Remarks on the different species of Orang-utan.—By E. Blyth, *Esq.*

To Mr. W. W. Nicholls of Sarawak, the Society is indebted for the nearly perfect skeleton of an adult wild Orang-utan, of the peculiar species known to the inhabitants of Borneo, according to Sir James Brooke, by the name *Mias Pappan;* and which, together with other skulls and skeletons of adult Orangs in our museum, and the exquisite lithographs of others, again, published by Professor Owen, fully bears out the opinion of Sir J. Brooke expressed in a letter to the Zoological Society and published in the 'Proceedings' of that Society for 1841, p. 55, of the existence of three distinct species of Orang-utan in Borneo.

Professor Owen had previously distinguished his Pithecus morio (*Mias Kassar* of Brooke) from the great Orang then known to him, from specimens to which I had the pleasure of first calling his attention, and which are admirably figured in the 'Transactions of the Zoological Society,' Vol. II, pl. 30 to 34 inclusive; and from certain differences observable in skulls of great Orangs compared and figured by him, believed or known respectively to be from Borneo or Sumatra, the same zoologist has indicated what appeared to him to be at least local varieties, one proper to each of those islands, and he applies the names P. Abelii to that of Sumatra and P. Wurmbii to that of Borneo, of course under the impression that the great Sumatran Orang referred to was identical with that described by Dr. Clarke Abel from Sumatra in *As. Res.* XV, 489.

A huge skull of an adult male Orang, undoubtedly from Borneo, is figured in *Trans. Zool. Soc.* II, pl. 31 and 32; and that of an adult female (?), said to be from Sumatra, in the same work, Vol. I, pl. 53 and 54. The differences between these skulls are considerable: and they are, to some extent, borne out in a huge male skull marked from Sumatra and in an aged female skull marked from Borneo, in this Society's museum.* In both of the latter, however, the characters are throughout intermediate. The zygomatic suture

* Presented by Major Gregory in 1838 (vide *J. A. S.* VII, 669); the Sumatran male skull, however, having been for some years reserved.

of the Sumatran male begins even anteriorly to that of Prof. Owen's Bornean male: the *symphysis menti* in both is equally developed: the supra-orbital ridges, however, are much more prominent in the male from Sumatra, as in Prof. Owen's Sumatran female; but in our aged Bornean female skull, they are considerably more developed, proportionally, than in Mr. Owen's Bornean male. In both of Mr. Owen's specimens, the palate is represented as contracted posteriorly, between the last molars on each side, to $1\frac{1}{2}$ in. (or rather more in the Sumatran female). In our Sumatran male the distance is fully $1\frac{3}{4}$ in.; and in the Bornean female $1\frac{5}{8}$ in. I can come to no other conclusion than that all represent individual varieties of one species, having perhaps a tendency to exhibit the local variation which Prof. Owen has indicated.

The same naturalist adds—"The Bornean Pongo, if we may judge from the few specimens undoubtedly from that locality which exist in the museums of this country, is clothed with loose long hair of a deep fuscous colour, approaching in some parts to black; the Sumatran Pongo is covered with loose long hair of a reddish-brown colour. The adult male of the Bornean species has the countenance disfigured by large dermal callosities upon the cheek-bones. These do not exist in either sex of the Sumatran species." It is worthy of note that the term *species* is here bestowed, probably from the remarkable difference implied by the last mentioned character. The fully adult Sumatran male described by Dr. Clarke Abel, however, and the skin of which is still in this Society's museum, possesses the cheek callosities, less developed however than in the Bornean male figured by Prof. Temminck.

Sir J. Brooke, in his highly interesting letter already referred to, besides pointing out the distinctions of two of his three species of Bornean Orangs from personal observation of the living or freshly killed animals wild and tame, remarks that the skulls also examined by him may be divided into three distinct sorts.

"The first presents two ridges, one rising from each frontal bone, which joining on the top of the head, form an elevated crest, which runs backward to the cerebral portion of the skull." To this may accordingly be referred the P. Wurmbii and the P. Abelii of Owen, and, it would seem, all the adult skeletons at present in Europe

without described exception.* It would appear that neither sex has the cheek callosities at any age; and the colour of the hair is said to be darker than in the others. This description corresponds with the appearance of an enormous female Orang-utan that was exhibited some years ago in Calcutta (vide *J. A. S.* XVI, note to p. 729); and the animal is the *Mias Rambi* of Sir J. Brooke.

