

No. 5 — *A New Species of Chelid Turtle*, PHRYNOPS (BATRACHEMYS) DAILLI, from Colombia

By RAINER ZANGERL

Chicago Natural History Museum

and

FRED MEDEM

Instituto de Ciencias Naturales
Universidad Nacional de Colombia

Bogota, Colombia, and
Department of Zoology, Chicago Natural History Museum

During the summer of 1956 the senior author received from Dr. Fred Medem in Colombia a turtle for identification. The specimen could readily be identified as a member of the genus *Batrachemys* Stejneger, 1909, but was clearly different from the presently recognized species, *B. nasuta* (Schweigger, 1812).

Since Dr. Ernest E. Williams of the Museum of Comparative Zoology at Harvard University and Dr. P. E. Vanzolini of the Departamento de Zoologia da Secretario da Agricultura, São Paulo, Brazil, are currently collaborating in a revision of the South American members of the family Chelidae, these colleagues were at once advised of the new material from Colombia. In the meantime Dr. Williams gathered for study from various major collections as much material of this family as was possible. His comparisons soon indicated that the genera *Phrynops*, *Mesoclemmys* and *Batrachemys* were not as sharply distinct as the genera *Chelus*, *Hydromedusa* and *Platemys*, and there were notable difficulties at the species level as well. Dr. Williams felt that a direct discussion in the presence of the specimens might be useful and thus kindly invited the senior author to visit him at the Museum of Comparative Zoology during August, 1957. The results of this conference will be mentioned here only to the extent necessary for the present purposes and will be fully discussed in the forthcoming revision by Williams and Vanzolini.

There can be no doubt that the members of the three genera, *Phrynops*, *Batrachemys* and *Mesoclemmys* are very closely re-

lated forms—so closely related, in fact, that their inclusion in one genus, *Phrynops* Wagler, 1830, seems well justified. On the other hand, there are consistent minor features by which the three species groups can be separated. Accordingly, the announced revision will recognize the three groups as subgenera.

Boulenger (1889) illustrated the skulls of *Batrachemys nasuta* and *Phrynops hilarii*. Both represent large specimens. The differences between these skulls are most notable in that the parietal crest is very narrow, and the parieto-squamosal arch extends far behind the exoccipital region of the skull in *Batrachemys*; in *Phrynops* the parietal crest is broad and the parieto-squamosal arch lies dorsal and slightly anterior to the exoccipital bone. The material presently assembled at the Museum of Comparative Zoology shows that these differences are not quite as striking, if one compares skulls of juvenile as well as adult specimens of these with other species of *Phrynops* or of *Mesoclemmys*. Skulls of juvenile individuals, particularly, show much greater similarity than do those of old specimens, which is, of course, not especially surprising. The two conditions as outlined above, can be clearly distinguished on X-ray plates, much better, we think, than on the actual skulls, because the skulls often are injured or slightly warped in maceration so that the exact position and nature of the parieto-squamosal bar is difficult to ascertain.

A more complete characterization of these three subgenera of the genus *Phrynops* is immaterial for the present description of a new species and will be given in the revision mentioned above.

Order TESTUDINATA

Suborder Pleurodira

Family Chelidae

Genus *Phrynops* Wagler

Subgenus *Batrachemys* Stejneger

Phrynops (*Batrachemys*) *dahli*,¹ sp. nov.

Holotype: adult male, CNHM 75980.

Paratypes: an adult female, CNHM 81991; a juvenile male, CNHM 81992; a hatchling, CNHM 81993.

¹ Named in honor of Prof. George Dahl of the Liceo Bolivar in Sincelejo, who collected the material and brought it to the attention of the junior author.

Locality: Vicinity of Sincelejo, Bolivar, Colombia.

Local names: The turtle is evidently well known to the people of the middle and upper Sinú valley under the name "Carranchina."

Up to the present, only one species of *Batrachemys* has been recognized by the reviewers of the group, Boulenger (1889), Siebenrock (1909), and Mertens and Wermuth (1955): *B. nasuta* (Schweigger). However, the collections presently assembled by Dr. Williams clearly suggest that there are several species represented, even though some vast areas, such as the Amazon Basin, have not yet yielded sufficient material to permit adequate conclusions. *B. tuberculata* (Luederwaldt, 1926), distributed throughout the drainage area of the Rio San Francisco, is now well represented by a large series of specimens, and is quite distinct from *B. nasuta*. The material from Colombia, described below, is likewise quite distinct. A very few specimens, from distant points in the Amazon drainage and elsewhere seem to indicate that other species besides *B. nasuta* will be recognizable when additional material from these areas becomes available.

