NOTES UPON SOME SEA TURTLES

by

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(with Plate I, and 9 text-figures)

In recent years much attention is being paid to marine turtles, and it is the merit of Deraniyagala, Carr, and others to have contributed much to our knowledge of this group. Nevertheless, our knowledge of the species and subspecies that may be recognized, and that of their distribution is as yet far from complete. Before a satisfactory classification can be reached, many more data will have to be assembled. In the meantime, notes on variations in individual cases, and locality records may be of some value to future research. It is with this in mind that the present notes are published. They are based upon specimens in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden (ML), of the Zoölogisch Museum, Amsterdam (ZMA), of the British Museum (Natural History), London (BM), and of the Royal Scottish Museum, Edinburgh (RSM). I am greatly indebted to Prof. Dr. H. Engel (Amsterdam), to Dr. H. W. Parker, Miss A. G. C. Grandison and Mr. J. C. Battersby (London), and to Dr. A. S. Clarke (Edinburgh) for permission to study the specimens in their care, and to Dr. E. Williams (Cambridge, Mass.) for information about turtles in the Museum of Comparative Zoölogy.

Deraniyagala (1939 a-b; 1943, pp. 79-80; 1952, p. 57) and Wermuth (1956, pp. 405, 406, 413) raised some nomenclatorial problems, and these are also discussed in the present notes.

The drawings reproduced in figures 2-8 do not pretend to be anything more than sketches; they were made without the help of instruments, and although they may prove to show slight errors in the proportions of the shields, I believe that they are sufficiently accurate to illustrate the features discussed in the text.

Caretta caretta (L.)

Specimens examined:

Atlantic:

1 hatchling, Florida, Dr. S. Garman, BM no. 1920.1.20.1766.
2 embr., Little Cayman Id., Caribbean, Lt. Carpenter, R.N., BM no. 82.1.17.6-7.
1 juv., Bahamas, don. De Haas, 1885, ML no. 9359.
1 hfgr., Surinam, ML no. 6182.

1 juv., Inishmore, Aran Ids., S. W. Ireland, don. S. Meskell, BM no. 1926.5.7.1.
1 juv., Collister Beach, West side of Unst, Shetland, 13.XII.1945, RSM no. 1946.8
1 juv., West side of North Uist, Outer Hebrides, 13.II.1946, RSM no. 1946.9.
1 juv., Ormaclett, South Uist, Outer Hebrides, 8.II.1960, don. Sir Walter Hungerford Pollen, BM no. 1960.1.1.16.
1 ♀ ad., Pool Roag near Dunvegan, Skye, 13.XII.1923, RSM no. 1925.101.
1 juv., Girvan, Ayrshire, 4.XII.1951, RSM no. 1952.1.
1 juv., Trevail Cove, Zennor, West of St. Ives, 12.II.1950, leg. J. Loosemore, don. Plymouth Laboratory, BM no. 1950.1.4.59.
1 juv., Selsey Bill, Sussex, 18.XI.1938, don. Mr. E. Heron-Allen, BM no. 1940.3.15.1.
1 juv., St. Aubins Bay, Jersey, 5.II.1955 don. Mr. R. F. Le Sueur, BM no. 1955.1.1.18.
1 ♀ ad., Ouddorp, Overflakkee, XII.1894, ML no. 10671.
1 juv., Noordwijk, 24.XII.1954, don. P. de Groot, ML no. 10674.

Mediterranean:

1 juv., 20 miles off Aguilas, Spain, 24.III.1899, RSM no. 1899.79.27.
1 juv., carapace, Algeria, don. Mr. Guyon, ML no. 6181.
1 hfgr., Sardinia, ML no. 6183.
1 ad., Leghorn, leg. F. Cantraine, ML no. 10672.
1 ad., Leghorn, leg. F. Cantraine, ML no. 10673.
1 ad., Catania, Sicily, don. A. G. Soika, BM no. 1949.1.2.86.
1 ad., Adriatic Sea, 14 km off the coast near Chioggia, don. A. G. Soika, BM no. 1949.1.2.85.

Indo-Pacific:

2 hatchlings, Shark's Bay, West Australia, H.M.S. "Herald", BM no. 1961.1065-1066.

No locality:

1 carapace, holotype of *Caouana elongata* Gray (1855, p. 73), BM no. 1947.3.5.41.
1 juv., ML no. 3284.

In a number of papers, Deraniyagala (1939a-b; 1943, pp. 79-80; 1952, p. 57) expresses the opinion that the specific name *caretta* Linnaeus, 1758, should not be used for the common loggerhead, but for the ridley (Atlantic ridley, Mexican loggerhead, Kemp's bastard turtle), which at present is known as *Lepidochelys kempii* (Garman) or as *Lepidochelys olivacea kempii* (Garman). Deraniyagala (1952, p. 57) states that "Schoepff restricted Linné's name *Testudo caretta* to a specimen of what is undoubtedly the Mexican olive loggerhead." If this point of view were correct, a serious confusion of names would arise. Deraniyagala went no further than to point out the change of names, which he believed to be necessary, but he did not use the corrected names in his papers. When Deraniyagala first published his conclusions (1939a-b), these were debated by Parker (1939c-d). There would be no reason to enter again upon this matter, were it not for some evidence that

the specimen described and figured by Schoepff is not the ridley, but the common loggerhead.

Deraniyagala (1943, pp. 79-80) mentions three arguments in favour of his opinion: 1°, the specimen shown on Schoepff's (1793a) plate XVI has four inframarginals on one side of the plastron; 2°, the specimen has a single enlarged mandibular scale; 3°, the carapace shown in Schoepff's plate XVII B [1]) has the shape typical of that of the ridley. These three arguments will be discussed below, and I hope to show that they do not hold good.

1. Number of inframarginals

At the time of Deraniyagala's publication it was generally assumed that the common loggerhead has constantly three inframarginals on either side, whilst the ridley has four inframarginals (exceptionally four on one side and three on the other side, De Sola, 1931, fig. 2). Since then Willgohs (1952) described a common loggerhead with four inframarginals on either side. Carr (1952, p. 394, table 10) mentions two loggerhead hatchlings from the Solomon Islands, which have four inframarginals on either side, and one hatchling with five inframarginals on the right and four on the left (out of a series of ten specimens; this author (l.c., p. 395) also states that "the aberrant occurrence of a fourth enlarged lamina on the bridge is not rare". The figure of a specimen of *C. caretta gigas* Der., published by Scott & Mollison (1956, pl. 1) is not very clear, but this specimen apparently has three inframarginals on the left, and four inframarginals on the right side. Caldwell (1959, p. 343, table 6) gives data on 154 newly hatched specimens of the common loggerhead, and among these the presence of four or more inframarginals is slightly more common than that of three inframarginals. But 57 of the specimens (i.e., 37 % have three inframarginals on either side; the other 97 specimens (i.e., 63 %) have four or more inframarginals at least on one side or the other. If the left and right sides are taken as separate cases, three inframarginals occur in 149 out of 308 cases (48.4 %), four inframarginals are found in 151 cases (49.0 %), and five are present in seven cases (2.3 %), whilst six inframarginals are found in one case (0.3 %). Among the specimens of the common loggerhead in the collections of the Leiden Museum I found one from Sardinia (Mediterranean; reg. no. 6183) which shows five inframarginals on the left side, and three on the right side (fig. 1 *c, d*). In the British Museum (Natural History) I examined a juvenile loggerhead from Florida (reg. no. 1920.1.20.1766) which had three inframarginals on one side,

1) On the plate is printed: XVII B, but this is an error for XVI B; on the cover of pt. V this plate (issued with pts. III & IV) is mentioned as XVI B.

and four on the other side. These data show that the presence of four inframarginals is no longer a reason to conclude that Schoepff's (1793a, pl. XVI; 1793b, pl. XVI) specimen cannot be a common loggerhead. Moreover, the ridley may have but three inframarginals on either side (Carr, 1952, pl. 70 fig. on lower right). Schoepff's figure does not show any trace of inframarginal pores, such as these occur in the ridley.

Despott (1930) describes two turtles captured off Malta; both specimens are referred by him to *Chelone mydas*, but as Carr (1957, p. 48) has pointed out this applies to only one of the specimens. The other is considered by Carr (1957, p. 48) to be a ridley. The figure published by Despott (1930, p. 73) shows four or five inframarginals on the left side of the specimen; it is not clear enough to ascertain whether inframarginal pores are present. It may be that Carr based his identification on the number of inframarginals, and as shown above that does not provide conclusive evidence. The specimen, which was in the museum at La Valetta (Malta), became destroyed during the second world war, and thus its characters can no longer be checked. For the present I do not consider the figure published by Despott convincing evidence that the ridley occurs in the Mediterranean, and I am strongly inclined to refer the specimen to the common loggerhead (*Caretta caretta* (L.)).

2. Mandibular Scales

Examination of the upper figure on Schoepff's plate XVI made it clear to me, that the specimen has three mandibular scales, the second of which is smallest. Above these scales the coloured figure shows an oblong dark patch, and it may be that Deraniyagala mistook this patch for a mandibular scale. In fact it represents that part of the skin above the mandibular scales, that passes under the upper lip when the mouth is closed. In having three mandibular scales, Schoepff's turtle agrees with the common loggerhead, whilst in this respect it differs from the ridley.

3. Shape of the carapace

The description of the carapace given by Schoepff (1793a, pp. 68, 71; 1793b, pp. 76, 79) agrees well with the common loggerhead. The width of the carapace is 80 per cent of its length; this value is within the range of variation of the common loggerhead. In fourteen specimens of the common loggerhead (length of carapace ranging from 180 to 965 mm) the width varies from 75.3 to 89.7 per cent of the length; the lowest value was

found in a specimen from Leghorn (length of carapace 810 mm); the highest value occurs in a specimen from Unst (length of carapace 219 mm). Carr (1952, p. 394) gives measurements of hatchlings of one Atlantic loggerhead, and of ten Pacific loggerheads; in the hatchling from the Atlantic the width is 77.1 per cent of the length, and in the hatchlings from the Pacific the width varies from 82.6-88.4 per cent. In the Mexican ridley the carapace is relatively wider; in the five specimens examined by me, the width of the carapace varies from 90.4 to 97.0 per cent, but as is shown by Carr & Caldwell (1956, p. 20 fig. 3) the width may exceed the length. However, in hatchlings of the Mexican ridley (measurements published by Carr & Caldwell, 1958, p. 254, 258, 259) the width varies from 80.5 to 89.3 per cent.

The carapace shown in Schoepff's plate XVII B is very broad in relation to its length, and in this respect it resembles to some extent the carapace of the Mexican ridley. There are some indications that either the carapace is not drawn correctly, or that it is abnormal. Instead of having a single nuchal shield, the specimen is shown to have two such shields. On the left side there seems to be an open space between the first costal and the marginals. The carapace may have been somewhat distorted, or the artist may have drawn it relatively broader than it was. The reddish-brown colour shown in the plate agrees more with that of the common loggerhead than with the colour of the Mexican ridley.

It may be pointed out that Schoepff (1793a, p. 71; 1793b, p. 79) states that the specimen shown in the plate (i.e., pl. XVI; pl. XVII B is not mentioned in the text) was captured at Leghorn (Livorno, Italy). The common loggerhead is well known from the Mediterranean, and the locality record of Schoepff's specimen is also more in favour of the specimen being a common loggerhead. Schoepff (1793a, p. 74; 1795a, pl. XVII; 1793b, p. 84; 1975b, pl. XVII) gives an additional description of a juvenile loggerhead, and I can find nothing in it that would point to the specimen being a ridley.

Summarizing, I may state that most of the evidence in Schoepff's publication points to the common loggerhead, and there is no pertinent evidence at all that his specimen was a ridley. Hence, I do not share Deraniyagala's point of view that Linnaeus's *Testudo caretta* must be restricted to the Mexican ridley. However, it is a completely different question as to which of the known species must bear the name *caretta*. This question will be discussed below.

It is evident that Linnaeus (1758) had little personal experience when he dealt with the sea turtles, and that he relied mainly upon the writings of

previous authors. Many of the earlier descriptions contain one error or another, and apparently these authors combined features of one species with those of another species. The species, which they described in this way are composites, and thus, *Testudo caretta* when first proposed by Linnaeus (1758, pp. 197-198) was a composite species. To attach the specific name *caretta* definitely to one of the species involved, it becomes necessary to examine critically the diagnosis, the locality record, and the literature cited by Linnaeus.

The locality record ("Habitat ad insulas Americanas") is of no value as the common loggerhead, the Mexican ridley, the hawksbill, and the green turtle occur in the area.

The diagnosis reads: "T[estudo] pedibus pinniformibus, unguibus palmarum plantarumque binis, testa ovata acute serrata." The description of the feet is only of use to show that *caretta* is a sea turtle, but as all turtles have flippers it is of no value as a specific character. The reference to the presence of two claws on fore and hind flippers, is useful in that it excludes the green turtle (*Chelonia mydas* (L.)), which has but one claw on each flipper; it does not exclude the other species, for two claws on the flippers occur in the hawksbill, the common loggerhead, and at least in some specimens of the Mexican ridley. The remark about the oval, sharply serrated carapace, may apply to the common loggerhead, but even more so to the hawksbill.

Linnaeus (1758, pp. 197, 198) adds four references to literature: Gronovius, Browne, Catesby, and Ray are the authors cited, and the data that may be ascertained from their writings have to be taken into consideration as well.

The last-mentioned reference ("Raj. quadr. 258, Testudo Caretta") was removed from the synonymy of *Testudo caretta* by Linnaeus himself, and it was transferred by him to the synonymy of his new species *Testudo imbricata* (Linnaeus, 1766, p. 350). The description by Ray (1693, p. 258) is a translation of that given by De Rochefort (1665, p. 248), which in its turn is a repetition of the description published by P. (1658, p. 231). The features mentioned by P. (and hence, those mentioned by De Rochefort and by Ray) can be divided into three groups: 1°, morphological characters; 2°, biological characters, and 3°, economic use.

1. P. states that the "Caret" is smaller than the other two species recognized by him (viz., the "Tortue Franche" and the "Caouanne"). Assuming that this remark refers to adult specimens, the statement points to the "Caret" being the hawksbill, although the remark by itself does not exclude the Mexican ridley.

