The Quaternary in Basutoland

(South Africa)

(Succession and stratigraphy of artefacts discovered in the Upper Orange River Basin)

by

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I

PREVIOUS WORKS

In a previous note (*Comptes Rendus Ac. Sc. Paris,* 14.2.1955) I reported the discovery of many stone artefacts in Basutoland (Lesotho), a land of high plateaux (1600 to 3500 m altitude) that hitherto was little known to prehistorians.

A campaign of prospecting that was started in 1930 and continued in a more systematic manner from 1953 was largely responsible for the creation of the museum of the "*Centre culturel français de Morija"* (the second largest town in Basutoland and old centre of civilisation of the Bantu country that has remain almost independent since its origins). Our discoveries are now housed in this museum.

T. ARBOUSSET (1848), a pioneer missionary, geographer, explorer and ethnographer, already mentioned in this book that on the alluvial terraces of the Upper Orange River Basin (High Caledon, and High-Vaal, Elands River) there were: "layers of pebbles and gravel lying within the silts" (p. 132), hanging and intermeshed peneplains in Natal (p. 135) and the occurrence of quartzites, flints and other raw materials that the Palaeolithic artists living in the country's caves were still using at that date and that were situated at the base of the lavas of the Blue Mountains.

From 1850 to 1890, H. DYKE, F. ELLENBERGER and then F. CHRISTOL studied the life and art of the last Palaeolithic people, who were still living at that time (Bochimans). H. DIETERLEN (1880) collected relics of the ancient fauna (Hippopotamus, etc.), whereas his son G. DIETERLEN collected specimens of recent stone implements collected on the soil surface and discovered (1925) the rich "Middle Stone Age" (Stillbay) prehistoric site on the natural hill fort of Liphokoaneng (1). It was in 1930 that V. ELLENBERGER started systematic prospecting and a full-scale survey of the rock paintings, a work that he continued in 260 caves and rock shelters, whereas I, while assisting him, in the most systematic manner possible, surveyed and sampled the surface artefacts at a large number of sites. Since then I have systematically continued the survey of this rock art belonging to all ages in 200 new caves in Basutoland.

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(1) Details of a local collection made by the amateur Macdean from Qeme and Quthing remain unpublished.

The occurrence of an ancient Palaeolithic culture was reported for the first time by D. R. MACFARLANE (1943) on the Makhaleng terraces where he found "Upper and Lower Levallois inextricably mixed up". In 1947, the Abbot H. BREUIL (pers. comm.) reported an as yet unpublished section near the Saint-Rose Mission (Leribe, Basutoland) that showed the following strata from the bottom to top: reworked gravels from the old Palaeolithic (Stellenbosch), Fauresmith and Middle Stone Age, overlain by intact Stillbay, itself covered by a thick mantle of sterile silts. Father LAYDEVANT (1947) was interested for some time in this research (pers. comm.). At the same period, B. D. MALAN (1947) from Witwatersrand University undertook, on the recommendation of Abbot BREUIL, the first excavation through the recent Quaternary in the decorated rock shelter at Rose Cottage (the region of Basutoland then called "Conquered Territory"): under a thin superficial deposit aged from pre-Wilton to Wilton with crescent-shaped tools, a thick layer of sterile red sand covered a Magosian level, that was thus reported for the first time from "Outer Basutoland".

Recently, when the present communication had already been published, Professor VAN RIET LOWE (1957) reported the unpublished discovery, made by chance in 1946 by a student J. F. CORNETT, of a few specimens of quartzite hand axes on various terraces of the river Phofung (Little Caledon, Outer Basutoland). In collaboration with Dr COOKE he gave a more precise description of these ancient industries and their respective terraces, that seemed to correspond to their homologues so masterfully described by himself from the banks of river Lekoa (Vaal), at the limits between the Transvaal and Orange Free State.

An attempt was made by DESMOND-CLARK (1950) to correlate tool classifications and climate in Africa, following his remarkable discoveries and works on the terraces of the Upper Zambezi. This attempt was continued by H. B. S. Cooke (1941, 1947, 1955, etc.) and extended by H. ALIMEN (1952). I would like to thank the curators of the Johannesburg and Cape Town Archaeological Museums for the invaluable information that they have provided and for their material support in identifying the various artefacts that I have discovered in Basutoland, and also Abbott BREUIL for his most helpful advice.

II

A GEOLOGICAL SKETCH: THE STRUCTURAL TERRAINS AND INTERMESHED PENEPLAINS OF BASUTOLAND

A) *The terminal sedimentary structural terrains (Stormberg) (2) and volcanic terrains (Drakensberg) (3) of the Gondwana continent in South Africa strongly influence the current topography of Basutoland by their succession of superimposed strata.*

1) The strata consist of (from the bottom to top) *the following:*

a) Coarse greenish sandstones of Molteno up to an altitude of 1700 m on average.

b) Red argillites and sandstones of the Red Beds up to 1800 m.

c) Massive white sandstones of the Cave Sandstone forming tall cliffs with decorated rock shelters up to 1900 m.

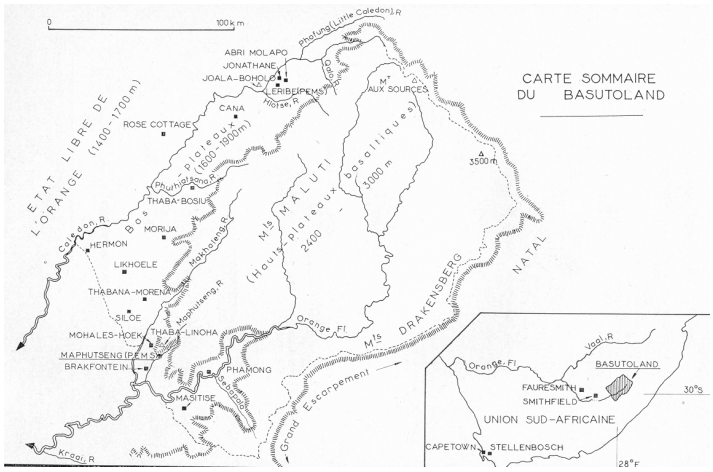
d) Above, a thick mass of basalt lavas that rise to 1900 to 3500 m and include an enormous accumulation of 1600 m of blackish, almost horizontal lava flows.

2) The raw material of stone tools has been formed by the powerful regressive erosion that has gouged out this country rock to a depth of 1500 to 2000 m, creating within it a vast system of deep valleys and hanging

(2) Upper Triassic -Rhaetien according to DU TOIT, HAUGHTON, VON HUENE, etc.

(3) Mostly Jurassic.

SKETCH MAP OF BASUTOLAND



ORANGE FREE STATE

Low plateaux

High basalt plateaux

Great escarpment

plains. Many detritic fragments of siliceous rocks have been washed out from the basaltic rocks, including agates, chalcedony and jasper, that were used in the Middle to Recent Palaeolithic. The frequent silicification of the uppermost sandstones in contact with the Drakensberg lavas have given rise to secondarily formed quartzites that were the main rocks used for ancient Palaeolithic tools, but sometimes lydites (porcelanites) resulting from metamorphosis of sandy argillites of the Molteno in contact with dolerite dykes were also used. Finally, we should note the unusual use by men at a certain period in the Middle Stone Age (late Levallois) of primary polished quartzite pebbles that occur as inclusions within the Molteno Triassic sandstone of Basutoland.

B) *The intermeshed erosion peneplains of Basutoland* can be explained by uplifting and downthrow movements (5).

1) Following the final break-up of Gondwanaland (in the mid- to late-Jurassic), the level of the structural plain of the Drakensberg (current altitude 3200 to 3500 m) was uplifted.

2) The new baseline level became stabilised at the end of Mesozoic, the bottom of the valleys in the headwaters now being about 2700 m on average in Basutoland (*the high perched plateaux of Maphutseng*).

3) A new lowering of the baseline level created new peneplains or hanging valleys at 2200 to 2300 m (*many hanging cirques in the upper Maphutseng valley* and other tributaries of the Orange River near Phamong, possibly dating from the Eocene).

4) A lower, more extensive peneplain formed either at the level of the uppermost Cave Sandstone or slightly above it, i.e. at 1800 to 1900 m, probably during the mid-Tertiary (*the lower plateau of most of Basutoland*).

5) Finally there was a spectacular lowering of the level of the Stormberg sandstone massif that stabilised temporarily at about 1650 to 1750 m, i.e. 150 to 200 m lower or *150 m above the current river valley bottoms.* This is no longer a peneplain surface but rather an alluvial terrace in the true sense (Valleys of the Orange and its major tributaries (5) in Basutoland: a) the Caledon or Mohokare and its sub-tributaries, the Qalo, Hlotse, Phutiasana and Phofung, b) the Makhaleng, c) the Sebapala, d) the Qomoqomong, e) the Telle, f) the Maphutseng and g) the Kraai River).

III

THE QUATERNARY TERRACES OF BASUTOLAND

Although these have been studied or noted along all the above-mentioned rivers, the example that will be used will be the river Maphutseng (Mohale's Hoek District in southern Basutoland) that now lies in a treeless "Alpine" landscape.

