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**NEW REPTILE MATERIAL FROM THE GERMAN
TERTIARY
5* FOSSIL TURTLE REMAINS (*CHELYDROPSIS*, *TRIONYX*)
FROM THE MIOCENE FISSURE FILLING OF
APPERTSHOFEN / N-INGOLSTADT**

**NEUE REPTILIENFUNDE AUS DEM TERTIAR
DEUTSCHLANDS
5* SCHILDKRÖTENRESTE (*CHELYDROPSIS*, *TRIONYX*)
AUS DER MIOZÄNEN SPALTENFÜLLUNG
APPERTSHOFEN/N-INGOLSTADT**

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& Hans Hermann SCHLEICH (**)

ABSTRACT. - From the miocene fissure filling of Appertshofen, turtle remains of the aquatic genera *Trionyx* and *Chelydropsis* have been identified on the basis of elements from the shell, the skull and the postcranial skeleton.

KURZFASSUNG. - Nachfolgend der Darstellung SCHERER's über die Krokodile von Appertshofen konnten nun auch die Schildkrötenreste von dieser miozänen Spaltenfüllung bearbeitet werden. Von zwei Gattungen rein aquatischer Vertreter (*Chelydropsis*, *Trionyx*) werden Reste zum Panzer, Schädel und Postcranialskelett beschrieben.

RESUME. - Les restes de tortues provenant des remplissages karstiques d'âge miocene d'Appertshofen appartiennent à deux genres aquatiques *Trionyx* et *Chelydropsis*. Ces genres ont été reconnus sur base d'éléments du crâne, de la carapace et du squelette.

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INTRODUCTION.

In studying the fossil reptile material recovered from the German Tertiary, the turtle assemblage from the Miocene fissure filling of Appertshofen appears to be particularly important because of its non thekal elements. Indeed, elsewhere in Southern Germany, there are very few localities that yielded skeletal remains from the skull or the extremities. Mentionworth are in respect to such material mainly the outcrops of Höwenegg, Unterwohlbach, Steinheim and Langenau. Adding to the previous paper by SCHERER (1978) on the fossil crocodiles from Appertshofen, the study of the turtle material will contribute to a better

4*) Nouveaux Matériels des Tortues (*Ptychogaster*/*Ergilemys*) de la localité oligocène moyen de Ronheim (Sud de l'Allemagne).

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knowledge of the local fauna and also provide better description of the non thekal elements of Trionychids and Chelydropsids.

ACKNOWLEDGMENTS.

We are utmost indebted to Prof. Dr. D. HERM for his hospitality in our working at the institut and using the facilities of the Bayerische Staatsammlung für Paläontologie und historische Geologie; to Dr. P. WELLNHOFER, who kindly provided the fossil material; last but not least to the Deutsche Forschungsgemeinschaft and the Humboldt Foundation for their generous grant to the "study of fossil tertiary reptiles from Germany".

THE LOCALITY OF APPERTSHOFEN.

The geographical situation and informations on the locality (fissure filling) are thoroughly described by DEHM (1961 : 37-38). The geographical situation (distributional maps of tertiary paleoherpetological records) and the fossil reptile and amphibian records are mentioned in SCHLEICH (1985). DEHM (op. cit. : 38) draw the attention on the fact that this fissure filling is characterised by a high contribution of aquatic animals. Following faunal list is based on DEHM's (op. cit.) informations combined with further additions by FAHLBUSCH (1964), SCHERER (1978), ESTES (1981) and SCHLEICH (1985). These records can now be updated with our recent study; following faunal list can be thus proposed :

Mollusca :	Bythinia sp.
Pisces :	Teleostei gen. div.
Amphibia-Urodela :	Mioproteus caucasicus ESTES & DAREVSKY
Reptilia-Testudines :	Trionyx sp. Chelydropsis cf. decheni
- Crocodilia :	Diplocynodon cf. buet- konensis
- Sauria :	Ophisaurus sp.
Mammalia :	Insectivora gen. indet. Chiroptera gen. indet. Rodentia :
	- Democricetodon minor gracilis FAHLBUSCH.
	- D. affinis mutilis FAHLBUSCH
	Duplicidentata, gen. ind.

Already DEHM (1961 : 38) regarded the fauna by both, species and habitat, as unique for South Germany and mentioned for the lower Vertebrates (op. cit.) : ... "die reiche Fisch-und Reptilfauna kann unmöglich in einem begrenzten Karsttümpel gelebt haben. ...", which implies the presence of "ein nicht ganz kleines Süßwasserbecken, möglicherweise Flußlauf und Alt-wässer, ..." in the north of Ingolstadt for this time of the "Helvetikum".

Still mentionworth seems the postulation by SCHERER (1978 : 89), "... daß die Krokodile von Appertshofen und Sandelzhausen einander nahestehen, wahrscheinlich zur selben Spezies gehören und daß die beiden Fundstellen wahrscheinlich zeitlich nicht sehr weit auseinanderliegen".

After comparison of the turtle material of both localities, one can

conclude that for all remains of trionychid shell plates, their callosities (see SCHLEICH, 1984a) are completely different from those from Appertshofen. But it is yet not clear whether there is any taxonomic value in such features, neither in recent nor in extinct forms.

Compared with equally stratified localities from the molasse basin, Appertshofen also looks quite unique in this periode. Most of the localities from the stratigraphical range between MN 5 and MN 6 show a higher diversity in species (see SCHLEICH 1985) than observed for Appertshofen. Here, on the bases of the fossil amphibian and reptile material, a typical aquatic habitat interpretation is to require.