The carapace consists of fifteen plates, both large and small ones. As

is usual in descriptions of this kind and of that time, only the costals and vertebrals are counted; the series of nuchal and marginals are not included in the count. Ten of these plates are flat, and with these two series of five costals must be meant. Four plates are curved, and these I take to be the second to fourth vertebrals. One plate is described as covering the neck, it is triangular and hollowed out; this must refer to the first vertebral. The total number of plates, divided into two series of five costals, and one series of five vertebrals, points to the "Caret" being either a common loggerhead or a Mexican ridley. The normal number of costals in the hawksbill is four on either side, and deviations from the normal situation are extremely scarce. Deraniyagala (1939d, p. 196) mentions three juveniles (out of a brood of twenty-two) which have five costals on one side and four costals on the other side; in another brood of twenty-six this abnormality was not found, and the presence of five costals on either side in an adult specimen must be extremely rare.

2. The "Caret" lays its eggs in coarse sand intermixed with small pebbles. This feature may point to the hawksbill of which Ingle & Smith (1949, p. 32) state that it lays its eggs on sandy or gravelly beaches.

3. The meat of the "Caret" is not agreeable to eat. This remark is found in many notes upon the hawksbill, which is (sometimes) poisonous in some areas of its range, but Carr (1952, p. 371), in referring to the Atlantic hawksbill, states that the meat is actually perfectly good food. The common loggerhead also is stated (P., 1658, p. 231) to provide meat of inferior quality, but it is used as food (Carr, 1952, p. 392). The remarks on this subject by P. are of little value to decide whether the hawksbill or the common loggerhead was meant.

P. (1658, p. 232) and De Rochefort (1665, p. 249) state that the "Caret" is abundant at the Yucatan Peninsula and at various small islands in the Gulf of Honduras, and they add that this shows that Pirard was misinformed when he stated that this kind of turtle was only found in the Maldives and in the Philippines.

The remarks about the quality of the meat and eggs, and upon the value of the oil for medicinal purposes do not offer any clue of importance as to the identity of the "Caret". The small size of the "Caret", the use made of its shell, and possibly its choice of a site for depositing its eggs, point to the hawksbill. On the other hand the only character mentioned, which allows of distinguishing between the two groups of genera (*Chelonia* and *Eretmochelys* on the one hand, and *Caretta* and *Lepidochelys* on the other hand), i.e., the number of plates of the carapace, definitely points to *Caretta*

and *Lepidochelys*. Thus, I arrive at the conclusion that the "Caret" of P., De Rochefort, and Ray is a composite, partly based upon the hawksbill, partly upon the loggerhead and/or Mexican ridley.

Linnaeus (1758, p. 198) refers to Catesby p. 39, pl. 39. On p. 39, Catesby (1743, 1754) uses the name "Testudo Caretta, Rochefort", and the vernacular names "Hawks-bill-Turtle" and "La Tortue Caret". The description mentions the shape of the beak upon which the name hawksbill is founded; the head and neck are said to be longer than in the other species; the hind part of the shell is narrower, and indented with sharp-pointed notches; the fore-legs are said to be longer than in the other kinds. Special mention is made of "the usefulness of its shell, so well known in mechanick uses". The reference to the shape of the beak, to the sharply serrated border of the carapace, and to the use made of the shell, all point to Catesby's "Hawks-bill-Turtle" being the species still known under that name (i.e., *Eretmochelys imbricata* (L)). The turtle figured on pl. 39 gives the impression of a hawksbill, but for two important details. The specimen shows five costals; the first costal is in contact with the nuchal, separating the first vertebral from the marginals. These features are characteristical of the loggerhead and ridley, but are not found in the hawksbill. Thus, Catesby's "Testudo Caretta, Rochefort" is also a composite, based partly on the hawksbill and partly on the loggerhead. That Catesby (p. 40) also describes the loggerhead is of minor importance, because this does not exclude the possibility of his having confused this species with the hawksbill on p. 39. One might consider the figures published by Catesby to be of less importance than the descriptions, because the figures of all three turtles (pls. 38, 39, 40) contain errors. In plate 38, supposed to depict a green turtle, the sutures between the nuchal and the anterior marginals are not shown; a longitudinal suture divides the vertebrals in at least two rows of shields [2]), and five costals are shown. The figure on plate 40 depicting the loggerhead, shows a row of additional shields along the lateral border of the costals; there are six costals, the anterior of which is continued as a narrow strip between the additional shields and the marginals. Thus the plates 38 and 40 show features not known from any species of sea turtle; in this respect plate 39 is better as it only shows existing features of two different species combined in one drawing.

Browne's (1756, p. 465; 1789, p. 465) description of "The Loggerhead Turtle" was based on a specimen captured off the Azores, many miles out at

2) The specimen is shown from the left, and three rows of shields are visible; presuming the turtle to be symetrical, it would have five rows of shields, instead of the normal three rows.

sea, an area from which both the common loggerhead and the Mexican ridley have been recorded. The description fits the species at present known as *Caretta caretta,* but it does not definitely exclude the possibility of the specimen having been a Mexican ridley. The remark that the five upper scales (viz., the five vertebrals) terminate in "a pointed bunch behind" applies to both species. I have little hope, that Browne's remarks about the after-effect of eating this turtle will offer any clue to the identity of the species. A further complication is, that Browne refers to "Testudo Cat. ii.t.39", which plate combines the characters of the hawksbill and of the common loggerhead. From his description no definite conclusion can be reached as to this turtle being a common loggerhead or a Mexican ridley.

Gronovius (1756, p. 86, no. 69) described "Testudo pedibus natatoriis, unguibus acuminatus, palmarum plantarumque binis," which Linnaeus (1758, p. 197) places in the synonymy of *T. caretta.* The species was apparently described from a newly born specimen. The word "aculeatum" used to describe the snout probably points to the presence of an egg-tooth. The remark that the snout is "acuminatum" may point to the specimen being a hawksbill. This conclusion is also strengthened by the fact that Gronovius (1763, p. 16, no. 71) in redescribing the species refers to "Grew. Mus. Societ. p. 38, tab. 3" in which plate the shell of a hawksbill is shown. The fact that the dorsal scutes are tuberculate ("*Squamae Dorsales* in medio sunt tuberculatae") may point to the common loggerhead, the Mexican ridley or to the hawksbill. Gronovius also refers to Browne's description, which, as I have mentioned above, may refer to the common loggerhead or to the Mexican ridley. He also cites "Edwards. hist. of Birds, tab. 206". Edwards (1751a, b, pl. 206; Edwards & Catesby, 1776, pl. CI) figured a hatchling turtle with four pairs of keeled costal shields, one pair of prefrontals, and one claw on fore and hind limbs. The four pairs of costals exclude this hatchling from being a loggerhead. The single pair of prefrontals, and the single claw on the limbs, point to the hatchling being *Chelonia mydas* (L.). The fact that the costal shields are keeled, does not exclude this possibility, as a faint keel occurs on the costals of hatchling green turtles. Edwards supposed this hatchling to be a hawksbill, but he is not certain of this identification being correct, as he had no specimens of the various species for comparison. Linnaeus (1776, p. 10) identified this hatchling with his *Testudo caretta,* and this may be used as additional evidence that he was rather confused about the specific characters of the various species of turtles recognized by him.

Summarizing, I arrive at the conclusion that *Testudo caretta* Linnaeus, 1758, is a composite species, based partly upon the hawksbill, partly upon the

common loggerhead, and perhaps even partly upon the Mexican ridley. There is nothing in the diagnosis, nor in the literature cited by Linnaeus that allows of assigning the name definitely to one of the species now known. The fact that Linnaeus (1766, p. 351) transferred the reference to Ray ("Raj. quadr. p. 257") to *Testudo imbricata* does not solve the problem, for he added (1766, p. 351) a reference to Seba (pl. 80 fig. 9) to the synonymy of *T. caretta* [3]). Seba's (1734, pl. 80 fig. 9) figure definitely shows a hawksbill. If Linnaeus had not been so confused about the species of sea turtles, he might have used the specific name *caretta* for the hawksbill, the tortoiseshell of which was widely known as "caret"; this would have made matters more easy for future generations. Now the common loggerhead (*Caretta caretta*) is known in some countries (inter alia in the Netherlands and Germany) as the 'false caret turtle', whilst the hawksbill (*Eretmochelys imbricata*) is known as the 'true caret turtle'. Even if we eliminate that part of Linnaeus's *Testudo caretta* which is based upon the hawksbill, it is impossible to state definitely whether the rest is based upon the common loggerhead or the Mexican ridley, although the chances are that the authors cited (e.g., Browne) had a specimen of the more widely spread common loggerhead before them. In the course of time the specific name *caretta* has become restricted to the common loggerhead of the (West-) Atlantic Ocean (*Caretta caretta caretta* (L.)), and changing the name of this species and subspecies would cause great confusion. The status of the specific name *caretta* can only be saved by establishing a neotype of *Testudo caretta* L. As H. M. Smith & Taylor (1950a, p. 315; 1950b, p. 16) restricted the type locality of *Testudo caretta* to the Bermuda-Islands it would be best if an undoubted specimen of the common loggerhead from those islands would be selected as neotype. I must leave that to some one who has a common loggerhead from the Bermuda Islands at his disposal.

Three times *Caretta caretta* (L.) has been found on the Dutch coast (fig. 1) [4]). Van Lidth de Jeude (1895, p. 211: *Thalassochelys caretta*) recorded a specimen which was captured alive near the villlage of Ouddorp (island of Overflakkee). Van Kampen & Heimans (1927, p. 50; Mertens, 1938, p. 2) mention a specimen which stranded at Scheveningen in 1927. The third specimen stranded at Noordwijk on December 26th, 1954. Of these three I have examined the specimens from Ouddorp and Noordwijk; the turtle from Scheveningen could not be traced.

The female from Ouddorp (ML no. 10671) has nine neural bones which

3) The same figure from Seba (vol. 1, pl. 80 fig. 9) is also cited by Linnaeus (1766, p. 351) for var. β of *Testudo mydas*.

4) Perhaps four times (see p. 39).

Fig. 1. Localities in the Netherlands from which marine turtles have been recorded; 1, Petten; 2, Camp; 3, Wijkermeer; 4, IJmuiden; 5, Noordwijk; 6, Katwijk; 7, Scheveningen; 8, Ouddorp; 9, Scharendijke; 10, off Domburg; 11, Westkapelle. 1, 2, 4, 6, 11, *Chelonia mydas* (L.); 5, 7, 8, *Caretta caretta* (L.); 9, *Lepidochelys kempii* (Garm.); 3, not identified, possibly, *Caretta caretta* (L.); 10, not identified.

form a continuous series; the sixth neural is very small. Behind the series of neurals a pair of costal bones forms a median suture; there are two suprapygals. The greatest length of the skull (with the horny shields still attached), measured from the anteriormost point of the snout to the posterior tip of the occipital processus, is 315 mm; the length from the anterior border of the premaxilla to the posterior border of the occipital condyle is 216 mm, and the greatest width of the head is 225 mm. The specimen weighed 280 kg (Van Lidt de Jeude, 1895, p. 212), or about 617 lb. It contained 1150 eggs; the largest had a diameter of 35 mm, and a weight of 17.5 grams; the smallest measured 25 mm, and weighed 11 grams (Van Lidth de Jeude, l.c.).

The young specimen from Noordwijk (ML no. 10674) has also nine neural bones. The third of these has become subdivided into three bones: two small bones side by side, with an elongate bone behind them; from the fifth neural a narrow strip has become separated by a transverse suture. If these small, separated elements are included in the count, there are eleven neurals in a longitudinal row. The neurals form a continuous series (fig. 5*c*).

Both specimens have the normal number of five costal shields; the numbers of marginal and inframarginal shields are indicated in table I, together with data on some of the other specimens.

Deraniyagala (1943, 1945. 1946) distinguishes between two subspecies: *Caretta caretta caretta* (L.) occurring in the Western Atlantic Ocean, and *Caretta caretta gigas* Der. occurring in the eastern Atlantic Ocean, the Indian and Pacific Oceans. Carr (1952, p. 382) is of the opinion that *C. c. caretta* occurs in the Atlantic Ocean (both west and east), and in the Mediterranean, whilst *C. c. gigas* is found in the Indian and Pacific Oceans. The main differences between the two subspecies would be found in the average number of marginal shields (12 in *C. c. caretta*; 13 in *C. c. gigas*), and in the series of neural bones (7 or 8, the series rarely interrupted in *C. c. caretta*; 7 to 12, the series usually interrupted in *C. c. gigas*). Caldwell, Carr & Ogren (1959, p. 307) have stated that the number of marginal shields does not hold good as a character to distinguish between the two subspecies, and some additional evidence may be given here. Individual counts for twelve specimens from Key West are given by Deraniyagala (1946, p. 195); the average calculated from the numbers mentioned by Deraniyagala is lower than the average calculated from the numbers of marginals mentioned by other authors, and it crossed my mind that the difference might be explained by the supracaudals being excluded in the counts of the Key West specimens, whilst they were included in the counts published by other authors. Dr. Ernest E. Williams, Museum of Comparative Zoölogy, Cambridge (Mass.) has checked the

TABLE I.

Caretta caretta (L.)

