

lusca, pl. XXXIX. f. 3. Yet there is just that amount of difference between the palette of these animals and those found in the young specimen of *Furcella* which prevents one from saying that the animal is absolutely the animal of the *Furcella*.

The palettes of *Furcella* were slender, cylindrical, with a dilated tip like a double-headed hammer, like the young palette of *Teredo malleolum* of Turton, but of a much larger size; and they had a small, slightly-raised tubercle on the middle of the inner side of the dilated end.

The palette in the two specimens of *Teredo* which we have lately received is of precisely the same form, and nearly of the same size; but instead of having this small tubercle, the middle of the dilated end is produced into an elongated process about half an inch long, which is more slender and oblong at the base, thicker, flattened, and dilated above, and truncated at the top.

The valves of the shell are exactly like those of the *Teredo navalis*, *T. norvegicus*, and other normal species of the genus, but larger.

I am inclined to name this species *Teredo furcelloides*; for I do not think it would be safe to decide, without further evidence, that it is the animal of *Furcella*, Lamk.; but at the same time I consider it right to bring the occurrence of this animal at once before the Society, as it has led me to doubt if my conclusion was correct that *Furcella* is a genus of Conchiferous Mollusks without any valves, as I was inclined to believe before the animal occurred, and which the evidence then before me led me to believe was a correct conclusion.

The palettes are situated at the hinder end, just within the edge of the mantle, the siphons being quite distinct from or within their base. The siphons are slender, of nearly equal diameter, and united nearly to their tips; in their contracted state they just reach to the dilated part of the palette at the base of the terminal elongated process. These are some fragments of a thin lamina of shell attached to the hinder end of the mantle near the base of the palettes.

If this should prove to be the animal of *Furcella*, or even of a *Furcella*-like *Teredo*, it shows most conclusively that the cup at the end of the tubes cannot be regarded as the analogue of the true valves of the genus, as I have also proved in a former paper (see Proc. Zool. Soc. 1858, p. 258).

If these animals prove to belong to the genus *Furcella*, as I suspect they may, then that genus or group of species will only be separated from the other *Teredines* by the habit of living in sand, by the club-shaped form of the tube closed at the end with two arched plates, the division and separate prolongation of the tubes of the siphonal aperture, and the hammer-like form of the palettes.

#### 4. ADDITIONAL OBSERVATIONS ON THE GENUS CUSCUS.

By DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

In the 'Proceedings' for 1858, p. 100, I gave some observations on the genus *Cuscus*, with the description of a new species; and

in the volume for 1860, p. 1, I described another species of the genus.

Since that time we have received several other specimens from Mr. Wallace, and I have also been able to examine several other examples sent home by the same excellent collector; and the examination of these specimens has induced me rather to modify my views as regards the species, and has enabled me to observe other characters for the species which were before unknown to me.

I therefore lay before the Society these additional observations, in the hope of doing something towards settling the species of this very difficult group of animals, which are curious as being the only Marsupials that have as yet been submitted to a kind of domestication; though I have never been able to see why Kangaroos might not have been domesticated by the Australian emigrant, except from the difficulty of making them adopt new ways even in a new country.

I may observe that I believe the British Museum contains the largest and finest collection of the specimens of this genus that has been ever brought together. A few years ago we considered ourselves fortunate in having two specimens; now we have thirty-three from very different localities, and I have besides these examined about half as many more.

The zoologists of the modern school are very desirous that the name of the original namer of the species should always be inserted after the specific name, to show to whom belongs the honour of having first named the species,—often a very doubtful source of congratulation or proof of scientific attainment, as for example in this genus.

Should the various varieties of colour really be proved to be good species in this genus, we shall have to adopt the names of Lesson, an author who seems only to have seen a very few specimens, and to have given a name to each of those that he saw, without giving himself the trouble to discover what were the characters that separated them from the other examples of the genus; and it is often the case, not only with species but with genera, that the man who first gives the name to either one or the other often knows less about them, and takes less trouble to study the subject, than men who have never given a new name to either genus or species. This was specially the case with Swainson, who has given the names to many genera of shells and birds even on the slightest characters, and without the least analysis.

