

PLATE XXXIX.

Arunella subsalsa, ♂.

- Fig. 1. Antennule, $\times 140$.
 2. Antenna, $\times 140$.
 3. Sensory seta of antenna, $\times 300$.
 4. Mandible and palp, $\times 140$.
 5. Maxilla of first pair and labium, $\times 84$.
 6. Processus piliferus, $\times 84$.
 7. Portion of ejaculatory duct and sac, $\times 84$.

PLATE XL.

Arunella subsalsa, ♂ cont.

- Fig. 1. Foot of first pair }
 2. " second pair } $\times 84$.
 3. " third pair }
 4. " fourth pair, $\times 140$.
 5. Posterior maxilla of right side, $\times 140$.
 6. " " left side, $\times 140$.
 7. Caudal ramus, $\times 84$.
 8. Copulatory organ, $\times 84$.

19. The Dwarf Buffalo of Southern Nigeria; with a
 Revision of the Dwarf Buffaloes of Western Africa*.
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(Text-figures 42-44.)

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In 1910 I gave an account of certain Dwarf Buffaloes seen and shot by Lieut. H. J. L. Thompson in the Yala country of Southern Nigeria, between the Aloda towns of Echimoga and Iveku-Okaku, in an open grassy country watered by tributaries of the Yaké†. The adult bulls were described as almost wholly black, and the cows as dun or khaki-coloured; immature bulls being also dun. As I could not obtain specimens of these Buffaloes for the British Museum, I refrained from giving them a name. Recently, however, Lieut. A. W. Hunt, R.N., has brought home from Southern Nigeria heads of Buffaloes doubtless belonging to the same race, and as he has presented one of these, a cow, to the Museum, the time has come for naming the South Nigerian Buffalo.

* [The complete account of the two new races described in this paper appears here, but since the names and preliminary diagnoses were published in the 'Abstract,' they are distinguished by being underlined.—EDITOR.]

† See my book 'The Ox and Its Kindred,' p. 242, 1912; in line 10 from bottom, cow should be bull.

Before proceeding further, it may be remarked that the study of the Dwarf Buffaloes of Western Africa is beset with great difficulties owing to the fact that the localities of the type specimens of *Bos nanus*, *B. planiceros*, and *B. centralis* (all of which are in the Museum) are unknown.

Taking first the case of *B. planiceros*, which was named from a frontlet and horns of a very old bull, it appears that these are racially inseparable from the younger pair of horns on which *B. centralis* was based, and as there is some clue to the locality where the latter were obtained, there is a presumption that the former came from the same region. Now the type of *B. centralis* was collected by a Mr. Dalton about the year 1854, and as Mr. Thomas* has shown that at least some of Dalton's specimens came from the Gambia, there is a presumption that this may have been the case with the Buffalo-horns. This presumption is strengthened by the fact that these horns are indistinguishable from those of Buffaloes killed in Gambia by Messrs. G. Fenwick Owen and G. Russell Roberts, two specimens of which—a mounted head and a skull, with horns—were presented by the former gentleman to the Museum. This renders it practically certain that the Gambian Buffalo is identical with *B. centralis*, which appears to be inseparable from *B. planiceros*; and I accordingly apply the name *B. caffer planiceros* to the Gambian, or Senegambian, Buffalo, with the proviso that if the type of *planiceros* should be proved to be racially distinct from that of *centralis*—which I believe to be an impossibility—the latter name would be available for the Gambian animal. The head from the Gambia, presented by Mr. Owen to the Museum, is remarkable for the bright orange tawny colour of the throat and upper part of the chest, which, together with a patch of the same colour below each ear, contrasts strongly from the slaty black of the rest of the head. A similar bright orange tawny band characterises the whole of the under surface of a cow from Sierra Leone (adjacent to Southern Senegambia), which was living in the Zoological Gardens at Antwerp in 1875; the colour of the upper-parts being yellow—or rather, perhaps, khaki. This cow, which is described and figured by Sir Victor Brooke in the Society's 'Proceedings' for 1875, p. 455, pl. liv., I accordingly take to represent the female of *B. c. planiceros*†.

