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A Comparison of Hamitic Longhorn, West African Shorthorn and Afrikander Cattle Particularly with regard to the Skull (1).

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INTRODUCTION.

It is intended first to summarise certain facts regarding each of the above three types of cattle (since they represent foundation types of African cattle); and then to indicate how the skulls vary, the skull, as is generally known, being the feature of greatest importance in the study of ancestry. Thanks to Epstein (Dr. H.), much light has been thrown on the racial history of African Cattle⁽²⁾, and it is his account of the Hamitic Longhorn⁽³⁾ which is being followed in this paper.

⁽¹⁾ This note could very well appear under *Studies in Native Animal Husbandry*, which series at present comprises the following:—

- CURSON, H. H., THOMAS, A. D., AND NEITZ, W. O. (1930). 1. Notes on the Wankonde. *Jl. S.A.V.M.A.*, I (4).
- CURSON, H. H., THOMAS, A. D., AND NEITZ, W. O. (1931). 2. Proposed Plan of Investigation. *Jl. S.A.V.M.A.*, II (2).
- CURSON, H. H., THOMAS, A. D., AND NEITZ, W. O. (1933). 3. Native Milking Pails. *Argeologiese Navorsing van die Nasionale Museum, Bloemfontein*.
- DICKE, B. H. (1931). 4. Bantu and Cattle in the Northern Transvaal. *Jl. S.A.V.M.A.*, II (2).
- THOMPSON, F. R. B. (1932). 5. Indigenous Cattle in the Transkeian Territories. *Jl. S.A.V.M.A.*, III (4).
- GROENEWALD, J. W., AND CURSON, H. H. (1933). 6. A Note on Ovambo Cattle. *Onderstepoort Jl. Vet. Sc. and Anim. Indust.*, I (2).
- BISSCHOP, J. H. R., AND CURSON, H. H. (1933). 7. Makalanga Cattle: A Representative Described. *Id.*
- DART, R. A. (1933). 8. The Domesticated Animals of Pre-European South Africa. *Jl. S.A.V.M.A.*, IV (2).
- EPSTEIN, H. (1934). 9. The West African Shorthorn. *Jl. S.A.V.M.A.*, V (3).
- CURSON, H. H. (1934). 10. The West African Shorthorn (*Bos brachyceros*). *Id.*

⁽²⁾ His book, *The Origin of Africa's Indigenous Domestic Animals*, is unfortunately not yet published, but he kindly submitted Chapter IV on "The Cattle of Africa" to the Director of Veterinary Services for comment. Epstein believes that the West African Shorthorn and the Afrikander are representatives of the Brachyceros and Longhorned Zebu types respectively.

⁽³⁾ Neffgen (1904), in his description of the *Veterinary Papyrus of Kahun*, mentions that the oldest race of cattle was the "Langhornrasse" which was dominant during the "Alten Reiche", i.e. c. 2830 B.C.—2530 B.C.

HAMITIC OR EGYPTIAN LONGHORNED CATTLE.

It is believed that the ancestor of this type was the giant horned indigenous wild ox of the Nile Valley, called by Hilzheimer *Bos primigenius Hahni, nova subspecies Hilzheimer*. Domestication took place probably before and during the Neolithic era of Egypt. At the end of the Neolithic era, there entered Egypt from Asia (via the Isthmus of Suez), cattle of an entirely different type, namely, the Brachyceros or Shorthorn.

In the meantime Hamitic migration carried the Hamitic Longhorn west along North Africa into Spain and Portugal, and descendants of these cattle are now to be seen in the Raza de Barroza, Raza Minhota, and Raza Alentejana* (Portugal) and cattle of Andalusia (Spain). From the Iberian Peninsula, Brazil imported cattle and the Franqueiro Breed there represents the Hamitic Longhorn. Great Britain too has representatives in the Black Cattle of Wales, West Highland Cattle, and Herefords. Other migrations in Africa were mainly in a southerly direction.