Diagnosis: Plastron narrow, especially across posterior lobe; particularly pronounced in males. Limbs powerful; feet large and strongly webbed. Skin of neck lacking tubercles. Carapace olive-brown above, yellow below. Plastron and bridge bright yellow with shield boundaries outlined in gray. Head a fairly uniform gray dorsally, bright yellow or whitish below, including the angle of the mouth and the tympanic membrane. A fine bluish-gray streak extends from nose to anterior corner of eye and from posterior rim of eye-socket to dorsal edge of tympanic membrane and along the side of the neck, forming boundary between gray and whitish skin areas. Color of hatchling much as in adult, but shield boundaries more sharply outlined in dark gray, and whitish underside of head and neck with a few small gray specks and dots.

Description: External features. The series of specimens at hand is small, but probably adequate to characterize the species, since there are few noteworthy differences between the specimens, which present a rather uniform appearance.

The carapace of this species is characteristically tapered in dorsal aspect, widest at the 7th marginal pair of scutes, narrowing to about the second (Pls. 1, 2). Between the marginals mentioned the edge of the carapace is slightly curled upward. In the area of the second, third and fourth vertebral shields the shell is slightly flattened, sometimes even a little depressed, and provided with a weak carina in the juveniles; in the adults the keel is interrupted and, at least in CNHM 75980, barely noticeable. In the type specimen the costal plates are more strongly curved than in the juvenile or in the female.

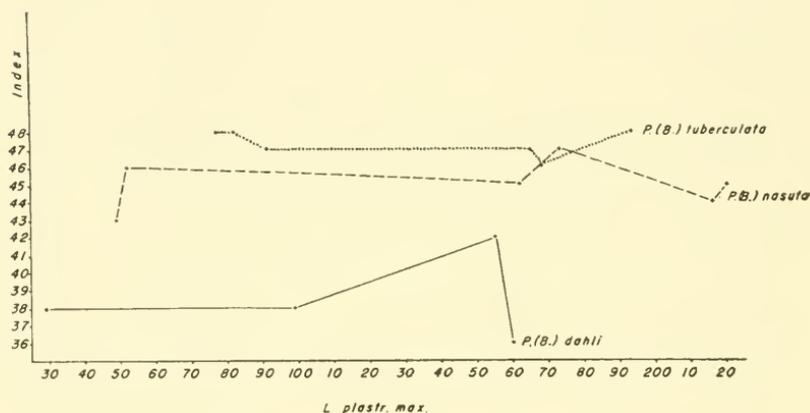


Figure 1. Graph to illustrate the relative width of the posterior lobe of the plastron in *Phrynops (Batrachemys) dahli*, *P. (B.) nasuta* and *P. (B.) tuberculata*. The indices were calculated as follows: width of posterior lobe at base times 100 divided by total length of the plastron.

The plastron is very narrow in this form. In the type, in the juvenile male, and in the hatchling, the width of the posterior plastral lobe amounts to only 36 to 38 per cent of the total length of the plastron (see Fig. 1). In the female, CNHM 81991, the plastron as a whole is somewhat wider, the width of the posterior lobe reaching 42 per cent of the plastral length. Greater plastral width in females than in males was observed in other species of this family and may reflect sexual dimorphism. The anterior

plastral lobe, always wider than the posterior lobe, is broadly rounded in front with the wide intergular slightly protruding. The posterior lobe is deeply notched behind.

The head is covered, dorsally, with very smooth skin, traversed by a system of extremely fine skin furrows that subdivide the upper head region into numerous irregular polygons of different size, thus simulating true scutellation. The skin of the underside of the head and of the neck shows normal papillation but there are no traces of horny tubercles. In the adult male the papillation is particularly well developed below the chin.

The limbs are notably larger in the male than in the female of nearly equal size. The forelimb is distally expanded to form a relatively large paddle, the surface of which is further increased by a row of much enlarged scales along the ulnar edge of the limb, forming a scale fringe from the stylopodial region all the way to the claw of the fifth digit. The hind feet are provided with a series of four keeled and much enlarged scales along the tibial edge of the zeugopodium. The pes is heavily webbed with the fifth digit, which does not bear a claw, supporting the large fringe of webbing along the outer side of the foot.