Passing on to Gray's *Bubalus brachyceros*, or *Bos caffer brachyceros*, as I prefer to call it, a difficulty has arisen with regard to the sex of the type skulls brought by Denham and Clapperton from the Lake Chad district. Hitherto I have regarded the bigger of the two as representing an adult bull and the smaller a full-grown cow, but the acquisition by the Museum of a larger series of heads of female West African Buffaloes leaves no doubt

* Ann. Mag. Nat. Hist. ser. 8, vol. viii. p. 121, 1911.

† Also figured in Brehm's 'Tierleben,' ed. 3, Säugetiere, vol. iii. p. 320, 1891; the figure being reproduced in the 'Royal Natural History,' vol. ii. p. 201. Brooke incorrectly stated that it came from Senegal.

in my mind that both are referable to full-grown cows, as was considered to be the case by Sir V. Brooke. The male of the Lake Chad race I take to be represented by a frontlet and horns (the latter in a worm-eaten condition) brought by Captain H. Cock from Northern Nigeria, some distance to the east of Kontago, or Kontagora, and presented by him to the Museum in 1904. The Dwarf Buffaloes met with during the Alexander-Gosling Expedition* from Nigeria to the Sudan in the Shari Valley and on an island in the upper Ubangui (a skull of one of which from the locality last named is in the Museum) likewise appear to be referable to this race. Two cows are described as being respectively rich and dull tawny, with black legs, black fringes to the ears, and black tail-tips; while the one bull was dull tawny with similar black points. Dwarf Buffaloes shot by Gen. P. S. Wilkinson in Northern Nigeria on the Benue River, near Abiusi, have been noticed by Mr. Pocock†. Of these an old bull was jet-black, while an apparently younger animal of the same sex is described as red, which is no doubt the equivalent of the rich tawny in the account given in Boyd Alexander's book of the male buffalo from the Ubangui, which may likewise have been comparatively young. The cows of the Benue herd appear to have been all red or bright khaki-coloured.

Here it may be mentioned that the head of a Buffalo from the interior of French Congo, described and figured by myself on page 996 of the Society's 'Proceedings' for 1910 as that of an immature male (as it was stated to be by the donor), is really that of an adult cow, as is indicated by the condition of the bases of the horns, which, like those of the type specimens of *B. c. brachyceros*, are fully formed and incapable of further growth.

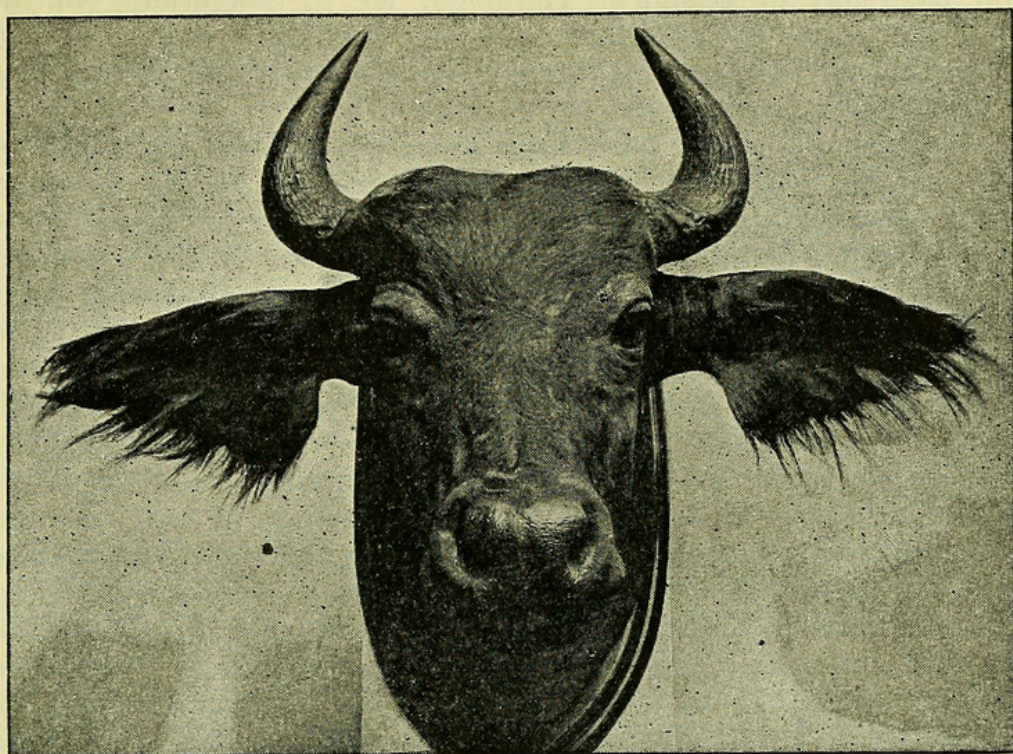
From the cow of the Gambian race this head (text-fig. 42) differs by the absence of an orange tawny area on the throat and the more rufous colour of the hair, as well as by the much more upward direction and greater incurving of the horns. In the latter respect it is more like the cow, figured on page 321 of the above-mentioned volume of Brehm's 'Tierleben,' and said to be from the Congo, but differs by the much larger amount of black on the ear-fringes. The associated body-skin is wholly rufous, with the exception of a black dorsal stripe; the shanks being also dark. Unfortunately it is not known from what part of the interior of French Congo this Buffalo was obtained; but if it came from a place well to the east, there seems no reason why it should not be within the distributional area of *B. c. cottoni*, to which race it was provisionally assigned in the original description. It is possible, however, that it may belong to *B. c. nanus*.