	Reg. no.	Marginals r.	Marginals l.	Infra-marginals r.	Infra-marginals l.	Measurements of carapace in mm length	width	Width × 100 / length	
Florida	BM 1920.1.20.1766	13	13	4	3	—	—	—	
Little Cayman Id.	BM 82.1.17.6-7	12	12	3	3	—	—	—	
		12	12	3	3	—	—	—	
Bahamas	ML 9359	13	13	3	3	198.5	155	78.1	
Surinam	ML 6182	13	13	3	3	422	358	84.8	
Inishmore	BM 1926.5.7.1	13 [1]	13	3	3	198.5	169.5	85.4	
Unst	RSM 1946.8	13	13	3	3	219	196.5	89.7	
N. Uist	RSM 1946.9	13	13	3	3	180	160.3	89.0	
Ormaclett	BM 1960.1.1.16	12	13	3	3	248	211	85.1	
Pool Roag	RSM 1925.101	13	13	3	3	—	—		140 kg
Girvan	RSM 1952.1	13	13	3	3	228	197	86.3	
Trevail Cove	BM 1950.1.4.59	12	12	3	3	186	160	86.0	
Selsey Bill	BM 1940.3.15.1	13	13	3	3	202	174	86.1	
St. Aubins Bay	BM 1955.1.1.18	12	12	3	3	190.5	169.5	89.0	
Ouddorp	ML 10671	12	13	3	3	965	765	79.3	280 kg
Noordwijk	ML 10674	13	13	3	3	205.5	170	82.7	
Aquilas	RSM 1899.79.27	13	13	3	3	—	—	—	
Algeria	ML 6181	13 [2]	13	—	—	—	154.5	—	
Sardinia	ML 6183	12	12	3	5	441	356	80.7	
Leghorn	ML 10672	12	12	3	3	810	610	75.3	
Leghorn	ML 10673	13	13	3	3	625	475	77.6	
Catania	BM 1949.1.2.86	12	12	3	3	—	—	—	
Chioggia	BM 1949.1.2.85	13	13	3	3	—	—	—	
Shark's Bay	BM 1961.1065-1066	12	12	3	3	—	—	—	
		12	12	3	3	—	—	—	

counts of some of the Key West specimens, and to make the counts comparable to those made by Deraniyagala himself, and to those made by other authors they must be raised by one. Thus the counts for the Key West specimens become 12 marginals in seven instances, 13 marginals in sixteen instances, and 14 marginals in one instance. Individual counts for twenty four specimens from Jekyll Island are given by Caldwell, Carr & Ogren (1959, p. 307); to these may be added the counts for the specimens examined by me (table I), the counts for the specimen from Norway given by Willgohs (1952, p. 1), those published by Cadenat (1949, p. 19), and by Carr (1942, pl. I; 1952, p. 394). Individual counts for specimens of *C. c. gigas* are given by Deraniyagala (1946, p. 195), and to these may be added the counts for ten

1) Second marginal very small

2) Second marginal very small; the first and third marginals meeting laterally and mesially of the second.

hatchlings from the Solomon Ids. (Carr, 1952, p. 304), those for a specimen mentioned by Scott & Mollison (1956, pl. 1), and for two hatchlings from Shark's Bay, W. Australia, in the British Museum (Natural History). The variation in the number of marginals has been indicated in table II. The average number of marginals in 43 specimens from the West Atlantic is 12.62, that for 12 specimens found on the coasts of Western Europe is 12.71,

TABLE II.

Caretta caretta (L.) Variation in the number of marginal shields.

	Number of specimens	Number of marginals of either side				Average
		11	12	13	14	
C. c. caretta (L.)						
Key West	12	—	7	16	1	12.85
Jekyll Id.	12	—	8	16	—	12.67
„ „	12	—	13	11	—	12.46
Carr, 1942, pl. I	1	—	—	2	—	
Carr, 1952, p. 394	1	—	2	—	—	
Florida, BM. 1920.1.20.1766	1	—	—	2	—	
Little Cayman Id., BM 82.1.17.6-7	2	—	4	—	—	
Bahamas, ML 9359	1	—	—	2	—	
Surinam, ML 6182	1	—	—	2	—	
Western Atlantic, total	43	—	34	51	1	12.62
Cadenat, 1949, p. 19	6	—	2	10	—	
Willgohs, 1952, p. 1	1	—	1	1	—	
E. Atlantic, table I	11	—	6	16	—	
Eastern Atlantic, total	18	—	9	27	—	12.75
Mediterranean, table I	7	—	6	8	—	12.57
Eastern Atlantic + Mediterranean	25	—	15	35	—	12.7
Atlantic (W. and E.) + Mediterranean	68	—	49	86	1	12.65
C. c. gigas Der.						
Deraniyagala, 1946, p. 195	13	2	3	19	1	
Carr, 1952, p. 304	10	—	1	19	—	
Scott & Mollison, 1956, pl. 1	1	—	—	2	—	
Shark's Bay, BM 1961.1065-1066	2	—	4	—	—	
Indo-Pacific, total	26	2	8	40	1	12.78

that for 6 specimens from Senegal (West coast of Africa) is 12.83, for 7 Mediterranean specimens 12.57, and for 26 specimens of *C. c. gigas* from the Indo-Pacific 12.78. I do not believe that these slight differences in the

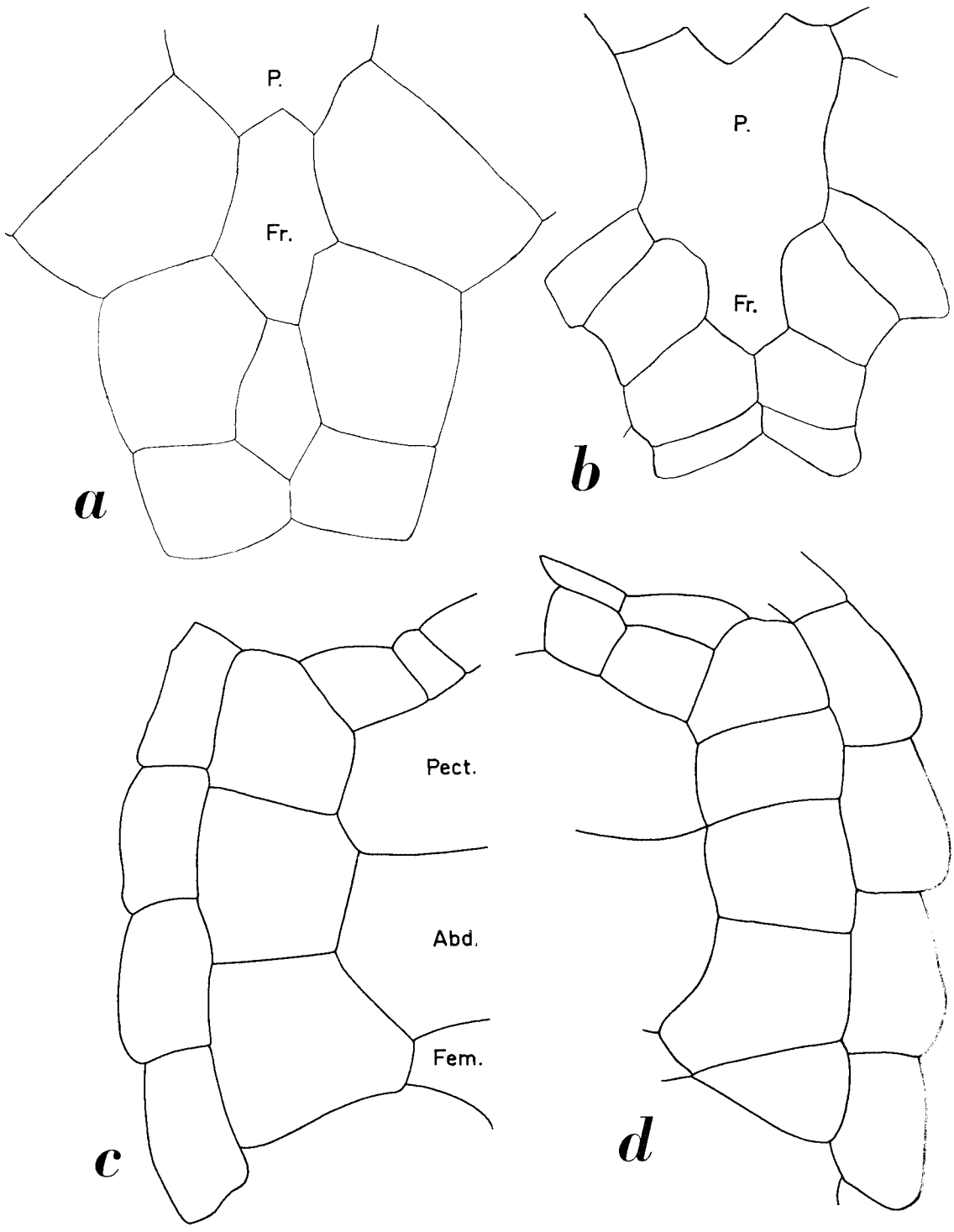

Fig. 2. *Caretta caretta* (L.); *a*, anterior head shields, Leghorn, ML 10673; *b*, head shields (frontal and parietal fused), Pool Roag, RSM 1925.101; *c*, right inframarginals, and *d*, left inframarginals, Sardinia, ML 6183. Abd., abdominal; Fem., femoral; Fr., frontal; P., parietal; Pect., pectoral.

average numbers of marginals are of any value to distinguish between subspecies, nor that they do give any clue as to the area from which the specimens stranded on the coasts of western Europe did originate. There will be slight differences in the averages from population to population (as from locality to locality), and even from nest to nest (average for twelve specimens from one nest 12.67, and for twelve specimens from another nest 12.46; both from Jekyll Id.).

In the number of neurals (nine or at the most eleven) the two Dutch specimens would be within the range of variation of *C. c. gigas*; the fact that the series of neurals is continuous points to *C. c. caretta*. Of only a few specimens from the Atlantic Ocean the neurals have been studied, and for the present it seems hardly possible to distinguish between two subspecies on this character alone.

The shell of the specimen from Ouddorp bears a number of barnacles (Holthuis, 1952, p. 77: *Chelonibia caretta* Spengler, and *Platylepas hexastylos* (O. Fabr.)); both species have a wide distribution, and they do not give any clue to the area from which the loggerheads reached the Dutch coast. The general trend of the ocean currents, however, is in favour of the hypothesis that these turtles come from the western Atlantic Ocean.

Caretta caretta has two pairs of prefrontals, which may vary in size; although the anterior and posterior frontals may be about equal in size (e.g., fig. 3*f, g*), the posterior frontals are distinctly longer than the anterior shields in many specimens (fig. 2*a, b*; fig. 3*a-e, h*). In some specimens the left and right prefrontals are in contact over the whole of their length (figs. 2*b*, 3*f*), but very often additional shields are wedged in between the prefrontals. Sometimes a single, small, lozenge-shaped shield is wedged in on the intersection of the longitudinal and transverse sutures between the prefrontals (fig. 3*g*); this azygous extra shield may be large (fig. 3*a*), and it even may completely separate the posterior prefrontals (fig. 1*a*). In other specimens two shields are wedged in at the intersection of the sutures (fig. 3*c, d*) and these two may become so large as to separate the posterior prefrontals (fig. 3*e*). The specimen from the Bahamas has three additional shields, which completely separate the prefrontals (fig. 3*b*), and in that from Inishmore the prefontals are separated by four additional shields (fig. 7*a*). In several specimens a small, transversely oval shield is wedged in between the frontal and parietal (fig. 3*b, e, h*). Incisures originating from the border may partly subdivide a shield (the posterior prefrontals, fig. 3*a*; the azygous shield between the prefrontals, fig. 3*h*; the parietal, fig. 8*a*).

The shape and the number of mandibular scales show some variation

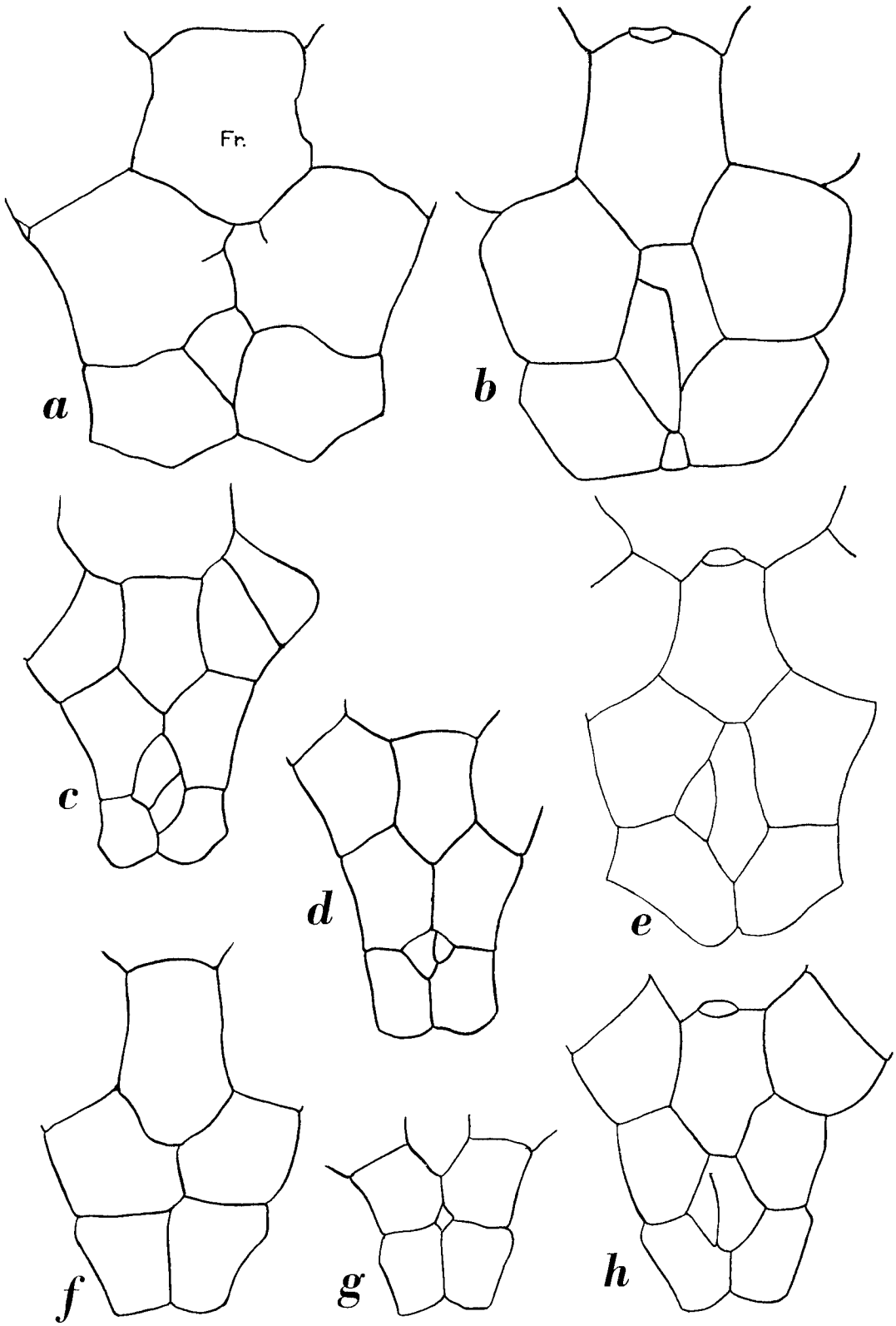

Fig. 3. *Caretta caretta* (L.), anterior head shields; *a*, Ouddorp, ML 10671; *b*, Bahamas, ML 9359; *c*, Collister Beach, RSM 1946.8; *d*, North Uist, RSM 1946.9; *e*, Surinam, ML 6182; *f*, Girvan, RSM 1952.1; *g*, Ormaclett, BM 1960.1.1.16; *h*, Noordwijk, ML 10674. Fr., frontal.