The stratification for the fissure filling material (MN 5, Upper Orleanium) is based upon FAHLBUSCH (1964) whose opinion is in agreement with that of SCHERER.

THE FOSSIL TURTLE MATERIAL.

The material is composed mainly of postcranial skeleton bones and plates of the carapace and only one cranial bone, namely a well preserved left postorbital of *Chelydropsis*. To the same genus belong one cervical centrum two caudal vertebrae, two ilia (one is fragmentary and eroded), a right ischium fragment, ten pleuralia fragments, two complete peripheralia, one fragmentary left hyoplastron, two fragmentary hypoplastra and fragmentary epi- and xiphoplastra.

A lot of *Trionyx* remains complete the material, all belonging to the postcranial skeleton and carapace. The postcranial skeleton material contains a fragmentary right pubis, a fragmentary right ischium, a left femur lacking its proximal part, a right tibia, a fragment of a scapula three fragmentary humeri and ten vertebrae belonging to different parts of the axis. Two fragmentary nuchals and five plastral fragments are to mention for the shell. These numerous fragments are generally sharply broken and have not been eroded by transport, thus we may interpret this fauna as autochthonal.

Trionyx sp.

BONES OF THE POSTCRANIAL SKELETON.

Many fragments from the appendicular apparatus and from the axial skeleton belonging to *Trionyx* are preserved, some pieces of the shell complete this material.

Girdles and Limbs.

From the horizontal ventral puboischiadicum, only the proximal part of the right symphyse of these two bones are preserved. The pubiatic part (BSP 1953 II 310) is broken right at the beginning of the pubial anterior expansion (Fig. 1). The proximal part of the lateral great expansion forming the pectineal process is easily recognized as the medial edge which is less curved and suggests the large opening of the puboischiadic foramina without median expansion of the two bones. Dorsally, the ilium attachment make a triangular scar surface which excavated the dorsal border of the puboiliac symphyseal surface. The ventral part of

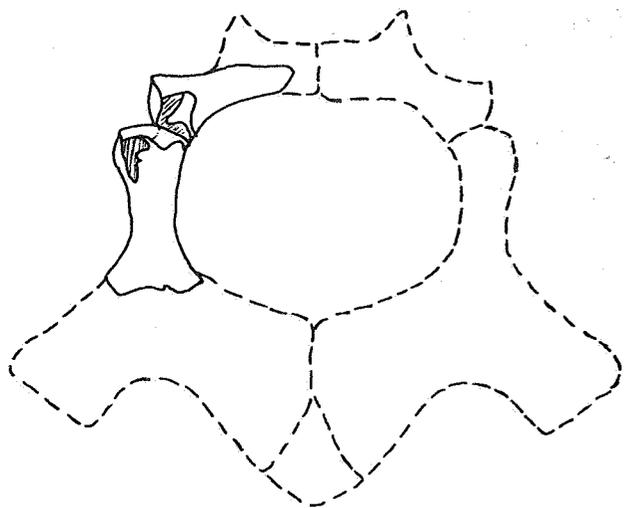


Fig. 1 - Fragmentary fossil parts of pubis and ischium in a reconstruction of an extant (stippled) *Trionyx* sp. pelvis.

this symphyseal surface forms the articulation to the ischium; ventro-medially the edge is pitted for the reception of the little expansion of the ischium. Laterally the acetabular part of the bone is similar to the same from the recent *Trionyx triunguis* although of smaller size. (Transversal expansion of the acetabulum with the symphyseal portion : 18 mm; width of the symphyseal surface : 9 mm). The ischium (BSP 1953 II 311) belongs probably to the same specimen (Fig. 1). This fragment is more flattened dorsoventrally than the former one. The articular face for the ilium is practically on the dorsal side of the bone. The articulation face to the pubis bears at its medio-ventral margin a little spot just beside two little pits. The acetabular portion is more transversally extended here than on the pubis. (Transversal width : 19 mm; height of the symphyseal area : 10 mm; length of the acetabular surface : 12 mm). The medial edge (of the puboischiadic foramina) is very thin and makes a sharp keel as in the modern *Trionyx triunguis* from which it differs mainly by its smaller size, too.

The left femur (BSP 1953 II 312 Plate 2, Fig. 11) and a right tibia (BSP 1953 II 313; Plate 2, Fig. 13) are preserved parts of the hind limbs. The proximal articulation of the femur is lacking; it is broken at the base of the trochanters minor and major, which seem to have enclosed a broad intertrochanteric fossa as in the recent *Trionyx*. The distal end is practically complete; only the posterior part of the fibular condylus is damaged. The ventrodiscal surface of the trochlear articulation is eroded, so the weak intercotylar fossa seems to be absent. Dorsally, the distal head of this femur is more flat than that of the actual *Trionyx triunguis*. On the anterior side of the base of the trochanter minor a small longitudinal groove with proximo-dorsal protuberance is exposed. This feature is not so extended in the modern *Trionyx triunguis*; it is probably the attachment scar of the puboischiofemorales internus (s : ZUG 1971, Fig. 14 and 19) which must have been strongly developed in the fossil specimen. According to ZUG (op. cit.) it is an important muscle for swimming for Trionychids

and "it has a double origin : one on the pubis and the other on the distal end of the ilium and adjacent vertebrae". All the other features look like those in the extant species. The length of this femur must probably measure 70 mm, its distal width seems to be 25 mm.

The right tibia is practically complete; only the marginal edge is lacking. The dorsal and ventral sides of the proximal head are eroded. This bone is 58 mm long; it has the typical triangular shape in cross section and presents a very weak dorsal curvature. The medial cnemial crest is very sharp, a character which is (after ZUG, 1971) typical for the Trionychids. After ZUG the TL/FL ratio in this family is of 0.79. This tibia should correspond with a femur of 73,4 mm in length and it might probably be the femur above mentioned BSP 1953 II 312.