The same observer continues—"The second variety [of skull] is the SIMIA MORIO, and nothing need be added to Mr. Owen's account, save that it presents no ridge whatever beyond the frontal part of the head. No. 9 in the collection is that of an adult male. * * * There are many other skulls of the SIMIA MORIO which nearly coincide with this suite, and this suite so entirely coincides through the different stages of age, one with another, that no doubt can exist of the SIMIA MORIO being a distinct species. The different character of the skull, its small size and small teeth, put the matter beyond doubt, and completely establish Mr. Owen's acute and triumphant argument, drawn from a single specimen."—Of PITHECUS MORIO, our museum contains a skeleton (minus most of the bones of the hands and feet) of an aged female, presented by R. W. G. Frith, Esq., in 1836.† It had died in Calcutta, and the skin containing the bones of the hands and feet had been unfortunately thrown away when Mr. Frith secured the body for the Society's Museum. A few of the digital bones, however, were recovered. Comparing the skull of this specimen with that figured by Prof. Owen (*Trans. Zool. Soc.* II, pl. 33 and 34), I incline to infer that Mr. Owen's specimen is the skull of a male animal, chiefly from the greater depth of the alveoli: the longitudinal extent of grinding surface of the series of upper molars (bicuspids included) is exactly 2 in., as also in another skull of an adult female to be presently noticed, and 2 in. 2 l. in that figured by Prof. Owen: lastly, the zygomatic arch of our aged female skull is much more slender than that of either of the others.

* Unless, perhaps, that of an adolescent female in the museum of the Royal College of Surgeons, London.

† Vide *J. A. S.* V, 833, where mentioned as "the Sumatran Orang-utan." She was one, however, of a pair purchased by our joint-Secretary Mr. Grote, at Singapore; and this gentleman informs me—"They were not from Sumatra, but from Borneo. At least I am pretty sure that my memory does not deceive me on this point."

We have also another and complete skeleton of an adolescent female, which lived twelve years in Calcutta in the possession of J. Apcar, Esq., and was very young when he received it. The last molars above and below had just pierced the gums. The skin of this individual is mounted in our museum, possessing hair of a very dark colour on the crown, back and arms. Having passed its life in close captivity, with nought to call forth the vigorous action of its muscles, their development with that of the osseous system generally would seem to have been considerably affected, and the skull retains a remarkably juvenile (which in this case means *anthropoid)* expression, contrasting greatly with that of our other and aged female skull already noticed. But making every allowance for difference of age and a life of close imprisonment, and the other specimen had in all probability been captured when fully adult, there remain some extraordinary discrepancies, which probably indicate a further specifical distinctness. All the bones of the aged animal are more robust than those of the other; but while the leg-bones and the *humeri* of the two are of the same length, or at all events the *humerus* of the aged animal does not exceed by $\frac{1}{4}$ in. that of the adolescent, the *radius* of the aged specimen is 2 in. longer than that of the other.

The differences in the form of the skull are very considerable. The younger individual has the face conspicuously shorter and broader, with circular orbital cavities, while those of the aged animal are perpendicularly oblong. The vertical span of the orbital cavity is $1\frac{1}{2}$ in. in the aged specimen, $1\frac{3}{8}$ in. in the other; horizontal span of the same $1\frac{1}{4}$ in. in the former, $1\frac{3}{8}$ in. in the latter. In the younger individual the orbital process of the frontal and that of the malar bones form together a projecting angle where united by the suture; in the other they do not angulate at all. Extreme breadth of bony orbits in the adolescent specimen 4 in.; in the other $3\frac{3}{4}$ in. The zygoma of the aged individual, as before remarked, is much more slender than in the skull figured by Prof. Owen; in the younger, the malar portion of the zygoma is even broader than in Mr. Owen's specimen. The nasal orifice of the aged skull is much larger than that of the other. The development of the alveolar portion of the jaws is also much greater in the aged animal; whence the chin

slopes but little, whilst in the other it slopes excessively. In the aged specimen the ramus or ascending portion of the lower jaw turns abruptly at a right angle with the alveolar portion, and the coronoid process is little developed, and does not rise to a level with the zygomatic arch; in the young specimen, the form is more as in Mr. Owen's figure, though less angulated. In this adolescent skull the intermaxillary bones continue strongly demarcated.