In Africa, the Hamitic Longhorn has disappeared from the Nile Valley, but cattle of the same type are to be found in the interior of Senegambia and Liberia (Mandingo cattle)† and in the inaccessible mountain valleys of Morocco. With regard to Egypt, Flower (1932) describes the present cattle population as follows:—

“ *Domestic Ox.* ”*Bos taurus* Linnaeus.

The domestic cattle of Egypt in my time were all of one short-horned type from Alexandria to Aswan. Then followed in Lower Nubia an entirely cattleless country, except for a few animals imported into towns as El Derr and Wadi Halfa. In Upper Nubia from Dongola Province southwards cattle were again met with, but these could be referred to the humped species *Bos indicus*. I noted no domestic cattle in the Wadi Natron, and saw very few in Sinai.

When the importation of cattle from the Sudan to Egypt commenced in 1902 the large humped beasts with long up-standing horns were a matter of great interest to the fellaheen, all along the railway from Aswan north to Cairo. These oxen appealed to their minds as greater curiosities than giraffes or lions; after all, a wild animal, to people who were brought up to believe in the unicorn and the phoenix, might be of any shape or form, but they had definite ideas as to the necessary appearance of domestic beasts.

In Egypt, where the cattle literally live among the people, and often sleep in the same rooms, these animals are quiet and peaceable. I never found them aggressive, as on a few occasions I have found the humped cattle to be in Kordofan and on the Blue Nile.”

* Da Costa (1931) considers this breed a relative of the Afrikander.

† Sir Harry Johnston (1906) describes these cattle and includes several good photographs.

WEST AFRICAN SHORT-HORNED CATTLE.

As mentioned above, at the end of the Neolithic era in Lower Egypt there arrived the Brachyceros cattle, and even during the period of the New Kingdom (c. 1530 B.C.—1050 B.C.) they were dominant ⁽⁴⁾. According to Epstein, "it is safe to assume that there lived in some part of Asia a local subspecies of *Bos primigenius*, in the domestic descendants of which those physical characteristics that, throughout the animal world, are found only in the state of domestication, and which in *Bos taurus* are called brachyceros, became fixed by mutation".

As a result of the invasion by Brachyceros the Hamitic Longhorn, being less adaptable, was crowded out, not only in Egypt, but along the entire North African littoral. In other words, Brachyceros also accompanied the human stream of migration, along North Africa via Gibraltar into Europe and even into the Channel Islands where the Jersey represents the type. A part of the stream of advancing Brachyceros instead of entering Europe was diverted into West Africa as may be seen in several breeds of the West African Shorthorn. Du Toit (1927) and Stewart (1932) have referred to these cattle in Nigeria and the Gold Coast respectively.

At the present time, Brachyceros cattle are therefore not only to be found in North Africa and Europe, but also in their original Asia, where they occur in the northern part of the continent as far east as Japan.

While the movements described above were occurring, another invasion of North-east Africa took place, this time, the Semites entering mainly by way of South Arabia and Ethiopia and accompanied by their Longhorned Zebus.

AFRIKANDER CATTLE.

According to Epstein, cattle of the above type entered Africa about the end of the 3rd pre-Christian millenium. So great was their influence in Upper Egypt, chiefly on the Hamitic Longhorn, that (except for comparatively recent importations of the Shorthorned Zebu) the majority of all indigenous cattle south of the Sahara represents a cross of these two basic types.⁽⁵⁾ Besides the West

⁽⁴⁾ Neffgen (1904) states: "Die 'Kurzhorurasse', Tiere mit kurzen Hünern, wie schon der Name sagt, kommt im 'Alten Reich' selten vor, dagegen mehr in späterer Zeit." A wall painting from Thebes (British Museum) showing this type is reproduced by several authors. See Kronacher's *Allgemeine Tierzucht* (1921—I. Abt., p. 169).