In the female the tail is very short, tapering rapidly to a fairly sharp point. The cloacal opening lies within the fork of the plastral lobe. In the male the tail is much larger; the cloacal opening lies some distance behind the tips of the plastral fork. The tail region behind the cloacal opening is short and tapers sharply to a point. On the underside of the cloacal region the scallation (or rather papillation) of the skin is coarser than on the sides or top.

Color pattern: Besides fairly fresh specimens preserved in alcohol, the junior author has provided good color photographs of live specimens. The carapace is covered dorsally with rather translucent¹ (thus lightly pigmented) uniformly dull olive-brown shields. The lower sides of the marginal shields are bright yellow with the edges between adjacent scales outlined in dark gray. The plastron, and the bridges likewise, are yellow or whitish-yellow with the shield boundaries outlined in gray. In

¹ The sutures between the underlying bony plates are clearly visible through the epidermal shields when the specimens are wet.

the female specimen, CNHM 81991, the underside of the marginals, the bridge and the plastron are irregularly mottled with brown. Examination under the binocular microscope shows that the brown areas are not part of a color pattern; they are confined to superficial, horny flakes that were in process of being shed by the animal at the time of death. Most of these flakes are loose and can readily be removed. There is no brown pigment below these flakes. This seems to indicate that the brown color is the result of staining of the horny surface by an agent present in the particular environment in which this individual lived.

The dorsal side of the head is a fairly uniform gray that extends to the nostrils, laterally to the upper edge of the horny beak and from there to the dorsal rim of the tympanic membrane. On either side, a narrow bluish-gray streak runs from the nostril to the anterior corner of the eye and from the posterior-most point of the rim of the eye to the dorsal edge of the tympanic membrane. From here it extends backwards along the side of the neck separating the dark gray upper side of the neck from the yellow or whitish underside. The horny beaks, both upper and lower, are yellow. The angle of the mouth and the entire tympanic membrane lie in the yellow or whitish territory of the underside of the head. In the hatchling the color pattern is much as in the adults, except that the underside of head and neck shows a number of small but distinct gray specks and dots. The limbs and the tail are generally dark gray above and whitish, mottled with light gray, below. In the female specimen, CNHM 81991, the underside of the hindlimbs has a reddish cast. Examination reveals that this, like the brown mottling on the plastron (see above) is a stain affecting the surface of the horny scales only.

Skeleton: The skeleton, except for the skull, was studied from X-ray plates only. Stereoscopic X-ray plates were made of the type specimen, before the skull was removed. Simple dorso-ventral X-rays served for CNHM 81991 and 81992. These X-ray plates were compared with plates of *Phrynosoma* (*Batrachemys*) *tuberculata* as well as with a number of other members of this genus.

The skull is illustrated in Figures 2-4. It is very large relative to the size of the animal, its total length being about 30 per cent of the straight length of the carapace in the adult, about 45 per cent of that length in the hatchling (see Pl. 2).

The skull (Figs. 2-4) shows all the typical features of that of *Phrynops (Batrachemys) nasuta* as pictured by Boulenger (1889). The differences are probably due, to some extent, to the fact that Boulenger's specimen was a very old and large individual, and some of the sutures may not have been visible (as

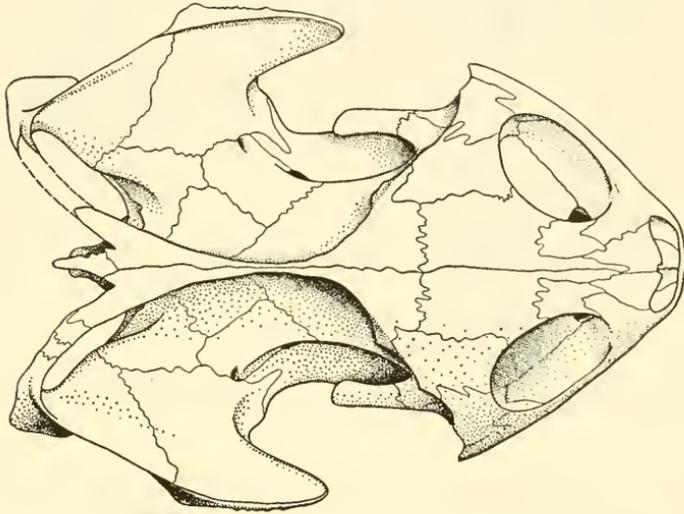


Figure 2. Skull of *Phrynops (Batrachemys) dahli* type specimen. Dorsal view.