(fig. 4). Some specimens have three large mandibular scales in a row (e.g., fig. 4*a, c*), but often the central scale of this series is distinctly smaller than the others (fig. 4*e, i, k, l, n*); this central scale may be reduced to such an extent that the anterior and posterior scales get into contact (fig. 4*g, j*), and in some specimens it is reduced to a small, triangular scale wedged in between the lower parts of the other scales (fig. 4*h*); in some specimens only two large mandibular scales are present (fig. 4*m*).

It has been mentioned already that the number of inframarginals is subject to variations, and that although many specimens have three inframarginals on either side, this number may rise to six (p. ...). The inframarginals of the specimen from Sardinia, which has three shields on the right, and five on the left are shown in fig. 2 *c, d*. A hatchling from Shark's Bay, approaches to having four inframarginals on one side (fig. 5*e*); the fourth is separated from the femoral by a very small shield. In specimens having but three inframarginals, the third may be in contact with the femoral (figs. 2*c*, 7*b*), or it may be separated from the femoral by an additional shield (fig. 7*c*). In none of the loggerheads examined by me did I find any trace of inframarginal pores such as these occur in the specimens of *Lepidochelys*. Carr (1952, p. 395) states that occasionally traces of inframarginal pores may be found in loggerheads; more elaborate data on the occurrence of pores in the common loggerhead are much wanted, for up to the present I believe the absence of pores in *Caretta,* and their presence in *Lepidochelys* to be a distinctive feature.

In juvenile loggerheads one or more scales on the outer margin of the fore limb may be strongly convex, protruding beyond the other scales; sometimes these scales are blunt (fig. 5*a*), but in other specimens they are distinctly spinose (fig. 5*b*), and the spines may be curved ventrally. In the adult specimens examined by me these protruding scales are less distinct, but it is possible that this is due to the adult specimens having been dried. Although I have no proof whatever, it might be possible that these scales develop into strong, more or less ventrally curved spines in males, allowing of a firmer hold on the carapace of the female, whilst they are but raised and blunt in females. This might also explain why they are less evident in the adult specimens examined by me; most adult specimens in collections are females, which were caught when coming ashore to lay eggs.

The gulars may be in contact over the whole of their length (e.g., specimens from Sardinia, Surinam, Selsey Bill, St. Aubins, Bay, etc.), but sometimes an intergular may be present; in some specimens it is a very small scale, hardly worth to be called an intergular, but in other specimens (e.g., the holotype of *Caouana elongata* Gray, the two specimens from Leghorn; fig. 6*a*) a

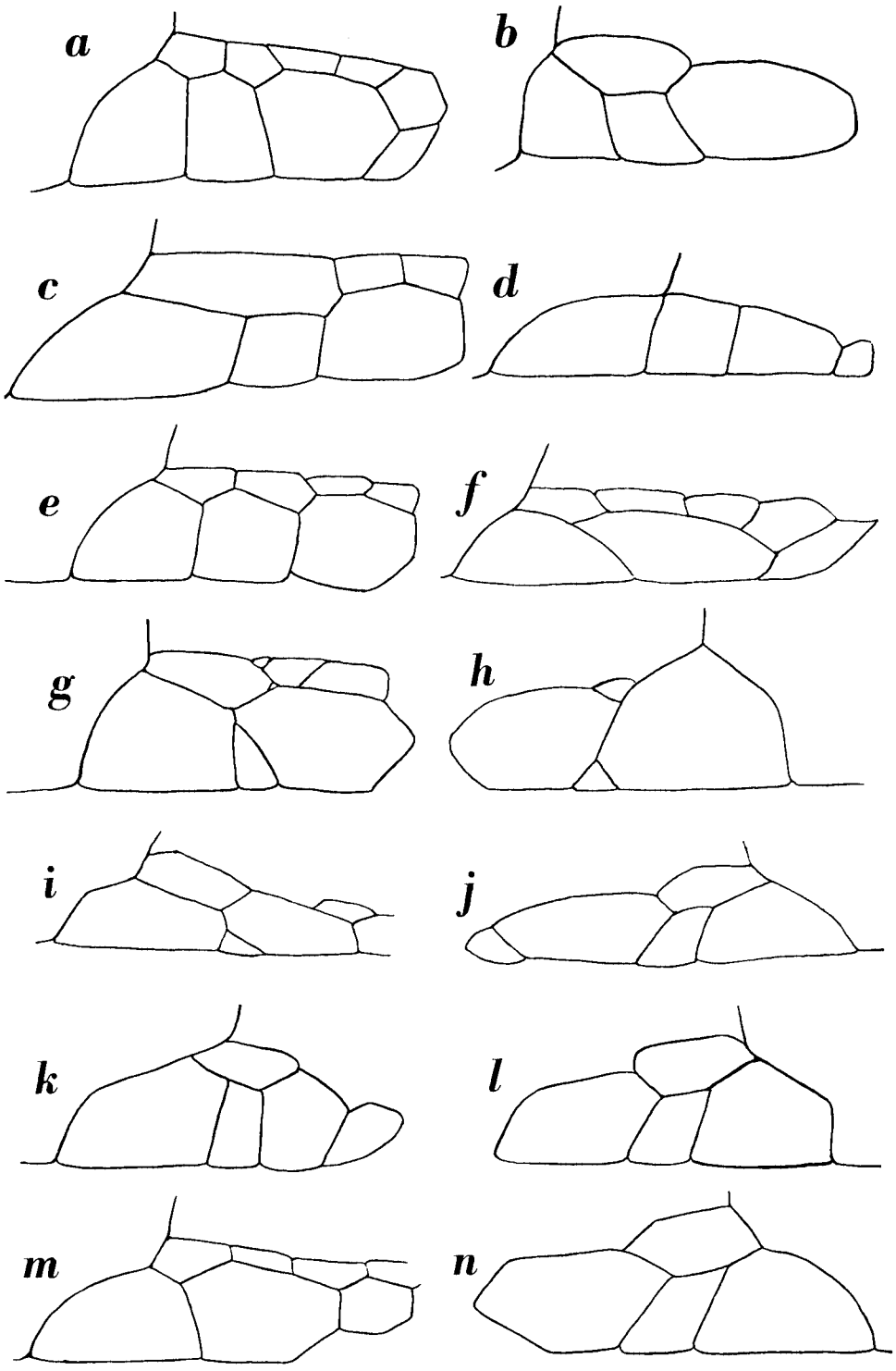

Fig. 4. *Caretta caretta* (L.), mandibular scales; *a*, Noordwijk, ML 10674; *b*, Ouddorp, ML 10671; *c*, Collister Beach, RSM 1946.8; *d*, Aguilas, RSM 1899.79.27; *e*, Girvan, RSM 1952.1; *f*, Sardinia, ML 6183; *g*, *h*, Leghorn, ML 10672; *i*, *j*, Surinam. ML 6182; *k*, *l*, Inishmore, BM 1926.5.7.1; *m*, *n* Ormaclett, BM 1960. 1.1.16; *a-g*, *i*, *k*, *m*, left side; *h*, *j*, *l*, *n*, right side.

distinct intergular is present. The loggerhead from Inishmore (fig. 6*b*), and that from Girvan (fig. 6*c*) have paired, asymmetrical intergulars. Sometimes

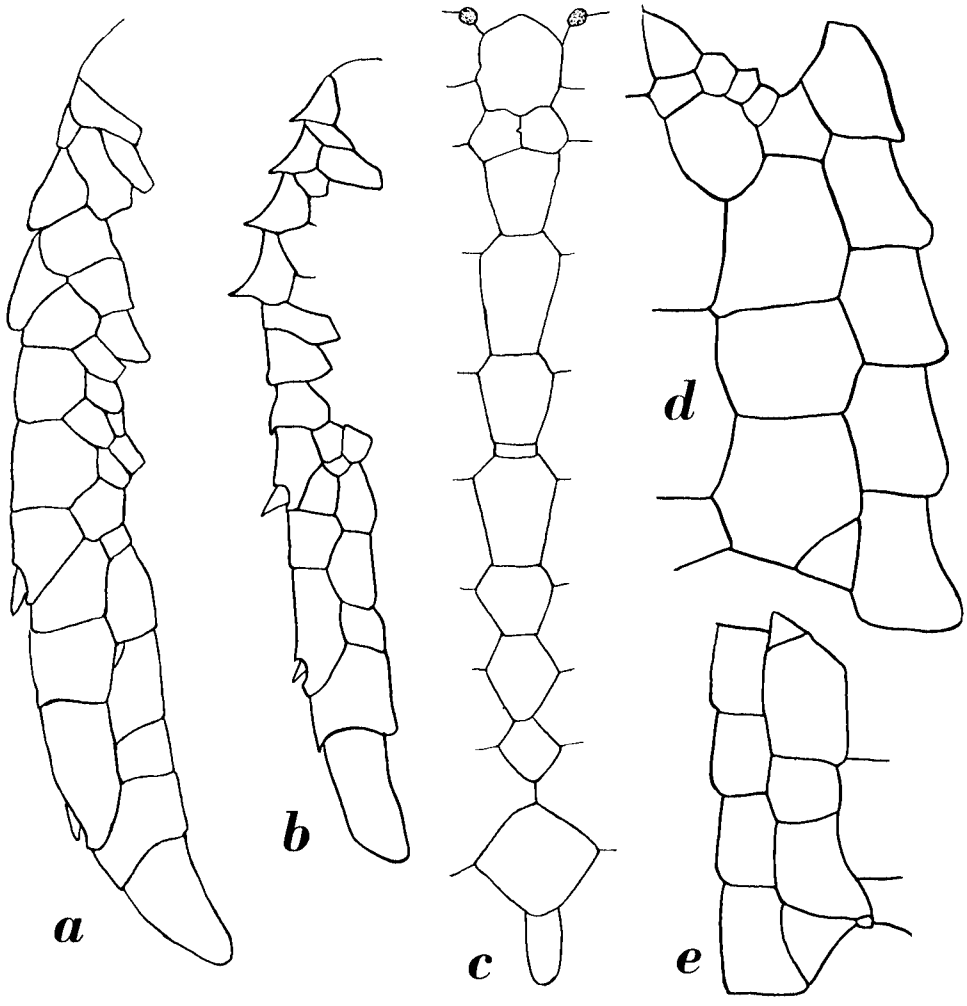

Fig. 5. *Caretta caretta* (L.). *a, b,* outer border of fore limb; *a,* Bahamas, ML 9359; *b,* Inishmore, BM 1926.5.7.1; *c,* series of neural bones, Noordwijk, ML 10674; *d,* left inframarginals, Inishmore, BM 1926.5.7.1; *e,* right inframarginals, Shark's Bay, BM 1961.1065-1066.

an interanal is present, it may be a very small scale, but in some specimens (e.g., a specimen from Leghorn, ML 10673) a distinct interanal is present; the other specimen from Leghorn (ML. 10672, fig. 7*a*) has rather large, paired interanals.

Testudo viridi-squamosa Lacepède, 1788

Lacepède (1788a, p. 92; 1788b, vol. 1, p. 119) describes a sea turtle under the French name of "Tortue écaille-verte". In a "Table Méthodique des Quadrupèdes ovipares", he also mentions the "Ecaille verte" with the diagnosis: "écailles vertes sur la carapace", and in a "Synopsis methodica quadrupedem oviparorum", under the genus *Testudo* he mentions *T. viridi-squamosa* with the diagnosis: "Squamis testae superiori viridibus". Both the Table Méthodique and the Synopsis Methodica are printed on a large sheet (about 106 × 54 cm), which probably was issued with the first volume of the edition in quarto (1788a) of his "Histoire naturelle des Quadrupèdes ovipares et des Serpens". Very probably these sheets became lost in various instances (e.g., they are lacking in the copy of the library of Leiden University), and hence the names may have escaped notice. In the edition in 8° (1788b) the Table Méthodique is included in the first volume (pp. 37-60), whilst the Synopsis Methodica is included in the second volume (pp. 443-462). A later edition in 4° (1799) contains only the Table Méthodique. The latin name *T. viridi-squamosa* is not mentioned in the Alphabetical list of all names mentioned in his book.

Whether the latin names used by Lacepède are available nomenclaturally is open to doubt, for his book is not strictly binominal; the loggerhead is named *Caouana*, and the green turtle is named *Testudo marina vulgaris*; Loveridge & Williams (1957, p. 474) refer to the last-mentioned name as *Testudo marina* (seu *vulgaris*) but there is no evidence that Lacepède considered *marina* and *vulgaris* as alternative names for the green turtle (Lacepède, 1788a, p. 54, footnote *a* refers to the Testudo marina vulgaris of Ray).

Wermuth (1956, p. 405) identifies Lacepède's *Testudo viridi-squamosa* with the Mexican ridley (*Lepidochelys olivacea kempii* (Garm.)), and he restricts the type locality of *viridi-squamosa* to "Bocas del Toro, Panama, Golf von Mexico." If *viridi-squamosa* and *kempii* would be proven to be identical, the selection of the type locality is not a lucky choice, because it is outside the range of *kempii*, such as this is known at present. The Mexican ridley does occur in the Gulf of Mexico, but hitherto it has not been recorded from the Caribbean (Carr, 1957, p. 45; Carr & Caldwell, 1958, p. 259). The restricted type locality "Bocas del Toro" is not situated on the Gulf of Mexico, but on the Panama coast of the Caribbean.

Lacepède did not examine specimens himself, and his description (Lacepède, 1788a, pp. 92-94; 1788b vol. 1, pp. 119-122) is based upon notes published by Valmont de Bomare, remarks made by travellers, and upon

observations made by the Chevalier de Widerspach. The French name "Tortue écaille-verte" is a substitute name for "Tortue verte" used for this species by Dampier (Lacepède, 1788a, p. 92, note *a*; 1788b, vol. 1, p. 119, note *a*). Lacepède rejects the name "Tortue verte", because it is also used for the "tortue franche" (i.e., *Chelonia mydas* (L.)). He also rejects the name "tortue Amazone", derived from the occurrence of this turtle on the banks of the River Amazon, and used for it in a large part of South America, because this name appeared to have been applied also to another species, which is not a sea turtle (Lacepède, 1788a, p. 92; 1788b, vol. 1, p. 119).