A) *Description of the main terraces of the Maphutseng*

1) *Terrace VI at + 150 m,* visible at Waterfall, Seliba, Tlai-tlai, only contains a few rare relics of its volcanic pebble covering of agates and zeoliths. (Note that the Leribe-Tsikoane E.C. the sedimentary cover of red and black pebbles is still present at this level, as it is at Phofung [368 feet according to VAN RIET LOWE]).

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4) See the works of L. KING and the correlation between these levels that are related to the Atlantic or intracontinental baseline to the west and those of the more recent sudden erosion of the Indian Ocean to the east.

5) As was so correctly stated by COOKE (1941, p. 35) with respect to the Orange at Aliwal and the Caledon at Smithfield OFS.

2) *Terrace V at + 70 to 80 m* visible at Maphutseng (Ranthake and Desolation), locally covered with very decomposed pebbles and many zeoliths, agates and quartzites derived from the lava. (Note the presence at this level of the thick terrace of Qalo that has yielded some quartzite flakes that may have been used). This is the terrace that VAN RIET LOWE placed at 230 feet at Phofung. It probably dates from the Villafranchian.

3) *Terrace IV at + 50 m* covered with many river and volcanic and quartzite pebbles that is well preserved at many points and is rich in very old artefacts.

4) *Terrace III* is subdivided into two gravel beds: *at + 30 m and at + 22 m to 25 m*. This is the most extensive and visible of the Quaternary terraces on the Maphutseng, belonging to the lower Palaeolithic.

5) *Terrace II at 15 m* (pebbles, sands, etc.) (lower Palaeolithic).

6) *Terrace I at + 4 m* (sands, pebbles etc; and stones affected by gelifraction) (middle Palaeolithic, Middle Stone Age: MSA).

7) *A negative terrace*, where the basal erosion level is at -3 m to -5 m in the case of the Maphutseng (two cycles).

8) *A floodplain terrace* of pink silts that have silted up the river up to a height of + 12 m to +15 m and that are surmounted locally with gravels and pebbles (recent Palaeolithic).

9) A new cutting down by all the rivers in Basutoland by erosion of the floodplain terrace has brought their level of sands and gravels to 0 m, which is the current level.

B) Possible climatic causes for terrace formation in Basutoland

The complex problem of gravel terrace formation is approached in different manners depending on the country, latitude, the local climate, the height above sea level and the geological context.

IV

THE VARIOUS TYPES OF CLIMATE THAT SCULPTED THE VALLEYS OF THE UPPER ORANGE RIVER (BASUTOLAND) DURING THE QUATERNARY

A) *Why are the rivers in Basutoland currently cutting down? - Why in the past did they accumulate large thicknesses of sands or gravels, pebbles or broken stones? Why did they silt up for millennia with such a thickness of wind-borne loess silt?*

Basutoland is a mountainous country where very contrasting climatic factors can play a role. Very considerable variations in the temperature or rainfall acting over short or long periods, either alternately or simultaneously, lead us to think that that a large number of annual climatic complexes could have immediate consequences on the development, in one sense or another, of river basins and on their beds.

B) The following can be distinguished:

1) An annual seasonal cycle which had an effect on the cutting down of rivers into their floodplain. We will call this "*A cold dry climate with brief summer deluges*." c.f. *The cold subdesertic climate of the High Karroo*.

a) *This is a stage that appears to have become installed artificially since less than 500 years ago, by the arrival in the primitive and still prehistoric region of Basutoland of Bantu farmers and pastoralists*. The rivers suddenly ceased to silt up and started to erode down through their sediments. What happened?

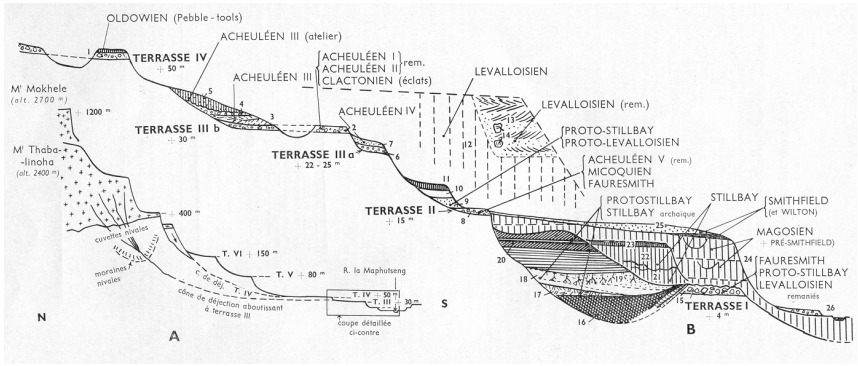
OLDOWIEN (Pebble - tools)
ACHEULÉEN III (atelier)
TERRASSE IV
+ 50 m
ACHEULÉEN I
ACHEULÉEN II
rem.
CLACTONIEN (éclats)
ACHEULÉEN III
LEVALLOISIEN
M' Makhele
(alt. 2700 m)
+ 1200 m
ACHEULÉEN IV
LEVALLOISIEN (rem.)
TERRASSE III b
+ 30 m
PROTO-STILLBAY
PROTO-LEVALLOISIEN
M' Thaba-
-linoha
(alt. 2400 m)
TERRASSE III a
+ 22 - 25 m
ACHEULÉEN V (rem.)
MICOQUIEN
FAURESMITH
PROTOSTILLBAY
STILLBAY archaïque
STILLBAY
SMITHFIELD
(et WILTON)
TERRASSE II
+ 15 m
MAGOSIEN
+ PRÉ-SMITHFIELD)
+ 400 m
curettes nivales
T. VI + 150 m
T. V + 80 m
R. la Maphutseng
FAURESMITH
PROTO-STILLBAY
LEVALLOISIEN
remaniés
moraines nivales
c. de déj.
T. IV
T. IV + 50 m
T. III + 30 m
cône de déjection aboutissant à terrasse III
TERRASSE I
+ 4 m
N
S
coupe détaillée ci-contre
A
B

Fig. 2.

A. DIAGRAMMATIC SMALL-SCALE SECTION OF THE NORTH SLOPE OF THE MAPHUTSENG VALLEY.

B. DETAILED SECTION OF THE QUATERNARY OF THE BOTTOM OF THE SAME VALLEY AT MAPHUTSENG (P.E.M.S.) (read the text for details of the erosional stages and their artefacts).

1. GRAVEL TERRACE IV (+50 m) with OLDOWAN pebble tools.
2. GRAVEL TERRACE III b (+ 30 m) with frost shattered stones and ACHEULIAN I and II tools.
3. River sands with ACHEULIAN III tools.
4. River gravels.
5. Relics of rubified loess silts in situ at the base, ACHEULIAN III (the "Neanderville" workshop)
6. GRAVEL TERRACE IIIa (22-25 m) with re-deposited ACHEULIAN.
7. Orange loess silts (ACHEULIAN IV in similar silts at Thabana-Moeran, Mathebe, etc.).
8. GRAVEL TERRACE II (15 m) with frost shattered stones, containing redeposited ACHEULIAN V, MICOQUIAN and FAURESMITH similar to the Mohale's-Hoek workshop.
9. Terminal sands and gravels, then loess silts (PROTO-STILLBAY and especially PROTO-LEVALLOIS).
10. Reddish silts affected by solifluction.
11. Black peaty clay.
12. Thick layer of yellow loess with LEVALLOIS type tools (Makhaleng bridge), overlying 9 and 10.
13. A donga (dried up river bed) silted up by volcanic rock alluvium (with LEVALLOIS) (ditto).
14. Scree of blocks of hardened yellow aeolian silt (ditto).
15. GRAVEL TERRACE I (+4 m) with frost shattered stones, with redeposited FAURESMITH, LEVALLOIS and PROTO-STILLBAY.
16. Black, compact clayey silts with seeds and a fine insect fauna, etc.
17. Green breccia affected by cryoturbation (sistre) with PROTO-STILLBAY and archaic STILLBAY (rare)
18. Very hard white silt (1.50 m) with ferruginous roots at the top.
19. Reddish forest soil filled with roots, black at top (0 to 1.50 m), artefacts as in 17.
20. Brownish-grey banded silts with fine white strata (like varves), up to 5 m thick.
21. Brown silt (transformed into a brick earth); STILLBAY using a post Solutrean technique (1 m to 2.50 m).
22. Brown silt (ditto) (1.50 m).
23. Black soil (0.30 m).
24. 15-20 cm of salmon pink aeolian loess silt with two major leaching episodes; MAGOSIAN (especially type C) and local PRE-SMITHFIELD.
25. Peaty layers (with PRE-SMITHFIELD), gravels, recent light silts (SMITHFIELD), etc;
26. Current river with its flood silts.

TERRACE

ACHEULIAN III (workshop)

redeposited
(flakes)

archaic
redeposited

snow cirques

snow moraines

alluvial fan ending in terrace III

detailed section opposite

The vegetation cover (grassland or steppe) ceased to exist as a result of cultivation and grazing (6). A very subtle equilibrium that had lasted for millennia was suddenly broken and the temperature and rainfall control stopped working as it had before. As a result, the winter cold became more severe and dry, the heat of summer was accompanied by less regular but more violent storms and sheet flood runoff increasingly transformed the formerly regular and slow-flowing rivers into surging torrents, which by erosion cut down deeply into their beds that were subject to seasonal drying out (10 to 12 m lowering of river level in the Orange and Maphutseng in less than 500 years).

b) *Similar stages occurred at certain periods in prehistory* for reasons in which humans obviously played no part. These periods, that probably lasted for a long time, imply that there was a *reduction in the vegetation cover* which can be explained by a longer or more severe annual dry season, a more harsh winter cold and more violent but less frequent summer storms.