⁽⁵⁾ Called by Epstein "the Sanga". As it is a cross, no further reference to it will be made here, the object of this study being an introduction of the three basic types.

African Shorthorn and the Mandingo cattle, the exception to the statement just made is the Afrikander of South Africa, which is the sole representative (in Africa) of the original Longhorned Zebu.⁽⁶⁾

The Shorthorned Zebu encountered to-day in Africa has been introduced within recent centuries and represents the influence in Asia of *Brachyceros* on the Longhorned Zebu. It must not be confused with the Sanga, which unfortunately is referred to by many African officials as Zebu.

Returning to the Afrikander, it is remarkable how in spite of several publications, oversea authors are frequently in doubt as to the origin of this breed. Snapp (1930), for example, describes the Afrikander as a cross of "these Kafir (i.e. Sanga type) cows . . . with Zebu or Brahma bulls for the purpose of obtaining an increase in size".

The ancestor of the Longhorned Zebu is believed to be *Bos namadicus* which was first domesticated in the steppe country of Central Asia.

MAIN POINTS OF DIFFERENCE BETWEEN THE THREE BASIC TYPES OF AFRICAN CATTLE (EPSTEIN).

Feature.	Hamitic Longhorn. Sec Fig. 1.	West African Shorthorn. See Figs. 2 and 3.	Afrikander. See Figs. 4 and 5.
1. Head.....	"Comparatively short and broad."	Elongated frontal region which is concave.	Long and narrow. Forehead convex.
2. Horns.....	Long and upright. "Of same length and shape" in bull and cow. Base almost circular, substance "light coloured with dark tips, rarely dark throughout."	Short, fine, and dense in texture. Base circular.	Long and slender. Base oval. Horns leave head in lateral direction and show a moderate twist.
3. Dewlap...	"Only moderately developed."	Moderately developed.	Well developed and commencing at chin.
4. Hump....	"Not the slightest sign of a hump."	Not present.	Well developed and does not fall abruptly on to withers, but slopes gradually.
5. Height, at withers	"About 57 inches."	Varies from 3 feet to 4 feet.	About 5 feet.
6. Type of beast	Beef ("large framed beasts").	? Milk. Generally a small beast.	Beef.

⁽⁶⁾ Neffgen (1904) refers to the "hornlosen Tiere", but not to the Longhorned Zebu.

OSTEOLOGICAL DIFFERENCES: SKULL (?).
GENERAL DESCRIPTION.

Feature.	Hamitic Longhorn Bull. See Figs. 6, 7, and 8 (Epstein).	West African Short-horn Bull (A. 82). See Figs. 9, 10, 11, and 12.	Afrikander Ox (A. 26). See Figs. 13, 14, and 15.
<i>Frontal Surface.</i>			
1. General shape...	"The head is comparatively short and broad."	Long, especially forehead, and fairly broad.	Long and comparatively narrow, especially between orbits.
2. Margin of orbit..	"The eye is big and prominent."	Slightly prominent.	Not prominent.
3. Profile.....	(Appears straight.)	Straight.	Convex.
<i>Lateral Surface.</i>			
4. Temporal fossa...	"The temple (temporal fossa) is broad and deep."	Deep, horizontal, and widely expanded caudally.	Deep and curved. Markedly influenced by base of horn.
5. Horn.....	"Lyre-shaped and slender." Upright.	Short and horizontal.	Lateral direction and slender with twist.
<i>Basal Surface.</i>			
Choanae.....	"The choanae begin a little more than $\frac{1}{2}$ inch behind the third molar."	Choanae begin approximately 1 cm. in front of posterior edge of third molar.	As for Egyptian Longhorn.
<i>Nuchal Surface.</i>			
6. General.....	Separated from frontal surface by prominent and thick frontal ridge, which is level when viewed anteriorly and straight from side to side.	Frontal ridge thick but not prominent. From front it is convex (with central depression) and is straight from side to side.	Frontal ridge thick and prominent. From front it is convex and markedly curved from side to side.