Before discussing the possible identity of *Testudo viridi-squamosa,* we may first examine the data about the distribution mentioned by Lacepède, and given in literature cited by him. As said above, according to Lacepède the species occurs at the River Amazon, and apparently in a large part of South America. From the reference to observations by the Chevalier de Widerspach, it may be inferred that it occurs in French Guyana, for Widerspach is mentioned by Lacepède (1788, p. 58, note *e*; 1788b, vol. 1, p. 76, note *e*) as being "Officier au Bataillon de la Guyane". Further, Lacepède states that the species occurs in fairly great numbers in the South Seas near Cape Blanco in New Spain, and that it apparently is also found in the Gulf of Mexico, and at nearly all shores in the tropics of the New World, both north and south of the equator; it has not been found in the Old World (Lacepède, 1788a, pp. 93-94; 1788b, vol. 1, pp. 120-121). The locality "Blanco, cap de la nouvelle Espagne dans la mer du Sud" is mentioned also by Lacepède (1788a, p. 93, note *d*; 1788b, vol. 1, p. 121, note *d*) in a quotation from the narrative of Dampier's voyage round the world. In an English translation (Lacepède, 1802, p. 126) this locality is given as: "Cape Blanco, on the western coast of Mexico, in the South Seas". The same locality had been mentioned already for Dampier's "tortue verte" by Daubenton (1784, p. 692). Indeed Dampier (1698, p. 129; 1701, p. 121; 1723, p. 146) mentions visiting "Cap Blanc, ou Blanco, sur le continent de Mexique", and in the English editions (1697, p. 111; 1729, p. 111; 1927, p. 83): "Cape *Blanco,* on the Main of *Mexico*". From this cape, which is situated in Costa Rica [5]), Dampier does not mention any turtles. However these are mentioned from "*Blanco* dans les Indes

5) New Spain (Nouvelle Espagne) was a vice-kingdom consisting of Mexico and the whole of Central America, and at a time also including Venezuela, and it sometimes is considered to be more or less synonymous with Mexico. This cape is indicated as "C. Blanco" on Dampier's map (1698 and 1701, facing, p. 17; 1729, facing p. 24; 1906, facing p. 54; 1927, facing p. 26). Two other capes are marked as "C. Blanco" on this map: one in Peru (and hence, beyond the borders of New Spain), and one on the north coast of Venezuela (and thus outside the South Seas).

Occidentales" (Dampier, 1698, p. 122; 1701, p. 115, 1715, p. 137; 1723, p. 137), or "at *Blanco* in the *West-Indies*" (Dampier, 1697, p. 105; 1729, p. 105; 1906, p. 131; 1927, p. 79). From his narrative (1698, p. 68; 1701, p. 64; 1723, p. 77; 1729, p. 57; 1906, p. 87; 1927, p. 48) it is clear that with Blanco as a locality for turtles, Dampier meant the island of Blanquilla in the Caribbean. I do not know which edition Lacepède used, and therefore I do not know when and where the error crept in by which "Blanco in the West Indies" became changed to Cape Blanco on the Pacific coast of New Spain. Whilst the French (1701; 1723) and English (1697; 1729; 1906; 1927) texts examined by me agree in most respects, they differ in one point, viz., where Dampier compares the turtles from Blanco to those of other localities; in the English text (1697, p. 105; 1729, p. 105; 1906, p. 131; 1927, p. 79) it is stated that they are larger than any others from the "North-Seas", but in the French text (1698, p. 122; 1701, p. 115; 1715, p. 137; 1723, p. 137) they are said to be larger than any others from the "mer du Sud"; in the version given by Lacepède, which places Blanco in the South Seas, they are stated to be larger than any others "de la même mer". However this may be, the changing of Blanco in the West-Indies into a cape in New Spain, certainly was an error.

In the same quotation the following localities are mentioned: Bocca-Toro de Veragua (Dampier, 1698, p. 122; 1701, p. 115; 1723, p. 138: "Bocca-toro, qui est à l'Occident de Porto-bello"; 1697, p. 105: "Bocca Toro, West of Portabel"; 1729, p. 105, 1906, p. 131, and 1927, p. 79: "Boca Toro, West of Portobel"), the Bay of Honduras, the Bay of Campeche, and Port Royal in the Bay of Campeche.

As Lacepède's "tortue écaille-verte" is based for a large part upon the "tortuë verte" or "Green-turtle" of Dampier, it is necessary to examine what Dampier wrote about this turtle. After having mentioned the presence of "tortuës vertes" (1698, p. 69; 1701, p. 65; 1723, p. 78) or "Green-turtles" (1697, p. 58; 1729, p. 58; 1906, p. 87; 1927, pp. 48-49) at Blanco (i.e., Blanquilla), turtles which for their size, and the quality of their meat are better than any others, Dampier (1697, pp. 103-108; 1698, pp. 119-125; 1701, pp. 112-118; 1723, pp. 134-141; 1729, pp. 103-108; 1906, pp. 129-132; 1927, pp. 77-81) deals more at length with the sea turtles, when describing his visit to the Galapagos Islands. In the channels between these islands the "tortuë verte" ("Green-Turtle") is abundant. Dampier distinguishes between four species of sea turtles viz., 1°, "grosses Tortuës, ou Tortuës à Bahu", "Trunk-turtle"; 2°, "grosses têtes", "Loggerhead"; 3°, "becs à Faucon", "Hawksbill"; 4°, "Tortuës vertes", "Green-turtle". Where, in the following notes I use the name "tortue verte", the remarks also apply to the "Green-

Turtle" of the English text. The "tortuë verte" is described as having the shell more green than that of the other species; its back is flatter than that of the hawksbill, and its head is small and rounded. The tortoise-shell procured from this species is very thin and transparent, it is better clouded than that of the hawksbill, but on account of its being extremely thin it is used only for inlaid work. Its meat is the best of all species, but the quality varies, as also does the size of the specimens. These variations are described (1697, p. 105; 1698, p. 122; 1701, pp. 114-115; 1723, pp. 137-138; 1729, pp. 105-106; 1906, p. 131; 1927, p. 79) for specimens from Blanco, Boccatoro, the Bays of Honduras and Campeche. Specimens from the Bays of Honduras and Campeche are smallest, but one turtle from Port-Royal in the Bay of Campeche was extremely large (a boy of nine or ten years used the carapace as a boat to row out to his father's ship). At Blanco the fat is yellow, at Bocca-toro less yellowish, and in the turtles of the Bays of Honduras and Campeche the fat is green; remarks are also made about the colour of the flesh. The turtles from the small islands south of Cuba vary in size, some are larger, some are small, and they also show differences in the colour of their flesh (1697, p. 106; 1698, p. 123; 1701, p. 115; 1723, p. 138; 1729, p. 106; 1906, p. 132; 1927, p. 79). The turtle from the Galapagos Islands (1698, p. 123; 1701, p. 116; 1723, p. 139; 1729, p. 106; 906, p. 132; 1927, p. 80) is described as being a kind of "Tortuë verte batarde" ("bastard green Turtle"). Here the French text differs from the English text. Whilst the French texts (1698, p. 123; 1701, p. 116; 1723, p. 139) state that the shell of the Galapagos turtle is thicker than that of the other "Tortuës vertes des Indes Occidentales", the English text (1697, p. 106; 1729, p. 106; 1906, p. 132; 1927, p. 80) reads: "for their shell is thicker than other green Turtle in the *West* or *East-Indies*". The French text mentions them to be larger than any other species of turtle, the English texts reads: "larger than any other green Turtle". Their shell commonly is two or three feet high, and the plastron five feet wide. Their flesh is not as "sweet" as in other (green) Turtles. There are other "Tortuës vertes" in the Pacific, which are not so big as the smallest Hawksbill, they are rank, but fat, and they are found at the island of Plata (i.e., La Plata, Ecuador) and thereabouts (1697, p. 106; 1698, p. 123; 1701, p. 116; 1723, p. 139; 1729, p. 106; 1906, p. 132; 1927, p. 80). Moreover, Dampier (1701, p. 116; 1723, p. 139) mentions another kind of turtle, which is very small, but good to eat; it is found to the west of the Mexican coast; in the English text (1697, p. 107; 1729, p. 107; 1906, p. 132; 1927, p. 80), this small turtle is mentioned as a kind of green turtle.

Lacepède (1788a, p. 94; 1788b, vol. 1, p. 122) mentions Bomare as being the only naturalist to have indicated this species of turtle. Valmont de Bo-

mare (1769, p. 490), remarks that there is a species of turtle, which is called the green turtle, because its carapace is much more green than that of the other species. The Tortoise-shell is very thin and transparent, and it is used only for inlays. By putting coloured sheets under the tortoise-shell one can give any colour to the inlays; for this the yellowish tortoise shell, that shows neither veins nor clouds, is chosen and not the greenish shell. Lacepède does not refer to Daubenton (1784, p. 692), who also mentions the varieties of turtles described by Dampier.

Wertmuth (1956, p. 405) is of the opinion that the characters mentioned by Lacepède (viz., the small and rounded head; green colour) make it impossible that *viridi-squamosa* is identical with *Chelonia mydas* (L.), *Caretta caretta* (L.), and *Eretmochelys imbricata* (L.); the green colour of the carapace would definitely point to Lacepède's species being *Lepidochelys olivacea* (Eschsch.), and on the basis of the locality records it must be the Mexican ridley (*L. o. kempii* (Garm.)). It must be remembered that the characters mentioned above, were apparently taken from Dampier's description, who used them to distinguish his "Tortuë verte" from other species, and with this in mind the characters may be of some value. Thus, the small size of the head may distinguish the "tortuë verte" from the "grosses têtes" (loggerhead, *Caretta caretta*), and in the same way it may be used to distinguish between *Chelonia mydas* and the loggerhead. The rounded head may distinguish the "Tortuë verte" from the "bec à Faucon" (hawksbill, *Eretmochelys imbricata*), and the same difference exists between *Chelonia mydas* and the hawksbill. The head of the Mexican ridley is described by Carr (1952, p. 398) as being large, and in this the description of *viridi-squamosa* fits *Chelonia mydas* rather than the Mexican ridley.

As far as Lacepède used the description by Dampier, it must be pointed out that Dampier included specimens from the Pacific in his "Tortuë verte", and the Pacific subspecies of *Chelonia mydas* is described by Carr (1952, p. 360) as being "essentially a greenish-olive turtle"; Wermuth & Mertens (1961, p. 235) state that the carapace of Pacific specimens is "vorwiegend grünlich oder olivfarben". Of the Atlantic subspecies of *Chelonia mydas,* Carr (1952, p. 348) states that the carapace is sometimes shaded with olive, and this I can only explain as the carapace sometimes having some kind of a greenish tinge. The Mexican ridley is described by Carr (1952, p. 398) as being "predominantly (and very constantly) gray in color"; Wermuth & Mertens (1961, p. 242) describe *kempii* as being "dunkelgrau".

The majority of the localities mentioned by Lacepède are within the range of *Chelonia mydas,* but outside, of that of *kempii,* and this pertains especially

to the restricted type locality of Bocas del Toro, Panama. The only locality that may be within the range of *kempii* is the Bay of Campeche.

Thus, neither the small, rounded head, nor the greenish colour, nor the distribution point to *viridi-squamosa* being identical with *kempii*. They are (at least to some extent) compatible with Lacepède's species being identical with *Chelonia mydas*. The remark by Dampier (1701, p. 114; 1723, p. 137; 1729, p. 105; 1927, p. 79) that the tortoise-shell of the "Tortuë verte" is extremely thin, and that it is used for inlays I cannot check, but I may point to the statement by Schoepff (1793 b, p. 100; referred to by Schubart, 1931, p. 1415) that the tortoise-shell of the green turtle once was used to make lanterns. Whether the shell of *kempii* is ever used I do not know. The remarks on the quality of the meat of *viridi-squamosa* does not give much help; they agree with the opinion generally expressed that *Chelonia mydas* provides the best meat, but as mentioned on p. 7 the statements with regard to the value of the meat of the different species are at variance; it is difficult to identify a species by the taste of its meat, such as this is described by eighteenth century authors.

From the above it will be clear that I do not consider Wermuth's identification of *Testudo viridi-squamosa* of Lacepède (1788a and 1788b) as well-founded. On the contrary, I believe that there is much in the description, and in the literature cited, that points more to *Chelonia mydas* (L.) than to any other species. Therefore, I agree with Loveridge & Williams (1957, p. 474), who refer Testudo *viridi-squamosa* Lac. to the synonymy of *Chelonia mydas* (L.). There is a possibility of course that the "tortuë verte" of Dampier, and hence the "tortue écaille-verte" of Lacepède is a composite species, and that some of the specimens included in it by Dampier belonged to other species. With regard to the difficulty of identifying species from the vague descriptions given by early authors, and the confusion existing at that time, I agree that it would be best to suppress *Testudo viridi-squamosa* Lacepède, (1788a, 1788b), *Testudo viridi-squamosa* Bonnaterre (1789, p. 20), and all other use of this name. At the same time *Testudo chloronotus* Bechstein (1800, p. 107, note *r*) should be suppressed; apparently Bechstein was not aware of the name *Testudo viridi-squamosa* having been given to this species by Lacepède and Bonnaterre. Therefore, he proposes the name *Testudo chloronotus*, in case the turtle described by Lacepède should prove to be a distinct species; it is a junior synonym of *Testudo viridi-squamosa* Lacepède.

Testudo mydas minor Suckow

Wermuth (1956, p. 413; Mertens & Wermuth, 1960, p. 71; Wermuth & Mertens, 1961, p. 242; Mertens & Wermuth, 1961, pp. 211, 212) identifies

this sea turtle with the Mexican ridley. I have not seen the original description, but Wermuth states that it is based upon Lacepède's and Bonnaterre's "Tortue écaille-verte". The type locality is given as being "Cap Blanco, Mexico." This is apparently the "Blanco, cap de la nouvelle Espagne dans la mer du Sud", which I have shown above (p. 23) to be an error for Blanco in the West Indies (i.e., the island of Blanquilla). If Suckow's name would have to be fixed to a species occurring at "Cap Blanco, Mexico" (i.e., Cape Blanco, Costa Rica) it would have to be applied to a turtle from the Pacific Ocean, and on this ground it cannot be *Lepidochelys kempii.*

In so far as Suckow's name should be available nomenclaturally, it should be suppressed.

Lepidochelys

Various authors (e.g., Mertens & Wermuth, 1955, p. 386; Loveridge & Williams, 1957, p. 496; Mertens & Wermuth 1960, p. 71; Wermuth & Mertens, 1961, p. 242) consider *kempii* a subspecies of *olivacea,* whilst others (e.g., Carr, 1952, pp. 396, 403; 1958) retain these forms as distinct species. The number of specimens examined by me is too small to offer a definite opinion on this matter. There are differences between these forms in the structure of the skull (Carr, 1942, p. 4; 1952, p. 396), and as far as the horny shields of the carapace are concerned, *L. olivacea* is much more variable than *L. kempii.* These features make it preferable (at least for the time being) to recognize them as separate species.

