ON PREHISTORIC MAMMALS FROM SOUTH CELEBES

by

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Up till now very little has been published about prehistoric mammals from Celebes. The nephews SARASIN have explored some caves in South Celebes in the neighbourhood of Lamontjong [1]). The animal remains detected in these caves are described at length and the following species of mammals are recorded:

Anoa depressicornis
Cervus moluccensis
Babirussa alfurus
Sus celebensis
Macacus maurus
Phalanger ursinus
Phalanger celebensis
Paradoxurus hermaphroditus
Lenomys meyeri
Mus neglectus
Mus spec.
Sciurus spec.
Cephalotes peroni
Pteropus alecto
Canis familiaris
Bubalus bubalus

All the bones were badly broken and smashed into small fragments, there was not a single marrow-bone, vertebra, skull, or even a mandible which was not damaged, except some belonging to such small animals as rats. The majority of these pieces do not allow a satisfactory identification: only the teeth and the articular extremities furnish adequate material for determination.

Of the above-mentioned mammals the Moluccan deer (*Cervus moluccensis*) does not belong to the prehistoric fauna proper, only two incisors of this species having been found among iron ware and China cups in a cave still in use today. As no remains of deer were detected in any of the other caves we are certainly dealing here with a recent importation. The SARASINS said therefore that the principal conclusion revealed by their researches was the absence of the deer and the presence of the babirusa: "Der wesentlichtste Unterschied der Höhlenfauna von der heutigen ist das Fehlen des Hirsches und die Anwesenheit des Babirusa" (l.c. p. 53). The babirusa does not occur in South Celebes today.

As may be seen from the following description we also did not meet with deer remains among the material at our disposal. All other mammals detected by the SARASINS were also represented in our collections except the species of *Paradoxurus, Sciurus, Cephalotes* and *Pteropus*. There may be some doubt whether *Paradoxurus hermaphroditus* was present in prehistoric times in Celebes

[1]) SARASIN, P. u. F. Versuch einer Anthropologie der Insel Celebes, Th. 1, Die Toala-Höhlen von Lamontjong, 1905.

and is not an introduction, like the deer, of more recent times. The remains of this beast of prey excavated by the SARASINS are rather scanty: two lower canines and a piece of a right maxilla with some milk-teeth. The SARASINS themselves are not so quite positive about the identification and, moreover, the remains may have got into the deposits fortuitiously.

Similar caves as explored by the SARASINS were examined by the late Dr. P. VAN STEIN CALLENFELS, the well-known archaeologist, in 1933 - 34. These caves were the Liang (= cave) Tomatoa Katjitjang and Liang Sebong, directly north of Tjani (Lamontjong) in South Bone. The top layer of the deposits in these caves must be quite modern as it contains pottery and is still in use. (The material from this layer bears the numbers 1 - 200.)

In 1937 a few more caves were excavated by the same authority: Panisi Ta'boettoe, near Watampone, district of Palaka, Central Bone; and Liang Batoe Edjaja and Liang Panganrejang toedeja, both situated on the south coast near Bonthain [2]). The deposits of the last cave are divided into the layers A-B and C-D. The first layer is said to date from about the beginning of the Christian era; the other one is much older and bears a mesolithic culture.

The mammalian remains discovered at the said localities were put in the hands of the writer for identification. The material is on the whole rather scanty, hardly a single bone being present undamaged. Of all species only the mandibles, which as a rule are more completely preserved than the other bones, and loose teeth allow a reliable determination. Most other bones except those of the limbs are absent; the latter too are badly broken or smashed into small fragments.

Not only was the flesh of the animals eaten by the prehistoric hunters, but the marrow from the bones, and the brains seem to have formed a large part of the diet. Of skull-bones only the mandibles and fragments of maxillae are present: all the other bones have been broken into small unrecognizable pieces.