In the former paper I divided the *Cusci* into two sections, according to the hairyness and prominence of the ears; I will now divide them into four sections, according to the form of the skull and the number and disposition of the anterior false grinders, and thus place at the disposal of the student two means of determining the species.

Sect. I. The nose of the skull short, broad, and rounded. The anterior conical false grinders one on each side, large, and nearly filling up the short diastema. The grinders large, in an arched series, con-

verging behind. The forehead of the skull rather swollen over the front, and depressed between the hinder part of the orbits. Ears hidden under the fur. Fur of one colour. *EUCUSCUS*.

1. *CUSCUS* (E.) *URSINUS*, Gray, P. Z. S. 1858, p. 103.

Temm. Monog. t. 1. f. 1, 2, 3 (adult), t. f. 1-5 (half-grown) (skull), t. 4 (skeleton).

Blackish; tail and rump dark, like back.

*Hab.* Celebes (*Temm.*).

The three skulls, of different ages, all show only a narrow linear space between the upper edges of the masseter muscles. The forehead of the youngest specimen is not so concave as that of the two older ones.

We have an adult and half-grown female from Celebes, obtained for the Leyden Museum in 1843; and a nearly adult specimen without any distinct indication of its sex—probably a female—with the pouch sewed up, from the Zoological Society, 1855.

If this should be the case, we have only female specimens of this genus; but I believe they have a male at Leyden.

2. *CUSCUS* (E.) *BREVICAUDATUS*, Gray, P. Z. S. 1858, p. 102.

Pale brown; the tail and rump of the same colour as the back.

*Hab.* Cape York (*Mr. Macgillivray*).

The skull, which is that of a very young animal, is more like that of *C. ursinus* than that of any other species in our Collection.

The canines are close to the cutting-teeth, and with a very small space between it and the first grinder. The skull is rather convex, and swollen in front over the orbits.

We have only the young specimen and its skull, on which Mr. Gould established the species. It seems very distinct from *C. ursinus*.

Sect. II. The nose of the skull rather produced, rounded. The anterior conical false grinders one on each side above, moderate-sized, near the middle of the broad diastema. The grinders in a slightly arched series. The forehead very convex, and rounded over the middle of the orbit, and flat behind. The ears hairy outside, hidden in the fur. The fur more or less variegated. Tail pale or yellowish. Dorsal streak none. *SPILOCUSCUS*.

The skulls which we have of the animals of this section show that there are probably two distinct species. One species has grinders of a rather larger size than those of *C. ursinus*, but differing from them in being in only a slightly curved line, the three first grinders forming a series of from 10 to 10½ lines, or twelfths of an inch. In this respect the skull agrees with those figured by Temminck (Mon. Mam. t. 3. f. 1-6) as of *Phalangista maculata*. But one skin agrees with the description of the skin of *P. chrysorrhos* of that author, and its teeth with the figure of the teeth of *P. maculata*. Yet it is to be recollected that this author only had a very small number of specimens to examine, and he does not mention in his

description of either species the difference in the size of the grinders, though he shows the difference in his figures.

The second species has smaller grinders, placed in the same manner as the former,—the three front grinders forming a series of from  $8\frac{1}{2}$  to 9 lines in length, as they are figured by Temminck (Monog. t. 1. f. 4–6) as *Phalangista chrysoorrhos*.

We have two skulls with their skins belonging to this kind; and both have the spotted skins which Temminck calls *Phalangista maculata*. Under these circumstances it is difficult to adopt Temminck's name. Are we to take those of the skin or those of the skulls? Perhaps what he describes as *C. chrysoorrhos* may be the proper and wild state of each species, and the spotted varieties described as *C. maculata* may be albino varieties or half-domesticated varieties of them, for the natives of some islands are said to breed them.

As I have not the power of examining the skulls of all the specimens, I have arranged those in the Museum provisionally under these two names, taking them as they designate the general colour of the fur.