As regards *B. c. nanus*, I take this race, which is typified by the well-known frontlet and horns in the Museum, to be also

* See Boyd Alexander, 'From the Niger to the Nile,' vol. ii. p. 394, 1907.

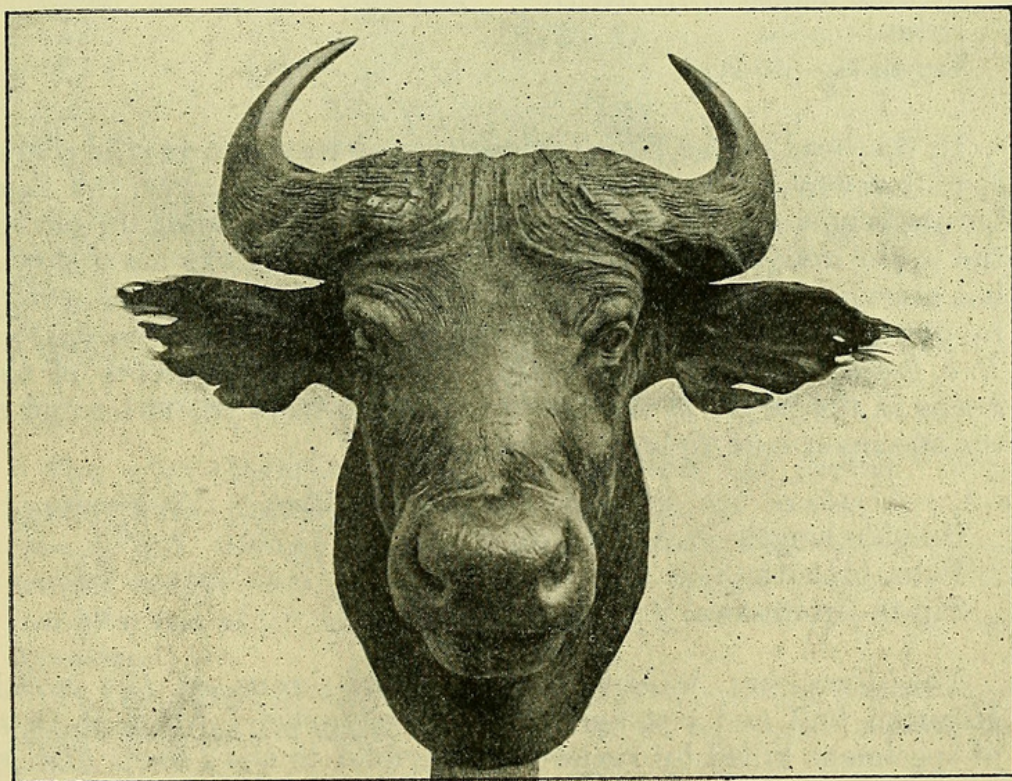
† 'The Field,' vol. cxix. April 5, 1912.