Lepidochelys olivacea (Eschscholtz, 1829).

Specimens examined:

Atlantic:

1 hatchling, Ambriz, Congo district, Angola, don. Rotterdam Zool. Gardens, April 1896, ML no. 9210.
1 hatchling, Congo, 1885, leg. Marcussen, ZMA.
2 hatchlings, Liberia, leg. J. Demery, ML no. 6891.
1 ad., carapace and plastron, Grand Cape Mt., Liberia, leg. J. Büttikofer, ML no. 10675.
1 hatchling, Braamspunt, Surinam, 1911, leg. Jhr. W. C. van Heurn, ML no. 9211.

Indo-Pacific:

2 hatchlings, Indian Ocean, ML no. 3301.
4 hatchlings, Karachi, don. F. W. Townsend, BM no. 99.3.23.1-4.
1 hatchling, Karachi, don. G. Jackson, BM no. 97.9.10.1.
6 hatchlings, Bay of Bengal, leg. Theobald BM no. 68.4.3.144-9.
1 hatchling, Java Sea, leg. Terwiel, ZMA.
1 hatchling, "*Chelonia polyaspis*", Bleeker Coll., ML 4298 (in very bad state).
1 hatchling, "*Chelonia polyaspis*", Bleeker Coll., BM no. 63.12.4.119.
1 hatchling, "*Chelonia dubia,* Bleeker Coll., BM no. 63.12.4.122.
1 hatchling, Lamakera, Flores, Lesser Sunda Ids., leg. Laurense, ZMA.

3 hatchlings, Menado, Celebes, leg. A. B. Meyer, BM no. 71.91.48-50.
1 hatchling, Philippines, BM no. 90a.
1 juv., Ternate, Moluccas, leg. C. B. H. von Rosenberg, ML no. 9211.
1 ex., Cape York, BM no. 73.2.21.1.
Head, neck, and forelimbs, West coast of America (Mexico?), holotype of *Cephalochelys oceanicus* Gray BM 71.2.7.48 = 1947.3.5.40.
1 hatchling, "North America", ML no. 3810a.

No locality

1 juv., loc.?, ML 9213.
2 plastra, loc.?, ZMA.

Wermuth (1956, p. 405) is of the opinion that Lacepède's *Testudo viridisquamosa* is identical with the Mexican ridley (*Lepidochelys kempii* (Garman)), which he considers to be a subspecies of *Lepidochelys olivacea* (Eschscholtz), and should his point of view be accepted, the species now know as *Lepidochelys olivacea* should in future be known by Lacepède's name. However, contrary to the views expressed by Wermuth (1956, p. 406), the (subspecific) name of the Pacific (and Atlantic) olive ridley would still be *olivacea,* were it not for an older name being available for it, viz., *Chelonia multiscutata* Kuhl (1820, p. 78). Kuhl's species is mentioned by Boulenger (1889, p. 185) in the synonymy of *Thalassochelys caretta*; Mertens & Wermuth (1955, p. 383), and Wermuth & Mertens (1961, p. 233, with a query) place it in the synonymy of *Caretta caretta*; Loveridge & Williams (1957, p. 495) mention *Chelonia multiscutata* as a doubtful synonym of *Lepidochelys olivacea.* In my opinion there can be no doubt as to Kuhl's *Chelonia multiscutata* being the same as *Lepidochelys olivacea.* The high number of vertebrals (9), and that of costals (8 on either side) definitely point in that direction. Kuhl states that the shields are slightly imbricate ("etwas imbricat"), and this might point to the specimen being an abnormal hawksbill. However, in hatchlings of *Lepidochelys olivacea,* the posterior border of the shields of the carapace may extend over the anterior border of the next shield, and therefore they may be described as being slightly imbricate. Moreover, Deraniyagala (1934a, pl. XVIII fig. 2; 1939d, p. 126) points out that the vertebrals and costals of adolescent *Lepidochelys olivacea* are imbricate. Like in hatchlings of *olivacea* all vertebral and costal shields are keeled. There are thirteen marginals on either side, a number which occurs in *olivacea* (as in other species). There are two claws on the fore flipper and one on the hind flipper. The head is covered with shields, of which the shield on the occiput is largest. In shape the specimen resembled the green turtle. The colour was blackish-brown ("braunschwarz"), a colour often found in preserved hatchlings of *olivacea.* There is nothing in Kuhl's description that points definitely to any of the other species of sea turtles, and there is nothing

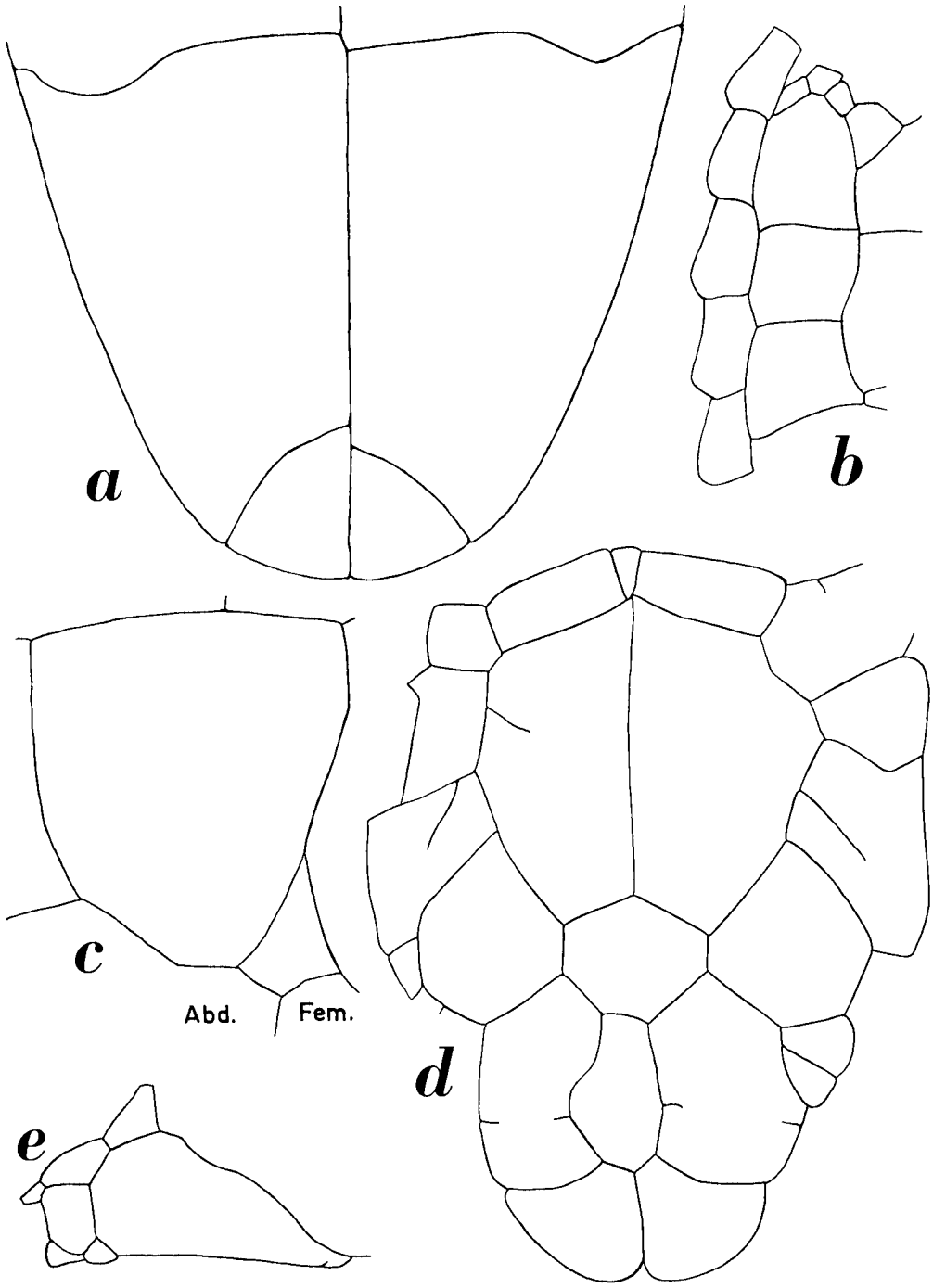

Fig. 6*a-c, Caretta caretta* (L.); *a,* anals and interanals, Leghorn, ML 10672; *b,* right inframarginals, Ormaclett, BM. 1960.1.1.16; *c,* third inframarginal, (the suture between marginals and inframarginals is shown at the top of this figure).

Fig. 6*d-e, Lepidochelys olivacea* (Eschsch.); *d,* head shields, Ternate, ML 9211; *e,* right mandibular scale, Ternate, ML 9211. Abd., abdominal; Fem., femoral.

in it that makes it unlikely that he had a specimen of *olivacea* before him.

It goes without saying that recognizing *multiscutata* as the first available valid name for the olive ridley, would mean a deplorable change of names. Hence, *Chelonia multiscutata* Kuhl, 1820, should be suppressed. The type, stated to be in the collection of Mr. Kuypers at Groningen, apparently is lost, and should *multiscutata* not be suppressed it would become necessary to select a neotype, at least when different subspecies of the species would have to be recognized.

Bleeker (1857, p. 239) in a list of reptiles from Java mentions (but does not describe) *Chelonia polyaspis*. Gray (1864, p. 13) mentions two juvenile turtles, which the British Museum received from Bleeker, and which were labelled *Chelonia polyaspis* and *Chelonia dubia* respectively; later, Gray (1873a, p. 90) quoted these names in the list of specimens of *Caouana caretta*; Boulenger (1889, p. 186) mentions these names in the list of specimens of *Thalassochelys caretta,* and recently Mertens & Wermuth (1955, pp. 383, 384) and Wermuth & Mertens (1961, p. 233) refer to these names in the synonymy of *Caretta caretta gigas*. Loveridge & Williams (1957, p. 495) correctly placed *Chelonia polyaspis* and *Chelonia dubia* in the synonymy of *Lepidochelys olivacea*. One hatchling labelled *Chelonia polyaspis*; (B.M. reg. no. 63.12.4.119) and one hatchling labelled *Chelonia dubia* (B.M. reg. no. 63.12.4.122) have been examined by me; without any doubt they belong to *Lepidochelys olivacea* (Eschsch.).

Cephalochelys oceanicus Gray (1873a, p. 91; 1873b, p. 408) must be referred to *Lepidochelys olivacea*. The holotype (B.M. 1947.3.5.40) consists of the head, neck, and fore limbs; it was purchased of a dealer, "who said it came from the West Coast of America — he believed, Mexico." On either side, there is a large inframandibular scale, followed by a much smaller one; this situation is found in *Lepidochelys olivacea,* and in *L. kempii,* but not in *Caretta caretta*. There are two pairs of prefrontals, and the fore flippers have but one claw. Its general colour is greenish-olive, and this is also in favour of its being *Lepidochelys olivacea*. At present, there is no reason to doubt the locality record, and should it be proven that the olive ridley of the West coast of America belongs to a distinct subspecies the name *oceanicus* Gray, 1873, should be used for it; this name antedates *remivaga* Hay, 1908.

Lepidochelys olivacea has two pairs of prefrontals; an azygous shield may be present between the posterior prefrontals(fig. 8*d*). In the hatchlings examined by me, the shields of the head are more subject to fragmentation (c.q. to fusion) than in *Caretta caretta*; some examples are given in figs. 6*d-g*, 8*d*. The number of vertebrals and costals is subject to rather wide

TABLE III.

Lepidochelys olivacea (Eschscholtz)

Locality	Reg. no.	Costals	Vertebrals	Costals
Ambriz	ML 9210	7	6	6
Congo	ZMA	5	7	6
Liberia	ML 6891	7	7 [1]	6
		7	6 [2]	7
Grand Cape Mt.	ML 10676	6	5 [1]	6
Braamspunt	ML 9212	7	7	7
Indian Ocean	ML 3301	7	7	7
		8 [3]	7	7
Karachi	BM 99.3.23.1-4	8	7	8
		5	6 [4]	6
		6	7	7
		6	5	5
Karachi	BM 97.9.10.1	6	5	6
Bay of Bengal	BM 68.4.3.144-9	6	5	6
		6	5 [1]	6
		6	7 [1]	6
		7	7	7
		6	5	6
		7	6	6
Java Sea	ZMA	6	6	5
Ch. polyaspis	BM. 63.12.4.119	7	6	7
Ch. dubia	BM 63.12.4.122	6	7	7
Lamakera	ZMA	6 [5]	5	7
Menado	BM 71.9.1.48-50	7	6	7
		6	5	6
		6	5	6
Philippines	BM 90a	6	6	7
Ternate	ML 9211	5	5	6
Cape York	BM 73.2.21.1	7	7	7
North American	ML 3810a	7	6	6

variations; their numbers are indicated in table III, which supplements the data published by Carr (1957, p. 49) for specimens from the eastern Atlantic Ocean. In some specimens the nuchal and first vertebral have completely or partly fused (fig. 8*d, e*). All specimens examined by me have four inframarginals with distinct inframarginal pores. The holotype of *Cephalochelys oceanicus* Gray has one claw on either fore limb; all other specimens have two claws on the fore and hind limbs. There is one large mandibular scale, bordered by smaller scales (figs. 7*e*, 8*c*); an incisure starting from the lower border may be present.

1) Nuchal fused with first vertebral.
2) Nuchal partly fused with first vertebral; nuchal just reaching border of carapace.
3) One costal not reaching vertebrals.
4) Nuchal divided, right half partly fused with first vertebral.
5) Fourth costal partly divided.