It remains for future observation of additional specimens to determine whether the differences here indicated denote a diversity of species, or whether they may be referred to extraordinary individual variation.*

"The third distinction of the skulls," continues Sir J. Brooke, "is, that the ridges rising from the frontal bones do not meet, but converge towards the top of the head, and again diverge towards the posterior portion of the skull. These ridges are less elevated than in the first mentioned skulls, but the size of the adult skulls is equal, and both present specimens of aged animals." A wild adult male killed by himself, with huge cheek callosities, proved to possess this form of skull: but Sir J. Brooke erroneously assigns the animal to PITHECUS WURMBII apud Owen, in which, as we have seen, the lamdoidal crests unite upon the crown, as they also do in his P. ABELII (here regarded as a mere variety of the same species); whereas the Bornean animal of Van Wurmb and the Sumatran animal of Dr. Clarke Abel were of the present race distinguished by the ugly cheek callosities, and to which no special name has been assigned, as the appellations *intended for them* have been at-

* I had recently the opportunity of observing a nearly grown living male of what I considered to be PITHECUS MORIO. It had no cheek callosities, and had not developed its hindermost *molares*. This animal was taken in the 'Hindustan' steamer for Suez; and is, I think, a larger Orang than has hitherto been seen alive in Europe. Before reaching Madras, it escaped from its cage and found its way into the saloon, where it would appear to have been re-captured with some difficulty and to have severely bitten two of its captors. In its cage it seemed quiet and good-tempered, and I handled it freely; but could not get to see it to much advantage. It appeared to resemble much the adolescent female above described, but was smaller, with larger face, and the expression was as distinctly masculine in the one as feminine in the other.

tached respectively to Bornean and Sumatran examples of the *Mias Rambi.*

The Bornean species with double-crested skull and huge cheek callosities is the *Mias Pappan* of Sir J. Brooke, or rather of the native Dyaks: and Sir J. Brooke remarks of it (not at that time having seen a female), that—"Both Malays and Dyaks are positive that the female of the *Mias Pappan* has cheek callosities, the same as the male:" and from his own observation he adds that the *Mias Kassar* has no cheek callosities in either sex; whereas some young *Pappans* he had shipped, "(one of them *not a year old*, with two first molars,) shew them prominently."* For a figure of the adult male of the *Mias Pappan* of Borneo, and series of plates illustrative of its anatomy, vide the great Dutch work of Dr. S. Müller and Professor Temminck; but unfortunately they give no representation of the bony crests upon the skull.

Of the long celebrated specimen of a large Orang-utan procured by Capt. Cornfoot in Sumatra, and described by Dr. Clarke Abel in the 'Asiatic Researches,' Vol. XV, p. 489, we still possess the skin minus the right hand and right foot, and of its osteology only the lower jaw and the bones contained in the dried left hand and left foot. It is by no means a specimen of the largest size, as long ago shewn by Dr. Harwood in *Lin. Trans.* XV, 472;† but the teeth and appearance of the jaw prove it to be fully grown, and the third inferior true molar is scarcely less abraded than the penultimate. This lower jaw is remarkable (especially as being that of a mature male animal) for the small antero-posterior diameter of its ramus or ascending portion as distinguished from the alveolar portion, and also for the small size of the condyle. Vide figures in *As. Res.* XV, pl. IV, and ($\frac{1}{2}$ size) in *J. A. S.* VI, pl. XVIII; and compare these

* Mr. Nicholls states, in a letter, that—"Both sexes of the *Mias Pappan* have immense cheek callosities: a full grown female was lately killed at Samaratan, the callosities of which extended as low down as the breasts [here the *tracheal sac* must be referred to!] The *Mias Rambi* is without any callosities, and is, I think, covered with longer fur than the *M. Pappan* has."

† Dr. Harwood gives the length of the feet of a Bornean Orang described by him as 15¼ in.: the dried foot of Dr. Abel's specimen (containing the bones) measures 13 in.