### 3. CUSCUS (S.) CHRYSORRHOS.

*Cuscus maculata*, var. 1, 2, Gray, P. Z. S. 1858, p. 102.

*Phalangista maculata*, Temm. Mam. t. 2. f. 1–5 (adult), 6 (young skull).

The grinders \* large, three front of from 10 to  $10\frac{1}{2}$  lines in length.

Fur dark grey-brown; sides and middle of the back blacker or black; face reddish; rump and tail yellowish; belly white.

Var. *albina*?

White; feet and large spots on back red-brown.

*Hab.* Ceram; south coast of New Guinea; “Moluccas” (Temm.).

1. An adult female of a large size from the Leyden Museum as *C. chrysoorrhos*, Temm. 1859.

2, 3. An adult and a three-fourths grown female, with the sides very deep black. From Ceram; Mr. Wallace, 1859.

4. A young female specimen from the south coast of New Guinea; J. B. Jukes, 1846.

The skull of this animal shows that it belongs to the large-toothed species.

Var. ? *albina*. White, reddish varied.

*C. maculata*, nos. 3–5, Gray, P. Z. S. 1858, p. 102.

5. White, with a long irregular patch on the back, and the four feet red. A female from Dufour Island, south-east coast of New

\* I give the measurement of the three first of the true grinders only, because in the young skull the hindermost grinders are not developed. I may state that the difference in the size of the grinders does not depend on the sex of the species, as there are both males and females with teeth of each size.

Guinea; John Macgillivray, 1851; and its skull, which agrees with Temminck's figure of the skull of *C. maculatus*.

6. ? An adult male, with numerous confluent reddish spots. New Guinea; John Macgillivray, 1855.

7. ? A half-grown male, with numerous small, reddish and dark-brown spots, often confluent. Daruley Island, south coast of New Guinea; John Macgillivray, 1855.

I have not been able to examine the skull and teeth of these specimens; so they may belong to the next.

#### 4. CUSCUS (S.) MACULATUS.

*Cuscus maculatus*, Lesson, Voy. Coq. t. 5.

*Cuscus maculatus*, var., nos. 3-7, Gray, P. Z. S. 1858, p. 102.

*Phalangista chrysoorrhos*, Temm. Mon. t. 1. f. 4, 5, 6 (skull, not skin).

Grinders moderate, three front forming a series of from  $8\frac{1}{2}$  to 9 lines in length. Skull very convex on the front of the orbit, flat or slightly concave behind the convexity, the temporal ridges close together, united (in the adult skull) and forming a sharp ridge.

White, spotted with fulvous grey-brown or black; forehead reddish.

*Hab.* New Guinea. Waygeroo and Aru Islands.

There are both sexes in the Museum Collection.

1. Adult male. Spots on the head and shoulders, confluent on the back and sides, small, scattered; tail white. Waygeroo. Purchased of M. Verreaux, 1856, as *Cuscus maculatus*.

2. Adult male. White, with numerous, scattered, small spots; tail white, slightly varied with pale reddish. Aru Island; Mr. Wallace, 1857. This belongs to the smaller-toothed kind.

3. Adult male and female. Very similar; yellowish white spots, numerous, smooth, intense black; head reddish-brown; tail white, marbled with pale reddish. Waygeroo (*Mr. Wallace*, 1860).

Mr. Wallace observes that these animals are diurnal: the female he marks as having a pale hazel iris. The skull of the male shows that it also belongs to the smaller-toothed kind.

The three skulls in the Museum agree with the above description, but vary among themselves; one of the skulls from Aru (1195 *b*) is much narrower in all its parts, and is less swollen and narrower between the orbits, than the others from the same locality, and is probably the skull of a female, as 1195 *a* is from the male specimen sent from Aru by Mr. Wallace.

The skull of the male specimen sent by Mr. Wallace from Waygeroo is similar to the male from Aru (1195 *a*), but is rather more swollen, especially between the front of the orbits.