for example the suture between opisthotic and supraoccipital); also there are differences in proportion, the skull of the Colombian species being notably more pointed anteriorly — which may or may not be a specific character. In *dahli* the maxillary rim lateral to the orbit is relatively narrower than in *nasuta* and the suture between opisthotic and squamosal on the dorsal side of the otic region of the skull reaches much farther medially than in the compared species. The basisphenoid of *dahli* is short,

lacking the slender anterior prong seen in *nasuta* and the pterygoids lack anterior processes on either side of the vomer. In *dahli*, furthermore, the premaxillae are almost in contact, ventrally, with the vomer.

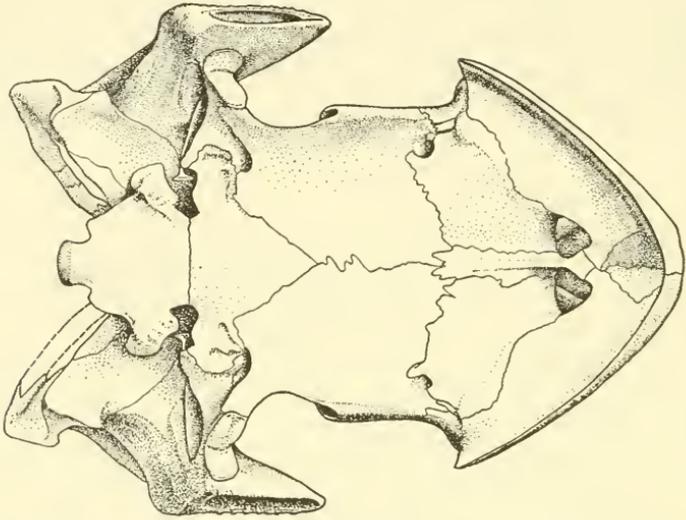


Figure 3. Skull of *Phrynops (Batrachemys) dahli* type specimen. Ventral view.

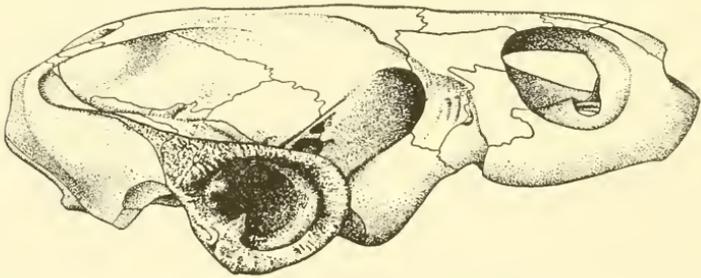


Figure 4. Skull of *Phrynops (Batrachemys) dahli* type specimen. Lateral view.

The skull of the type specimen (Fig. 2) shows an interesting abnormality. The extremely thin posttemporal bar, normally formed to about equal measure by the parietals and the squamosals, includes two supernumerary bones on the right side; on the left side the bar was injured, but since the remaining prongs of the bar are the sutural ends of the parietal and squamosal bones we must assume that the abnormal condition was paired.

The hyoid apparatus is well ossified and complex (Fig. 5). The hyoid body consists anteriorly of two pairs of bones and

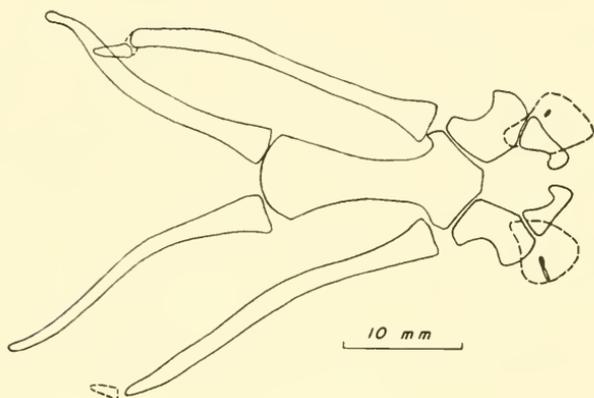


Figure 5. Hyoid apparatus of *Phrynops (Batrachemys) dahli* type specimen, drawn from X-ray plate.

posteriorly of an elongated unpaired element thus evidently ossifying from five distinct centers as noted by Siebenrock (1899). As in other forms (for example in *Clemmys*), there is a pair of cartilages associated with the anterolateral part of the hyoid body, that has been identified as reduced hyoid horns (Romer, 1956, p. 421). The cornua branchialia I are attached to the complex copula where the second pair of elements join the unpaired plate. The distal tips of these branchial horns seem to have separately ossified (or calcified — a definite identification

is not possible in the X-ray) terminal elements. The second pair of cornua branchialia originate in the usual fashion from the posterior end of the copula, but here this portion of the hyoid body is broadly rounded, rather than forked as in *Clemmys* or *Trionyx*.

