

Table 1. TEMPERATURE OF INCUBATION AND HATCHING TIME OF TURTLES

Species	Temperature*	No. of hatchlings†	Hatching day	
			Range	Mean
<i>Chelydra serpentina serpentina</i>	Room (1951)	9 (2)	65-69	66.9
<i>Chelydra serpentina serpentina</i>	Room (1952)	23 (8)	62-67	64.7
<i>Chelydra serpentina serpentina</i>	Room (1950)	3 (3)	66-70	67.7
<i>Chrysemys picta marginata</i>	Room (1959)	6 (6)	64-68	66.5
<i>Caretta caretta caretta</i>	30° C	2 (1)	54-55	54.5
<i>Chelydra serpentina serpentina</i>	28° C	9 (3)	55-62	58.0

* Incubation of eggs in any one group was begun at one time, in June or July. Room temperature varied considerably, but averaged close to 28° C. The dishes of eggs at constant temperature were kept in a water bath.

† The number in parentheses after number of hatchlings indicates the number of different clutches of eggs represented in each group.

timid and retiring. In my investigations the eggs are incubated in glass dishes between two layers of moistened absorbent cotton⁷. At the onset of hatching observations are recorded at least every 12 h. Some newly hatched specimens of *Chelydra serpentina serpentina* (Linné) have made their way out of the dishes, off the table, out of the laboratory, and one even down a flight of steps, all within a 12-h period. Others, on the contrary, have hidden themselves under the cotton or within the egg shell and have made no observed attempt to explore even after several days.

Miss Karen Diamond of Rockville, Maryland, told me of watching a Carolina box turtle, *Terrapene carolina carolina* (Linné), make a nest and lay her eggs under a rose bush in nearby Kensington on May 10, 1963. As the summer wore on, the spot was examined frequently for signs of emerging hatchlings. Finally, near the end of September, about 140 days later, the nest, between 4 and 6 in. deep, was dug up and revealed egg shell fragments and three live hatchlings with no sign of the yolk sac on the plastron. All three were 'timid' turtles⁸.

Domantay⁴ reports for *Chelonia mydas*, and Caldwell⁵ for *Caretta caretta caretta* (Linné), that the hatchlings usually emerge from the nest together, a fact which suggests that the more active ones open the way for the others.

In view of the foregoing evidence concerning other species of turtles, I suggest that the late emergers of *Testudo elegans* Schoepff as reported by Jayakar and Spurway¹ were not slow in developing but rather inactive as hatchlings, and that the correlation of low weight with late emergence from the hatching site is due to the yolk having been used up during the prolonged stay in the soil.

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Development of the Ovule in a Species of *Cissus*

IN an investigation of the floral morphology and embryology of the Vitaceae the following features were observed in the development of the ovule of *Cissus trilobata* Lamk. collected from Changanacherry, Kerala State, India.

The ovule is anatropous, bitegmic and crassinucellate. Of the two integuments, the inner which projects beyond the outer is initiated first by periclinal divisions in the protoderm simultaneous with the differentiation of the

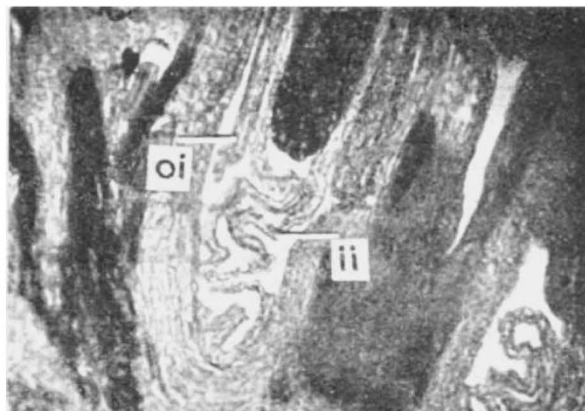


Fig. 1. Longitudinal section of the ovule ($\times 130$). oi, Outer integument; ii, inner integument

ovular archesporium in the first hypodermal layer. It develops faster than the nucellus and not only encloses the latter but also grows very long, 2-3 times the length of the nucellus, into a tubular structure which is thrown into folds and coils (Fig. 1). Although it is known that in other members of the Vitaceae the micropyle is formed by the inner integument¹⁻⁴, coiling and folding of the integument have not so far been mentioned. Moreover, such a long, coiled, and folded micropylar canal is not reported in any of the flowering plants.

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Marsupial Spermatozoa Pairing in the Epididymis of American Forms

IN 1962 Biggers and Creed¹ pointed out that conjugation (henceforth called pairing) of spermatozoa is a normal occurrence in the epididymides of the North American opossum (*Didelphis marsupialis virginiana* Kerr). Evidence has now been obtained which shows that this phenomenon is found in the majority of, if not all, marsupials in the American continents, and that, if it occurs in Australasian marsupials, it is likely to be exceptional. Also, three morphologically distinct types of spermatozoa have been found to exist in the extant American group, which consists of 69 species² grouped into 15 genera and two families. Our observations are summarized in this report.

The species of marsupial we have examined are shown in Tables 1 and 2. In most cases, fixed specimens of the testes and epididymides were examined histologically. However, the living epididymal spermatozoa of *Philander opossum* (four-eyed opossum), *Marmosa mexicana* (murine opossum), and *Caluromys derbianus* (woolly opossum) have also been examined.

Pairing of spermatozoa has been observed in the epididymides of all the species of American marsupials shown in Table 1. In no instance was pairing observed in sections of the testes. The only genera we have not been able to examine are *Glironia*, *Dromiciops*, *Caluromys*, *Lutreolina* and *Notodelphis*. A sufficient number of data are available on the two sub-species of *Didelphis* and *Philander* opossum to indicate the incidence of pairing within species. Out of 92 specimens of *D. m. tabascensis*, 88 (95.7 per cent) were paired, and out of 56 specimens of *P. opossum*, 54 (96.5 per cent) were paired. This incidence is very similar to that found for *D. m. virginiana*¹. Thus the pairing of