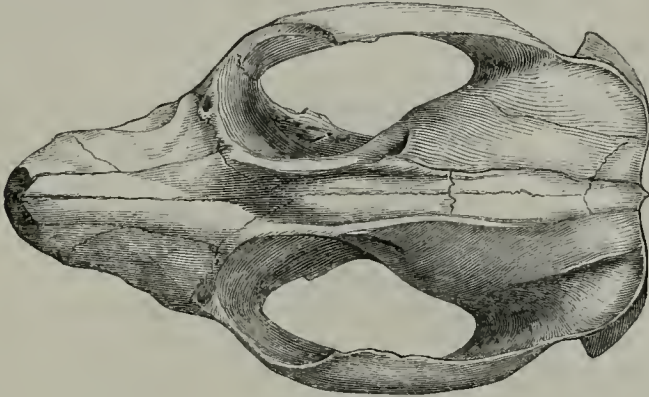
Sect. III. The nose of the skull rather produced, rounded. The anterior conical false grinders one on each side above, moderate-sized, near the middle of the broad diastema. The forehead deeply concave, with a raised edge on each side between the orbits. Ears naked

within, extended beyond the fur of the head. Fur of body and tail uniformly coloured, with a dorsal streak. **STRIGOCUSCUS.**

5. **CUSCUS (S.) CELEBENSIS**, Gray, P. Z. S. 1858, p. 105, t. 62.

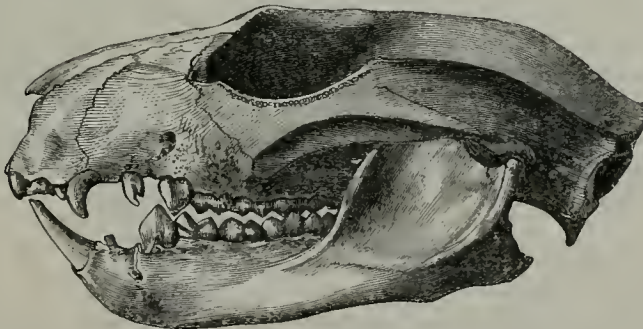
*Hab.* St. Cristoval, Solomon's Group of Islands.

We have both sexes in the British Museum Collection, and the skulls of two others nearly adult, collected by Mr. Rayner and Mr.



Skull of *Cuscus celebensis* (upper surface).

J. Macgillivray during the voyage of the 'Herald.' There is very little difference between the two skulls, though they are from a male and female animal.



Skull of *Cuscus celebensis* (side view).

In the description of the species in the paper above referred to, the animal is erroneously said, by a slip of the pen, to have no dorsal streak.

We have in the British Museum a young specimen of a *Cuscus* from Macassar, which is very like *C. celebensis*, but it has no visible dorsal streak: it is not in a very good condition. It may be a variety of this species, or the young of one of the other, or perhaps an undeveloped state of a new one.

Sect. IV. The nose of the skull rather produced, rounded. The anterior conical false grinders *two* on each side above, the anterior rather larger, the hinder very small, cylindrical; both near the other grinder, and widely separated from the canines. The forehead with a deep concavity between the orbits. Ears naked within, extended beyond the fur of the head. Fur on body and tail uniformly coloured, with a dorsal streak. CUSCUS.

6. CUSCUS ORIENTALIS, Gray, P. Z. S. 1858, p. 104, t. 61.

*Cuscus quoyii*, Lesson in Quoy & Gaim. Voy. Uranie, Zool. t. 56. f. 6.

The male and female grey brown, with a distinct dorsal streak.

Var. *albina*?

*Cuscus orientalis*, Temm. & Gray.

Males pure white, without any dorsal streak.

*Hab.* Islands of Waigiou and Ceram.

Mr. Wallace attached to the male species this observation, "the claws, soles, and end of the tail nearly white; eats leaves and cocoa-nuts (young)." He calls the male *C. orientalis*.