Text-fig. 42.



Head of Cow of *Bos caffer cottoni* (?) from the interior of French Congo.
(Reproduced from P. Z. S. 1910, text-fig. 148, p. 996.)

Text-fig. 43.



Head of Bull of *Bos caffer hunti* from Southern Nigeria.

represented by the cow and young bull from the Congo, figured on page 321 of Brehm's 'Tierleben,' ed. 3, Säugetiere, vol. iii. p. 321*, which are described as being wholly yellowish, with the exception of the brownish limbs. A full-grown bull of this race I have never seen.

The ground having been thus cleared, it is now practicable to discuss Mr. Hunt's specimens, as represented by the mounted heads of an adult bull and cow. In the former of these (text-fig. 43) the general colour of the skin and hair is best described as dusky, since it is not anything like black. Compared with the aforesaid head of *B. c. planiceros* in the Museum, it shows a much smaller amount of bright orange tawny on the throat and upper part of the chest, and no upward extension of this on each side of the head towards a similar patch at the root of the ear, this patch being absent in the South Nigerian head, in which the general colour is also lighter. The fringe of long hair on the upper edge of the ear is reddish orange, but that on the opposite margin mainly dark. The horns, in addition to being considerably smaller, differ from those of the male of the Gambian Buffalo in that their front surface slopes regularly backwards almost in one plane, instead of curving at first backwards, then forwards, and finally backwards. The following are the dimensions, in inches, of the Gambian and the South Nigerian horns, together with those of the Alexander-Gosling skull from the Ubangui referred to the Lake Chad race:—

	Lake Chad.	Gambian.	S. Nigerian.
Outside length	$25\frac{1}{4}$	$27\frac{1}{4}$	$20\frac{1}{2}$
Palm-breadth	$6\frac{3}{4}$	$7\frac{1}{2}$	$7\frac{1}{4}$
Tip-to-tip interval	$11\frac{1}{4}$	$21\frac{1}{2}$	12

In the head of the South Nigerian cow (text-fig. 44) the colour is dull tawny, with a dusky tinge on the lower part of the face, but no bright orange on the throat; the fringe being bright on the upper margin of the ear, as well as in two flecks lower down, but elsewhere dark. The front surface of the horns lies wholly in one plane, instead of curving backwards as in the case of *B. c. brachyceros*. The following are the measurements of the horns in the larger of the two type specimens of the latter and of the specimen now under consideration:—

	Lake Chad.	S. Nigerian.
Outside length	$17\frac{1}{2}$	12
Palm-breadth	4	$3\frac{3}{4}$
Tip-to-tip interval	7	$9\frac{1}{2}$

The foregoing measurements of the horns of the South Nigerian bull and cow agree, respectively, very fairly with those of specimens killed by Major A. J. Arnold in the Lokoja district