From the pectoral girdle, only the distal part of a right scapula (BSP 1953 II 314) belongs probably to a *Trionyx*. It bears long ridges on the dorsal side but its shaft is more rounded in cross section than in *T. Triunguis*, more flat however than in *Cheilydra*. It is a very straight bone. Three humeral fragments are present : the proximal part of a right humerus and the distal parts of another right and a left one. The proximal part of the hemispherical head (BSP 1953 II 315; Plate 2, Fig. 7) is approximately round as in *T. triunguis* and presents the same inclination (about 80°) with the shaft of the bone as in the recent species. The radial or lateral process is lacking entirely. The medial process is well preserved, it is quite similar to that of an extant specimen but has a more lateral orientation; the main character different to *T. triunguis* is the overall size; the fossil is smaller. The longitudinal section of the hemispherical head is 15 mm long, its transversal one 13 mm.

The left distal humerus fragment (BSP 1953 II 316; Plate 2, Fig. 6) is more complete; only the proximal articular extremity is entirely missing. The bone shows a relatively wide expansion between its epicondyles. Dorsally the ectepicondylar groove is well defined but not as well as in the recent *T. triunguis*. The two epicondyles are approximately of the same size. The distal fragment of the right humerus (BSP 1953 II 317) is of the same size and its epicondyles are laterally and ventrally eroded. The both shafts are entirely missing. The greatest width of both the left and the right extremity measures 29 mm.

Axial skeleton.

The cervical, sacral and caudal parts of the axial skeleton are represented by well preserved vertebrae.

Cervical vertebrae.

The vertebra (BSP 1953 II 318; Plate 2, Fig. 1) belongs to the cervical region and is probably C5. Unfortunately the front part of the neural arch with the prezygapophyses, the cotyles and the

posterior part of the centrum are missing. The centrum is elongated and opisthocoe-
 lous; ventrally it bears a prominent keel
 right between the posterior end of the
 lateral process. Dorsally the neural
 arch and the postzygapophyses are flat,
 which is typical for fifth cervical of
T. triunguis, too. The base of the condyle
 is broad and suggests ginglymes articula-
 tion (s. HOFFSTETTER & GASC, 1969).

- Length from the anterior part of the lateral process to the extremity of the postzygapophyses : 39 mm
- Width at the postzygapophyses : 23 mm.
- Width at the lateral process : 20 mm.
- Width at the middle of the centrum : 10 mm.
- Height at the middle of the centrum : 13 mm.

Sacral vertebrae.

The sacral region is represented by the first sacral vertebra with its two ribs and the left rib on the second vertebra. The first sacral vertebra (BSP 1953 II 320; Plate 2, Fig. 4) has a vertically elongated transverse process rectangular in shape, which is orientated rather posteriorly. It articulates well with the first sacral ribs and may belong to the same specimen. The wide neural crest is divided in two in its latter third part. The pre- and postzygapophyses are anteriorly directed with an horizontal orientation. Ventrally, the centrum is spool-shaped narrowing in its posterior part. The anterior cotyle and posterior condyle show an "half moon" shape.

- Length of the centrum : 14 mm.
- Width at the level of the transverse process : 16 mm.
- Length between the extremities of the pre- and postzygapophyses : 20 mm.
- Height of the vertebra : 18 mm.

Both first sacral ribs (BSP 1953 II 321; Plate 2, Fig. 8-9) are preserved. They are characterized by their wide distal ends articulating with the ilia and with the lateral ends of the second sacral ribs (BSP 1953 II 322; Plate 2, Fig. 10). From this last pair, only the left rib is preserved and is of a smaller size than the former one.

Caudal vertebrae.

Viewed from the dorsal side, the second caudal (BSP 1953 II 324) vertebra and its transverse process show a cross-shape. The postzygapophyse and the prezygapophyses are sloping at approximately 45°. The neural crest is still posteriorly bifurcated. On the ventral side, the centrum is "spool-shaped" and is smooth. In lateral view, the suture between the neural arch and the centrum is clearly visible. The transverse process is attached on the neural arch at the level of the postzygapophyses. The cotyles and condyles have an half round shape.

- Length of the centrum : 15 mm.
- Width at the transverse process : 22 mm.
- Length between the extremities of the pre- and postzygapophyses : 19 mm.

- Height of the vertebra : 15 mm.

Dorsally the transverse processes of the first caudal (BSP 1953 II 323; Plate 2, Fig. 3) vertebra is orientated perpendicularly to the longitudinal axe of the vertebra; they are very broad at their base and become rapidly narrow distally, as in the recent *T. triunguis*. The prezygapophyses are placed more externally than the postzygapophyses, all have a 45° inclination. The procoelous centrum is as the one of the next vertebra, "spool-shaped". Laterally the suture between the neural arch and the centrum is clearly visible. The transverse process is attached on the neural arch just beneath the level of the postzygapophyse.

- Length of the centrum : 15 mm.
- Length between the extremities of the pre- and postzygapophyses : 19 mm.
- Width with the transverse process : 21 mm.
- Height of the vertebra : 16 mm.

The seventh (BSP 1953 II 325), eighth (BSP 1953 II 326) and the ninth (BSP 1953 II 327) caudal vertebrae of a *Trionyx* sp. are preserved too. As they articulate very precisely with one another, they probably belong to the same specimen. They are similar to the corresponding vertebra of *T. triunguis* although somewhat smaller. Dorsally, their neural crest becomes wider posteriorly. The transverse process has the same orientation as in the two first but is attached right at the boundary between the neural arch and the centrum. The "spool-shaped" centra are wider anteriorly. The condyle and the cotyle are dorso-ventrally depressed.