A noteworthy feature of the collection is that all the more typical animals now known from Celebes and restricted mostly to that island are represented: the two species of marsupials of Celebes (*Phalanger ursinus* and *celebensis*), the dwarf-buffalo (*Anoa*), the babirusa and the moor-macaque (*Cynopithecus maurus*). The species of wild pig is also probably the Celebes wild boar (*Sus celebensis*) or a near relative.

The SARASINS call attention to the fact that the molars of the Anoa from the caves explored by them are a little smaller than those of recent dwarf-buffaloes from North Celebes. Our material belongs mainly to juvenile individuals but in the molars from adult specimens we cannot find any noticeable difference in size from those of recent ones.

There are at least four species of rats represented but our collection of this group of animals from Celebes available for comparison is too incomplete to allow an exhaustive identification. One of the species found by the SARASINS

[2]) See: Tijdschr. Ind. Taal-, Land- en Volkenkunde, Dl. 78, 4, 1938; and Tijdschr. Kon. Ned. Aardr. Gen. 2e R., Dl. 55, 1938, p. 138.

is named *Lenomys meyeri*. We have at our disposal also a few mandibles of a rat species (species a) with a pattern of the molars very similar to that of *Lenomys*, but otherwise these mandibles show some differences when compared with those of the said species. Another species named *Mus neglectus* JENT. (*Mus rattus celebensis* HOFFM.) may probably represent the common house-rat or country-rat (*Rattus rattus* subspec.). Among the material excavated there is also a rat species (species d) closely resembling *R. rattus* but not quite identical.

Besides the above mentioned wild species there are found, moreover, two domesticated animals, the water-buffalo and the house-dog. Both species are from the top-layer of the caves north of Tjani, but as this layer is quite modern these species are certainly a late introduction. However, there are a few bones (two phalanges and a piece of marrow-bone) of the buffalo bearing numbers above 200 and therefore said to be excavated from the lower and older layer. These pieces of bones seem to me to be quite recent and are not incrustated and dark in colour like those of *Anoa* found in the same layer. Therefore I feel some doubt as to whether these pieces are correctly numbered; they may have got among the material from lower deposits by chance.

The main bulk of the material consists of remains of the dwarf-buffalo, the babirusa and the wild pig, and in the most southern caves the Celebes cuscus (*Phalanger celebensis*) is also represented in fairly large numbers. It seems that the said game-animals, in the first place the babirusa, and in some localities also the cuscus, were the main food of prehistoric man in Celebes. In a much less degree the dwarf-buffalo and the wild pig seem to have been taken as in all caves remains of these beasts are less plentiful than those of babirusa.

The remarkable canines of the babirusa were apparently much appreciated by prehistoric man as ornaments: a few tusks cut through and polished came to light. The SARASINS have described similar ornaments from the Lamontjong caves.

The same authors called attention to the absence of the deer-species among the truly prehistoric remains and as mentioned above we also have not detected a single remain of the deer. If the deer really was present in prehistoric times in Celebes, the remains of it would almost certainly have been found, especially the antlers which have always been a material much esteemed by prehistoric man for making tools.

Survey of the species found in the caves.

A. Caves North of Tjani (Lamontjong).

1. buffalo (*Bos bubalis* L.).
2. dwarf-buffalo (*Anoa depressicornis* H. SM.).
3. babirusa (*Babirussa babyrussa* L.).
4. wild pig (*Sus celebensis* M. et SCH.?).

5. domesticated dog (*Canis familiaris* L.).
6. moor-macaque (*Cynopithecus maurus* CUV.).

B. Cave Panisi Ta'boettoe.
1. black cuscus (*Phalanger ursinus* TEMM.).
2. dwarf-buffalo (*Anoa depressicornis* H. SM.).
3. wild pig (*Sus celebensis* M. et SCHL.?).
4. rat-species c.
5. rat-species d.
6. moor-macaque (*Cynopithecus maurus* CUV.).