DETAILED DESCRIPTION.

Feature.	Hamitic Longhorn Bull (Epstein).	West African Short-horn Bull (A. 82).	Afrikander Ox (A. 26).
<i>Frontal Bone.</i>			
Frontal surface— (a) caudal	"Rather flat. The frontals slope slightly down towards the temples."	Slightly concave. Lateral part slopes towards temporal region. Torus frontalis prominent.	Gently convex in all directions, especially towards horn cores.
(b) cranial.....	"A deep cavity between the orbital arches."	A deep saucer-like cavity.	A shallow depression being almost flat.

(?) The skeleton of the West African Shorthorn was kindly presented to the Onderstepoort Museum by Capt. W. W. Henderson, M.R.C.V.S., Nigeria.

Feature.	Hamitic Longhorn Bull (Epstein).	West Afric. n Short-horn Bull (A. 82).	Afrikander Ox. (A. 26).
(c) Interfrontal suture	"Ridge . . . a slight elevation" caudally, but "is hardly raised at all . . . slightly above the orbit."	No ridge-like prominence. A shallow furrow connects (a) and (b).	No special prominence along suture, but highest point of profile is central and situated between (a) and (b).
(d) Elevation limiting (b) caudally and laterally.	"Strong elevation."	Scarcely perceptible.	Scarcely perceptible.
(e) Supraorbital groove	"Begins at horn core and ends . . . 1 in. above nasals . . . deep and broad near upper portion of orbit . . . inner edge is sharp."	Begins at horn core and converges slightly towards nasals. Broad and sharp along inner edge.	Does not begin so close to horn core. The grooves converge slightly towards nasals. Inner edge rounded and groove broad.
(f) Frontal ridge, from front	"Straight, except for a slight elevation towards the middle, which again shows a tiny depression in the centre."	Line slopes sharply upwards to Torus frontalis, whose summit is very slightly depressed.	Line slopes gently upwards to Torus frontalis which is not prominent. The summit is slightly depressed.
(g) From back.	"Elevation appears much stronger. It is formed by the parietal and supra-occipital bones. Note lap-like extension of the parietals into the forehead" (Torus frontalis).	Ridge while thick is not prominent. Parietals extend into Torus frontalis.	Ridge is thick, prominent and markedly curved (convexity cranial) in its length. Parietals extend into Torus frontalis.
<i>Horn Core.</i>			
(h) Neck.	"Stalk-like process."	No stalk-like process.	Stalk well marked.
(i) Base.	"Forms a pearled wreath which considerably exceeds in height" the neck. Almost circular.	Pearled wreath at base absent. Section of base is circular.	Pearled wreath at base absent. Section of base is oval.
(j) Furrows.	"Cores deeply furrowed."	Not well marked.	Well marked.
(k) Orbital arch.	"Rather thin and lower than the frontal elevations" (d). "Higher (slightly) than" dorsal margin of temporal fossa.	Almost level. Definitely higher.	Well developed and slightly higher than frontal elevations (d). Height of arch above dorsal margin striking.
(l) Fronto-lacrimal suture	General direction "straight" but edge "extremely jagged."	Direction straight and cranial half jagged.	Direction straight and entire edge jagged.

Feature.	Hamitic Longhorn Bull (Epstein).	West African Short-horn Bull (A. 82).	Afrikander Ox (A. 26).
(m) Fronto-lacrimal point	A triangular hole . . . clearly distinguishable."	Triangular hole marked.	No sign of triangular opening.
<i>Nasal Bone.</i> (n) Frontal surface.	Missing from skull.	Profile slight concave.	Profile slightly concave.
<i>Premaxilla.</i> (o) Nasal process...	"Seems to have touched" nasal bone.	Does not meet.	In apposition.
<i>Maxilla.</i> (p) Palate.....	"Palate is very flat."	Arched from side to side.	Arched from side to side.
<i>Occipital Bone.</i> (q) Median occipital crest	"Squama . . . halved by a rough line running . . . from the upper border of the foramen magnum."	This crest, ventral to the external occipital protuberance, is very well marked.	Here the crest is scarcely perceptible.
<i>Mandible.</i> (r) Posterior edge of vertical ramus.	Bone missing, but Epstein notes "at right angles."	Forms obtuse angle with horizontal ramus.	Slightly greater than a right angle.