They become smaller from the seventh to the ninth.

BSP 1953 II	Length centra	Width Proc.	Trans.	Length pre-post.	Height
325	13 mm	17 mm		15 mm	10 mm
326	11 mm	16 mm		13 mm	9 mm
327	10 mm	15 mm		11 mm	7 mm

BONES OF THE SHELL.

Only few fragments from the carapace and plastron of *Trionyx* sp. are to be mentioned, although they do not provide any further systematics information.

Carapace.

Two fragments of nuchals and seven pleuralia are preserved.

The nuchal (BSP 1953 II 328; Plate 1, Fig. 1) is rather complete, its right side and its middle part being present. Its dorsal face is completely covered by callosities; laterally a little spur prolongs the plate. The texture of the callosities might be indicated as the "c-type" described by SCHLEICH (1984).

The medial length of this plate measures 31 mm; its width must been of 140 mm including the lateral spur. The measurements of this nuchal corresponds to a carapace of approximately 28 cm in length.

The second nuchal fragment (BSP 1953 II 329; Plate 1, Fig. 2) is limited to the right half of the plate; its length

is approximately 37 mm and its width 134 mm, which corresponds to a carapace of about 27 cm. This fragment is not entirely recovered by callosities (texture similar to type "b-c" (SCHLEICH 1984) and lateroanteriorly a free osseous margin of about 1 cm remains in the same way as in the recent specimen of *T. triunguis* RG 15651 (Musée Royal d'Afrique centrale; Belgium).

An approximative determination of the distal pleuralia fragments is tentatively proposed. Two plates (BSP 1953 II 331; Plate 1, Fig. 3) belong most probably to the lateral part of a sixth left (330) and right (331) pleural.

The distal width of these plates is 41 mm for specimen BSP 1953 II 330 and 36 mm for specimen BSP 1953 II 331. The callosities of these plates might be referred to "Type-a" described by SCHLEICH (1984).

A distal part of a fifth left pleural is characterized (BSP 1953 II 333) by its width which increases to reach finally 45 mm at its distal part (texture pattern is of "type-a").

Only one proximal part of a pleural is preserved (BSP 1953 II 334); it is from the anterior part of the left side of the carapace. The callosities could be referred to "type-c".

Plastron.

Three small plastral fragments cannot yield any systematical information. The right hyoplastron fragment (BSP 1953 II 335) seems to belong to a well developed specimen with large callosities, indicating a sculptured pattern of "d-c type". The fragment (BSP 1953 II 336) shows a "d-type" of callosities pattern and belongs probably to the same part of a right hyoplastron, but is actually too small for further identifications. The same uncertainty exists for determining another fragment (BSP 1953 II 337) as being part of the anterolateral extremity of a right xiphiplastron. This last fragment presents a "d-c type" of sculpture. Only a few plates being preserved, one can only give a general description of the sculpture. It consists of a network of ridges and little pits. Ridges and pits are wider on the carapace than on the plastron. On the distal part of the pleurals, they show a more parallel arrangement than in the central part with, in some places, transverse ridges delimiting long grooves.

SYSTEMATIC DISCUSSION.

In the descriptions, the *Trionyx* material from Appertshofen is often compared with the extant species *Trionyx triunguis*. Shapes of the proximal articular head of the humerus, of the mediocnemial crest on the tibia and of the puboischiadic foramina indicate affinities with Trionychids. The elements of the axial skeleton and particularly the cervical vertebrae demonstrate without any doubt the presence of a *Trionyx* as do also the plates of the shell with their typical callosities. In absence of any study of postcranial features in *Trionyx*, and in view of the fact of the rather fragmentary state of the shell, no further systematic treatment can be made

beyond the generic level.

Chelydropsis cf. *decheni*.

Following description or remains of "snapping turtles" (*Chelydropsis*) will complete the turtles studies from Appertshofen.

BONES OF THE CRANIAL SKELETON.

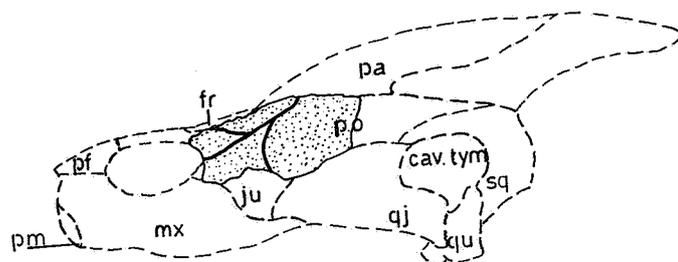


Fig. 2 - Skull reconstruction of a *Chelydropsis* with the fossil fragmentary left post-orbital (stippled).

One postorbital fragment (BSP 1953 II 356; Fig 2 and Plate 1, Fig. 10) can be mentioned here. The posterior end and the antero-superior margin of this left post-orbital are broken. Its general shape is that of a wing and slightly convex. In dorsal view the medial part is slightly concave at the level of the uppermost distal part of the frontal scale. Posteriorly, the plate's ventral margin is very thin, it becomes wider anteriorly, with an internal projection at the level of its anterior junction with the jugal and then becoming thinner at the orbital margin.

The scales scars are clearly preserved; they form a "Y" shape directed anteroposteriorly, while posteriorly the marginal scar of the interparietale leaves this bone at the 2/3 of its dorsal margin. A scale limit crosses the bone at its half length with following the ventral margin of the bone forming a wide anterior curve.