C. Cave Batoe Edjaja.
1. black cuscus (*Phalanger ursinus* TEMM.).
2. Celebes cuscus (*Phalanger celebensis* GRAY).
3. dwarf-buffalo (*Anoa depressicornis* H. SM.).
4. babirusa (*Babirussa babyrussa* L.).
5. wild pig (*Sus celebensis* M. et SCH.?).
6. rat-species a.
7. rat-species b.
8. rat-species d.
9. moor-macaque (*Cynopithecus maurus* CUV.).

D. Cave Panganrejang toedeja.

Layer A-B, top-layer.
1. black cuscus (*Phalanger ursinus* TEMM.).
2. Celebes cuscus (*Phalanger celebensis* GRAY).
3. dwarf-buffalo (*Anoa depressicornis* H. SM.).
4. babirusa (*Babirussa babyrussa* L.).
5. wild pig (*Sus celebensis* M. et SCH.?).
6. rat-species a.
7. rat-species b.
8. rat-species c.
9. moor-macaque (*Cynopithecus maurus* CUV.).

Layer C-D, older.
1. black cuscus (*Phalanger ursinus* TEMM.).
2. Celebes cuscus (*Phalanger celebensis* GRAY).
3. dwarf-buffalo (*Anoa depressicornis* H. SM.).
4. babirusa (*Babirussa babyrussa* L.).
5. wild pig (*Sus celebensis* M. et SCH.?).
6. rat-species a.
7. rat-species b.
8. moor-macaque (*Cynopithecus maurus* CUV.).

Description of the material.

Phalanger ursinus TEMM.

Cave Panisi Ta'boettoe.

It is with some hesitation that I refer to this species two pieces of bone belonging to a cuscus. One piece is a fragment of the right maxilla beneath the insertion of the zygomatic process, containing four molars (m^1-m^4); the other piece is the anterior part of a right mandible with the whole teeth-row, including the incisors, practically intact.

Among the species of *Phalanger* living nowadays in Celebes our specimen comes nearest to *ursinus* (the Black cuscus) but there are noteworthy differences. In the maxilla the length of the molar series is about the same as in *ursinus* but the molars are much heavier, broader, and more rectangular in shape. The distance between the molar series and the insertion of the jugale is much higher. In the mandible the length of the molar series (p_4-m_4), being 33.8 mm, matches that of *ursinus* again but the second small intermediate tooth is situated more on the innerside of the fourth premolar; moreover, the height of the mandible is greater, being 18.5 mm at p_4 against 17.4 mm in recent *ursinus*.

From *Phalanger maculatus*, the only other large cuscus with which our specimen is comparable, our specimen differs in the manner and the position of the jugal connection with the maxilla, the oblique stand of p_4 and the position of p_3 which in *maculatus* is situated in front of p_4.

Cave Batoe Edjaja.

A fragmentary right mandible with the molars and p_4 intact (length of p_4-m_4, 34 mm). In the length of the molar series and in other respects the specimen exactly matches *ursinus*, excepting in the position of the second intermediate tooth which is as described above; p_4 is set a little obliquely outwards.

Cave Panganrejang toedeja.

From the layer A-B we have before us a fragment of a right mandible with p_4 only and alveoli of other teeth; a very fragmentary piece of a left mandible with p_4 and m_1; one loose third lower molar. The molars are heavier than in *ursinus*, and are as described for the specimen from the cave Panisi Ta'boettoe.

From the older layer C-D there is only one small fragment of a left mandible without teeth.

Phalanger celebensis GRAY.

Cave Batoe Edjaja.

A piece of a left maxilla with part of the zygomatic process, molars p^4-m^3 present, of other teeth, including i^2, alveoli only. Length of molar row a little less and teeth slightly smaller than in recent *Ph. celebensis*. Further, a right and a left mandible are represented; of both the anterior part is missing, of molars p_4 to m_3 preserved, in the left mandible m_2 lost. Length of molar series and size of teeth as in *celebensis*, but in the left mandible the condylus is more projected backwards. All three pieces probably belong to the same specimen but the mandibles have not the same length.