The typical example of such a climate now occurs in the Southern Karroo, where the annual precipitation of 25 to 50 cm falls as autumn storms, leading to a bare eroded soil, the formation of pediments by sheet runoff and a xerophytic flora dominated by Asteraceae. This semi-desert climate could have invaded Basutoland at the period in question (7).

2) An annual seasonal cycle in Basutoland that led to a stop in the cutting down of rivers, with a long stabilisation in their baseline level and the formation of a floodplain of gravels and pebbles or rounded stones originating from the high volcanic plateaux (3000 m) (8). This was the:

"Wet climate with cold winters" or "pluvio-glaciation" or "Sub-Antarctic climate".

The cycle implies:

a) *A strong selective erosion preferentially affecting the highest parts of the mountains by frost phenomena.* A study of the alluvial fans below the cirques and snowfields or glaciers on the southern slopes of the mountains (e.g. Thaba-Linoha and Thaba-Liphiri at Maphutseng) revealed that they were full of frost shattered rock fragments that had moved downhill from the summits. These fans *end and merge into terraces IV, III and II (and in some cases I).*

b) *A powerful means of transport*. This can only be *runoff from storms, but also solifluction and massive landslides* (e.g. the south-east flank of Mount Thaba-Linoha ending in the formation of the fan of terrace III), the snowfield cirques with rudimentary moraines (leading to the fans of terraces IV and III), *cryoturbation* (in the valley bottoms and shaded slopes, under and within the same fans).

The formation of the various gravel and pebble plains that are called *terraces V, IV, III, II and I therefore occurred during a climate with very cold wet winters (probably moderately wet in summer)*, which is, with some exaggeration, the characteristic of the southern climate of the Cape (South Atlantic), with winter rains on the coastal plain, and even of the *Sub-Antarctic* climate (rain and snow for six months of the year in winter with a much more severe cold than now). This period ended in a very characteristic manner at least for terrace I, by a warming and increased rainfall that led to an exceptional forested period (pollen studies are underway), although this is difficult to imagine nowadays (dating is currently under study - possibly 20 000 years BP?).

These periods of terrace formation can be called *pluvial or pluvioglacial* periods.

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(6) Bushfires are another possible cause.

(7) "In mountainous areas a wet climate with an even though heavy rainfall may produce less erosion than a semi-arid one with a much smaller precipitation all of which falls within a very short period." H .B. S. COOKE pp. 24-25, 1941.

(8) When the block reaches 0.50 m the transporting current must theoretically reach 40 km/h.

3) *An annual seasonal cycle that results in silting up of riverbeds and any low points by aeolian silts* (with the local formation of marshy plains and peaty areas). We will call this:

"The climate with warm wet summers (influence of the Indian Ocean) alternating with dry winters."

With the exception of the current artificial climatic unbalance, which is continuing and extending across South Africa following the presence of modern man, this is the stage that existed in Basutoland for many millennia (more than 10 000 years). It is a climate of which we can have a fairly precise idea: hot wet summers with storms (monsoon coming from the Indian Ocean; maximum shade temperature +30°C and relative humidity 50 to 70 at an altitude of 1800 m) from October or November. Cold dry winters from April or May (minimum soil temperature by radiation of -10°C to -18°C. Very low relative humidity of down to 16, winters ending in September by storms of pink dust from the Karroo, Kalahari or Orange Free State at the same time as local white sandstones (Cave Sandstone that crowns the high plateaux), a very fine aeolian dust that is deposited every year in a layer 1 to 2 mm thick (9) over all areas protected from the wind and particularly in valley bottoms, where a vegetation of grasses quickly reappeared from October onward (with the first rains and the end of every-night frosts).

The silting up of rivers by thick layers of fine silts is characteristic of this final climate with a reduced summer monsoon, that follows on from a cold dry winter in a peri-desertic region. (see § VIII, B, Magosian Silts).

4) *An annual seasonal cycle resulting in the slow concentration at the soil surface of stones that developed a red "desert varnish" on their surface from aeolian activity* (clear for example on mid-Magosian and Fauresmith artefacts), seems to correspond to a more or less long-term change in the previous climate. We will call this:

"*The climate with winter and summer drought":*

Winters very dry and relatively cold with strong nocturnal radiation, very dry summers with rare or late rainfall. The winter arrival of aeolian deposits could become fixed, but erosion was insufficient to deepen riverbeds. Hence there was a long exposure of stones that became more or less loosened both by the searing heat of the high sun in summer and by overnight frosts in winter caused by radiative losses (10).

This is in fact the extension of the climate of the Northern Kalahari into Basutoland.

These are the four main types climate that seem to have succeeded one another in a varied order throughout Prehistory in Basutoland [where primitive "man" has lived for perhaps 1 000 000 years].

V

THE DAWN OF PREHISTORY IN BASUTOLAND
(ANTE-PALAEOLITHIC INDUSTRIES: OLDOWAN, etc.)

A) *Terrace VI (+150 m).* Up till now the gravel and pebble beds covering this very ancient terrace have proved to be free from any stone tools, even the oldest.

B) *Terrace V (+ 70 m to 80 m).* Unproductive at Maphutseng and the river Phofung (Little Caledon, according to VAN RIET LOWE), in contrast at Qalo (Northern Basutoland) it has yielded flaked quartzite pebbles, which because of their fairly constant elongated shape, could have been used by a species related to the autralopithecines (research underway).

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(9) The dust storm of 1933 led to the formation of a layer 1 cm thick over all the country in 24 hours.

(10) See the study by DESMOND-CLARK on patination phenomena in the Upper Zambezi (*op. cit.)*

C) *The long-duration interstadium of riverbed lowering* (with climate No. 1 dominating), has not yet provided any sufficiently well-preserved deposits.

D) *Terrace IV (+50 m at Maphutseng)*: sometimes frost-shattered pebbles and stones at Maphutseng.

1) *Description* +60 m on the Caledon (at Leribe -"Caillouville"), +61 m to +65 m on the Phofung, + 60 m on the Orange and +57 m on the Vaal.

2) *The climate* was No. 2 of Basutoland, i.e. a pluvio-glacial period that corresponds to the "Kageran pluvial" recognised in the Vaal (VAN RIET LOWE) or the "Major Wet Phase" of the Upper Zambezi (DESMOND-CLARK) (?).

3) The fauna is for the moment unknown in Basutoland, but *Australopithecus*, etc. have been reported in the Transvaal at Makapan and Sterkfontein [see R.F. EWER (1956) (11)] and *Plesianthropus* in the corresponding terrace on the Vaal (COOK, 1947) (12).

4) The artefacts collected in situ (but weathered) at Maphutseng are very archaic (13) and include two types:

a) Quartzite pebbles (silicified sandstone) from which a few flakes have been roughly detached to provide a crude cutting edge on at least one of the sides.

b) Pointed stones of more or less prismatic shape at the base, which seem to imitate the frost-shattered flakes of basalt from the same terrace, but made of a beige quartzite, that is relatively resistant to frost (These stones have been less weathered than the previous).

These tools appear to belong at least in part to those of the homologous terrace on the Vaal collected by VAN RIET LOWE and that he identified as "*Oldowan Pebble Tools*", a type of Pre-Stellenbosch or Pre-Chelles-Acheul to use the terminology used in South Africa.

VI

THE ANCIENT PALAEOLITHIC INDUSTRIES OF BASUTOLAND

A) *The riverbed lowering interstadium at + 50 m to + 30 m.*

1) *The lowering of the river* by erosion of terrace IV and its former covering, then erosion of the subsoil and the subsequent redeposition at a baseline level of +30 m (terrace III B), often over a width of nearly 1 km, represents a considerable time span (that can be estimated to be at least a hundred thousand years). What remains of the archaic tools from this long period now occur concentrated in the gravels of terrace III B or in frost-affected alluvial cones that fed it, and then in redeposited form in terrace III A (22-25 m).

2) *The dominant climate* (which must have included a great variety different phases) was No. 1 (following the "Major Wet Phase I" according to COOKE).

3) *The fauna* is unknown.

4) The artefacts collected by us at Maphutseng and in other sites have mostly been much weathered. Although somewhat like those of terrace IV, and made of quartzite derived from silicified sandstone, they appear to be much more diversified, while remained very crude:

a) Hand axes (0.15 m to 0.20 m), abundant but crude. It seems as if they were made by detaching large flakes from stones already of roughly the right ellipsoidal shape. This Clactonian knapping technique (or stone against stone) shaped the future tool, whose final size was achieved by alternately and violently striking along its sides so as to produce a more or less sinusoidal cutting edge

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(11) A level that appears to date from the Kagerian Pluvial of Central Africa and perhaps to the Villafranchian of Europe.

(12) In gravels surmounted by the aeolian sands of the terrace.

(13) A similar specimen has just been described by VAN RIET LOWE in the same terrace of the Phofung.