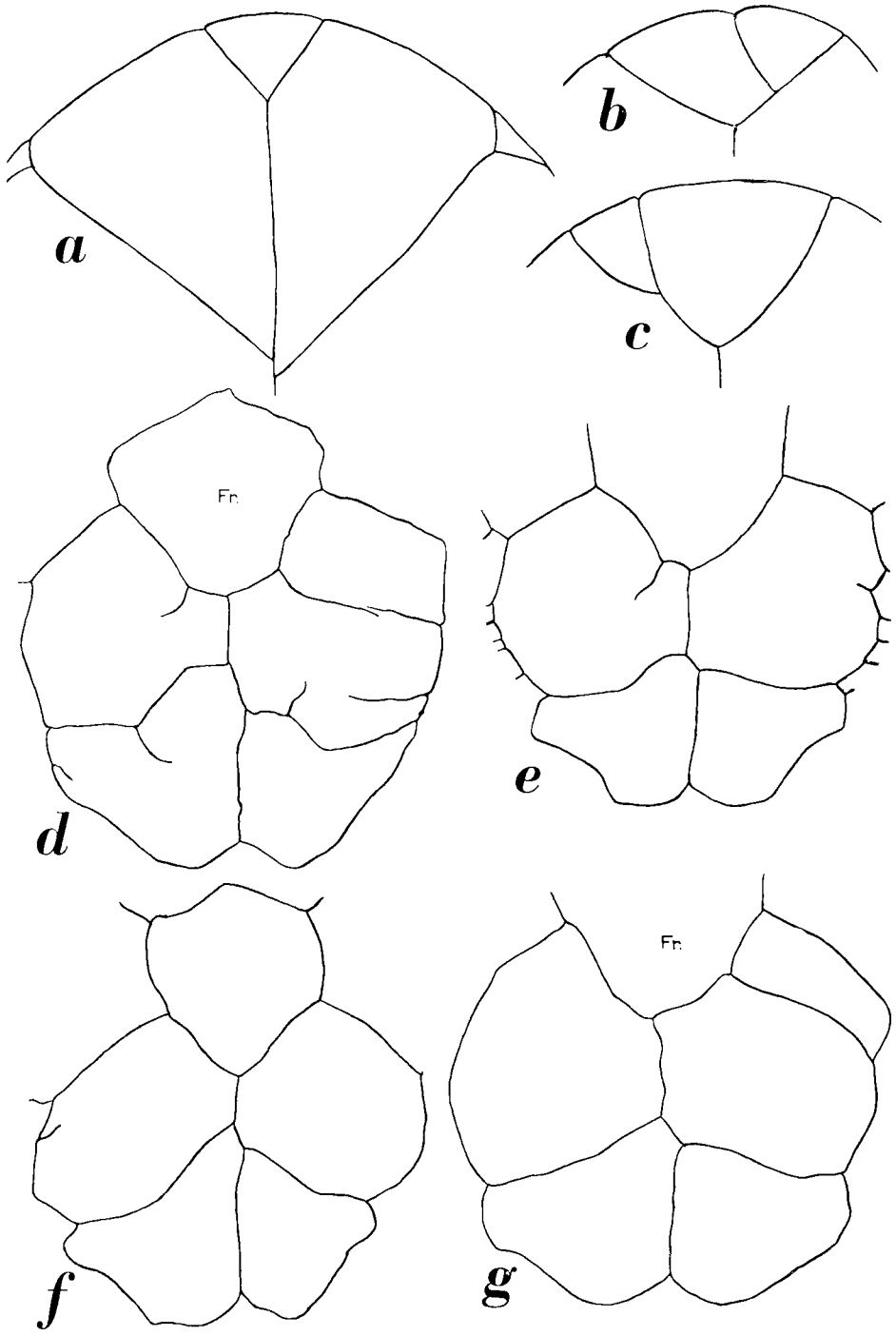

Fig. 7, *a-c*, *Caretta caretta* (L.) *a*, gulars and intergulars, Leghorn, ML 10672; *b*, intergulars, Inishmore, BM 1926.5.7.1; *c*, intergulars, Girvan, RSM 1952.1.

Fig. 7, *d-e*, *Lepidochelys olivacea* (Eschsch.), anterior headshields; *d*, *g*, Liberia, ML 6891; *e*, Braamspunt, ML 9212; *f*, Indian Ocean, ML 3301. Fr., frontal.

Carr & Caldwell (1958, p. 252) stress the importance of a careful search for breeding grounds of ridleys in Dutch Guiana (i.e., Surinam), and in this respect the juvenile from Braamspunt (Surinam, M. L. reg. no. 9212) is of interest. I have referred this specimen to *Lepidochelys olivacea* on account of the number of vertebral and costal shields; I cannot find any character to separate this juvenile from the young specimens from the West coast of Africa. If we accept the hypothesis that the loggerheads and ridleys found on the coasts of Great Britain and the Netherlands were brought there by ocean currents from the western Atlantic Ocean, it is just as possible that *Lepidochelys olivacea* has been transported by the currents that pass from Africa to South America. The specimen being very small, with the umbilicus still distinct, and its having a distinct egg-tooth, makes it likely that the species breeds somewhere along the coast of the Guiana's, and indeed a further search along these coasts may yield interesting results.

The juvenile said to have come from North America (M.L. reg. no. 3810a), without any further indication of either locality as collector, agrees with *Lepidochelys olivacea* in the number of vertebral and costal shields.

Lepidochelys kempii (Garman, 1880).

Specimens examined:

1 juv., Scilly Ids., don. H. M. Coast Guards, BM no. 1925.12.23.1.
1 juv., Portreath, N.W. of Redruth, Cornwall, 30.XII.1938, leg. Mrs. E. Priory, BM no. 1940.3.14.1.
1 juv., Treganon Beach, 4 m SW of Padstow, Cornwall, don. D. P. Wilson, BM no. 1950.1.1.28.
1 juv., Polzeath, Cornwall, 3.I.1943, don. Receiver of Wrecks, BM no. 1945.11.8.2.
1 juv., Newlyn harbour, Cornwall, 8.II.1947, BM no. 1947.3.3.2.
1 juv., Pagham Beach, between Selsey and Bognor Regis, Sussex, 28.I.1938, don. V. H. Vick, BM no. 1940.3.13.1.
1 juv., beach at Beaumont, Jersey, Channel Ids., 10.XII.1938, don. Jersey Museum, BM no. 1950.1.2.70.
1 juv., Scharendijke, Schouwen Id., 4.XII.1954, don. Zoological Gardens Rotterdam, ML no. 10676.

Deraniyagala (1938a-b) was the first author to mention *Lepidochelys kempii* (Garman) from European waters. Parker (1939b, p. 127: *Caretta kempi*), Taylor (1949, pp. 11, 26: *Lepidochelys kempi*), Frazer (1949, p. 51: *Lepidochelys kempi*), M. A. Smith (1951, fig. 84; *Caretta kempi*), and Stephen (1953: *Lepidochelys kempii*) published further records. The ridley is now know from several localities in England, Wales, Scotland, Ireland, and from the Channel Islands. To these may be added a record from the Dutch coast.

On December 4th, 1954, a living ridley was found near Scharendijke on the island of Schouwen: it was sent to the Zoological Gardens at Rotterdam,

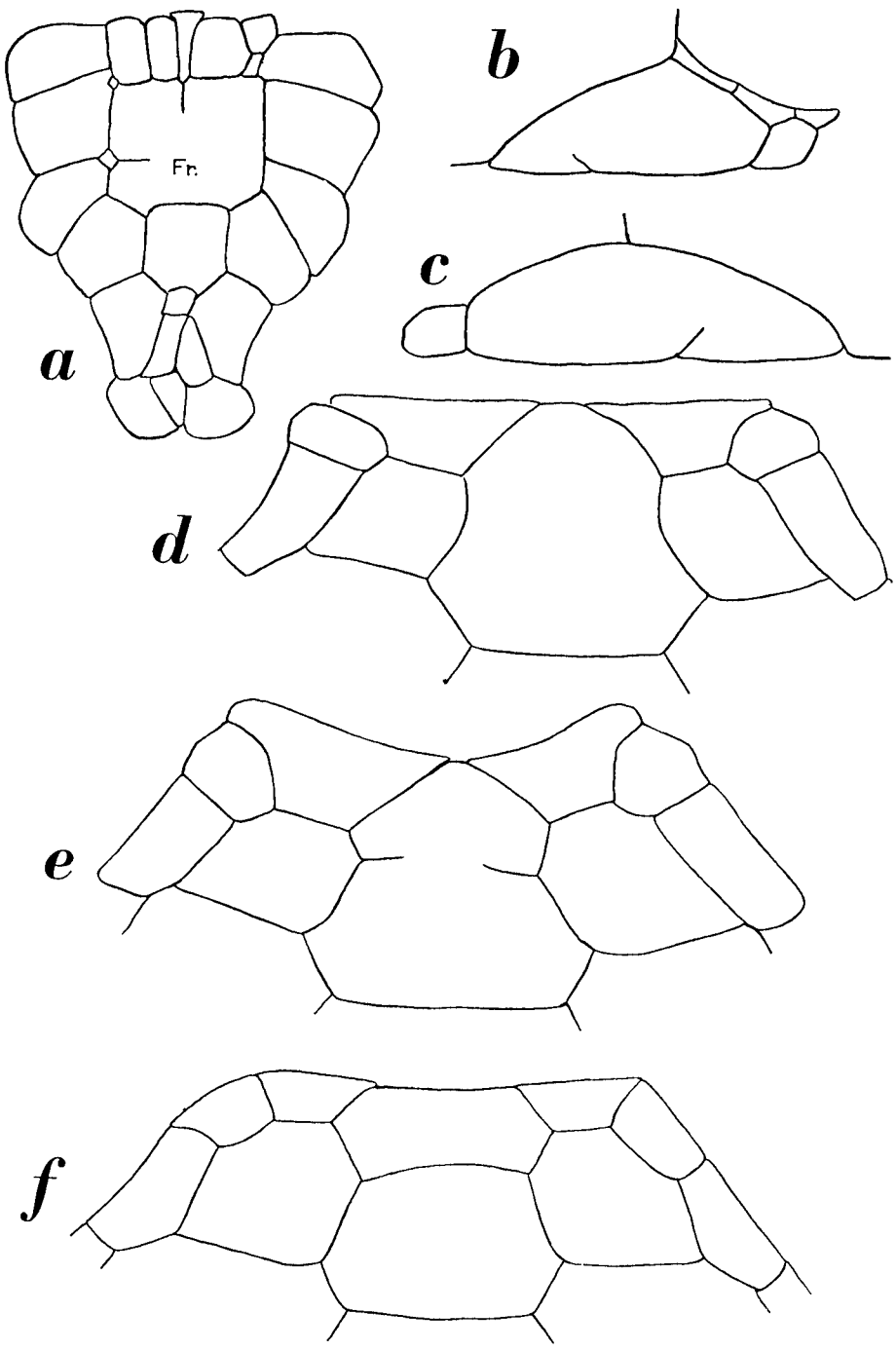

Fig. 8*a*, *Caretta caretta*, headshields, Inishmore, BM 1926.5.7.1; *b*, *Lepidochelys kempii*, left mandibular scale, Scharendijke, ML *c*, *Lepidochelys olivacea* (Eschsch.), right mandibular scale of type of *Cephalochelys oceanicus* Gray; *d-f*, *Lepidochelys olivacea* (Eschsch.), nuchal, first vertebral, and adjoining shields; *d*, *e*, Liberia, ML 6891; *f*, Braamspunt, ML 9212; Fr., frontal.

and after its death it was presented to the Leiden Museum. Swennen (1955, p. 30) mentioned this specimen as *Thalassochelys caretta,* but examination of this turtle proved it to be a young *Lepidochelys kempii.* The greatest length of the carapace is 266 mm; the greatest width is 245 mm. The specimen has five vertebral shields, five pairs of costals, and thirteen pairs of marginals. Of the vertebrals the first, second, and third have a distinct keel. There are four inframarginals and five inframarginal pores on either side. The first of these pores is placed in the anterior half of the first shield, the others are situated at the posterior borders of the inframarginal shields (fig. 9). One large mandibular scale, followed by a much smaller one (fig. 8*b*). Fore flippers with one distinct and one very small claw; hind flippers with two distinct claws, the first strongly curved.

The ridley captured in Newlyn harbour has six vertebrals (the fifth is divided into two shields), on the right six costal shields (the fifth divided into two shields), and on the left five costal shields. The other specimens have five vertebrals, and on either side five costal shields. The specimen from Beaumont has an asymmetrical (left) intergular, and a small interanal. A small interanal is also present in the specimen from Scharendijke. All specimens have four inframarginals, and in all of them inframarginal pores are present. None of the specimens of *L. kempii* examined by me shows any of the raised or spinose scales found in juveniles of *Caretta caretta.* There are two claws on fore and hind limbs; the second claw of the fore limb may be minute.

Deraniyagala (1939c, 1943) who recorded a juvenile *Lepidochelys kempii* from the Azores, is of the opinion that the ridley breeds in these islands, and that the specimens found on the coasts of Europe derive from this colony. The general trend of the ocean currents makes it more likely that the ridleys, as well as the loggerheads, come from the western part of the Atlantic.

Chelonia mydas (L.)

Although specimens of *Chelonia mydas* (L.) have been found on the Dutch coast, they apparently were specimens thrown overboard from ships that brought them to Europe.

Weber (1890, p. xxxiii) and Van Lidth de Jeude (1895, p. 212) mention specimens that came ashore at Westkapelle (island of Walcheren) in 1889; these were thrown overboard from an American ship that put out from Antwerp.