An important difference is seen in the spinous processes of the thoracic vertebrae. From the 6th vertebra onwards in the Afrikander (and indeed in all Zebus) not only is the upper 1/5th divided medially, but it is also compressed antero-posteriorly. In the West African Shorthorn no such cleft occurs. See Figs. 16 and 17.

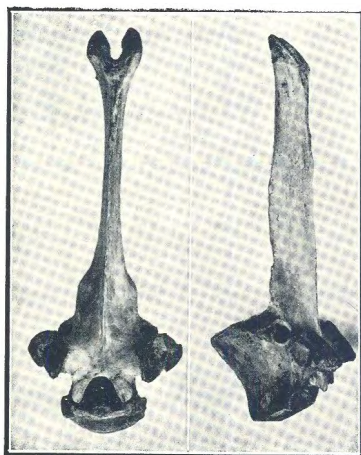


FIG. 16.

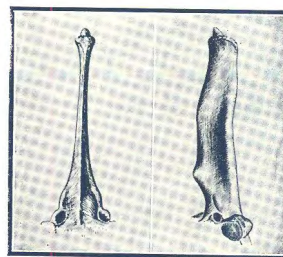


FIG. 17.

(Drawn by G. C. Walker.)

Fig. 16.—Ninth dorsal vertebra of Afrikander cow (Curson). Compare with same vertebra West African Shorthorn bull (A.82).

Fig. 17.—Ninth dorsal vertebra of West African Shorthorn bull (A.82).

DISCUSSION.

In order that there may be no confusion, the detailed features are indicated on Figs. 13-15 of the Afrikander skull by the letters a—r.

The ages of the animals shown in the figures are approximately 3 years and 8 years for the West African Shorthorn and Afrikander respectively and not less than 5 in the case of the Hamitic Longhorn.

As will be observed from a study of the information tabulated above, the differences depend mainly on the development of the horns and the situation of the orbit.

It is not suggested that the above specimens are pure bred but they are sufficiently characteristic of the various types. It must be remembered that during the course of centuries much crossing has taken place and so all gradations are met with, but if typical skulls are selected, noteworthy differences are to be observed.

In a subsequent study it is hoped to give more information regarding measurements.

SUMMARY.

Assuming that the three foundation stocks of African cattle are the Hamitic Longhorn, Brachyceros, and Longhorned Zebu types, it is possible to differentiate between them (*a*) on account of their conformation, and (*b*) and because of differences in osteology. These differences are tabulated in the text and to emphasize them, photographs accompany the paper.

ACKNOWLEDGMENT.

We are indebted to the Directors of Veterinary Services of the following countries for assistance in connection with the compilation of this study: Union of South Africa (Dr. P. J. du Toit), Tanganyika (H. E. Hornby, Esq.), Nigeria (W. W. Henderson, Esq.), and Gold Coast (J. L. Stewart, Esq.). Prof. R. Dart of the University of the Witwatersrand kindly read the paper and made some useful observations.

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EXPLANATION OF FIGURES.

(Only Figs. 9-17 to scale, being approximately one-quarter of original.)

PHOTOGRAPHS ILLUSTRATING CONFORMATION (FIGS. 1-5).



Fig. 1.—Hamitic Longhorn bulls. (Taken from Kronacher's *Allgemeine Tierzucht*, 1 Abt., Fig. 73, from Adametz, 1921.)