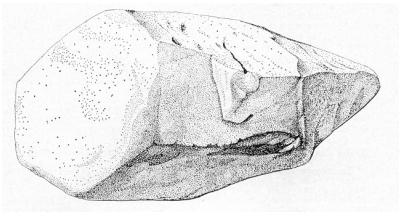

Fig. 3 - Terrace IV. "Pre-Chelles-Acheul" (Oldowan) (Maphutseng P.E.M.S.). Beige quartzite. - Advanced form of the "pick" appearing in terrace V. - x 1/2.

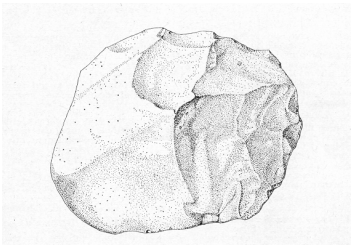

Fig. 4. - Terrace IV. - "Pre-Chelles-Acheul" (Oldowan) (Maphutseng P.E.M.S.). Beige quartzite. - Quartzite pebble knapped on one margin, typical of terrace IV. - x 1/2.

b) Exceptionally very large flaked, lanceolate hand axes can be found perhaps made on an anvil, but rather unwieldy.

c) Three-sided prisms, with a pointed end, similar to the first pointed stones from terrace IV, very crude but of a more constant shape and somewhat standardised.

d) Rare and poorly made *choppers.*

5*) Identification.* This is the start of the vast Acheulian industry (or even proto-Acheulian) of southern Africa to which the first Pan-African Congress in Nairobi (1947) gave the generic name "Chelles-Acheul" to replace that of "Stellenbosch" (Abbott H. BREUIL proposed the term "Acheulian" for the whole). This is the *first stage* (with echoes of the Abbevillian [14]) of the Acheulian of the Vaal). VAN RIET LOWE (1957) reported the 1st and 2nd very worn stages in the homologous terraces of the Phofung.

B) *The double terrace III of the Maphutseng (+30 m and + 25 m).*

1) *The upper and main level* is at +30 m (terrace III b) (Orange: + 40 m, Caledon at Leribe: +40 m, Phofung: +35 to 43 m, Vaal: +40 m). This is the Kamasian I of VAN RIET LOWE in the Vaal.

2) *The climate* in Basutoland was typically pluvio-glacial (climate 2 above; "Major Wet Phase II" according to Cooke, the sea level being + 200 m on the coasts of South Africa [15]; "Very wet" according to DESMOND CLARK in the Zambezi).

3) *The fauna* is still unknown in Basutoland.

4) *The artefacts,* less worn and abundant, belong to *Stage II of the South African Acheulian.* They occur most frequently toward the top of the terrace III B layer (and are clearly distinguishable from the much more worn stage I which occur in the middle of terrace III B):

a) The hand axes are very crude and are all without exception knapped like those of stage I, using the stone-on-stone technique. They are more symmetrical in shape than in stage I and the curve of the cutting edge seen from the front is more regular. The flakes have been detached by blows with a stone. Dimensions: 0.15 m to 0.25 m.

b) Choppers appear, but in contrast to what was found in the Vaal, they are much less frequent than hand axes at Maphutseng.

5) *The "Clactonian" tools of Basutoland*. The very abundant flakes mixed with the stage I and II Acheulian do not seem to form an identifiable industry. These are probably only the residues of the knapping on an anvil, forming unworked broad flakes in the plane of the blow (16), with a large concave percussion impact and some rare primary retouches. Whether they were used or not, they are difficult to separate from the Acheulian I and II.

The raw material is a beige quartzite, like all the other tools of this age.

C) *Loess silts deposited on the surface of the pebble and gravel terrace* III B (+30 m).

1) *The stratigraphy* from the bottom to the top is as follows: a) River sands with overlapping stratifications, b) pebble beds, c) fine river sands, d) khaki brown loess sand. Then comes a thick layer of yellow aeolian silt (the latter is clearly visible under a cryo-niveal solifluction landslide apparently related to the III A fan, on the flanks of Thaba-Linoha).

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(14) Name that the South Africans tend not to use because it is difficult for them to pronounce (Abbott H. BREUIL, pers. comm. 1958).

(15) See COOKE 1947.

(16) c.f. VAN RIET LOWE: S.A.A.B., 1948, p. 20.

2) *The climate* corresponded to No. 3: a damp and relatively warm climate with dry winters and aeolian transport (Inter-pluvial).

3) *The fauna* is currently unknown.

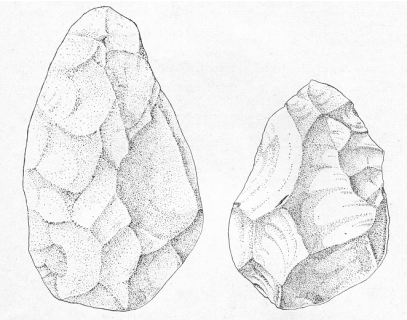

Fig. 5. - Terrace III b. Acheulian stages II and III (Maphutseng P.E.M.S.). Beige quartzite. - The bifaces are usually symmetrical, with a sinusoidal cutting edge [The stage I with an Abbevillian appearance, not shown here, is very crude]. - x 1/2.

4) *The artefacts.* These occur within these loess deposits, most often below, although most of the terrace has been denuded and has been washed down to the lower terrace III A, and we don't know what there was above:

This is Acheulian stage III.

One remarkable site is the "Neanderville" workshop site, near Maphutseng, which reveals all the features of the *Stage III Acheulian of Basutoland* (corresponding to Stage III of the Vaal). The thousands of specimens all seem to be in their original place, dislodged gradually from their own stratum of aeolian silt by modern sheet erosion.

a) *Biface hand axes* 0.10 m to 0.25 m long are quite frequent (same size as those of the Upper Zambezi).

b) *Hand axes knapped from a flake, detached by a blow on an impact surface on a large core with prepared faces*. This technique that is quite distinct from the very crude Clactonian knapping on an anvil, provides control over the shape and dimensions of the flake (Proto-Levallois technique). The elongated core described by VAN RIET LOWE and then by MALAN under the name of the "*Hoenderbek Core*" also appears to be characteristic of Stage III Acheulian of Basutoland and is found at "Neanderville". The oval flakes are in the transverse

direction (side flakes) and they therefore have a parallelogram cross-section. The main secondary workings are broad and shallow and have been obtained by using a *wooden tool*, whereas the finer secondary workings show a real mastery of the raw material. *The cutting edges are straight* and no longer curved.

c) Some *oval or pear-shaped hand axes* of Stage II reworked in Stage III at Maphutseng.

d) *Choppers made from side flakes*, but especially in the transverse plane of the core.

e) *Long trihedral points* in the shape of a dagger at Maphutseng and Zastron.

f) Fairly abundant *Proto-Levallois discs.*

5) *Tayacian* tools occur clearly mixed with *Stage III Acheulian* at Neanderville. The many secondarily worked flakes are forerunners of a true Proto-Levallois in this part of southern Africa; they are no longer Clactonian as in Stages I and II and herald Stage IV.

At Vaal, Tayacian flakes are abundant on the terrace at +32 m (100 ft) at Vereeinging (BREUIL and VAN RIET LOWE, 1954, etc.) (17).

D) *The double terrace III at Maphutseng: the lower level at +22-25 m*

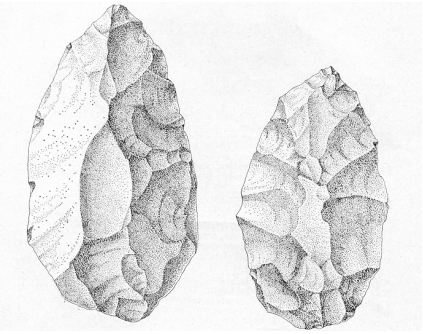

Fig. 6. - Red silts deposited on terrace II a; Acheulian IV on left, rubefied quartzite (Thabana-Morena); on right orange quartzite (Maphutseng P.E.M.S.). - x 1/2. - These hand axes often have a precise bilateral symmetry, with a straight cutting edge and careful point (e.g. the Mathebe workshop).

(17) See also *Bull. Soc. préhist. fr.* Nov. 1954, pp. 24 and 28(BREUIL and KELLEY).

1) This secondary terrace twinned with that at +30 m has, like it, equivalent terraces on other rivers such as the Orange at +28 m, Caledon at +30 m, Phofung at +31 to 32 m (18) and Vaal at + 30 m (Where VAN RIET LOWE considered it to be Kamasian II, which corresponds to the "Younger Gravels" of COOKE (1952).

2) *The climate* was at first for a period that of a semi-arid interstadium during which the river cut down through its aeolian silts and then through the pebble terrace, down to a depth of 5 to 8 m. The climate was then that of the accumulation of frost-shattered stones from terrace III A (+ 22-25 m), i.e. climate No. 2 (pluvio-glacial). This period probably corresponds to the start of the maximum of the 2nd Pluvial in Rhodesia according to DESMOND-CLARK or to the Eburrien in Kenya (?), the deposit of the "Younger Gravels" on the Vaal being contemporary according to COOKE (1952) with the lowering of the sea level to -200 m in South Africa.

3) *The fauna* is currently unknown in Basutoland.

4) *The in situ artefacts* at Maphutseng *are still Acheulian III*, but now weathered by redeposition.

E) *The silts silting up the surface of terrace III A (+22-25 m).*

1) *Of the silts and soft earth,* that formerly covered terrace III A, there only remain fragments. These are red steppe deposits covering the Neanderville site, with a superficial red varnish on the tools, the Acheulian IV sites at Thabana-Morena in similar silts and Mathebe.