On February 20th, 1934 a dead green turtle was found on the beach near

Katwijk; the specimen had the letters "AB" scratched on its plastron. In the same week a specimen was found at IJmuiden, and a specimen was washed ashore at Camp; both specimens were marked in the same way as that from Katwijk. On December 1st, 1937 another green turtle was washed ashore

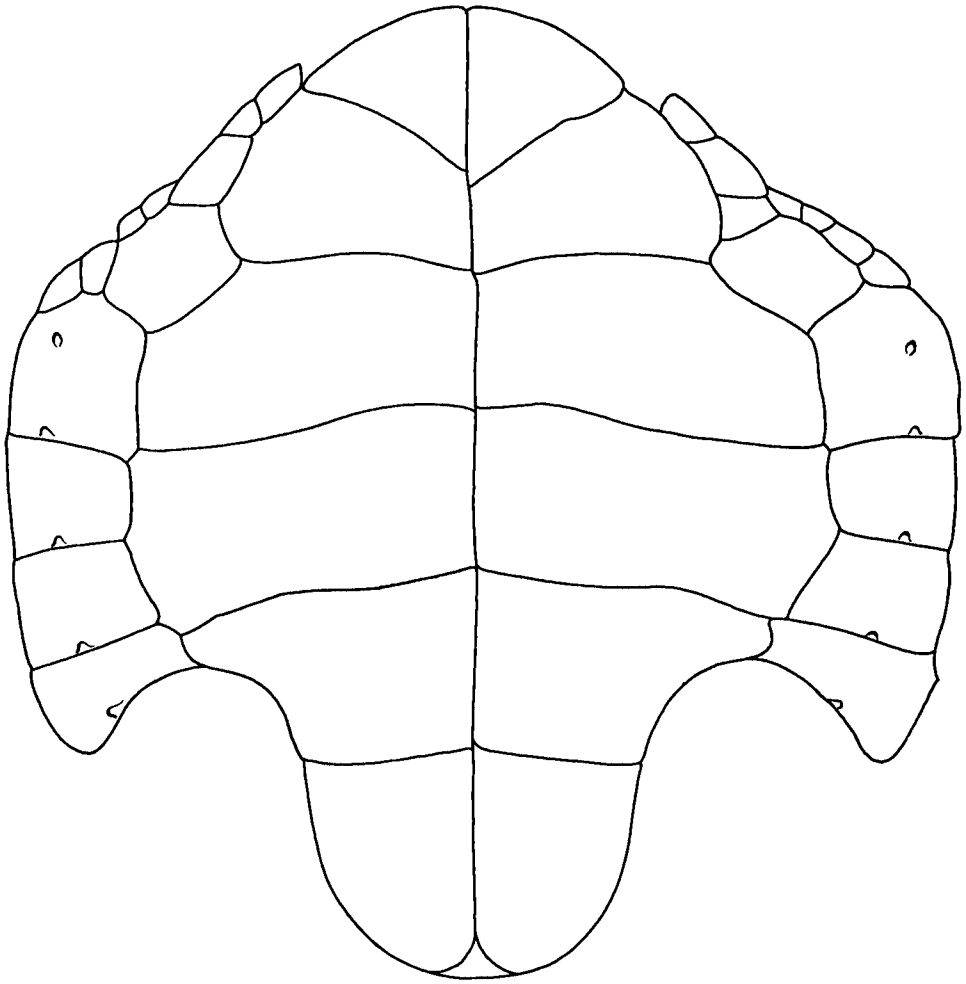

Fig. 9. *Lepidochelys kempii* (Garm.), plastron; five inframarginal pores are present on either side. ML 10676.

near Katwijk; this specimen was marked on its plastron with the letters "AE"; moreover, a leaden tag with the numbers $\frac{20}{142}$ was attached to its left fore flipper. Dr. H. W. Parker, British Museum (Natural History), made inquiries with a London firm that imports turtles, and it was stated by this

firm to be usual for fishermen to scratch the initials on the plastron of the turtles they catch; usually a leaden tag is attached to the flipper, indicating the weight of the specimen in lb. Whether the tag attached to the specimen found at Katwijk indicates the weight of the specimen is not certain; the weight has not been checked when the turtle reached the museum. The oesophagus of the 1937 turtle contained undigested food, viz., remains of plants with some small molluscs. It is known that the digestion of turtles comes to a stand still when the specimens are taken out of the water. The undigested food, the markings on the plastron, and the tag make it highly probable that the specimen was brought to Europe by ship, and that, when dead, it was thrown overboard.

In November 1952, a smal green turtle (carapace; long 360 mm, wide 295 mm) stranded alive on the Dutch coast near Petten; it was sent to the Amsterdam Zoo, but on its arrival it was found to have died. On its shell small barnacles (about 4.3 mm in diameter) were present; these were identified as *Elminius modestus* Darwin. These barnacles probably developed on the turtle in the North Sea. Whether this specimen also was put overboard from a ship is not known. It must be mentioned that the green turtle has never been found in the British Isles (Parker, 1939b, p. 129). As stated by Parker, *Chelonia mydas* is a herbivorous turtle, and this habit makes it improbable that it would survive a long ocean voyage from the West Indies to Europe.

To the synonymy of *Chelonia mydas mydas* (L.), such as this is given by Mertens & Wermuth (1960, p. 70) and by Wermuth & Mertens (1961, pp. 235-236) may be added: *Chelonia albiventer* Nardo (1864, p. 1420, pl. XXXV), and *Thalassiochelys albiventer* Günther (Zoological Record for 1865, p. 148). Nardo proposed the name *albiventer* for a juvenile *Chelonia* caught in the harbour of Malamocco, Adriatic Sea. Although the figure published by Nardo seems to indicate a second, small, anterior pair of prefrontals, the other characters (e.g. the dentated margin of the lower jaw) point to *Chelonia mydas* (L.).

Unidentified Turtles from the Netherlands

The oldest record of a sea turtle having been captured in the Netherlands is that of a specimen, which on October 2nd, 1707, was taken in the "Beverwyker meer" (or "Wijker Meer"), an inland water, which through the IJ was in open connexion with the Zuider Sea. This turtle is mentioned by Burger (1710, p. 233; 1728, p. 530; 1736, p. 231; 1767, p. 171; Houttuyn, 1764, p. 16; Van Iperen, 1778, p. 623; Van Bemmelen, 1886, p. 530; Meijer, 1889, p. 44; Van Kampen & Heimans, 1927, p. 51). Burger gives the fol-

lowing information about the turtle: it had a length of nearly six feet, and a weight of between 400 and 500 pounds [6]); it was sold first for twelve guilders, and later it was auctioned at Zaandam, where it was purchased by a citizen of Amsterdam for 146 guilders; afterwards it was sold once more, and this time it fetched some 300 guilders. It liked to eat small fish and shrimps, but in December it was dead already.

Van Bemmelen (1866, p. 530) expressed the opinion that this turtle may have been a specimen of *Sphargis coriacea* (*Dermochelys coriacea* (L.)), but as pointed out by Van Kampen & Heimans (1927, p. 51) he did not give any definite reason for this identification. Probably the large size was his only argument.

I am greatly obliged to Mr. A. H. Huussen of the Leiden University Library for his advice as to the ways I might use to try and obtain additional information about this turtle. The Amsterdam Municipal Archives informed me that a drawing of the turtle was present in the library of the Amsterdam Zoological Gardens. To Mr. J. J. van Frieswijk I am indebted for the permission to examine a collection of drawings bound together in one volume, and according to the title page made by Jan Velten [7]). On one of the sheets a fairly large drawing of a turtle is given; it is stated to be a true picture of a large turtle caught in the Wijker Meer, as large as a Frisian horse, and weighing over 560 pounds (610 lb, or 276 kg); the specimen was shown alive in the "Witte Oliphant" (White Elephant) a tavern on the Botermarkt in Amsterdam. On the same sheet a smaller drawing of this turtle is given, and with a few sketchy lines the surroundings where it was captured are indicated. A third drawing occurs on the frontispiece of the volume. These drawings are reproduced in Pl. I. All three drawings show a sea turtle of which the carapace is covered with shields. But as to the specific characters, the drawings are far from being true pictures of any species of turtle. The shields are arranged in five longitudinal rows, and their shape is drawn more or less at random, leaving triangular and lozenge-shaped spaces between some of the shields. The original pencil lines can still be seen in the

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6) Burger uses "houtvoeten" as measurement. I am indebted to Dr. C. Kruyskamp, Leiden, for the information that this is Amsterdam measure, one foot being equal to 283 mm. Therefore, the length of the turtle would have been nearly 170 cm. The weight is probably given in Amsterdam weight; 400 to 500 pounds would equal about 435 to 544 lb (avoirdupois), or 197 to 247 kg.

7) The (manuscript) title page gives "Wonderen der Natuur" (Wonders of Nature) as the title, it states that the drawings of beasts, birds, plants,etc., were made from life by Jan Velten. However, the drawings are so very different in character, that it is hard to believe that they were made by one and the same man. More probably it is a collection of drawings mady by two or three different artists.

larger drawing, and these show the contours of the shields different from those in the drawing in ink (although equally untrue). Marginal shields are indicated, but according to the drawing there would have been about eighteen marginals on the left side (and hence thirty-six in all).

Assuming that the indication of this turtle having shields on the carapace is correct, the conclusion that can be reached is that the specimen definitely is not *Dermochelys*. Taking into account that there is no record of *Chelonia mydas* (L.) from the British coasts, and that most probably the specimens found on the Dutch coast have been brought to the North Sea on board of ships, it is unlikely that the turtle from the Wijker Meer was a green turtle. Taking into account its size it may have been a common loggerhead (*Caretta caretta* (L.)), but this is a surmise only. I doubt whether the length mentioned by Burger is in any way accurate. The loggerhead from Ouddorp weighed 280 kg (617 lb), and this comes in the same order as the weight mentioned by Velten in the explanation of his drawing; as far as can be made out from the skeleton, the Ouddorp specimen had a total length of about 140 cm, which is distinctly shorter than the measurement given for the turtle from the Wijker Meer. A number of mandibular scales are indicated, but as the drawing as a whole is so very much incorrect, I should not like to draw any conclusion from these scales. The carapace is shown to bear two barnacles.

Van Iperen (1778, p. 620) mentions the presence of a large turtle observed at sea off the coast of Domburg (Island of Walcheren) on July 17th, 1777. Five fishermen observed an object floating in the sea. At first they took it to be a buoy; coming nearer it looked more like an overturned boat, but when they got quite close to it, they recognized it as a turtle. They tried to catch it, but in vain; it dived and passed under their ship. One of the men, who from his ninth to his twenty-first year had served on ships that sailed to the Mediterranean and to the West Indies, and who had seen, caught, and eaten many turtles, stated that he never had seen one of this size. The fishermen estimated this turtle to be as long and as broad as the largest hatch of a fishing boat, and from this Van Iperen (1778, p. 623) calculated its length (longitudinally over the carapace) to be not much less than five Rhineland feet (i.e., 157 cm). Of this turtle too, van Bemmelen (1866, p. 530) supposed that it was *Dermochelys coriacea,* but the data are too scanty to arrive at a definite conclusion as to its specific identity.

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8) The title page mentions Dirk Burger von Schoorel as the author, and hence the author's name is sometimes cited as being "Schoorel". From the preface, and from a passage on p. 287 (1728, p. 293; 1736, p. 277; 1767, p. 207) it is clear that the author's name is Dirk Burger, and that the addition "van Schoorel" means only that the author originally came from the village of Schoorel (nowadays spelled: Schoorl). See also: "Burger (Dirk)" in: Nieuw Nederlandsch Biografisch Woordenboek, vol. 2, 1912, column 297.

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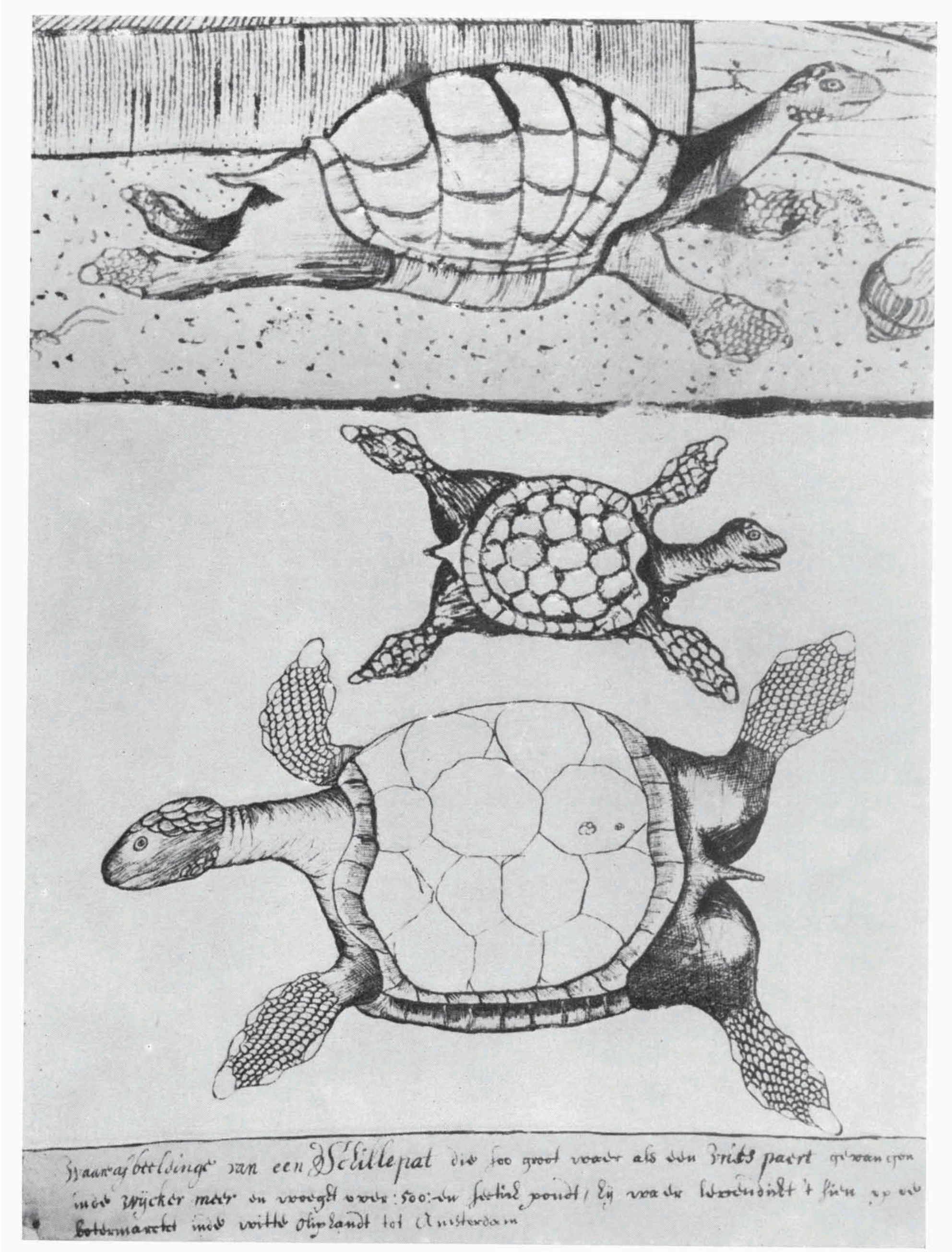
EXPLANATION OF PLATE I

Three drawings by Jan Velten of the turtle from the Wijker Meer.

Translation of the explanation of the lower figure: True depiction of a turtle, which was as large as a Frisian Horse, captured in the Wijker Meer, and weighed over 500 and sixty pound, it was to be seen alive on the Butter Market in the White Elephant in Amsterdam.


van een Schillepat die soo groot waer als een
Wycker meer en weeght over :500: pondt
tot Amsterdam