with the representations now given of the lower jaws of other Orangs, and especially with that of the great Sumatran skull of a female *Mias Rambi* figured by Prof. Owen in *Trans. Zool. Soc.* I, pl. 53. Its greatest antero-posterior diameter (on a plane with the molars) is $2\frac{1}{4}$ in. only, that of a female (?) *Pappan* from Borneo is $2\frac{3}{4}$ in., of a Bornean female *Rambi* $2\frac{5}{8}$ in., of a Sumatran male *Rambi* $2\frac{3}{4}$ in., and of Prof. Owen's Bornean male the same, and of his Sumatran female $2\frac{7}{8}$ in. Yet all the teeth are somewhat larger than in the Bornean female (?) *Pappan*, and equal those of our great Sumatran male *Rambi*. The hands and feet also are larger than those of our female (?) *Pappan* from Borneo. There are no materials for extending the comparison: but it may be remarked, of Dr. Clarke Abel's specimen, that (as before asserted) it has distinct cheek callosities, though seemingly less developed than in Dr. S. Müller's figure. The beard, however, is scarcely less grown:—but the general colour of the hair is much darker, and more of a maronne-red; inclining to ferruginous upon the crown, and the beard is bright ferruginous contrasting strongly with the rest.* I incline to consider it identical with the *Mias Pappan* of Borneo, notwithstanding the comparative feebleness of the ramus of the lower jaw in this particular specimen; and I suggest that the old name PITHECUS SATYRUS be now restricted to this species, and justly or with peculiar justice, as Sir J. Brooke remarks in his letter, "from the ugly face and disgusting callosities."†

The nearly perfect skeleton now presented to the Society by Mr. Nicholls is that of a fully mature Bornean female (?) of the *Mias Pappan*, in which the strongly developed lamdoidal ridges of the skull do not unite upon the vertex to form a single sagittal crest,

* This specimen is remarkable for having a well developed unguinal phalanx and nail to the hallux; a character of rare occurrence in the genus, and exhibited by no other specimen in the Society's collection.

† As the *Rambi* is neither Wurmb's nor Abel's animal, the names WURMBII and ABELII are unsuitable for it, and had better be disused; while as Raja Brooke was the first to discriminate it from the *Pappan*, I would suggest that it now bear the designation of PITHECUS BROOKEI. Should the second small Orang also prove a good species, the name OWENII bestowed on it would be a fitting compliment to the eminent zoologist, who has devoted so much attention to the study of the great anthropoid Apes.

but continue an inch apart where most approximated. The size of the skull is fully equal, or even somewhat superior, to that of our aged female skull of a *Mias Rambi* from Borneo; but is inferior to that of our Sumatran male of the *Mias Rambi*. The skull is perfect, except that part of the face appears to have been shot away, viz. the uppermost portion of the right superior maxillary from the orbit to the nasal orifice, with parts of the adjacent malar, lachrymal, and nasal bones of the same side; and the supra-orbital ridge of the left frontal is diseased, with portions of bone exfoliating away. The vertebral column is complete, excepting the two last small coccygeal bones. The ribs and sternal series are also complete, and the great bones of the limbs; but many of the smaller bones of the latter are unfortunately missing. Thus, of the right hand, there are wanting the scaphoid, and the five unguinal phalanges. Of the left hand, there also are wanting the five unguinal phalanges, the medial thumb-phalanx, and the cuneiform bone of the wrist. Of the right foot are wanting the *os calcis*, *astragalus*, and navicular bone, four unguinal phalanges (the terminal phalanx of the hallux remaining), the penultimate phalanx of the finger-toe next to the hallux, and the penultimate and ante-penultimate phalanges of that furthest from the hallux, corresponding to the human little toe. And of the left foot there are only the *astragalus*, and the digital bones excepting the metatarsal of the digit next to the *hallux*, and the unguinal phalanges of the outer three toes.* The *patellæ* are also lost.

This valuable skeleton affords us the means of demonstrating, from adult specimens in our museum, the existence of the three species of Bornean Orang-utan indicated by Sir J. Brooke; and most probably we possess a fourth in the mounted skin and complete skeleton of the adolescent female resembling PITHECUS MORIO in size, but having a much shorter fore-arm and more anthropoid conformation of skull. We have also (provisionally) identified Dr. Clarke Abel's

* Accordingly, but one unguinal phalanx remains, which articulates with the digit next to the hallux of the left foot. The terminal phalanx of each hallux exhibits a peculiar structure, and represents the ordinary penultimate (and not the unguinal) phalanx; so that this Bornean *Pappan* differs herein from Abel's Sumatran *Pappan*, which possessed a well developed unguinal phalanx and nail to the opposable hallux or great toe.