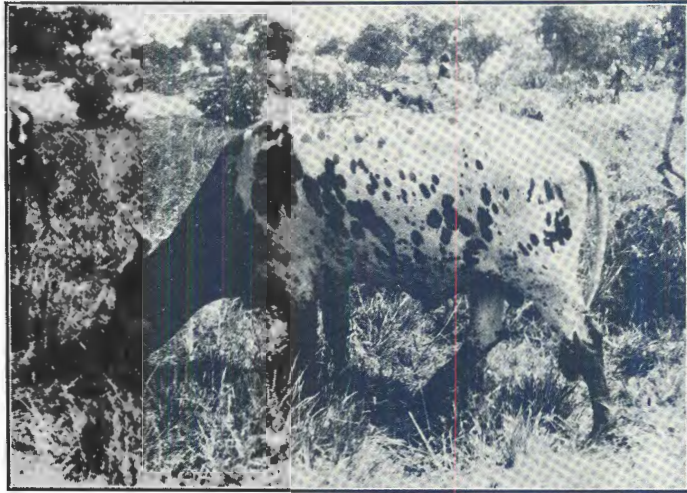


Fig. 2.—West African Shorthorn bull (photo provided by J. L. Stewart, M.R.C.V.S., P.V.O., Gold Coast, through H. E. Hornby, F.R.C.V.S., D.V.S., Tanganyika).



Fig. 3.—West African Shorthorn cow. (Photo taken by Dr. P. J. du Toit, D.V.S., Union of South Africa.)



Fig. 4.—Afrikaner bull “Vaderland”, bred by P. Biljoen, owned by Union Govt., purchased for £1,000 from Louis Wessels. (Photo provided by School of Agriculture, Potchefstroom.)



Fig. 5.—Afrikaner cow “Lemoen”, owned by P. Biljoen, Hoopstad, O.F.S. (Photo provided by School of Agriculture, Potchefstroom.)

PHOTOGRAPHS INDICATING SKULL DIFFERENCES (FIGS. 6-15).

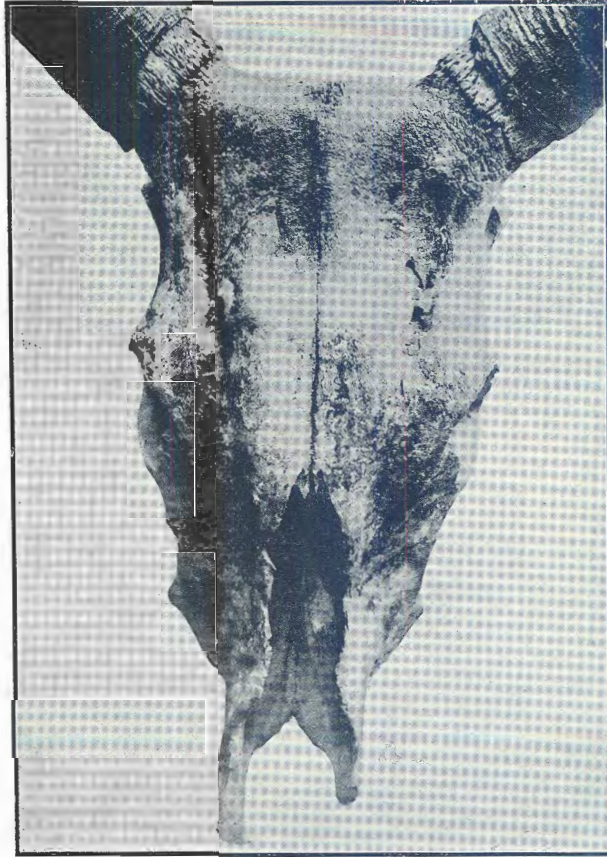


Fig. 6.—Frontal surface, Hamitic Longhorn bull.

Length of forehead, 234 mm.



Fig. 7.—Lateral surface, Hamitic Longhorn bull.