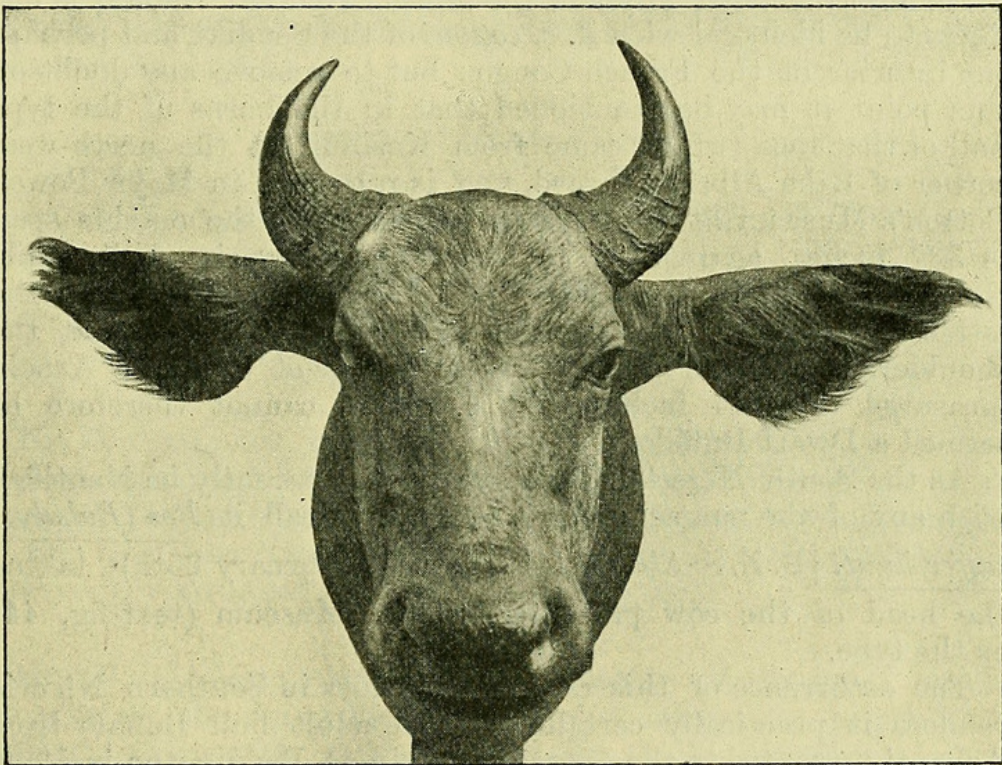
* The figure is reproduced in the 'Royal Natural History,' vol. ii. p. 203.

of Nigeria, at the junction of the Benue and the Niger, and quoted by myself* :—

	Bull.	Cow.
Outside length	19 $\frac{1}{2}$	12 $\frac{1}{2}$
Palm-width	7 $\frac{1}{2}$	4 $\frac{3}{4}$
Tip-to-tip interval	15	11

These Buffaloes, together with an immature mounted specimen in the Museum, from Lokoja, although hitherto referred to *B. c. nanus*, must, from their locality, be assigned, I think, to the same race as Mr. Hunt's specimens. Major Arnold states that "their colour varies from the light red of the younger animals deepening through the warm rufous red of the mature beast, to the deep dirty brown of the aged bull."†

Text-fig. 44.



Head of Cow of *Bos caffer hunti* from Southern Nigeria.

The above-mentioned female head from the French Congo agrees with the South Nigerian cow in its generally rufous colour, but differs by the more abundant and mainly black fringes to the ears, as well as by the middle portion of the front surface of the horns being distinctly curved in a backward direction.

As the result of the foregoing comparisons and descriptions, it appears that the South Nigerian Buffalo represents a relatively

* 'Game Animals of Africa,' p. 84, 1907.

† 'Game Animals of Africa,' *loc. cit.*

small race of *Bos caffer* in which old bulls are often dusky coloured or blackish, with a well-defined bright orange tawny area on the throat and chest, while adult cows are khaki-coloured, with an orange fringe on the upper margin of the ears, and a dusky tinge on the middle of the lower part of the face; the horns in both sexes being relatively small and lying mainly in one plane.

That these South Nigerian Buffaloes are racially distinct from *B. c. planiceros* and *B. brachyceros* seems abundantly clear; their relationship being nearer to the former than to the latter. They are also distinct from *B. c. simpsoni*, in which both sexes are blackish.

That they differ from *B. c. centralis*, as represented by the type horns and the two animals figured by Brehm, seems sufficiently apparent; and their horns are likewise different in type from those of Dr. Matschie's *B. c. thierryi* from Togoland.

On distributional grounds the South Nigerian Buffalo is unlikely to be identical with *B. c. cottoni* of the Semliki, and perhaps the interior of the French Congo; but to remove any doubt on this point it may be mentioned that in the horns of the type bull of that race (which came from Kasindi, at the north-west corner of Lake Albert Edward, and is preserved in Major Powell Cotton's Museum at Quex Park, Birchington) the outside span is $33\frac{3}{4}$ inches, against 21 in Mr. Hunt's Nigerian bull, while the palm-width in the former is 10 inches, against $7\frac{1}{4}$ in the latter. Moreover, the Semliki bull stood $57\frac{1}{4}$ inches at the shoulder, whereas an adult Nigerian bull shot by Major Arnold measured only 44 inches. *B. c. cottoni* cannot therefore be termed a Dwarf Buffalo.