Sumatran Orang-utan with the *Mias Pappan* of Borneo, to which the specific name SATYRUS is here proposed to be restricted; and we have referred Prof. Owen's P. WURMBII and P. ABELII to the *Mias Rambi* of Borneo, which also should therefore be common to the two islands. The small P. MORIO, so far as hitherto known, is peculiar to Borneo; and it now remains to ascertain whether there be not two small species confounded under this, two small as well as two large species of these animals. It is only recently that a great and a small species of Chimpanzee have likewise been discriminated and completely established by Prof. Owen and Dr. Kneeland.*

The three Bornean species of Orang of Sir J. Brooke (at least two of which would appear likewise to inhabit Sumatra) are more different from each other in the appearance of the adult skull than the Lion, Tiger, and Leopard are among cats; yet with the exception of the bony ridges, which in the MORIO are merely indicated (exhibiting the direction which they assume in the *Mias Pappan*), I have been unable to detect any difference of structure between the skulls of the two great species which may denote other than slight individual variation. In general, the form and size of our *Mias Pappan* skull are intermediate to those of our (Sumatran) male and (Bornean) female *Mias Rambi* skulls; and the nasal orifice of the former is comparatively small. But how slight is the difference between the skulls even of the Lion and Tiger among cats,—confined to a straighter profile on the part of the Lion, and to the fact that the nasals extend back beyond the suture of the maxillaries in the Tiger skull, while they fall short of that suture in the Lion skull!†

* Vide *Trans. Zool. Soc.* III, 381, and *Ann. Mag. N. H.*, July, 1852, p. 23 *et seq.*

† An analogous diversity perhaps exists in the skulls of the *Mias Rambi* and *Mias Pappan*, which, if it prove constant, will be of service in enabling us to determine to which of these species immature skulls shewing large permanent molars should be referred. In our adult male and female *Mias Rambi* heads, and also in one juvenile skull taken from a stuffed specimen of a half grown male without a sign of cheek-callosities in our museum, the united nasal bones extend upward to the summit of the *glabella* between the supra-orbital ridges; whereas in our *Mias Pappan* skull, and also in both (species ?) of our *Mias Kassar*, the united nasal bones extend upward but little beyond the maxillary suture, and the same in

From the form of the pelvis, and from the inferior longitudinal extent of the molar series as compared with that of the lower jaw of Dr. Clarke Abel's Sumatran male *Pappan*, also from the inferior size of the hand and foot as compared with these members in Dr. Abel's specimen, I have considered the skeleton of a *Pappan* now presented by Mr. Nicholls to be that of a female animal; but not without considerable hesitation.* We have no male pelvis of an adult Orang for comparison; but two of undoubted females of the small species, and one of these (that of the animal which passed its life in close captivity) is singularly narrow, and probably differs little from a male pelvis. The skeletons of adult *Mias Rambi* and of adult of the small Chimpanzee figured by Prof. Owen in the first Volume of the 'Transactions of the Zoological Society' are also those of females; and Mr. Owen gives 5 in. 5 l. as the antero-posterior diameter and 4 in. as the transverse diameter of the pelvic aperture of his adult female *Mias Rambi*, the corresponding diameters of the pelvic aperture of our *Mias Pappan* being 5 in. and 4 in., in our aged female *Mias Kassar* $4\frac{1}{2}$ and $3\frac{1}{2}$ in., and in our adolescent female with the comparatively short fore-arms $4\frac{1}{2}$ and $2\frac{1}{2}$ in. (!); which last are probably the permanent male proportions, to which I

three immature skulls with large permanent molars in course of development, which should therefore represent the young of the *Mias Pappan*.

It remains however to ascertain how far this distinction may prove constant. We have, in all, five stuffed specimens of Orangs, viz.: 1, Dr. Clarke Abel's Sumatran male *Pappan*,—2, Mr. Apcar's adolescent female *Kassar (?)* with short fore-arm,—3, a young female *Kassar (?)* with small permanent grinders appearing, and similar proportion of arm and fore-arm to last,—4, a very young *Mias*—— *?*,—and 5, the young male *Mias Rambi (?)* before referred to. Colour of No. 5 a darkish ferruginous, deepest on the crown, paler and more rufous on the shoulders and back and also the whiskers; hands and feet small, as in the *Mias Kassar*. Colour of No. 3, a lightish ferruginous, deepening on the arms, and darkest on the crown and between the shoulders. It would seem that the various species, however distinct in form of skull, are not to be very readily distinguished when prepared as stuffed specimens, unless indeed we had *adults* of each for comparison.