Fig. 8.—Nuchal surface, Hamitic Longhorn bull. Photographs 6-8 were furnished by Dr. H. Epstein, Welverdiend, Transvaal.



Fig. 9.—Frontal surface, West African Shorthorn bull (A.82).
Length of forehead, 193 mm.

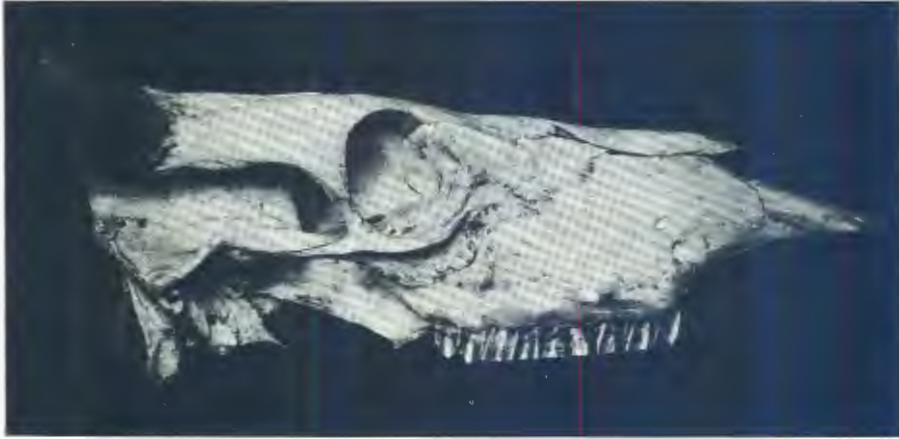


Fig. 10.—Lateral surface, West African Shorthorn bull (A.82).

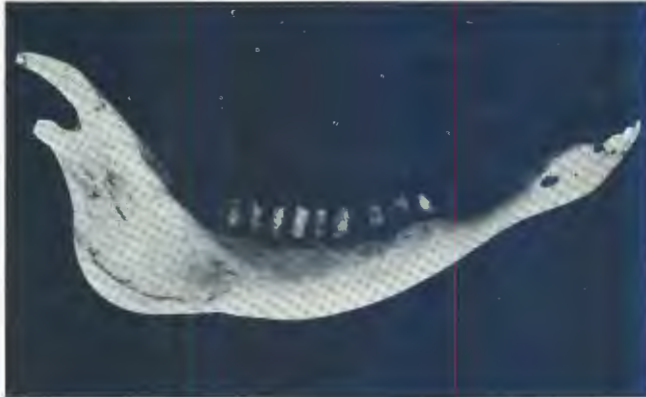


Fig. 11.—Mandible, West African Shorthorn bull (A.82).

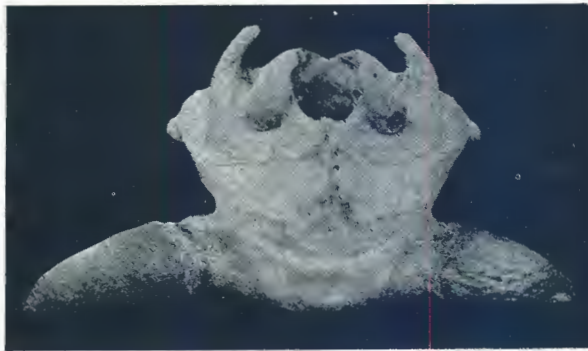


Fig. 12.—Nuchal surface, West African Shorthorn bull (A.82). The skeleton was kindly presented to the Onderstepoort collection by W. W. Henderson, M.R.C.V.S., C.V.L., Nigeria, and photos were taken by T. Meyer.



Fig. 13.—Frontal surface, Afrikander ox (A.26).
Length of forehead, 260 mm.