BONES OF THE POSTCRANIAL SKELETON.

Axial skeleton.

Only three vertebrae are preserved. The eighth cervical centrum (BSP 1953 II 338; Plate 2, Fig. 5) is characterized by the anterior pair of articular cotyles forming the procoelous ginglymoid articulation between the seventh and the eighth cervical (HOFFSTETTER & GASC 1969 : 213). The present centrum lost the half anterodistal right articular face, its ventral keel is broken just at its base. The length of the centrum measures 19 mm, the posterior condylus width 11 mm. The dorsal and the sacral regions are completely missing in the material; from the tail only two opisthocoelous vertebrae are preserved (BSP 1953 II 339-340). Being opisthocoelous, they should fit after the fourth biconcave caudal vertebra (HOFFSTETTER & GASC, op. cit.). The presence of a well developed transverse process laterally at the base of the neural arch indicates a relatively anterior

position in the caudal part of the column.

For one vertebra (BSP 1953 II 339; Plate 2, Fig. 2), the anterior portion of its neural crest is more inclined posteriorly. It lost its prezygapophyses. The posterior ventral border of its centrum bears the articular surfaces for the chevrons.

- Length of the centrum : 22 mm.
- Width at the level of the transverse process : 28 mm.
- Height of the vertebra at its posterior extremity : 20 mm.

The vertebra BSP 1953 II 340 is more complete and smaller than the former. The anterior border of its neural crest is vertical and the articular facets of its pre- and postzygapophyses are strongly inclined. Ventrally, it bears also articular facets for the chevron bones.

- Length of the centrum : 13 mm.
- Length between the extremities of the pre- and postzygapophyses : 15 mm.
- Height of the vertebra : 16 mm.
- Width with the transverse process : 19 mm.

Pelvic girdle.

Other parts of the postcranial skeleton from *CheLydroopsis* preserved in the material belong to the pelvic girdle.

One right ilium (BSP 1953 II 341; Plate 2, Fig. 13), is ventrodorsal somewhat damaged and proximal is slightly eroded. ZUG (1971) emphasized the different lateral forms presented by the turtles ilia in different families. The present ilium has a "spool shape" with enlarged proximal and distal ends like the Chelydridae. After ZUG (1971, p. 38) "... the enlarged distal end provides a larger surface area for attachment of muscles and for a wider articulation with the little thelial process which provides a sculptured attachment area for the iliobialis muscle.

According to ZUG (1971), the relative length of the ilium is the same among the different Cryptodiran taxa, and corresponds to twice to three times the length of the eight cervical vertebra. The length of this ilium is 43 mm and must fit with an eight cervical of about 44 mm : it seems thus comparable with the size of the centrum BSP 1953 II 338. A proximal part of a left ilium is also preserved (BSP 1953 II 342) and looks quite similar to the former, but is too incomplete to be assigned without any doubt to this genus.

The other part of a pelvic girdle from *CheLydroopsis* is an incomplete right ischium (BSP 1953 II 343; Fig. 3). Its medioanterior descending border should form the anterior extension characteristic in the Chelydridae but unfortunately this part is broken. Posteriorly also a characteristic straight metischial process is preserved. MLYNARSKI (1980) mentioned the high similarity in the shape of the ilium and ischium of the *CheLydroopsis* to those of the recent *CheLydra*. For him, this feature legitimates the attribution of this fossil genus in the family

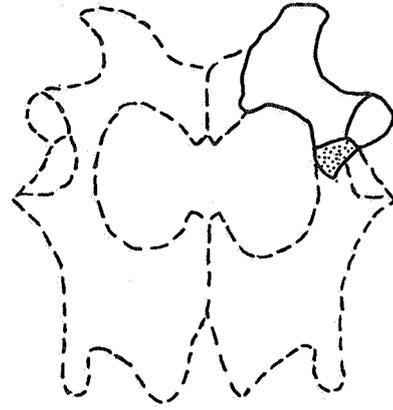


Fig. 3 - Reconstructed pelvis of *CheLydroopsis* with the fossil fragmentary right ischium.

Chelydridae. After MLYNARSKI the most important difference between the extinct and extant forms are the morphology of the more elongated pubis in the fossil genus *CheLydroopsis*.

BONES OF THE SHELL.

Plates of the carapace.

Three fragmentary pleuralia can be determined as *CheLydroopsis* sp. The lack of callosities and the furrows of the horny shields are typical. One fragment (BSP 1953 II 344) may become identified as an eight left pleural. The furrows of the fourth lateral and the fifth central are posteriolaterally directed and viscerally the rib's ends are anteriorly orientated as they are normally in the last pleural.

The biggest pleural fragment (BSP 1953 II 345) is neither proximal nor distal preserved and bears the longitudinal furrow of a lateral and can be determined as either a second, fourth or sixth pleurale.

Another, probably the proximal part of either a second or fourth left pleurale (BSP 1953 II 346; Plate 1, Fig. 8) is to be mentioned.