* Mr. Nicholls states, in a letter,—"I obtained the skeleton which I sent, through others, and therefore cannot be certain about its sex; but, if I remember right, it was given me as that of a male *Pappan*, full grown but not aged, and with a very broad face."

suppose Dr. Kneeland refers when he mentions "the narrow elongated shape of the Orang's pelvis."*

I shall now follow the list of admeasurements furnished by Prof. Owen of the adult and young small Chimpanzee and adult and young Orang-utan, and would have cited those given by him of his adult Orang for convenience of comparison, had his specimen been clearly a *Mias Rambi*, as the large skulls are which he has figured; but this is rendered doubtful in a note.† Another table of comparison by the same naturalist we quote to give the dimensions of the following skulls.—1. *Mias Rambi*, Bornean male (Owen).—2. Ditto, Sumatran male.—3. Ditto, Bornean female.—4. Ditto, Sumatran female (Owen).‡—5. *Mias Pappan*, lower jaw of Abel's Sumatran male.—6. Ditto, Bornean female (?)—7. *Mias Kassar*, male (? Owen).—8. Ditto, female.—9. *Mias Kassar* (?), adolescent female, with comparatively short fore-arms.

* *Ann. Mag. N. H.*, July, 1852, p. 27.

† In which Mr. Owen remarks—"The admeasurements in this column are taken, by permission of the Board of Curators, from the skeleton in the museum of the Royal College of Surgeons, in which the absence of the cranial ridges, and some still separate *epiphyses*, would indicate the non-attainment of full growth." It may, therefore, prove to be an adolescent *Mias Pappan*.

‡ The measurements in this column are taken from Mr. Owen's published lithographs.

*	M.R.,B.M.(O) 1	M. R., S. M. 2	M. R., B. F. 3	M. R.,S.F. (O) 4	M. P.,S.M. (A) 5	M. P., B. F. (?) 6	M. K., M. (O) 7	M. K., F. 8	M.K. (?) 9
	in. l.	in. l.	in. l.	in. l.	in. l.	in. l.	in. l.	in. l.	in. l.
Length of the skull from the vertex to the base of the occipital condyle,	4 6	4 4	3 8	4 1	..	3 6	3 7	3 4	3 5
Length of the skull from the posterior plane of the occiput to the margin of the incisors, ...	10 6	10 3(?)	9 5	9 3	..	9 7	7 10	7 7*	7 7
Length of the skull from the posterior plane of the occiput to the fronti-nasal suture, ...	5 3	5 0	5 0(?)	4 8	..	5 3	4 4	4 5	4 8
Length of the skull from the fronti-nasal suture to the margin of the incisors, ...	5 7	5 5(?)	4 9	4 7(?)	..	4 7	4 1½	4 0	3 2½
Greatest lateral diameter of the skull (at the post-auditory ridges,)	5 4	6 1	5 2	5 3½	..	5 7	4 8	4 9	4 9
Smallest lateral diameter of the skull (behind the orbits,) ..	2 9	2 6	2 7	2 7½	..	2 6	2 4	2 4	2 7½
Distance between temporal ridges, ...	..	2 5	2 2	..	..	2 3	,, 7(?)	2 1	2 3
Diameter of the skull at the zygomata, ...	6 9	6 8	6 3	6 0	..	6 6	5 1	5 2	5 1
Length of the zygomatic fossa (measured from below,) ..	2 6	2 5	2 2	2 0	..	2 2	1 9	1 8	1 5
Diameter of skull taken between the outsides of the orbits. ..	4 6	5 1	4 4	..	..	4 5	3 6	3 7½	4 0
Inter-orbital space, ...	,, 7	,, 6	,, 5	..	..	,, 4½	,, 4	,, 4	,, 5
Transverse diameter of orbital cavity, ...	1 6	1 5	1 5	..	..	1 4	1 3	1 2½	1 3½
Vertical diameter of orbital cavity, .. .	1 7	1 8	1 7	..	..	1 7	1 6	1 5	1 3½
Vertical diameter of nasal aperture, ...	1 6	1 5	1 4	..	..	1 2	1 1	1 2	1 0
Transverse diameter of nasal aperture, .. .	1 0	1 2½	1 0	..	..	,, 9	,, 9	,, 9	,, 9
Interspace between infra-orbital foramina, ...	2 0	2 3	1 9	..	..	1 9	1 7	1 7	1 5
Distance between the inferior margin of the nasal bone and the inferior margin of the intermaxillary bone, ...	3 3	3 1	2 7½	..	..	2 7	2 5	2 2½	1 7½
From the anteror margin of the occipital foramen to the posterior margin of the bony palate, ...	2 10	3 5	3 2½	2 8	..	3 2½	2 3	2 6	2 6½
Length of the bony palate along the mesial suture, ..	4 0	4 0	3 6	3 2½	..	3 7½	3 1½	2 6	2 8
From the anterior margin of the intermaxillary bones to the anterior palatal foramina, ...	1 3	1 2½	1 0	,, 8	..	1 2	,, 10	,, 7	,, 7½
Breadth of the crown of the first incisor, upper jaw, ..	,, 7	..	,, 6	,, 5½	..	,, 6	0 6	0 5†	,, 5
Breadth of the crown of the second incisor, upper jaw, .	,, 4	..	0 3½(?)	0 3½	..	0 3½	0 3½	0 3½(?)	,, 3
Breadth of the four incisors, *in situ*, upper jaw, ...	1 9	..	1 7	1 6½	..	1 7	1 6	1 5	1 7
Longitudinal extent of grinding surface of the *molares*, bicuspides included, of one side, upper jaw, ...	2 5	2 2½	2 1½	1 7½	..	2 2½	2 2	2 0	2 0
Length of the enamelled crown of the canine tooth, upper jaw, ..	1 0	..	..	..	..	1 2	0 6½	..	,, 7
Breadth of ditto, ...	,, 9	0 8	0 7	0 7	..	0 6½	0 5	,, 5	,, 6
Length of the lower jaw from the condyle to the anterior surface of the sockets of the incisors, ...	7 4	7 3	6 3	6 7	6 3	6 7½	5 7	5 5	5 2
Length of the *ramus* of the lower jaw, ...	4 7½	4 7½	3 7½	4 2	4 0	4 0	3 4	3 5	3 5
Greatest breadth of ditto, ...	3 1	2 8	2 7½	2 9	2 3½	2 7½	2 0	1 8	2 0
Interspace between the mental foramina, ...	2 1	2 5	2 0	..	2 1	2 0	1 8	2 0	1 7