2) *The climate* must have changed from type 3 (hot and wet) to type 4 (continuous drought). This would be the declining stage and the end of the 2nd maximum of the 2nd Pluvial in the Upper Zambezi according to DESMOND CLARK, i.e. 125 000 years B.P. (19).

3) *The fauna* associated with the Acheulian IV of the Vaal that occurs here (according to COOKE) is: *Equus burchelli, E. capensis, Hippopotamus amphibius, Phacochoerus species, Hippotragus niger* and *Connochaetes gnou.*

4) *Artefacts*. These are poor on the Phofung, rich on the Vaal and with fine workshops in the Upper Zambezi. There are fine examples of Stage IV Acheulian in Basutoland in this stratum, but sometimes transported and weathered in the lower terrace II (+15 m) (Maphutseng):

a) *The hand axes* are carefully and beautifully made, *either from cores or from flakes* (21), marking the end of the Victoria West technique that started in Stage III. The cores, that are frequent in Basutoland, are called Perdehoef or Tortoise Cores because of their circular disc shape (22), with a facetted strike plan. The trapezoidal shaped flakes are detached in the longitudinal direction.

The main secondary working at the tip and the sides is carefully controlled using a wooden tool, as is the finer secondary work.

Dimensions: 0.07 to 0.30 m.

The shapes vary from oval to pear shaped (heralding the Micoquian).

b) U-shaped or almost rectangular *choppers* (made from side flakes or end flakes, respectively) are rare in Basutoland.

c) *Elongated trihedrals,* bolas, flakes reworked to make crude scrapers and points occur alongside the hand axes in these deposits.

d) *The flakes* are Tayacian.

F) *The interstadium when the river cut down through the soft deposits lying on top of terrace III +25 m, down to a level of +15 m (terrace II).*

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(18) At Phofung VAN RIET LOWE saw sub-terraces at +64 -78 ft, +49-55 ft and +33-40 ft, all containing transported and worn Acheulian I and II from the Major Wet Phase.

(19) See COOKE, Fossil Mammals.

(20) There are examples of each species at Thabana-Morena.

(21) H. BREUIL, *Bull Soc. préhist. fr.* Nov. 1954, p. 24: it starts the Levallois.

1) *This interval* represents a considerable time of erosive stages that also occur on the Vaal at +30 m and on the Phofung where several sub-stages could be described.

2) *The climate* corresponds to Nos 4 and 1 in our scale: *very dry winters and summers, then with strong and irregular rainstorms and an undoubtedly semi-desertic or desertic flora.* (Red desert varnish on many of the tools of this age in Basutoland).

3) *The fauna is unknown* (because of the lack of sediments).

4) There are three types of *artefacts* that are rather similar and difficult to distinguish stratigraphically because they occur mixed together as a result of runoff and erosion of the surfaces of terraces III B and III A (23) or in terrace II, or else in sites isolated from their stratigraphical context.

The first is the *Acheulian V of South Africa* of which some rare specimens have been found *in situ* (e.g. in terrace II of Qomoqomong at Leloaleng). As a result "the problem of distinguishing Stage V tools of the South African Chelles-Acheul from those of Fauresmith is often extremely difficult" (MALAN). Large and fine hand axes.

5) *The 2nd industry* is that of the characteristics *Micoquian technique* that occurs in terrace II, but especially above (the Lerato site at Morija and Hlaka-la- Matsepe at Likhoele). A technique using wooden tools:

a) *Large hand axes* swollen out to a rounded blunt end narrowing 1/3 the way up to the point. Knapped into 2 or 3 faces.

b) *Small well made bifaces.*

c) *Points, round and straight edged scrapers, raspers and piercing tools made from flakes.*

6) *The third industry at this stratigraphic level is Fauresmith,* whose origins can be found:

a) Either in the use of Clactonian sized flakes.

b) Or in archaic flakes to which the name *Hope-Fontain* has been given, consisting of many small shapeless flakes that have been knapped in various ways and used as piercing tools, scrapers, etc. and which in Basutoland suggest a Pre-Fauresmith.

(These archaic flakes are abundant in Basutoland, on terraces III and in hill forts. They are worthy of a study on their own).

c) *Fauresmith* (pseudo-Mousterian of southern Africa) probably developed to a great extent in Basutoland, being found at Likhoele (Mohlanapeng), Mohale's Hoek (Moiloa), Maphutseng (Morifi-Gaudeng), Siloe (Crossroads), which could be contemporary with the formation of terrace II or could even sometimes predate it. This industry is rather crude and seems to be the work of a coarse and awkward people ("The man pauses in his ingenuity", VAN RIET LOWE). The stone knapping is not very refined, the tools heavy, with little fine secondary working (cf. Sangoen of Luangwa in Zambezia). "Pointed flakes and blades can be easily detached from the rather elongated oval shaped Fauresmith cores" (H. BREUIL) (25).

In Basutoland the following quartzite tools are found:

I. Badly made small hand axes (0.1 to 0.8 m long)

II. Crude scrapers with cutting edge at the end or blades on the side, often crude scrapers.

III. Picks with a convex section (Zastron, etc.) as in the Zambezi or boat-shaped as in Witwatersrand.

IV. Bolas and pebble choppers (rare).

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(22) COOKE 1952: "This is the end of the Younger Gravels of the Vaal, then the calcification of the sands." "Semi-arid then arid." On the coast the sea level falls.

(23) And the alluvial fans that end at them at Thaba-Linoha.

(24) *Bull. Soc. préhist. fr., Nov. 1954, p. 24.*

VII

THE MID-PALAEOLITHIC INDUSTRIES IN BASUTOLAND

A) *Terrace II at Maphutseng + 15 m*

1) This terrace corresponds to the terraces at 9 to 24 m on the Vaal (?) and to the lowest terrace on the Phofung, a terrace that has been associated with the Gamblian Pluvial of Kenya, when lake levels rose (25).

In the Upper Zambezi the Micoquian, Fauresmith, Tayacian and Levallois all seem to be mixed up (DESMOND CLARK).

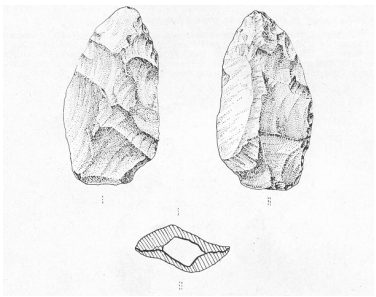

Fig. 7. - Terrace II: Fauresmith (north of Morija). Beige quartzite. - This is an example of an ordinary biface with a rounded tip, sometimes occurring together with pyriform Micoquian hand axes. - X 1/2.

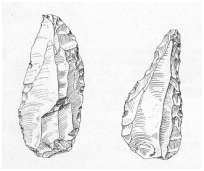

Fig. 8. - Terrace II: (Maphutseng P.E.M.S.) - *On left:* Type of reworked flake (other flakes have been worked to form thick points, single strike plane without additional faces. - *On right*: Appearance of Levallois type flakes with crude secondary working, brown quartzite. - X 1/2.

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(25) EXSTEENS, p. 291.

2) *The climate in Basutoland:* Typical pluvio-glacial. Age: 115 000 years? (DESMOND CLARK). COOKE states: "Wet period with low coastal submersion."

3) *The fauna* is unknown.

4) *The artefacts* are not abundant and in Basutoland still include:

a) Micoquian.

b) Fauresmith.

c) A Proto-Levallois that is very distinct from the two previous and which could be derived from Tayacian flakes, but only develops stratigraphically in period B.

B) *The silts covering the surface of terrace II* (+ 15 m)

1) *The section at Maphutseng is, from bottom to top:*

a) Terminal sands and gravels overlying pebble beds; b) sandy, ochre or orange and partly aeolian silts, with Proto-Stillbay tools; c) their erosion limited by a hard ground containing some Proto-Stillbay implements; d) deposit of reddish silts affected by solifluction; e) black peaty clay (section perhaps incomplete at the top).

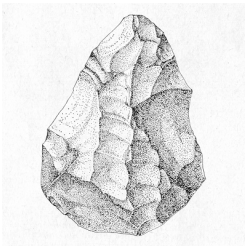

Fig. 9. - Yellow silts covering terrace II (Nkolanyane, Likhoele workshop). Levallois core in the shape of a hand axe (quartzite)

At Makhaleng, this terrace is silted up to a great thickness (10 to 15 m) with a remarkable yellow loess, with locally brick earth levels (e.g. at the base), with Levallois type tools (blades with multi-faceted strike planes). A very characteristic later episode shows erosion by the river, over more than 10 m thickness, through this loess, by a wide donga that was later silted up with alluvia (mountain gravels) with Levallois tools (blades, etc.).

2) *The climate* appears to be No. 3: a wet "monsoon" climate with some dry periods (No. 4 hard ground).

3) *The fauna is poorly known*: see *terrace I*.

4) *The artefacts* here are:

a) *Fauresmith* (in the course of disappearing).

b) *Proto-Stillbay* (still little developed), including small, very fine circular scrapers).