As the South Nigerian Buffalo cannot apparently be identified with any of the named races, I propose to call it *Bos (Bubalus) caffer hunti* [P. Z. S. Abstract, 1912, p. 6 (February 25th)], taking the head of the cow presented to the Museum (text-fig. 44) as the type.

The occurrence of this race of Buffaloes in Southern Nigeria renders it practically certain that an adult bull Buffalo from Ashanti presented to the Museum by Mr. C. Beddington in 1900, and hitherto identified with *B. c. nanus*, cannot belong to a race inhabiting the Congo. Since, moreover, the fringe of hair on the ears is much less abundant, and the horns are considerably less closely approximated at the tips than in the type of *nanus*, I propose to make this bull the type of a new race, under the name *Bos (Bubalus) caffer beddingtoni* [P. Z. S. Abstract, 1912, p. 6 (February 25th)]. The height at the shoulder is $51\frac{1}{2}$ inches, the outside length of the horns $20\frac{1}{2}$, the palm-width $6\frac{1}{4}$, the tip-to-tip interval $13\frac{1}{2}$, and the outside span $23\frac{1}{4}$ inches. There is no dark dorsal stripe, which apparently occurs in *nanus*.

In conclusion I give the following tentative "key" to the named races of West African Dwarf Buffaloes in which the colour of the coat is known:—

- A. Both sexes dark; horns regularly curved in a subcircular form.
 Size medium *B. c. simpsoni*.
- B. Adult bulls often dark, young bulls and cows red or tawny; horns more expanded laterally.
- a.* Throat of bulls orange tawny.
 a'. Size large; throat of cows orange *B. c. planiceros*.
 a''. Size smaller; throat of cows coloured like neck; horns mainly in one plane; ear-fringe of cows partly orange *B. c. hunti*.
- b.* Apparently no orange on throat.
 Size medium; horns strongly bent backwards; ear-fringe of cows mainly black *B. c. brachyceros*.
- C. Adults of both sexes rufous or tawny; horns more or less angulated and flattened.
- a.* Size small; horns strongly angulated; heavy ear-fringes; apparently a dark dorsal stripe *B. c. nanus*.
 b. Size apparently larger; horns less strongly angulated; less abundant ear-fringes; no dark dorsal stripe *B. c. beddingtoni*.

[Since the above was written I have seen specimens which show that old bulls of *B. c. hunti* may retain the red coat while younger ones may be dusky.]

EXHIBITIONS AND NOTICES.

March 4, 1913.

Dr. A. SMITH WOODWARD, F.R.S., Vice-President,
 in the Chair.

Dr. P. CHALMERS MITCHELL, F.R.S., F.Z.S., Secretary of the Society, exhibited a lantern-slide made from a photograph of a domestic Donkey (*Equus asinus*) taken by Captain C. H. Armitage in the Gold Coast, and showing a very remarkable pattern of transversely arranged black stripes on the flank.

Mr. E. G. BOULENGER, F.Z.S., Curator of Reptiles, made remarks on the Lung-Fish, *Protopterus æthiopicus*, which the Society had recently received from Mr. C. W. Woodhouse, and which was the only Dipnoan that had not previously been exhibited alive in Europe.

Dr. S. F. HARMER, M.A., F.R.S., exhibited a Hair-ball which was presented to the British Museum (Natural History) by Mr. A. Dobrée, in January 1911. Alluding to Mr. E. G. Boulenger's exhibit, on February 18th last, of spines of a Madagascar Insectivore in the excrement of a Boa, he pointed out that this was perhaps another case of the occurrence of spiny hairs in the alimentary canal of a reptile. Mr. Dobrée's specimen, which has been described by Mr. R. Lydekker, F.R.S., in 'The Field,' vol. 117, Feb. 25, 1911, p. 383, was found in the Province of Morondava, West Coast of Madagascar, between Belô on the



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