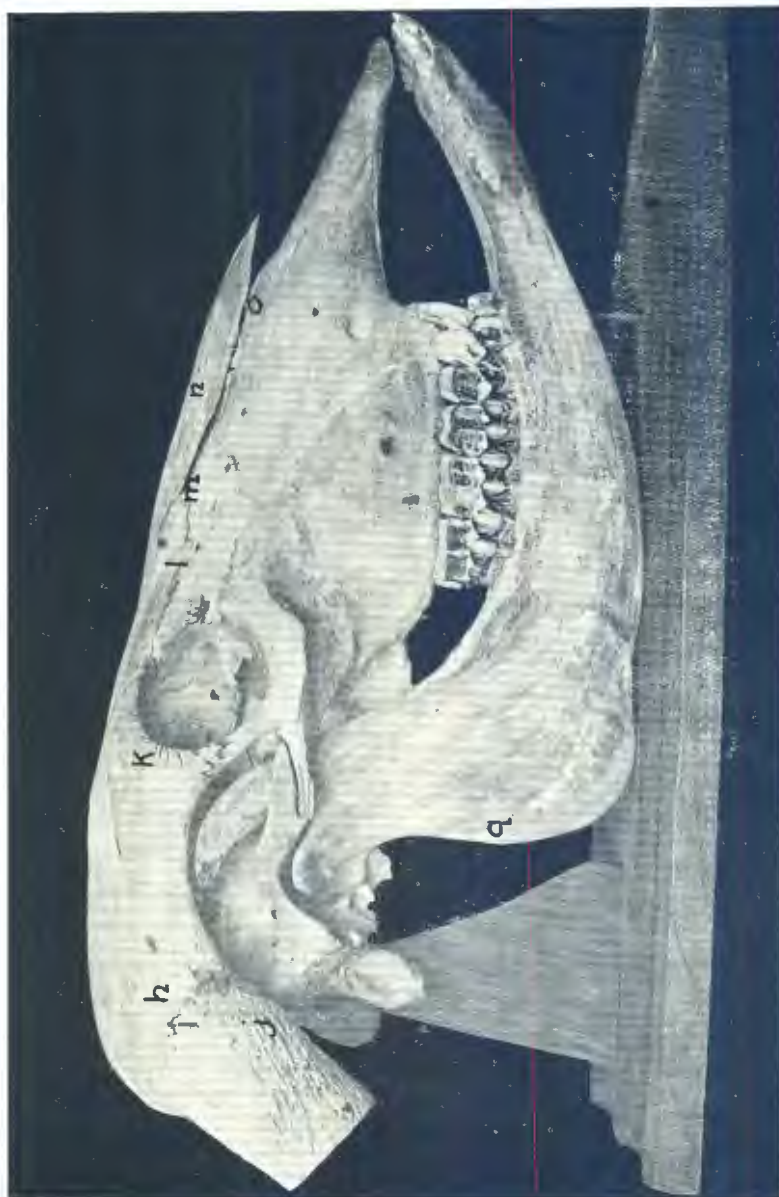


FIG. 14.

Fig. 14.—Lateral surface. Afrikander ox (A.26).

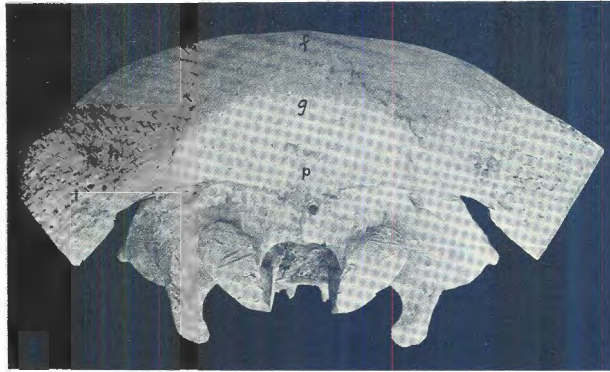


Fig. 15.—Nuchal surface, Afrikander ox (A.26). The skull was obtained through the kind offices of G. Pilditch, Pretoria Abattoirs. Photographs 9-15 by T. Meyer.