Cave Panganrejang toedeja.

From layer A-B there are 5 right mandibles, all fragments, two with all molars lost, two with only a few molars, and one piece with the molars p_4-m_3 represented. Moreover, 7 left mandibles, far more complete, two without teeth, two with a few molars only, and three with molar series p_4-m_4 intact. Of all mandibles only the central part is present; the anterior part with the incisors and posterior condylar part is always broken off. Besides these mandibles there is also one lower part of a left humerus which probably belongs to this species of cuscus.

In the layer C-D the species is represented by 7 right and 6 left mandibles, all again fragmentary; two right ones only have the molars p_4-m_3 complete; in the left mandibles there is only one with the molar series p_4-m_4 intact.

From this layer two pieces, both lower parts, of a right and a left humerus, were also excavated.

Bos bubalis L.

Caves N. of Tjani (Lamontjong).

In the uppermost layer there were found a number of buffalo teeth, four upper premolars and four upper molars (Nos S. 6; 30, 55, 56, 95, 128, 168). Further, remains of limb-bones and of a buffalo scapula, all smashed into small fragments (Nos 2 - 139).

Moreover, there are a few other small bones bearing higher numbers than 200 and therefore presumably derived from the lower layer of deposits. These are two proximal phalanges (Nos 231 and 271) and a piece of marrow-bone (No. 534).

Anoa depressicornis H. SMITH.

Cave N. of Tjani (Lamontjong).

From this cave we have before us one upper premolar (No. 237) and two upper molars (Nos 120 and 211); one lower premolar (No. 460) and two lower molars (No. 119). Besides the teeth there are a few remains of limb-bones (Nos S. and S. 50; 242, 247).

Cave Panisi Ta'boettoe.

Only two small fragments of teeth were brought to light.

Cave Batoe Edjaja.

One upper and one lower molar from a juvenile individual, and one lower incisor are present. Further, scattered pieces of limb-bones and perhaps some vertebrae.

Cave Panganrejang toedeja.

The dwarf-buffalo is represented in the upper layer A-B by one upper molar, two lower molars (m_1 & m_3); and one upper molar and two lower molars from a young specimen. The same layer yielded also some pieces of limb-bones broken into fragments.

From the older layer C-D there are several lower molars, and a number of upper and lower molars from a juvenile specimen.

From this layer a few fragments of limb-bones were alse excavated.

Babirussa babyrussa L.

Cave N. of Tjani (Lamontjong).

A piece of a right maxilla is present, with the molars m^1-m^3 (No. 109); a fragment of a right mandible with m_1 (No. 469), idem with m_2-m_3 (No. 139); a piece of a left mandible with m_1-m_2 (not numbered); idem with the molars p_3-m_2 (No. 223), a fragment with m_1-m_2 (No. 230), two pieces with m_1-m_3 (Nos 220 and 228), two other fragments with the third molar only (Nos 147 and 266).

Moreover, there are a number of loose teeth, both premolars and molars from adult and juvenile individuals, but only one lower incisor.

Bones other than teeth are represented only by a few scanty remains of limb-bones, belonging either to babirusa or wild swine. As we have no skeleton of *Sus celebensis* at hand and the bones of swine and babirusa are rather similar, I am for the moment not able to give a definite identification, especially as the remains before me are so very incomplete.

Cave Batoe Edjaja.

A piece of an upper tusk of a young specimen was among the material from this cave: apparently it was used as an ornament, for it is polished and has the lower part cut away. The greatest diameter is 11 mm.

Beside the said canine (now in the collection of the Archaeological Survey) there are:- two fragments of left maxillae, one from a young individual with the second molar only, the other small piece from an adult, with the molars m^2 & m^3. Further, some stray incisors, premolars and molars, from adult as well as from juvenile specimens; a fragment of a lower tusk.