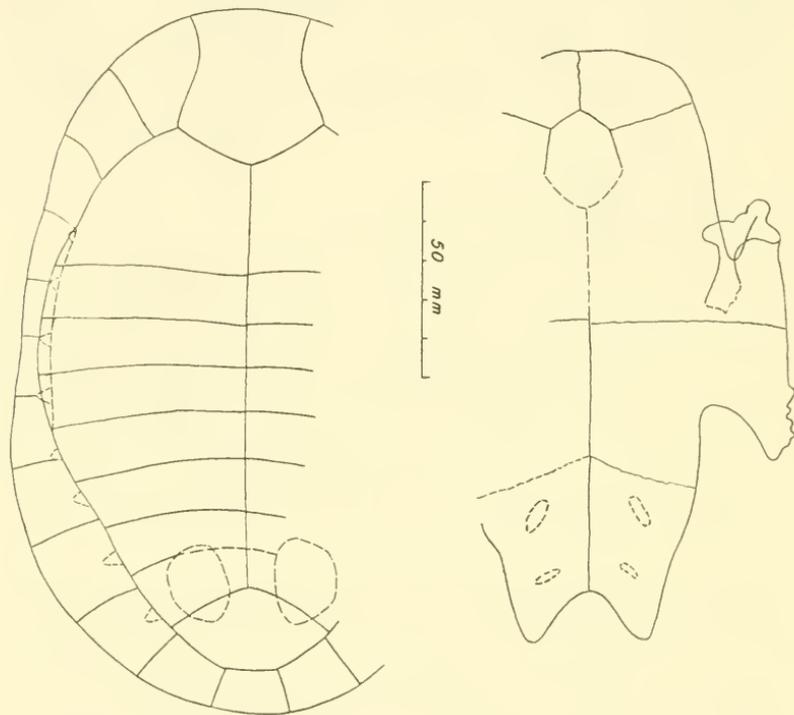


Figure 6. Carapace and plastron of *Phrynops* (*Batrachemys*) *dahli* type specimen, drawn from stereoscopic X-ray plates.

The carapace (Fig. 6), typically elongated in the anterior region as in all pleurodires, shows a complete lack of neural plates, at least in the type specimen, CNHM 75980 and in

CNHM 81992. In CNHM 81991 no neural plates were observed in the X-ray, but in the critical area, between the first costal plates, the picture is difficult to interpret. Since Figure 6 was drawn from X-ray plates, it includes features that would not ordinarily be visible on the macerated shell (for example the distal rib ends) or would not be visible from one aspect of the shell only — such as the internal ilial scars of the carapace, the ventral rim of peripherals 4 to 7, the pelvic scars on the plastron and the buttress pillars.

In the type specimen and in CNHM 81991 the carapace is solidly ossified. In the juvenile, CNHM 81992 with a carapace length of 112 mm., a costoperipheral fontanelle extends from the third to the eighth peripheral. In this same specimen, on the right side, there is a supernumerary peripheral.

The plastron is attached to the carapace by a powerful anterior buttress pillar only. In both adult specimens the bridge suture remains open and there is no indication of a posterior buttress. In the juvenile a lateral fontanelle marks the immature state of ossification. The buttress pillar is shown in the plastron figure (Fig. 6), and consists of an anterodorsal extension for the attachment to the carapace and a posteroventral attachment to the plastron.

The posterior outline of the entoplastron could not be made out on the X-ray. This indicates that the suture, instead of being vertical, is strongly oblique in that area and thus failed to produce a sharp suture shadow.¹

The vertebral column of the neck shows the central articulation pattern indicated by Williams (1950) for the chelid turtles. In the juvenile specimen the joint between vertebral bodies 7 and 8, however, seems incompletely developed; instead of a concave surface on centrum 7 and a convex one on centrum 8, both are flat. Little can be said about the shell vertebrae from what is visible in X-ray pictures. However, the oval opening formed by the

¹ Oblique entoplastral sutures are known in many turtles and this accounts for the fact that the dorsal and ventral outlines of the entoplastra differ from each other notably.

posterior edge of the first (vestigial) shell rib and the anterior edge of the second is always clearly visible. It is rather large in this species (see below). There are (in the present material) constantly 17 tail vertebrae. In the female which has a considerably shorter tail, the vertebrae are smaller and more feebly developed.