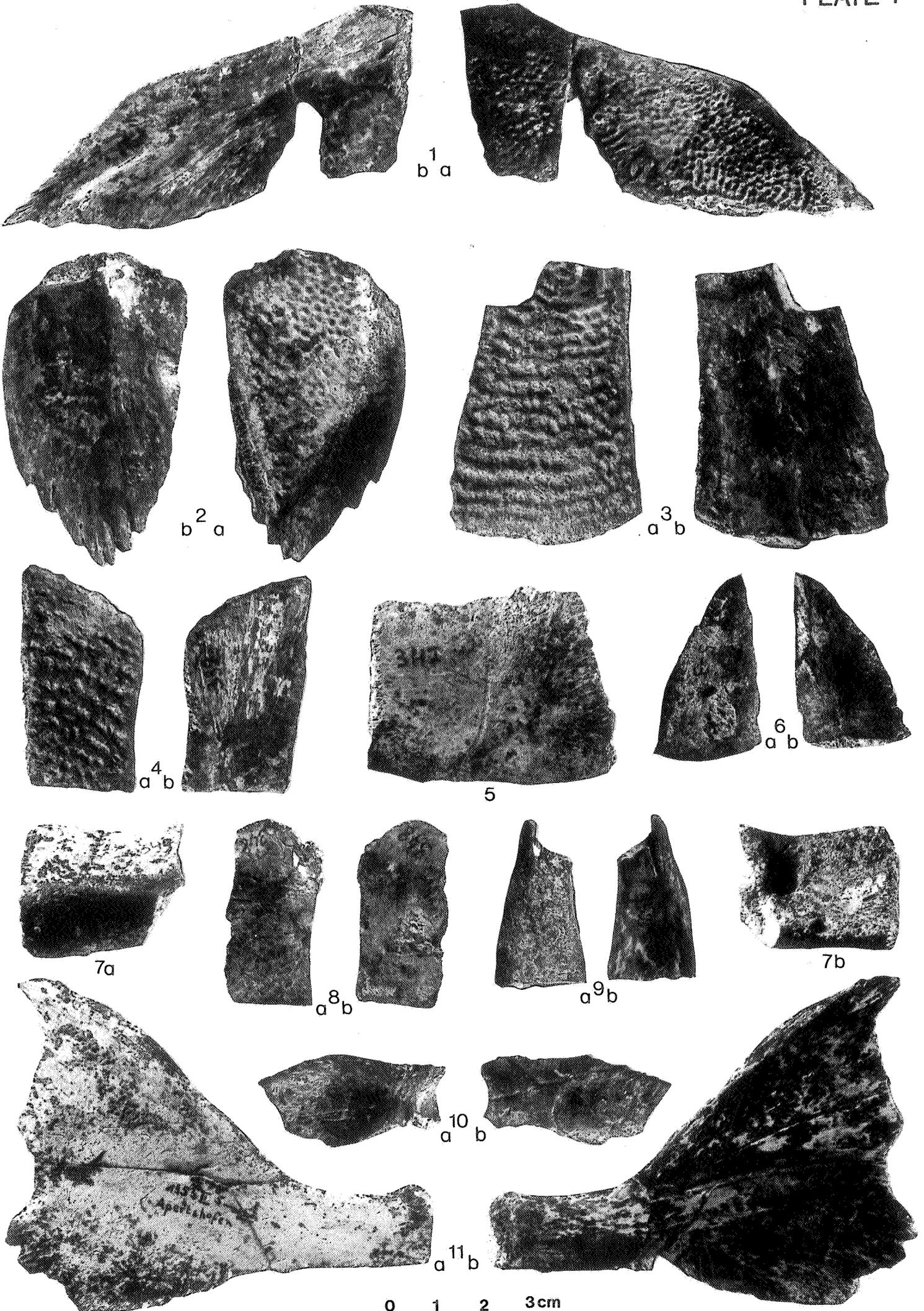
Three peripherals are preserved, but only one ninth left peripheral is complete (BSP 1953 II 347; Plate 1, Fig. 5). Its proximal border is slightly eroded. This plate is somewhat wider than long. Distally the marginale is both dorsally and viscerally directed forward. The lateral border lacks any gomphosis.

- Length of the plate : anterior 35 mm.
posterior 40 mm.
- Width of the plate : 52 mm.
- Distance between the ribs articulation surface and the posterior proximal end : 20 mm.

One fragment (BSP 1953 II 348) might belong to an eighth or a ninth left peripheral but it is too fragmentary to allow a good localisation. The only peripheral of the bridge (BSP 1953 II 349; Plate 1, Fig. 7) is a left peripheral -7