From this cave too there are a number of limb-bones, mostly broken, and a piece of a scapula, representing either babirussa or swine.

Cave Panganrejang toedeja.

In this cave too a tusk of babirusa was found which had been used for ornament or tool. It is a piece of an upper canine of a very old individual, measuring in diameter 18 mm and also cut straight through. (This piece is kept in the collections of the Archaeological Survey.)

The babirusa is well represented as rather a large number of bones, although all incomplete, was excavated. There are 8 fragments of right, and 4 of left maxillae, from the layer A-B; further, 2 of right and 4 of left mandibles. Some of these bones are without teeth and with the alveoli only; others are with a greater or smaller number of molars.

There are at least two juvenile specimens, one represented by a piece of a left maxilla with the four last molars complete; and another by a fragment of a right mandible of a very young individual with m_1 and m_2, the third molar being not yet visible. Here also are several loose teeth, incisors, fragments of tusks, premolars and molars, some of which belong to young specimens.

From the same layer there is a large number of remains of limb-bones, but only one piece of a scapula and one of the pelvic bones, either from *Babirussa* or *Sus*.

The older layer C-D yielded also several remains of the babirusa:- A part of a right premaxilla with the first incisor; two pieces of right and three of left maxillae, most fragmentary, some with a single tooth only, others with the series p^3-m^2 complete. Furthermore, there are two pieces of right mandibles, one with three, the other with a single molar (m_3) only; four left mandibles are represented, the most complete part with p_3 to m_2 intact. Moreover, a number of loose incisors, premolars and molars are found, and two fragments of lower tusks. Remains of the limb-bones are also present but all broken into pieces, and, as already told above, we are not able to tell whether they belong to the babirusa or wild swine.

Sus celebensis M. et SCHL. (?)

As there are only fragments of skull-bones and other bones at our disposal we are not quite sure about the identification of the remains belonging to a species of wild swine. The tusks are not larger or heavier than in recent specimens of *Sus celebensis* and the lower ones are similar in cross-section to those of this species. Also in other respects I cannot detect any other outstanding difference from the characters of the recent Celebes wild swine, so, notwithstanding the rather poor material at hand, we most probably are dealing here with *S. celebensis*.

Cave N. of Tjani (Lamontjong).

From this cave we have before us a fragment of a right maxilla with m^2 and m^3 (No. 227), a piece of a left premaxilla with the three incisors (No. 177); two fragments of mandibles each with three premolars (Nos 220 and 237). Two upper tusks of full-grown individuals, and one lower tusk, broken; some upper and lower loose molars, mostly from young specimens.

Cave Panisi Ta'boettoe.

The remains from this cave are very scanty; here were found only two lower incisors and a lower premolar (p_2) and a few fragments of teeth.

Cave Batoe Edjaja.

From this cave too only few bones of wild swine were brought to light:- a piece of a right mandible with the molars m_1-m_3; a few upper and lower incisors, two loose molars, and one upper canine from a juvenile specimen.

Cave Panganrejang toedeja.

This cave yielded the greatest variety of bones of the *Sus* species, especially the younger layer A-B. From the latter layer there are at hand two premaxillae, a left and a right one, the left one with the canine and two premolars, the right one with the canine only, which is broken off. There is, moreover, a piece of bone comprising the symphysis of a mandible with two premolars of the left side; and a fragmentary piece of mandible with one premolar (p_3) only.

Beside these parts there are present several upper and lower tusks, but only one intact, the others all fragmentary; and several single upper and lower incisors, and one upper molar (m^3) from a young individual.

The remains from the lower layer C-D are less numerous:- a fragment of a right maxilla, with the canine; a piece of a left maxilla with the canine and two premolars. Further, a fragment of a right mandible with the tusk, belonging to a juvenile specimen, and a number of loose incisors, a broken upper tusk, and one loose, upper third molar.

Muridae.