In the shoulder girdle the coracoid is but moderately expanded distally. Humerus and zeugopodium show no peculiarities. The carpus consists of radiale, intermedium, ulnare and five distal carpals. No centralia were noted. In the hand the third ray is the longest, the fifth the weakest.

The pelvis is not clearly enough visible in the pictures to permit description. The tarsus consists of tibiale, intermedium and fibulare proximally and of five distal tarsals of notably uneven size. The fifth is the largest and permits the fifth digit of the pes to be spread away from the fourth. The second and third digits are the longest and of nearly equal length. The fifth has a much reduced terminal phalanx that does not have a claw and the entire digit is fairly long and slender.

Food: No field observations exist concerning the food preferences of this species. But the X-rays of some specimens show abundant stomach and intestinal content. Most of this is in the form of mashed, compact food masses that do not permit recognition of the nature of the food. In one specimen, CNHM 81991, however, there are some broken splinters of long bones with very thin walls. Unfortunately, the ends of these bones are not visible, thus rendering further identification impossible.

Comparisons: Full comparison is possible between the present species and the adequately known *Phrynops* (*Batrachemys*) *tuberculata*. The type species *nasuta* of the subgenus *Batrachemys* is not at present a clearly definable entity due to insufficient representation and this makes comparison with the Colombian species unsatisfactory.

Externally the Colombian species differs from *tuberculata* by the lack of horny tubercles on the neck, by the uniformly yellowish or whitish plastron which is always a yellowish-brown ground color variously marked with dark brown blotches in *tuberculata*.

The lower side of the neck in the latter is usually dark gray, variously mottled with yellowish-brown, but lightly colored specimens occur in which the carapace, plastron, and the underside of the neck are fairly uniform yellowish-brown, lacking dark brown or dark gray mottling. As regards proportions, the Colombian species has, at all age levels, a relatively much more narrow plastron than does *tuberculata*; this is particularly striking in the posterior plastral lobe (see Fig. 1). In the skeleton the two species differ in the distal expansion of the coracoid which is consistently greater in *tuberculata* than in *dahli*; in the absence of a well-defined posterior plastral buttress in *dahli*; in a slightly larger opening between the two anteriormost shell ribs in *dahli*; in the size of metatarsals IV and V which are relatively longer and more slender in *dahli*.

Comparisons with *nasuta* are at present restricted to external features. In specimens referred to this species from the eastern end of the Amazon drainage (Para, Brazil) the carapace is a dull gray-brown. In juveniles, however, there are light brown, angular areas on the dorsal sides of the lateral marginal scutes (Nos. 3-9) and the ventral faces of all the marginals may be bright yellow. The plastron is dull brownish all over, possibly with yellow fringes along the anterolateral and posterolateral edges; in juveniles the central area of the plastron is dark brown, fringed with bright yellow all around except, perhaps, on the intergular. Head and neck are dull gray-brown above and below except for a yellow or whitish band along the ventral side of the mandible; in the juvenile there is furthermore an oblong, yellow mark over the temporal region and extending, less sharply defined, forward to the tip of the nose. One adult individual shows this pattern faintly. The limbs seem to be more feeble than in *dahli* or *tuberculata*. The color pattern of this form is quite characteristic and very notably different from that of the Colombian species.

A juvenile specimen, possibly representing a geographic race of *nasuta*, from the opposite side of the Amazon drainage (eastern Bolivia) differs greatly from the Para material. It has a

light brown carapace with yellow marginals beneath, whose shield boundaries are marked by brown edges. The plastron is light brown with yellowish fringes posterolaterally. The limbs are gray except for yellow areas beneath the thigh. The neck is dull brown above, throat and neck brown below. The mandible, the maxillary beak and the tympanic membrane are whitish. The dorsal surface of the head is light brown with a mottled pattern of darker brown spots. The color pattern of this specimen differs from that of *dahli* primarily in the brown underside of throat and neck and the plastral pigmentation. *Emys barbatula* Gravenhorst (1829), *Hydraspis raniceps* Gray (1855) and *Hydraspis maculata* Gray (1873) are based on specimens that resemble fairly closely the materials from the eastern end of the Amazon Basin, described above.