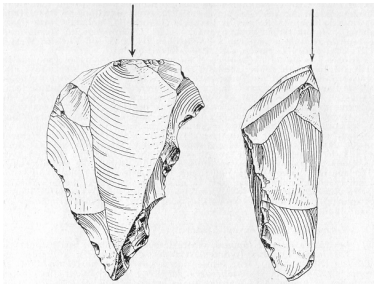

Fig. 10. - (As fig. 9). - Levallois core in the apparent shape of a point (quartzite).

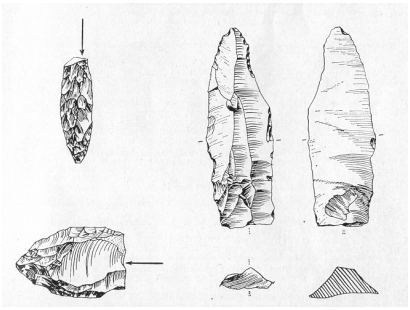

Fig. 11. - (As fig. 9). - Levallois core; detached flakes. X 1/2.

c) A large scale development of *Levallois* took place in the following periods (26). In Basutoland, the impressive workshops of Likhoele (Lerotholi), Mohale's Hoek (Qoalaheng) and Maphutseng (Moshanyana) are reported. The *Levallois in Basutoland* takes over the technique that appeared in the Achulian III and IV (or Victoria West I and II, i.e. Tayacian and then Proto-Levallois).

It was eclipsed at the end of the Achulian at the time of the upsurge of the Basutoland Fauresmith, but suddenly re-emerged, rejuvenated, uniting the small Mousterian tools with the more ancient mid-Achulian knapping technique (27). Could the Levallois with its remarkable flake technique have evolved in some other mysterious part of Africa since the Victoria West Stage, asked Malan (28)? Miss ALIMEN perhaps provided the key to this enigma by declaring that the Levallois technique appeared in the North-West Sahara in the late Acheulian (Kamasian II) (29) and continued there late into the recent Palaeolithic and Neolithic complexes. It is therefore possible that it regained southern Africa with its advanced facetted strike planes (South African Middle Stone Age).

The raw material of the South African Levallois consists partly of quartzite or "lydian" formed from the silicification or metamorphosis caused by dykes and partly of Devonian quartzites collected in the form of Triassic pebbles in Basutoland (see § II).

The commonest forms are:

- *Fine, long blades*, real knife blades with little retouching.
- *Thick blades* (points). At the Likhoele (Nkolanyane) workshop, the details of their manufacture from multi-facetted discoidal cores with a pyramidal shape can be worked out. This involved detachment of flakes, primary reworking in a Mousterian manner, and secondary working using a wooden or bone tool. The fine points with careful finishing and that can be compared to Proto-Stillbay are only rarely found in this workshop.
- *Disc-shaped and usually rather crude scrapers.*
- *Picks* in the form of a spindle or boat.

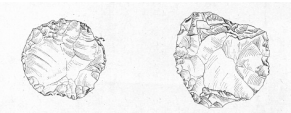

Fig. 12 - Levallois biface discs, brown quartzite (Mekaling). - X 1/2.

C) *The erosion that leads to the river at + 4 m.*

1) Little is known of the *stratigraphy* of this long period.

2) The predominant *climate* was No. 1 on our scale (cold, arid, semi-desert climate).

3) *The fauna* is poorly known.

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26) MACFARLANE stated the complexity of the Levallois problem in his short note on the Makhaleng (It was if there were two Levallois separated by a large hiatus).

(27) What GOODWIN felt from 1935 onward.

(28) Presidential Address.

(29) Bull Soc. préhist. fr. LIII (1956), p. 350 (see also Tayacian, Aterian, etc. developments).

4) The *artefacts* are those of the Proto-Stillbay and Levallois as in the previous period, but collected mixed and weathered in terrace I (30).

D) *Terrace I (+ 4 m) at Maphutseng.*

1) Very similar in appearance to the previous terraces: many frost-shattered flakes among pebbles and stones.

2) *The climate* was *Pluvio-glacial* which is the latest in Basutoland and which possibly corresponds to the Major Wet Phase IV of the Phofung (reworking of the Middle Stone Age according to VAN RIET LOWE), but is more difficult to correlate with the +3 m terrace on the Vaal which may be Makalian (last moderately wet period in Kenya with post-Stillbay and Mesolithic), as we will see from the industries below.

3) *The fauna* of the Middle Stone Age seems to be rich on the Vaal and includes practically all the animals still living today (*Equus capensis, E. kuhni, E. burchelli, Hippopotamus amphibius, Phacochoerus helmei, P. compactus, P. aethiopicus, Pelocoerus helmei, Sylvicapra grinumia, Antidorcas marsupialis, Strepsiceros strepsiceros, Tamotragus oryx, Bubalus bainii* and *Equus quagga*) (See COOKE *loc. cit.)*.

4) *The artefacts* found here are:

a) Redeposited and weathered Fauresmith.

b) Redeposited archaic Proto-Stillbay.

c) Redeposited Levallois.

E) *The 1st cutting down of the river (the Maphutseng) through its terrace from + 4 m to about -3 m.*

Very little is known of this erosive period (with climate 1), the gravels that contain the tools generally being lower than the current thalwegs. Only boreholes through the bed of the Orange at SEAKA (1958) have given us some slender details.

F) *The ancient periglacial and forest deposits on the eroded terrace I.*

1) *Stratigraphy* - In the erosion described above there was then a major siltation (section 10 to 12 m high at Maphutseng. With the following from the bottom to top:

a) A deposit of very dense clay (2 m) with much pollen, seeds and insects; *b*) a local greenish "sistre" more than 1 m thick, a breccia affected by cryoturbation with slopes facing south with rare archaic Stillbay artefacts; *c*) a very hard white clay level (1.50 m) the top 1 m of which is filled with ferruginous tree roots; *d*) covering all these over a depth of 1.40 m is a red forest soil filled with the same roots (trees currently being studied by Mr ZINDEREN BAKKER) that is grey at the extreme base (0.10 m) and black at the top (0.30 m); *e*) covering all this is 5 m of an apparently cyclic and seasonal formation suggestive of varves, consisting of a mass of brown silts interrupted by many fine white, completely horizontal and parallel layers (0.01 m to 0.02 m thick at the base, thickening and becoming more irregular at the top, at the same time as the intervening layer becomes redder). These white layers seem to correspond to the seasonal snowmelt on the Thaba-Linoha in the spring.

2) *The climate was at first glacial and wet,* then warmed but remained wet, *with alternating forests, periglacial steppes or savannah* and then *erosive* (micro-climates Nos 2, 3 and then 1). An interesting parallel has been studied at Florisbad in the Orange Free State. A black layer containing pollen at the base of aeolian silts of recent Quaternary age (layer which provided the human cranium of Florisbad) was radiocarbon dated to 41 000 years BP (31).

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(30) Should the industry of Pieterburg with smooth based cores, surrounded by many almost vertical facets be assigned to this age (see VAN RIET LOWE: S.A.A.B., 1948, p. 20)?

3) *The fauna*. Several remains of antelopes never before found in Basutoland. The well-known human cranium from Florisbad. Abundant *not previously described fauna of insects*: Hymenoptera, Coleoptera with elytra sometimes still coloured, abundant *not previously described flora*: seeds and pollen in perfect state of preservation (under study). The xerophyte flora of the Karroo seems to be absent (compare with VAN ZINDEREN BAKKER, 1954).

4) *The artefacts.* The new population (*Homo sapiens*) could expand, replacing the Broken Hill hominids, during the last great wet period, accompanied with cold, snow, cryoturbation in the high valleys of Basutoland.

Levallois blades become rare: within the deposits of "sistres" (breccias) or varves and the forest soils that succeed them we find *Proto-Stillbay* and then ancient *Stillbay* of Basutoland, that still occur in the most ancient cave floor soils at a date prior to the their final thickening by frost (Leribe: Molapo and Maoanamasoana caves, etc.).

The raw material is a red or beige quartzite, chalcedony, etc.

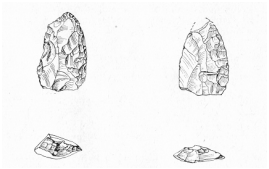
The cores are truncated cones with facets.

The flakes used are sometimes Pre-Magosian Levallois, flat, thicker at the percussion site and with an amputated strike plane (possible Tabalbalat technique).

Rare bifaces with secondary working using a wood or bone tool.

Composite scrapers.

Possibly burins and bolas (under study).



Figs 13 to 16. - Terrace I, its erosion and temporary siltation during the forest period. - Two main types: (a) thick Stillbay points (with facetted strike plane) and then increasingly long (beige quartzite). Secondary working with a wooden tool Liphokoaneng hill fort. - (b) advanced Stillbay: elongated uniface spear head of white chalcedony (Thaba-Bosiu) or biface spear head of white chalcedony (same find). - X 1/2.

G) *The period of sinking down of rivers, their erosion through the forest soils, piercing terrace I and cutting down to a depth of at least -4 m.*

1) *Stratigraphy.* - The flanks of the mountains are eroded (landslides of stones over the argillite of the Red

(31) The sandy silts here are from bottom to top: greenish, greyish and then yellow, interrupted by thin peaty beds ("Peat, I, III, IV"). See Prof. W. LIBBY, S.A.A.B., 1954, p. 86.

