in the West Lake Museum of the Chekiang Province, Hanchow, it reveals that the costals are increasing the breadth in a rate much rapid than the vertebrae are when the animal's ages advanced.

**ERETMOCHELYs Fitzinger**


Carapace with persisting fontanelles between the costals and marginals. Dorsal shields imbricate in the young and juxtaposed in the old; costal shields four pairs; an intergular; a series of inframarginals. Prefrontals two pairs. Carnivorous.

Distribution—Tropical and subtropical seas.

Eretmochelys imbricata (L.)

(Fig. 12)


Testudo caretta, Daud., Rept., ii, 1802, p. 39, pl. xvii, fig. 2.


Chelonia pseudo-caretta, Lesson, l. c., p. 302.


Caretta squamosa, Girard, l. c., p. 442, pl. xxx, figs 1-7.

Caretta rostrata, Girard, l. c., p. 446, pl. xxx, figs. 8-13.


Fig. 12. *Eretmochelys imbricata* (L.)


Description—A single, half grown, stuffed specimen, loaned from the West Lake Museum of Chekiang Province, Hangchow; collected from Foochow, Fukien, in Summer 1931, by Prof. Y. M. Tung.

Snout elongate, somewhat compressed with the lower portion projecting; vertical profile curved; jaws bilobed, the lower one hooked (the upper one also hooked in Stejneger’s figures of a young specimen of Eretmochelys imbricata, 1907, p. 512, fig. 398); horny sheath of jaws without denticulated edges, but with fine obliquely vertical striations; (front of upper jaw with a single central ridge; lower concave, with rather strong ridges on the inner edge, “Gray, 1855, p. 73”); symphysis of lower jaw long, only slightly shorter than longitudinal diameter of orbit; head covered with large, smooth, regular shields: one pair of parietals, a single fronto-parietal, a single frontal, two pairs of prefrontals, one supraocular and two temporals at each side, three postoculares, three or four oculares, a single supra- and infra-labial, series of supra- and infra-ciliaries also present. Shields or scales present on anterior of upper neck and chin and throat. Body depressed, its depth being much less than half the width of carapace. Carapace subcordial and subtectiform, with the nuchal and the first marginals projecting, strongly serrated in posterior two-thirds; median keel extending from first to the last vertebral, lateral keels only very faintly indicated as interrupted ridges on second, third and fourth costal shields, dorsal shields strongly imbricate, smooth, but the portions near the attached border more or less with cut lines; nuchal about five times as long as broad, emarginate in front; all vertebrals narrower than costal; costals 4 pairs, the postero-lateral portion of the fourth subdivided into a small, narrow shield in the specimen; 22 marginals (with nuchal and supracaudals or anals excluded), last marginals and supracaudals somewhat curved upward. Plastron rounded in front and sub-truncate in behind, with two strong keels, extending from humeral to anal shields, the space between the keels strongly...
concaved; posterior lobe less than one half the length of the bridge, much shorted than opening of the shell; a single intergu­
lar; a small shield posterior to hind end of the anal suture; the order of the median seams between the plastral shields from the longest: Anal, abdominal=femoral, humeral, pectoral, gu­
lar; a series of four inframarginals; four or more shields at the axil region; one or two minute shields at the inguinal region; all the shields with cut lines and somewhat inbricate. Limbs paddle-shaped, each provided with two claws; all covered with juxtaposed shields or scales; fore-limbs elongate, reaching hind-limb when fully extended hindward; hind-limb shorter and broad. Tail very short, about 1/8 the length of carapace.

Color of carapace very similar to that of Chelonia mydas, marbled with yellow, dark brown or chestnut; head shields chestnut, marginated with yellow; upper jaw yellow, with a longitudinal chestnut band and one or two chestnut blotches at each side; lower jaw also yellow, with more or less brownish near its base; dorsal shields and scales of limbs more or less similar to those of the head; lower side yellow, but a few scales or shields in throat and limbs centered with dark brown.