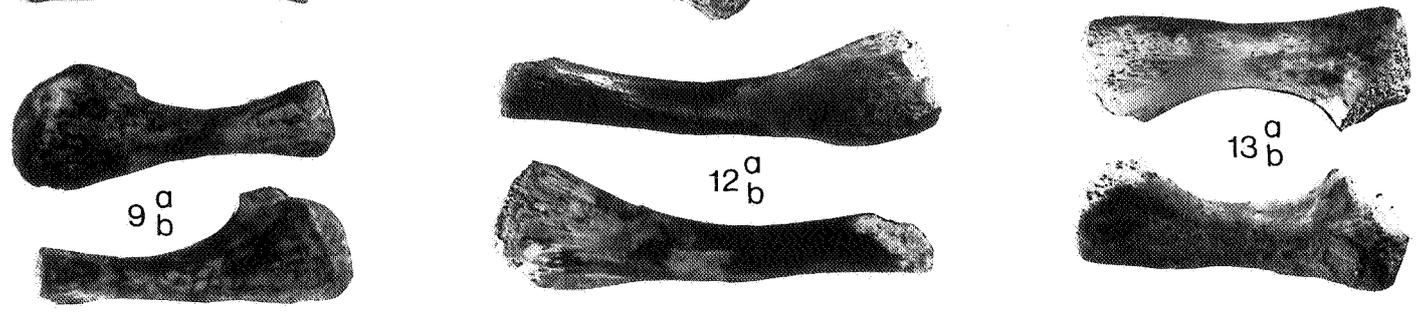
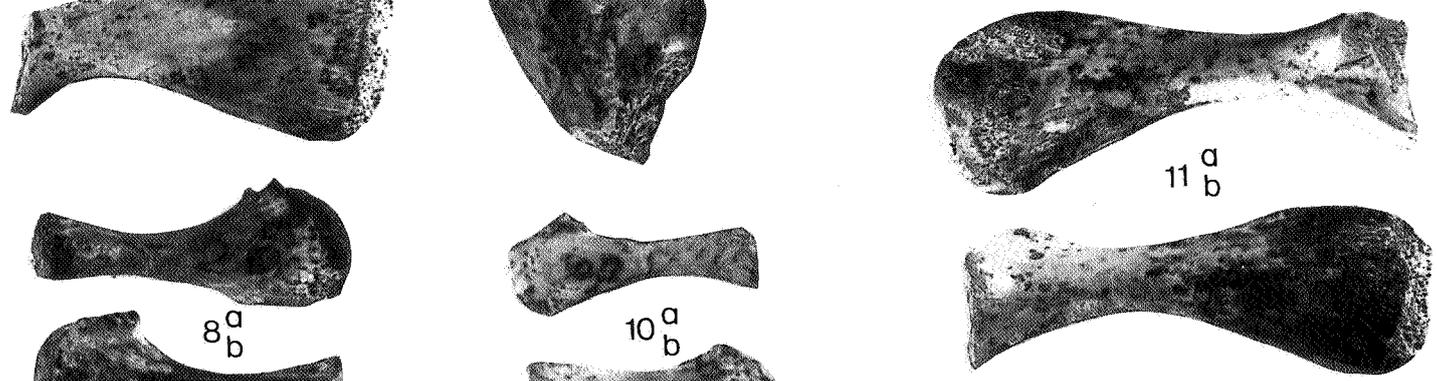
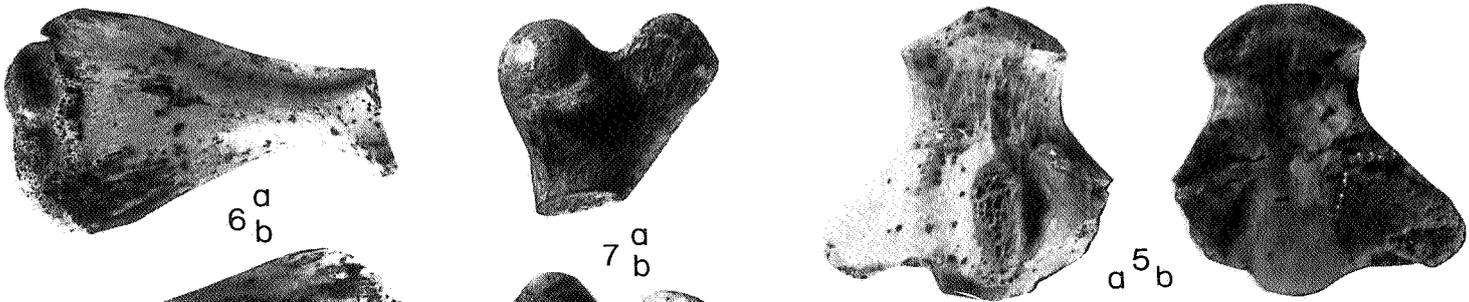
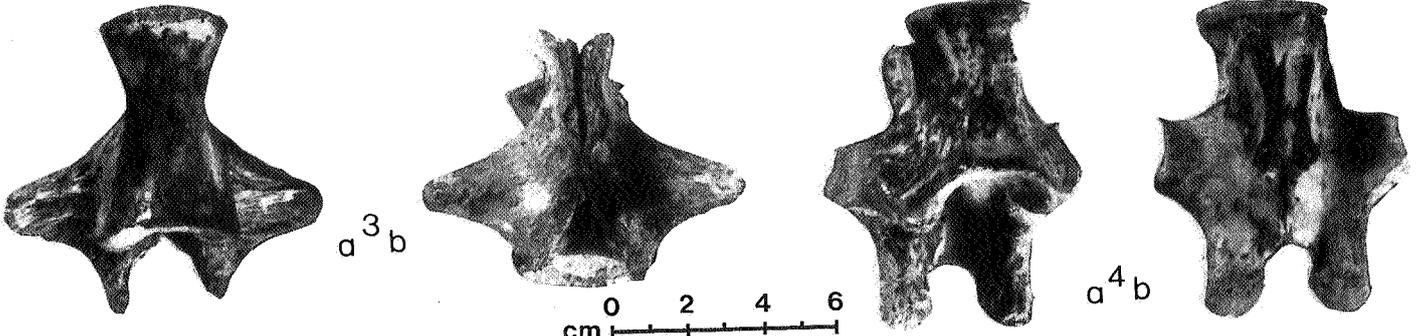
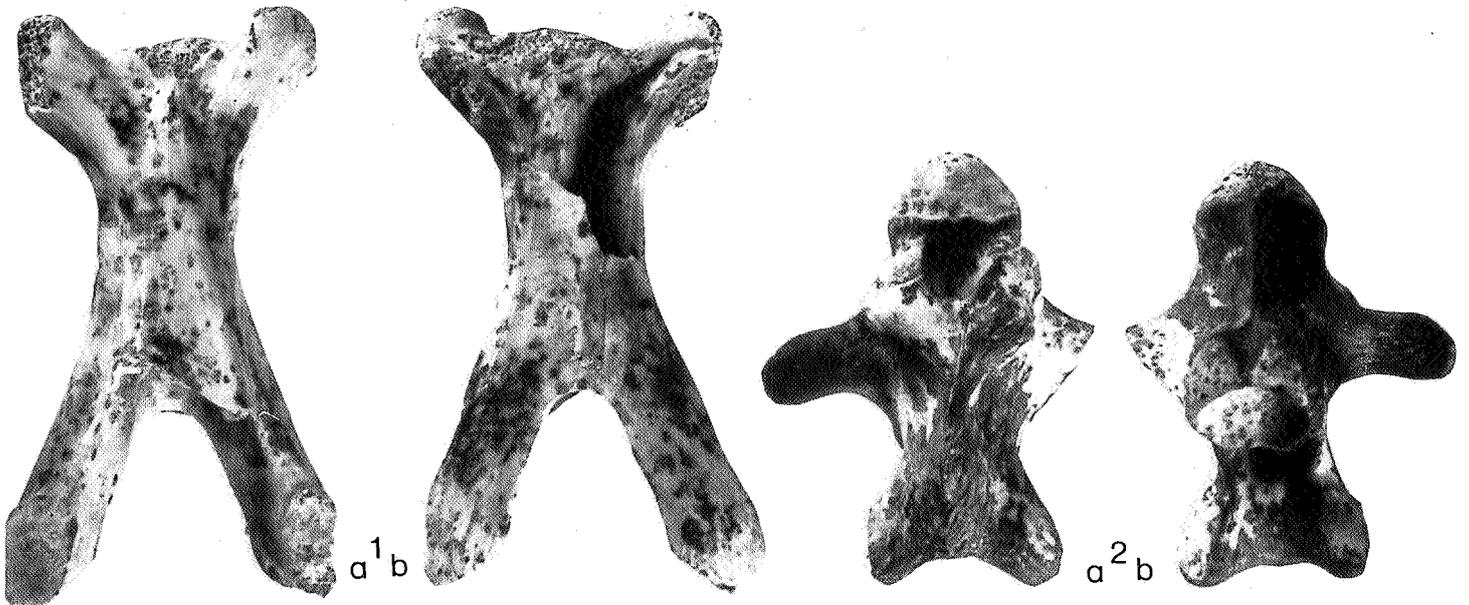
P L A T E I