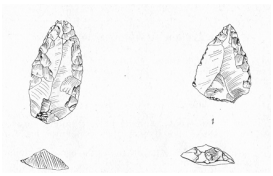


Fig. 14. - (See Fig. 13). - X 1/2

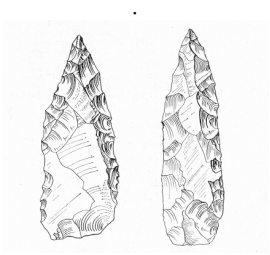


Fig. 15. - (See Fig. 13). - X 1/2.

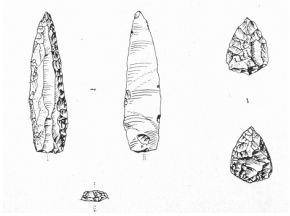


Fig. 16. - (See Fig. 13). - X 1/2.

Beds), often until bare (stones of the subsoil accumulated on itself). There only remain traces of the former thick forest savannah soil, now hardened. The contemporary industry occurs:

a) Collected in the accumulation of stones visible at the natural sections eroded by the modern-day dongas (ravines).

b) The same types concentrated on natural hill forts such as Botha-Bothe and Thaba-Bosiu (Liphokoaneng) (32) and Moshesh (33) (perhaps because of the danger from enemies, wild animals or erosion).

c) In the gravels at the base of several ancient caves such as Leribe (Molapo and Maoanamasoana).

2) *The climate* must have been severe and corresponds to our type I (dry summer and winter with brief storms) (34).

3) *The fauna* has not been defined (under study).

4) *The artefacts* suggest Stillbay. The Stillbay industry is itself similar to the Sebilian of Egypt (blades with a facetted strike plane). This could be a Capsian mixed with recent Mousterian techniques (35).

The advanced technique seems to be that of secondary working using a wooden or bone tool (which sometimes gives it a proto-Solutrean appearance). The rich Thaba-Bosiu site has in particular provided the following made of beige quartzite, agate and jasper:

a) Flat and small bifaces.

b) Thick, equilateral, uniface spearheads.

c) Thick, isosceles, uniface spearheads (very abundant).

d) Scrapers with the cutting edge at the end of the blade.

e) Elliptical scrapers.

f) Rectangular one-sided scrapers (frequent).

g) Disc-shaped biface cores.

h) Bolas and choppers seem to be rare or absent.

VIII

THE INDUSTRIES OF THE UPPER PALAEOLITHIC IN BASUTOLAND (PRE-LATE STONE AGE AND LATE STONE AGE)

A) *The period of the end of cutting down (negative terrace at -4 m)*

1) *Stratigraphy.* - In the Maphutseng North and South sections the following siltations of the last major erosion are recorded from the bottom to top: *a*) the partly invisible lower part at - 4 m at least, consisting of pebbles and stones at the base (boreholes for the pillars of the bridge over the Orange at Seaka, 1958); *b*) coarse and then finer gravel.

2) *The climate*. Changes from aridity to a mildness suggestive of climate No. 1 and then 2.

3) *The fauna* is still poorly defined.

4) *The artefacts* at this level seem to belong to the industries of Maphutseng (Majakaneng) or Leribe (Sebothoane), a type of Stillbay with a Proto-Solutrean technique, situated in basal redeposited clay-silts covering eroded subsoils of slopes and their eroded pebbles (36) (or Magosian B):

a) Very fine, partly biface, spearheads (only the shaft attachment has been carefully reworked on both faces, in the manner of the European Solutrean) (37).

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(32) Identified by BURKITT or VAN RIET LOWE in about 1930 (pers. comm.)

(33) Perhaps suspected here by MACFARLANE, p. 291.

(34) Stillbay: Wet to semi-arid of the Upper Zambesi (DESMOND CLARK).

(35) *Bull. Soc. préhist. fr.,* 1956, p. 596. - GOODWIN, 1935. - Which would date it to after 35 000 B.P. (the Aurignacian of Europe).

(36) Among these the bones of dinosaurs from the extremely rich deposit of Maphutseng. *C. R. Somm. Soc. Géol. Fr.,* 1956, pp. 99-101.

(37) They suggest the "partially bifaced lance heads" of the eponymous Magosi site in Uganda and Khami (Zimbabwe) (COOKE, S.A.A.B., 1955, p. 53) and Howison Poort, S.A.A.B., 1955, p. 6).

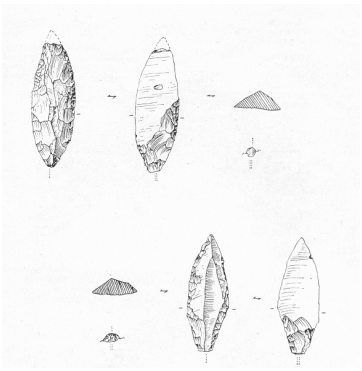

Fig. 17. - Negative terrace at -4 m; Advanced Stillbay. - Spearheads with the shaft attachment reworked on both faces. - *Top:* red quartzite (Hermon). - *Bottom*: orange quartzite (Sebothoane, Leribe). - X 1/2.

Fig. 18. - (As Fig. 17). Elliptical scrapers, belonging to the Stillbay: white chalcedony (Maphutseng "Bushmanville"). - X 1/2.

b) Spearheads with much "Solutrean" secondary working around all the margin on the strike face of the flake but not on the other.

c) Burins.

B) *The long-duration filling up the valleys to a level of + 15 m under steppe conditions.*

1) *Stratigraphy*; - The section at Maphutseng (which occurs at several points) has the following strata from bottom to top *a*): very fine orange loess silt I, partially metamorphosed into clay and very hardened (2 to 3 m), silicified in rock shelters (1 to 2 m); *b*) beds of rubefied gravels; *c*) loess silt II with very fine, salmon coloured, beige and often pink particles (4 to 5 m), sometimes converted to clay, calcified with "dolls"; *d*) beds of gravels

Fig. 19. - Base of the last infilling under steppe conditions with brick earth (lehms). - Late Stillbay, Levallois type flakes, but with Solutrean type secondary working (with a bone tool) around the margin only on the strike face (Maphutseng P.E.M.S.). - X 1/2.

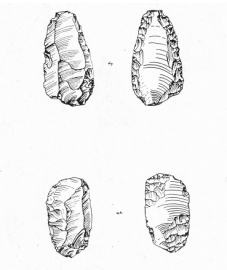

Fig. 20. - (As Fig. 19). - X 1/2.

and stones affected by solifluction, pisoliths of ferricrete, rubefaction; *e*) loess silt III of beige colour, with much local calcification ("dolls", etc.), sometimes white by reduction of oxides (5 to 8 m); *f*) erosion and iron pisoliths (several successive intermeshed erosions through all the silts); *g*) red plateaux sands and rock shelters. Radio-carbon dating of the middle and upper Florisbad levels 9000 B.P. and then 6000 B.P. (VAN ZINDEREN BAKKER).

2) *Climate.* This is typical climate No. 3, a wet climate with a warm summer monsoon interspersed with dry and sometimes dusty winters. *Less wet* at Phofung (38); *arid* in the Zambezi.

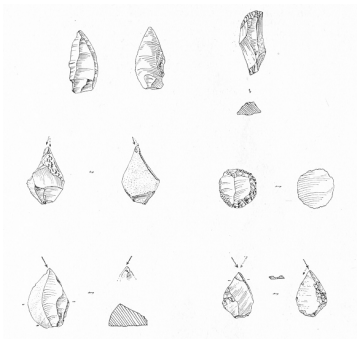

Fig. 21. - Basal level of the infilling of former caves. - Magosian A of Basutoland or burin industry (various chalcedonies and jaspers) covering at this point a twisting cavity in the wall (Molapo shelter at Leribe). - X 1/2.

3) *Fauna.* Many remains of antelopes not previously described from Basutoland at various levels, especially level c, plus rodents in one level (c) in the caves (Brakfontein). Hippopotamus, elephants, etc. in levels a and c.

4) *The artefacts* are very abundant and of great variety in Basutoland, all belong to the large Magosian group of the Zambezi dated at 10 000 B.P. by DESMOND-CLARK. VAN RIET LOWE stated: the last Stone Age

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(38) VAN RIET LOWE thought of the Phofung: "that the fine-grained sediments fifty feet thick are a period of declining precipitation interrupted with partly ferruginised grit = spells of pronounced desiccation with L.S.A. on top."

covers at least 5 to 10 000 years before the first Egyptian dynasties (39). The Magosian is somewhat revolutionary in terms of its stone industry "at this time all the Levallois technique disappeared" (40). It was in 1947 that the Magosian was reported for the first time near Basutoland at Modderpoort by MALAN in the Rose Cottage rock shelter (see References). In Basutoland six very particular facies are recognised (41):

a) *The Magosian A* of Basutoland, or the burin industry. The type site is in level A of the Molapo cave at Leribe, an extremely hard base layer where among the tools the following are distinguished:

- A striking preponderance of *burins*: angular burins with the body reworked, multiple burins, double-sided burins, truncated pyramid shaped burins, transverse burins and a burin combined with a scraper.
- *Very small circular scrapers.*
- *Some spear heads, etc.*

All these tools have a striking resemblance to the Sebilian III of Upper Egypt with many burins (contrasting greatly with the Sebilian I and II with a Levallois appearance) (42) and contemporary with the final dry stage of the Komombo.