Dimensions

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Greatest length of carapace</td>
<td>310 mm</td>
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<tr>
<td>Greatest width of carapace</td>
<td>246</td>
</tr>
<tr>
<td>Greatest length of plastron</td>
<td>232</td>
</tr>
<tr>
<td>Length of hind lobe</td>
<td>58</td>
</tr>
<tr>
<td>Width of hind lobe</td>
<td>60</td>
</tr>
<tr>
<td>Gular suture</td>
<td>20</td>
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<td>Humeral suture</td>
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<td>Pectoral suture</td>
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<td>Femoral suture</td>
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<td>Anal suture</td>
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<td>Width of bridge</td>
<td>135</td>
</tr>
<tr>
<td>Depth of shell</td>
<td>98</td>
</tr>
<tr>
<td>Width of head</td>
<td>41</td>
</tr>
<tr>
<td>Length of fore-limb</td>
<td>173</td>
</tr>
<tr>
<td>Length of hind-limb</td>
<td>110</td>
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<tr>
<td>Length of tail</td>
<td>37</td>
</tr>
<tr>
<td>Depth of shell in width of carapace</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Distribution—Tropical and subtropical seas. Hainan and Fuchow, China.
Remarks—According to Guenther, 1864, the Javan Testudo squamata was firstly described by Bontius. In Linnaeus’ "Systema Naturae", it was quoted as a synonym of the Atlantic Testudo imbricata. All subsequent zoologists have adopted Linnaeus' view, until the Indian Caret was separated from the Atlantic form by Agassiz, 1857, under the name of Eretmochelys squamata. But the characters assigned by Agassiz to the Indian Caret, only the presence of small scales on the neck appears to be constant. Boulenber, 1889, depend upon the result of an examination of nineteen specimens, young, half grown and adult, from both Atlantic and Indian Oceans, it is recognized that the Atlantic and the Indian forms are identical. But Eretmochelys squamata is still considered as a separate species by Stejneger in 1907.

CARETTA Rafinesque


Cephalochelys, Gray, l. c., p. 408 (type, C. cephalo).


Carapace completely ossified in the adult. Dorsal shields juxtaposed, costals five pairs or more. A series of inframarginal plastral shields. Carnivorous, eating fishes, mollusca and crustacea.
FANG—SOME CHELONIANS OF CHINA

Caretta caretta (L.)

(Fig. 13)

Testudo caretta, Linn., S. N. i, 1708, p. 351.—Walbaum, Chelonogr., 1782, p. 96.—Schoepf., Testuc., 1702, p. 67, plas. xvi, & xvii, fig. 3.

Testudo cephalo, Schneid., Schildkr., 1873, p. 303.

Testudo caouana, Daud., Rept., ii, 1802, p. 55, pl. xvi, fig. 2.


Caretta atru, Merr., Tent., 1820, p. 17.

Caretta cephalo, Merr., l. c.


Chelonia caretta olivacea, Gray, Syn. RepL, i, 1831, p. 54 (China).


Chelonia pelasgorum, Val. in Bory, Expé. Merée, Zool., 1828, pl. vi.


Lepidochelys dussumieri, Girard, l. c., p. 437.
Thalassochelys elongata, Strauch, l. c., p. 63.
Eremonias elongata, Gray, l. c.
Thalassochelys terapaona, Philippi, Zool. Gart., xxviii, 1887, p. 84.


Head elongate; snout projecting, vertical profile more or less curved; jaws strongly hooked, the edges not denticulated; alveolar surface of horny beak with a median ridge, of jaws without; symphysis very long, longer than eye slit; top of head covered with large smooth shields; one pair of parietales, each of which is subdivided into two (a lateral one, each supplement to the parietal proper); a large frontoparietal; a smaller frontal; two pairs of prefrontals; one pair of minute nasals; two supraoculars at each side; two temporals. The side also covered with shields: the orbit bordered with series of minute supra- and infra-cililaries; a series of four postero- and infra-oculars; a group of about ten large and small shields at the auricular region. The upper jaw covered with a very large rostral shield, which followed with two upper labials; the lower jaw with a very large mental and two large and several small lower labials. Dorsal side of neck, chin and throat also distributed with small shields. Body depressed, its depth being much less than half the width of carapace. Carapace arched, no keels, but the first and the last vertebrae only with faint indications of the median
keel (according to Boulenger, 1889, the young is distinctly with three strong keels; the carapace of the adult may be subtectiform); dorsal shields juxtaposed; margin not serrated (according to Boulenger, 1889, margin of carapace serrated in the young); somewhat heart-shaped, more or less concave at the posterior one-third; nuchal very short and broad, its length nearly 1/3 in width, somewhat concave anteriorly; six verte-