- Fig. 1-4 *Trionyx* sp., Shell plate fragments, Upper Orleanum, MN5, Appertshofen, Bayerische Staatssammlung für Paläontologie und historische Geologie, Inv. Nr. BSP 1953 II.
- Fig. 1 Right Nuchale fragment; (BSP 1953 II 328)
a. dorsal
b. visceral
- Fig. 2 Left Nuchale fragment; (BSP 1953 II 329)
a. visceral
b. dorsal
- Fig. 3 Left Pleural-6-fragment; (BSP 1953 II 330)
a. dorsal
b. visceral
- Fig. 4 Right Pleural-1-fragment; (BSP 1953 II 332)
a. dorsal
b. visceral
- Fig. 5-11 *Chelydropsis* cf. *decheni*; shell plate fragments. Upper Orleanum, MN5, Appertshofen. Bayerische Staatssammlung für Paläontologie und historische Geologie, BSP 1953 II.
- Fig. 5 Left Peripheral-9-fragment; (BSP 1953 II 347)
- Fig. 6 Right Epiplastron; (BSP 1953 II 352)
a. ventral
b. visceral
- Fig. 7 Left Peripheral-7; (BSP 1953 II 349)
a. dorsal
b. visceral
- Fig. 8 Left Pleural-4; (BSP 1953 II 346)
a. dorsal
b. visceral
- Fig. 9 Right Xiphiplastron; (BSP 1953 II 353)
a. ventral
b. visceral
- Fig. 10 Left Postorbital; (BSP 1953 II 356)
a. visceral
b. dorsolateral
- Fig. 11 Left Hyoplastron; (BSP 1953 II 351)
a. ventral
b. visceral



P L A T E 2

- Fig. 1-13 *Trionyx* sp. and *Chelydropsis* cf. *decheni* bones of
extremities and axial skeleton. Upper Orleanium,
MN5, Appertshofen. Bayerische Staatssammlung für
Paläontologie und historische Geologie (BSP 1953 II).
- Fig. 1 *Trionyx* sp.; Cervical vertebra ?5; (BSP 1953 II 318)
a. ventral
b. dorsal
- Fig. 2 *Chelydropsis* cf. *decheni*; Caudal vertebra;
(BSP 1953 II 339)
a. dorsal
b. ventral
- Fig. 3 *Trionyx* sp.; First caudal vertebra; (BSP 1953 II 323)
a. ventral
b. dorsal
- Fig. 4 *Trionyx* sp.; First sacral vertebra; (BSP 1953 II 320)
a. ventral
b. dorsal
- Fig. 5 *Chelydropsis* cf. *decheni*; Eighth cervical centrum;
(BSP 1953 II 338)
a. ventral
b. dorsal
- Fig. 6 *Trionyx* sp.; Left humerus, distal end; (BSP 1953 II 316)
a. ventral
b. dorsal
- Fig. 7 *Trionyx* sp.; Right humerus, proximal end;
(BSP 1953 II 315)
a. ventral
b. dorsal
- Fig. 8, 9 *Trionyx* sp.; First pair of sacral ribs;
(BSP 1953 II 321)
a. dorsal
b. ventral
- Fig. 10 *Trionyx* sp.; Left second sacral rib; (BSP 1953 II 322)
a. dorsal
b. ventral
- Fig. 11 *Trionyx* sp. Left femur; (BSP 1953 II 312)
a. ventral
b. dorsal
- Fig. 12 *Trionyx* sp.; Right tibia; (BSP 1953 II 313)
a. lateral
b. medial
- Fig. 13 *Chelydropsis* cf. *decheni*; Right Ilium (BSP 1953 II 341)
a. anterior
b. posterior



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