Distribution and Habitat: The present species is documented by specimens from the area of Sincelejo only. The only clue as to its probable distribution lies in the fact that the people of the middle and upper Sinú valley know the animal by name (see above), considering it as not edible. The turtle does not live in the major rivers, such as the Sinú or the Betanci, or in the lagunas, but rather prefers ponds in the woods. It is a fast walker on ground and may be found long distances from water. Nothing is recorded concerning its behavior in the water.

Acknowledgements: The writers are greatly indebted to Dr. Ernest E. Williams of the Museum of Comparative Zoology at Harvard University, who has kindly invited the senior author to look at the results of his and Dr. Vanzolini's forthcoming revision of the South American members of the family Chelidae thus providing a far better background for the present description than would have been otherwise possible. Our sincere thanks are due also to Dr. Robert F. Inger and especially to the late Dr. K. P. Schmidt whose contagious enthusiasm and love of herpetology have greatly inspired both of us. Miss Maida Wiebe, staff artist, Department of Geology of Chicago Natural History Museum, has rendered the illustrations in her meticulous and expert manner.

MEASUREMENTS

Phrynops (Batrachemys) dahli, sp. nov.

	CNHM 75980 type	CNHM 81991	CNHM 81992	CNHM 81993 (juv.)
Carapace length, horiz.	184 mm.	177 mm.	112 mm.	36.5 mm.
Carapace width, max.	125	130	86	27.0
Shell height	57	54	34	12.5
Carapace width at marginals 3-4	104	107	67	23.0
Plastron length, max.	160	155	99	29.0
Plastron length to notch	143	141	90	27.0
Width anterior lobe, at base	74	80	48	14.0
Width posterior lobe, at base	58	65	38	11.0
Width across anal sulci	44	47	29	7.4
Bridge length	37	37	24	6.0
Head length	53	52	37	16.0
Head width, max.	42	47	29	13.5

REFERENCES

- BOULENGER, G. A.
1889. Catalogue of the Chelonians, Rhynchocephalians and Crocodiles in the British Museum (Natural History). London, 311 pp.
- DUMERIL, A. M. C. AND G. BIBRON
1835. Erpetologie générale ou histoire naturelle des reptiles, vol. 2, Paris, 680 pp.
- GRAVENHORST, J. L. C.
1829. Deliciae Musei Zoologici Vratislaviensis. Lipsiae, 106 pp.
- GRAY, J. E.
1855. Catalogue of the shield reptiles in the collection of the British Museum. Part I. Testudinata. London, 79 pp.
1873. Observations on chelonians with descriptions of new genera and species. Ann. Mag. Nat. Hist., ser. 4, vol. 11, pp. 289-308.
- LUEDERWALT, H.
1926. Os chelonios brasileiros com a lista dos especies do Museu Paulista. Rev. Mus. Paulista, vol. 14, pp. 405-470.

MERTENS, R. AND H. WERMUTH

1955. Die rezenten Schildkröten, Krokodile und Brückenechsen. Zool. Jhrb. (Syst.), vol. 83, pp. 323-440.

ROMER, A. S.

1956. The osteology of reptiles. Chicago, 772 pp.

SCHWEIGGER, A. F.

1812. Monographiae cheloniorum. Königsberger Arch. Naturges., Math., vol. 1, pp. 271-368, 406-458.

SIEBENROCK, F.

1898. Ueber den Bau und die Entwicklung des Zungenbein-Apparates der Schildkröten. Ann. K.K. Nat. Hist. Hofmus. Wien, vol. 13, pp. 424-437.
1904. Schildkröten von Brasilien. Denkschr. Akad. Wiss. Wien. Math. Nat. Kl., vol. 76, pp. 1-28.
1909. Synopsis der rezenten Schildkröten, mit Berücksichtigung der in historischer Zeit ausgestorbenen Arten. Zool. Jhrb. Supplement 10, pp. 427-618.

STEJNEGER, L.

1909. Generic names of some chelyid turtles. Proc. Biol. Soc. Washington, vol. 22, pp. 125-128.

WAGLER, J.

1830. Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel. München, 354 pp.

WILLIAMS, E. E.

1950. Variation and selection in the cervical central articulations of living turtles. Bull. Amer. Mus. Nat. Hist., vol. 94, pp. 507-551.