Fig. 13. Caretta caretta (L.). M. 2831.
brals, first broader than long, hexagonal, second and third elongate, fourth short and small, fifth and sixth nearly isodiametric, but the latter is the longest of all and much broader in behind than in front; one pair of supracaudals; costals five pairs, all much broader than vertebral; marginals 22 (according to Boulenger, 1889, marginals formed of 27, or rarely 26 shields with the nuchal and supracaudals included). Plastron with a median, longitudinal, broad concaved band, subtruncate in front and rounded in behind; posterior lobe shorter than half the width of bridge, much narrower than opening of shell. No intergular (or with very minute intergular, Boulenger, 1889); the order of the median plastral seams from the longest: Anal, femoral, humeral, abdominal, gular, pectoral; a series of three broad inframarginals below fourth to seventh marginals; another series of many small shields bordering the outer edges of gular, humeral and pectoral shields. Limbs paddle-shaped, fore-limb very long, but far from reaching hind-limb, all with a strong, curved and rudimental claws (according to Boulenger, 1889, limbs of young usually with two claws, of adult frequently with but one).

Color brownish, varied with yellowish above; yellowish inferiorly (according to Boulenger, 1889, young dark brown or blackish).

Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
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</thead>
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<tr>
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<td>940 mm</td>
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<tr>
<td>Greatest width of carapace</td>
<td>707 &quot;</td>
</tr>
<tr>
<td>Greatest length of plastron</td>
<td>656 &quot;</td>
</tr>
<tr>
<td>Length of hind lobe of plastron</td>
<td>208 &quot;</td>
</tr>
<tr>
<td>Width of hind lobe of plastron</td>
<td>370 &quot;</td>
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<tr>
<td>Gular suture</td>
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<td>112 &quot;</td>
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<td>Abdominal suture</td>
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<td>Width of bridge</td>
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<tr>
<td>Depth of shell</td>
<td>273 &quot;</td>
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<tr>
<td>Width of head</td>
<td>181 &quot;</td>
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<tr>
<td>Length of fore-limb</td>
<td>520 &quot;</td>
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<tr>
<td>Length of hind-limb</td>
<td>320 &quot;</td>
</tr>
<tr>
<td>Length of tail from vent</td>
<td>360 &quot;</td>
</tr>
<tr>
<td>Depth of shell in width of carapace</td>
<td>2.58</td>
</tr>
</tbody>
</table>
Distribution—Tropical and subtropical seas; Mediterranean; an accidental visitor in the North Coast of China; Hong Kong (according to Mell, 1922, present along Ping-chshan Islands near Hong Kong from June to August), Canton; Wenchow; and Paracel Is. & Reefs (西沙群岛). It is said, in the last mentioned locality, animals of this species are very numerous. They serve as the food of the fishermen.

Remarks—In Boulenger’s Catalogue of Cheloniens, 1889, there are only two species of this genus described, Thalassochelys (=Caretta) caretta and Thalassochelys kempii. The latter is confined to Gulf of Mexico. It differs from the former in having ridges on the alveolar surfaces of the jaws (underlying the horny shields), and the openings of the inner nostrils not being covered by the alveolar border. The former is subject to great variation. It is generally recognized as two distinct species, Caretta caretta and Caretta olivacea. The latter was firstly described from Philippine and has been recorded from China by Guenther (1864). Guenther and Stejneger agree in opinion in considering this species as the form of the Indian Ocean. The former, on the other hand, is the Atlantic species. The only salient character used to differentiate them is the number of claws of the limbs, two on each limb in Caretta caretta and single in Caretta olivacea. But this specific character is not constant in animals of all ages. Boulenger, 1889, from an examination of 22 specimens of different sizes from Atlantic, Pacific and Indian Oceans, clearly pointed out that the young usually with two claws, but the adult frequently with one. In our present described specimen, an adult, a rudimental claw is, in addition to the strong curved claw, also distinctly present in each limb. Again, judging by comparing the present specimen with the figure of a young Atlantic Caretta, about 47 mm. in carapace length (Stejneger 1907, p. 508, figs. 389-392), and Eschscholtz’s original drawing of Caretta olivacea from Philippine, reproduced by Stejneger in his Herpetology of Japan (Stejneger 1907, pl. xxxiv), the general shape of the present specimen rather resembles to Caretta caretta than to Caretta olivacea. It seems that the differentiation of the Atlantic and Indian Ocean species is not satisfactory or impossible. In following Boulenger, the In-
dian Caretta olivacea is synonymized with the Atlantic Caretta caretta in this paper.