In the different caves remains of several species of rat were discovered, but among the bones only mandibles are represented: no other skull-bones were found. As our collection of Celebes rats is far from complete we are not able to identify with any certainty the rather scanty material. At least four species are, however, distinguishable.

Murid species a.

This is the largest rat represented; the lower molars are very heavy and with complicated sculpture, in these respects the species much resembles *Lenomys meyeri* JENT., but the mandible is higher and longer.

Cave Batoe Edjaja:- one left mandible with complete molar series, which is 10.9 mm in length.

Cave Panganrejang toedeja:- from the upper layer A-B there are three right mandibles, two of which are fragments only, one has the molar series intact, length 11.2 mm; three left mandibles, all broken, in two of them all three molars are intact, length 10.7 mm; only two lower incisors are present and these are slender like those of *Lenomys*.

From the older layer C-D we have before us two right mandibles, both fragmentary with incomplete molars; one left mandible with the molar series complete. The latter has a length of 11.8 mm and seems rather too large to be classed with the same species as the remains from the other deposits. This piece may represent another species.

Murid species b.

A large rat but smaller than the preceding one, lower molars less heavy and structure less complicated, lower incisors, however, much broader in antero-posterior section; molar series 9.4 till 9.9 mm.

Cave Batoe Edjaja:- a left mandible with m_1 and m_3 present, length of teeth-row 9.4 mm; another small fragment with m_1 only.

Cave Panganrejang toedeja, layer A-B:- a piece of a right mandible with the incisors and two molars; a fragment of a right mandible with one molar only. Layer C-D:- one right mandible, nearly complete, molar series 9.9 mm; a fragment of a right mandible with the molar row intact, length of same 9.4 mm; one left mandible, nearly complete but m_3 missing; two fragments of left mandibles with incomplete molar series.

Murid species c.

A medium-sized rat, with a lower molar series of 7.9 - 8.5 mm. In sculpture the molars resemble those of *Rattus fratrorum* THOS., but the mandible is much heavier and higher and the lower incisors stronger and broader antero-posteriorly.

Cave Panisi Ta'boettoe: - two right mandibles, one nearly complete, only the third molar missing, the other fragmentary but with the molar series intact, length of latter 7.9 mm.

Cave Panganrejang toedeja, layer A-B: - one right and one left mandible, the right one with m_1 and m_3, length of molar series 8.5 mm; the left one fragmentary.

Murid species d.

The smallest species, about the size of *R. rattus*, but with the lower molars stronger and broader, resembling those of *Rattus hellwaldi* JENT.

Cave Panisi Ta'boettoe: - a right mandible, complete, molar series 7.1 mm.

Cave Batoe Edjaja: - one right mandible nearly complete, with a molar series of 6.9 mm.

Canis familiaris L.

Cave N. of Tjani (Lamontjong).

In this cave were found one right upper canine (No. 119) and a right and a left lower canine (S. 42), which exactly match the canines of the domesticated dog.

Cynopithecus maurus CUV.

From different caves there are remains of the Celebes macaque or moor-macaque. The more strongly built mandible conforms with that of *C. maurus*, but the shape of the canines comes nearer to that of *C. niger*. Our material at hand for comparison is, however, too small to elucidate the matter satisfactorily. *C. maurus* is usually considered the representative of *C. niger* in South and Southwest Celebes, and therefore we think it safer to refer our material to *C. maurus*.

Cave N. of Tjani (Lamontjong).

From this cave we have only one piece of a left mandible with m_1 and m_2 (No. 48).

Cave Panisi Ta'boettoe.

One left lower canine.

Cave Batoe Edjaja.

A fragment of a right mandible with m_2 and m_3; one right upper canine, deeply grooved on the anterior inner side; one right lower canine, badly broken; one loose, upper third molar.

Cave Panganrejang toedeja.

From layer A-B there are several upper and lower canines; from the layer C-D a fragment of a left mandible with m_3.