

Neural Bones in Chelid Turtles from Australia and
New Guinea

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NEURAL BONES IN CHELID TURTLES FROM AUSTRALIA AND NEW GUINEA.—Several earlier authors stated that all chelid turtles from Australia and New Guinea lack neural bones in the carapace (Boulenger, 1889; Waite, 1929; Zangerl, 1948; Williams, 1953). However, Burbidge (1967) and Burbidge et al. (1974) recently noted that several neural bones are consistently present in *Chelodina oblonga* from southwestern Australia and Warren (1969) reported a single neural in a specimen of *Emydura* sp. aff. *E. macquari* (Cuvier) from the mid-Tertiary of Tasmania. While examining series of New Guinean and Australian chelid turtles in the Museum of Comparative Zoology at Harvard University (MCZ), the American Museum of Natural History (AMNH) and the University of Michigan Museum of Zoology, we have obtained additional data on the number of neurals in *C. oblonga* and found that these bones also occasionally occur in *C. novaeguineae*, *C. siebenrocki*, *C. longicollis*, *Eelsey latisternum* and *Eelsey* sp. The results of our study are presented in Table 1.

That *C. oblonga* possesses neurals has been clearly established by Burbidge (1967) and Burbidge et al. (1974). Data from two specimens available to us are in full agreement. The "*C. oblonga*" figured by Boulenger (1889) lacks neurals. However, Boulenger considered *Chelo-*

dina from northern Australia (described by Ogilby in 1890 as *C. rugosa*) to be *C. oblonga*. *C. rugosa* does not possess neurals (Burbidge, 1967; Burbidge et al., 1974) and it is probable that Boulenger figured a northern Australian *C. rugosa* in his book. The *C. oblonga* discussed by Zangerl (1948), and also lacking neurals, is probably referable to *C. rugosa* as well (Burbidge, 1967; Burbidge et al., 1974). We have examined the holotype of *C. oblonga* (BM 1947.3.5.89) radiographically, and can confirm the presence, though not the number, of neurals. Clearly visible are two large contiguous neurals between the second and third costals. This is significant since the collection locality for the specimen indicates only "West Australia." Based on external characters it has previously been unclear to the authors whether the specimen actually represents *C. oblonga* from the vicinity of Perth or *C. rugosa* from the Kimberly Plateau.

C. oblonga is the only member of its genus to regularly possess neurals. Specimens of *C. rugosa*, *C. steindachneri*, *C. expansa* and *C. parkeri* we have examined lack neurals. However, we have discovered that *C. novaeguineae* occasionally possesses small, rudimentary neurals (Fig. 1). In a series of 20 *C. novaeguineae* from southern New Guinea, five specimens have neurals. We have found these neurals extending

TABLE 1.

Species	N	No. Neurals Present										Reference
		0	1	2	3	4	5	6	7	8		
<i>Chelodina oblonga</i>	10						1	3	4	2		Burbidge (1967), Burbidge et al. (1974)
<i>Chelodina oblonga</i>	2						1				1	Present study
<i>Chelodina rugosa</i>	4	4										Present study
<i>Chelodina longicollis</i>	12	11	1									Present study
<i>Chelodina steindachneri</i>	4	4										Present study
<i>Chelodina expansa</i>	2	2										Present study
<i>Chelodina siebenrocki</i>	8	7		1								Present study
<i>Chelodina parkeri</i>	3	3										Present study
<i>Chelodina novaeguineae</i>	20	15	1	2	1	1						Present study
<i>Eelsey</i> sp.	1				1							Present study
<i>Eelsey latisternum</i>	9	8				1						Present study
<i>Eelsey novaeguineae</i>	19	19										Present study
<i>Emydura fossil</i> sp.	2	1	1									Warren (1969)
<i>Emydura subglobosa</i>	31	31										Present study
<i>Emydura krefftii</i>	8	8										Present study
<i>Emydura macquari</i>	1	1										Present study

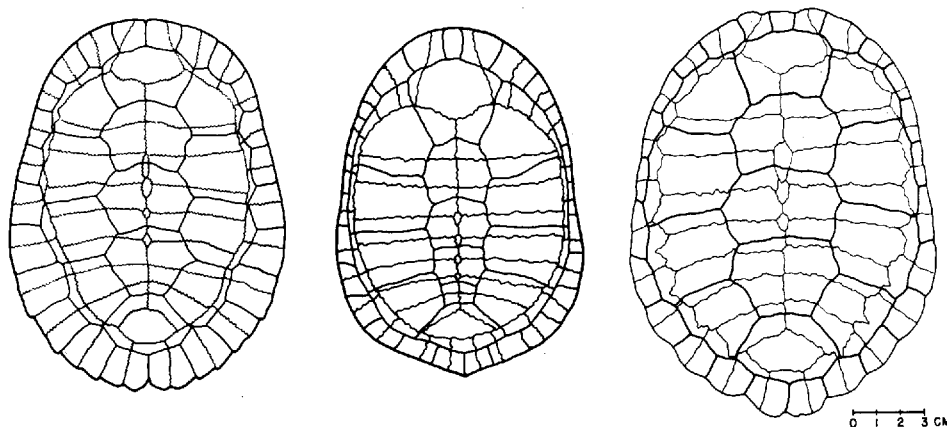


Fig. 1. Left: *Euseya latisternum* (MCZ 35011). Middle: *Chelodina novaeguineae* (MCZ 134396). Right: *Euseya* sp. (AMNH 76199).

non-contiguously from the second through the seventh costals. In addition, a single specimen of *C. siebenrocki* from southern New Guinea possesses two small, non-contiguous neurals and a *C. longicollis* from New South Wales has one small neural.

Neural bones have never been reported in *Euseya* (Burbidge, 1967; Burbidge et al., 1974). However, in a series of nine *E. latisternum* from Queensland, we found a single specimen with four neurals (Fig. 1). In addition, a single specimen of *Euseya* sp. of unknown origin also has neurals (Fig. 1). Within a series of 19 *E. novaeguineae* from southern New Guinea all lack neural bones.

Neural bones have also never been recorded from recent *Emydura* or *Pseudemydura* (Burbidge, 1967; Burbidge et al., 1974); the 31 *E. subglobosa*, eight *E. krefftii* and one *E. macquari* we examined all lack these bones. However, Warren (1969) figures a neural in a specimen of *Emydura* sp. aff. *E. macquari* from either the Oligocene or Miocene of Tasmania. He attributes the presence of this bone to either individual variation or the retention of an earlier, more primitive character that was no longer stable in the population by the mid-Tertiary. In addition, we have noted in five specimens from a series of 14 *E. subglobosa* from southern New Guinea the presence of a second, small suprapygal between the eighth costals in five specimens. This additional suprapygal is present dorsally and ventrally in three juveniles, but present only on the ventral surface of the

carapace in two larger specimens (i.e., the eighth costals meet fully in the midline on the dorsal surface of the carapace).

Burbidge (1967) and Burbidge et al. (1974) speculate that neural bones are an ancestral feature in *Chelodina* and were retained by *C. oblonga* in its isolated southwestern Australian range. It is possible that all Australian-New Guinean chelids once possessed neurals. Unfortunately the fossil record of this family is too poor to provide evidence for or against this hypothesis. The occasional presence of neural bones may be nothing more than a case of individual variation, as suggested by Warren (1969). It is important, however, in the light of theories of the progressive reduction of neurals in Pleurodira (Zangerl, 1948), to note that Australian Chelidae do possess neurals; one species regularly and others on a variable basis.

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