**TRIONYCHIDAE**

**PELOCHELYS** Gray


Outer extremities of the nuchal plate overlying the second dorsal rib; neural plates well developed. Limbs completely exposed. Hyoplastron distinct from hypoplastron; not more than five plastral callosities. Bony choanae between the orbits, jaws weak, postorbital arch as broad as or much broader than the diameter of the orbit; pterygoids posterior border free, without ascending process.

**Distribution**—East Indies & China.

**Pelochelys cantorii** Gray

(Figs. 14 & 15)

*Chitra indica*, part., Gray, Cat. Tort., 1844, p. 49; and Sh. Rept. 1, 1866, p. 70;—Guenther, Rept. Brit. Ind., 1864, p. 50, pl. vi, fig. C.


*A re-examination of the structures of the skull shows that the two specimens referred to _Pelochelys cantorii_, Fang, 1930, should be provisionally changed under _Amyda sinensis_.*
Fig. 14. *Pelochelys cantorii* Gray, M. 2832.
Pelochelys cantoria, Boulenger, Cat. Chelon., 1889, p. 283, fig. 69;—
Siebenrock, Sitzber. Akad. Wiss. Wien (math.-natur.), CXI, Abt. 1, 1902,
p. 832, fig. 12; and 1903, I. c., CXII, Abt. 1, p. 350; and Zool. Jahrb., Suppl.
X, 1909, p. 607.

Description—A single stuffed, female specimen, Met. Mus.
Nat. Hist., Academia Sinica No. 2832; Foochow, Fukien, 1931.

Head moderate, broad and somewhat flat at the top; snout
very short and broad; probosis very short, about more or less
than 1/8 in the interorbital space; nostrils separated by a
septum, provided with a papilla at each side near the opening;
interorbital space about 2.5 broader than the horizontal dia-
meter of orbit; mandible narrowest at the symphysis. Carap-
pace broad and convex, somewhat circular, only slightly longer
than broad; the bony carapace rounded and slightly emarginate
in front and subtruncately concave in behind; the nuchal
broad; costals eight pairs, the last well developed and forming
a median suture; a single neural between the first pair of
costals; skin smooth, of young, according to Boulenger, tuber-
culated. Epiplastra small and widely separated; entoplastron
forming an acute angle (or sometimes right angle, Boulenger,
1889); plastral callosities largely developed on hyo-, hypo-, and
xyphi-plastra.

Color olive above and whitish below. According to
Guenther, 1864, the soft dorsal portion usually vermiculated
and spotted with brown or rust color, black lines also on head
and neck; according to Boulenger, 1889, lips and throat of
young olive, speckle with whitish.

Dimensions

Greatest length of carapace .................................. 430 mm.
Greatest width of carapace ................................ 410 "
Length of soft portion posterior to hind border of
bony carapace .................................................. 130 "
Length of plastron ........................................... 345 "
Length of hind lobe ......................................... 118 "
Greatest depth of shell ....................................... 113 "
Greatest width of head ...................................... 69 "
Length from plastron to posterior border of carapace 86 "
Length from plastron to tip of tail ....................... 107 "
Free portion of tail, from its connection to carapace 46 "
Depth of shell in width of carapace ...................... 3.63 "
FANG—SOME CHELONIANS OF CHINA

Distribution—Burma; Malay Peninsula; Borneo; Philippines; China: Hainan, Canton, Foochow.

Remarks—Schmidt, 1927, considered that the figure of the skull given by Gray is defective. He gives the another one in his work "On the Reptiles of Hainan," fig. 8, p. 411. Judging by comparing the two drawings, it reveals that the interorbital bone in Gray's figure is much narrower than that in Schmidt's* figure. In the former case, it is much narrower than, while in

*The skull of Pelochelys bibroni, Smith, 1931, p. 161, fig. 36, is similar to that given by Schmidt in having the interorbital longer than diameter of eye and shorter than postorbital respectively.

Fig. 15. Dorsal external views of skull and lower jaw of Pelochelys cantorii Gray.
the latter case it is distinctly longer than the longitudinal diameter of the orbital fossa. But in our specimen, the interorbital bone is the broadest of all. It is not only much broader than the longitudinal diameter of the orbital fossa, but also exceeds the length of the postorbital, which is distinctly longer than the interorbital width in Gray and Schmidt’s drawings. The variation of the breadth is either due to the difference of the locations or due to the difference of ages is not able to be settled at present.

This species usually grows to a very large size. Specimens are found weighing 240 pounds. They are powerful and of ferocious habit. The shell of the largest individual measures 37 inches.

BIBLIOGRAPHY