* Incisors much worn. † Much abraded.

In the following table of admeasurements, the first column gives those of an adult female *Rambi* by Prof. Owen; the second are those of our adult female (?) *Pappan;* the third are those of our aged female *Kassar;* and the fourth are those of our adolescent small female Orang with short fore-arms:—

	Adult female Rambi.			Adult female Pappan.			Aged female Kassar.			Short-armed.		
	F.	*i.*	*l.*	*F.*	*i.*	*l.*	*F.*	*i.*	*l.*	*F.*	*i.*	*l.*
Length of the body from the *vertex* to the base of the *os calcis*,*	4	1	6	3	9	6	3	4	0	3	3	3
Length of the spinal column, ...	1	11	6	2	0†	5	1	8†	0	1	8	9
Length of *sternum* (not including the ensiform cartilage,)	,,	4	4½	,,	4	0	,,	4	0	,,	4	4
Length of the *manubrium sterni*, ..	,,	1	5	,,	1	2	,,	1	3½	,,	1	3
Breadth of the *manubrium sterni*, .	,,	2	4	,,	1	10½	,,	2	3	,,	1	9
Breadth of the *sternum* opposite the fifth rib, ...	,,	1	2	,,	1	4	,,	,,	10	,,	,,	11
Length of the first rib, ...	,,	2	7	,,	4‡	8	,,‡	3	9	,,‡	3	9
Length of the seventh rib, ...	1	4	6	1§	0	0	,,§	9	6	,,§	9	0
Length of the last rib (which is longer than in Man and has a cartilage,)	,,	6	2	,,	4	5	,,	3	0	,,	4	3
Length of *os innominatum*, ...	,,	9	10	,,	9	9	,,	8	6	,,	8	4
Breadth of *pelvis* from one antero-posterior spine of *ilium* to the other, ...	,,	9	10	,,	9	9	,,	8	6	,,	8	4
Breadth of *ilium*, ...	,,	4	9	,,	4	3	,,	4	0	,,	3	5
Breadth of *ischium*, ...	,,	3	7	,,	4	0	,,	3	5	,,	3	0
Breadth of *sacrum*, ...	,,	3	4	,,	3	1	,,	2	11	,,	2	9
Distance between the *acetabula*, ..	,,	5	5	,,	5	0	,,	4	7	,,	3	9
Length of the *clavicle*, .. .	,,	6	9	,,	6	9	,,	5	9	,,	5	5½
Length of the *scapula* along the base, ..	,,	5	5	,,	6	3	,,	5	5	,,	5	0
Breadth from the end of the *acromion* to the opposite part of the base, ..	,,	4	8	,,	4	6	,,	3	10	,,	3	6
From the root of the spine to the superior angle, ...	,,	1	4	,,	1	4	,,	,,	10	,,	,,	10