We have specimens of both sexes in the Museum; a very young and adult female from Waigiou, obtained from M. Verreaux in 1856; and male and female, with two young from the pouch, from Waigiou, and a male from Ceram, from Mr. Wallace, in 1859 and 1860.

In the skull of the female the temporal ridges are separated from one another by a wide flat band.

Temminck, and other authors since his work, have described the male of this animal as white, and the female as silver-grey with a black dorsal streak; but we have both sexes of the latter colour. Can the white males be an *albino variety*, and confined to the male sex? We have two full-grown males of that colour, one obtained from Leyden Museum, said to come from Amboyna, and another from M. Verreaux, said to come from New Zealand; they both have the small hinder false grinders.

7. CUSCUS ORNATUS, Gray, P. Z. S. 1860, p. 1, pl. LXXIV. (male).

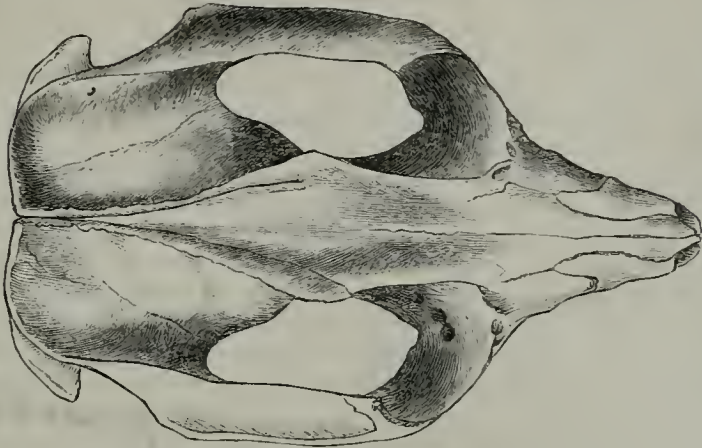
Both sexes grey-brown, grised, and marked with small white spots and a distinct dorsal streak; the ground-colour of the male is yellowish-red, of the female dark grey-brown.

*Hab.* Ternate and Batchian (*Wallace*).

We have a male and three females in the British Museum, all from Mr. Wallace—a male from Batchian in 1859, two adult and a young female from Ternate, obtained in 1858 and 1859.

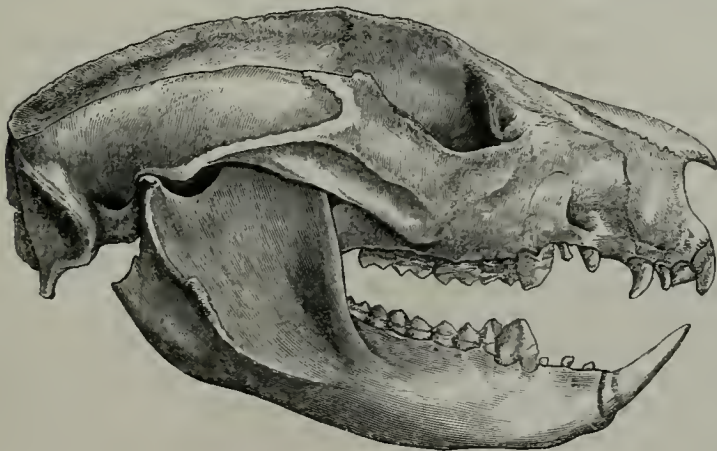
In the British Museum there are two young specimens of the genus which I am not able to determine with certainty. They are both of a fulvous-brown colour, and without any streak on the back.

1. Said to come from "Amboyna," and is supposed to be a young *C. orientalis*; the sex is doubtful, but probably a male.



Skull of *Cuscus ornatus* (upper surface).

2. The other was sent by Mr. Wallace from Macassar in 1857, and is a young male. I formerly considered it as a variety of *C. celebensis* (P. Z. S. 1858, p. 43); and it is like that species in se-



Skull of *Cuscus ornatus* (side view).

veral particulars; but the want of the dorsal streak is a great peculiarity, which was not so distinctly seen before it was stuffed.