* In the second, third and fourth columns, the *height* of the skeleton is given, standing, *more humano*. In the second column 1 in. is allowed, and in the third ¾ in., for the height of the *astragalus* and *os calcis*. In the small Orang with short fore-arms, the height of these bones *in situbus* is ¾ in.

† The extremity of the *coccyx* is here allowed for.

‡ Measured round the curve from posterior articulation.

§ The osseous portion only.

	Adult female Rambi.			Adult female Pappan.			Aged female Kassar.			Short-armed.		
	F.	*i.*	*l*	*F.*	*i.*	*l.*	*F.*	*i.*	*l.*	*F.*	*i.*	*l.*
From the root of the spine to the inferior angle, ...	,,	4	3	,,	4	3	,,	3	8	,,	3	0
From superior to inferior angle, ..		..		,,	5	10	,,	4	7	,,	4	3
Greatest breadth of *scapula*, .. .		..		,,	4	3	,,	3	3	,,	2	9
Length of the *humerus*, ...	1	1	4	1	2	6	1	0	9	1	0	6
Circumference of middle of trunk of *humerus*,		..		,,	3	2	,,	2	3	,,	2	0
Length of the *radius*,..	1	1	7	1	2	0	1	1	1	,, 11		2½
Length of the *ulna*, ...	1	2	5	1	2	8	1	1	3	,, 11		7½
Length of the hand,*	,,	10	5		..			..		,,	8	,,
Length of fore-finger (metacarpal included†), ...	,,	8	5		..			..		,,	7	0
Length of metacarpal of middle finger, ..		..		,,	4	0		..		,,	3	1½
Length of first *phalanx* of middle finger,.		..		,,	2	11	,,	2	9	,,	2	3
Length of first *phalanx* of little finger, ..		..		,,	2	5½	,,	2	3	,,	2	0
Length of the inferior or sacral extremity (to the base of the *os calcis*), ..	1	9	3	1	9‡	0	1	6‡	9	1	6	9
Length of the *femur*, ...	,,	10	3	,,	10	8	,,	9	9	,,	9	6
Circumference of middle of trunk of *femur*,		..		,,	2	9	,,	2	4½	,,	2	1½
Length of the *tibia*, ...	,,	9	0	,,	9	2	,,	8	3	,,	8	3
Length of the *fibula*, ...	,,	8	7	,,	8	7	,,	7	9½	,,	7	9½
Length of the *patella*, ...	,,	,,	10	,,	,,	9	,,	,,	9	,,	,,	9
Breadth of the *patella*, ...	,,	,,	9	,,	,,	8	,,	,,	8	,,	,,	9
Length of foot,§	,,	,,	10		..			..		,,	9	3
Length of the *hallux*,..	,,	2	10		..			..		,,	2	3½
Length of the next toe, ...	,,	8	5		..			..		,,	6	10
Length of first *phalanx* of same, ..		..		,,	2	10	,,	2	9	,,	2	3
Length of second *phalanx* of same, ..		..			..		,,	1	6	,,	1	3
Length of the little toe, ...	,,	7	0		..			..		,,	5	9

So many years have now elapsed since the fact of a plurality of species of this genus was established by Prof. Owen and Sir J. Brooke, that it cannot but occasion much surprize that the several species have not by this time been long accurately determined, and more especially when the greatly increased intercourse with Borneo is taken into consideration. Yet it seems that no progress whatever has been made in the enquiry since the publication of Sir J. Brooke's letter; and probably there is no collection yet in Europe, which can boast of so fine and demonstrative a series of Orang crania as those which are now figured.

* In Dr. Clarke Abel's male *Pappan*, the hand is about 11 in. long.

† In Abel's *Pappan* about 9½ in.

‡ An inch allowed in the second column, and ¾ in. in the third, for the *astragalus* and *os calcis*.

§ In Abel's *Pappan* about 13 in.