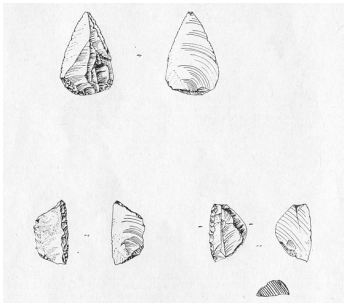

Fig. 22. - Beige loess silts. End of sedimentation level: Points and side scrapers in the shape of false crescents. This is Magosian C of Basutoland (Maphutseng plateau: Masitise). Compare with Fig. 23; see remark at end of article.

(39) S.A.A.B., 1948, p. 22. - VAN RIET LOWE spoke of the Nakurian wet phase which is evident on the 10.5 m, 7.5 m and 1.8 m terraces on the Vaal.

(40) WAYLAND and BURKITT concerning the eponymous Magosi deposits in Uganda, 1932. They saw a possible combination of a Wilton with microlith tools and a previous Stillbay.

(41) All the identifications were kindly made by M. MALAN of Witwatersrand University.

(42) Ed. VIGNARD.

Prehistoric art makes its appearance with a *large serpentine sign 2.50 m long* that was discovered engraved on the wall of the Molapo cave and covered by the archaeological level containing burins. This engraving varying in thickness from 1 cm to 2-3 cm seems to have been engraved with a burin (43).

b) *The Magosian B of Basutoland or lanceolate spear head industry.* Spear heads typical of the Botsabelo site, levels *a* and *b*: lanceolate and similar to those of period A (marshy siltation), but with no narrowed attachment point and only worked on one face. This level is similar to the industry of the eponymous Magosi site in Uganda.

- Other tools:
- One-sided scrapers
- So-called Kasonga blades with fine working on one side
- Some burins (rare).

c) *The Magosian C of Basutoland or strongly patinated reworked flake industry.*

There are many sites throughout Basutoland, restricted to levels *b*, *c* and *d* and especially to the layers of eroded brick earth with pockets of ferricrete (44).

- Many shapes of flake tools
- Cutting tools
- Crescents
- In the contemporary levels at the base of the *c* and *e* silts (see also the hill forts of Maphutseng, Ranthake, Desolation and Brakfontein) there is a very crude Pre-Smithfield to Smithfield A industry, characterised by flakes taken from small pebbles (7 to 8 mm) that were used as cores.

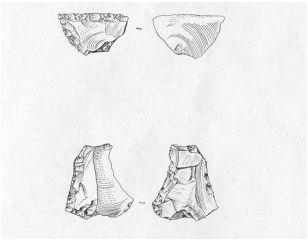

Fig. 23. - Beige loess silts, within the silts themselves: Magosian B single-sided triangular and trapezoidal scrapers. - Cana - X 1/2.

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(43) This is what VAN RIET LOWE felt from 1948, concerning the possible antiquity of art in southern Africa: "Possibly some engravings date from the Middle Stone Age, but as yet we have no proof (S.A.A.B. 48, p. 21).

(44) "Glacial Concentrative" of COOKE.

d) *The Magosian D of Basutoland or uniface patinated points industry.* Characteristic of level *f* of the plateaux. The type site occurs under the red brick earth of the plateaux at Joalaboholo.
- Carefully made points.
- Blades.
- Crude scrapers with a Pre-Smithfield appearance.
- Rare burins.

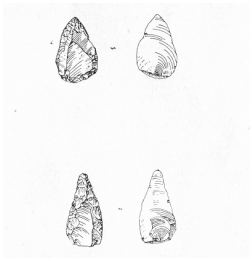

Fig. 24. - Base of the red sands of the plateaux; Magosian D with a glossy patina with small carefully made uniface points (Joala-Boholo) - X 1/2.

Fig. 25. - Red sands of the plateaux; Magosian E microliths.
- Leribe (plateau) - *X 1/2.*

e) *The Magosian E of Basutoland or microlith Magosian* also occurs in level *f* of the plateau under the red sand. Type site: Leribe plateaux.
- Small very carefully made points
- Microlith points
- Microlith crescents
- Circular scrapers
- Blades
- Many smashed concretions of ochre that had been used for body ornamentation and rock painting.

f) *The Magosian F of Basutoland with saw bladed points or Magosian associated with monochrome art,* occurs in a dark grey layer mixed with beds of ash under a thick sterile layer overlain by light grey bed with Wilton scrapers.

Type site: Leribe-Jonathan. This sediment in the rock shelter corresponds to the last complex levels of aeolian deposits.

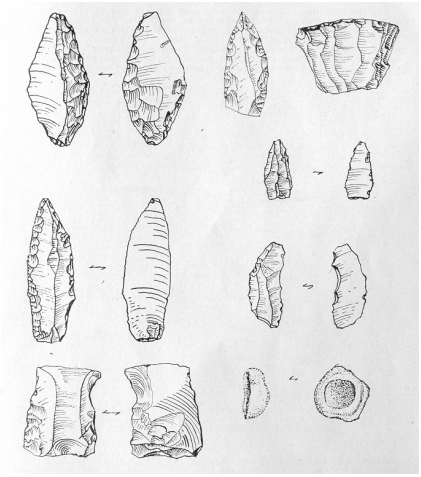

Fig. 26. - Red sands of the plateaux; Magosian E microliths: lanceolate points, micro-cores, micro-points, nodules of natural ochre, etc. - Leribe (plateau) - *Natural size.*

It is characterised by finely made *lanceolate points and points rounded at the base*.

Many points with saw-toothed edges similar to those of the Stillbay of Cape Province, of which perhaps there a long-lasting persistence.

Circular scrapers, etc.

The red monochrome art in the Jonathan shelter is particularly archaic. Well above any possible damage from bad weather and at about the level of the Magosian F floor, it would appear that the art probably belongs to the Magosian F culture.

C) *The final deposit of superficial grey silts and the installation of marshes in the infilled valleys at +15 m.*

1) *Stratigraphy.* - From the bottom to top: a) the last pink silts (containing some rare rocks that have fallen to below the caves); b) minor erosion; c) formation of ferruginous gravels on the surface with leaching; d) local deepening of the streams with the formation of a layer of peaty soil (Pre-Smithfield); e) new minor erosion, then covering of the infilled valleys by local layers of gravels and a new formation of peaty soils; f) deposit of whitish

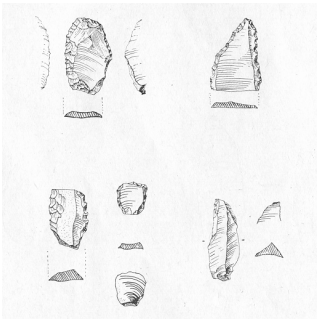

Fig. 27. - Grey level of the caves: Magosian F with saw edged points associated with an ancient monochrome art (Leribe-Jonathan). - *X 1/2.*

recent silts (Smithfield); g) deepening of all the rivers in Basutoland to almost the current level through the silts to a depth of 10 to 15 m (VAN RIET LOWE distinguished four episodes in this descent of the Phofung).

2) *The climate* oscillated around No. 3 (*wet steppe*) with drier periods and finally artificial modern destruction of the vegetation cover.

3) *The fauna*, contemporary including up until the last century a very large number of herbivores (42 species of antelopes, etc.) decimated by their natural carnivores (lions, leopards, cheetahs, hyenas, lynx, etc;) and in addition elephants, hippopotamus, rhinoceros, etc.

4) *The artefacts.* This is the great Wilton-Smithfield complex with more or less distinct local stages that can be distinguished within it. The term Wilton defines the stone working industry characterised by and accompanied by microlith tools, crescents and very small thumbnail scrapers. The term Smithfield defines a similar industry but in contrast to the Wilton, characterised by scrapers made from flakes with concave cutting edges and teardrop shaped scrapers.

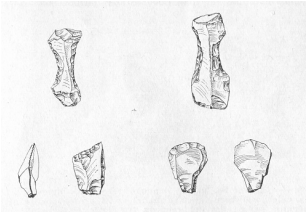

Fig. 28. - Upper layers of the caves decorated with polychrome art: Smithfield industry of Basutoland (lydite, agate and blue chalcedony) - *Top:* "waisted" blade with notches used for scraping sticks. - *Lower left:* cutting burin. *Lower right:* teardrop scraper. - Cana. - X 1/2.

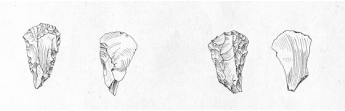

Fig. 29. - (As Fig. 28). Thick, teardrop scrapers (jasper, red porphyry or chalcedony). - Cana. - X 1/2.

In Basutoland the following can be distinguished:

a) *A Pre-Smithfield I* (Maphutseng: Ranthake and Desolation hill forts, see Magosian C).

b) *A Pre-Smithfield II* (age of the peat above). (Maphutseng, Brakfontein shelter, with fauna of rodents and monochrome paintings, which is an old Smithfield).

c) *Smithfield III* (age of grey loess). Large tools of Maphutseng-Store and Masitise with choppers and picks suggestive of ancient Sangoen. Bichrome painting. (Leribe Station, etc.).

d) *Smithfield IV.* This is the almost contemporary Smithfield that seems to be the industry in many sites at the soil surface (surface of the grey loess level *f*, on the margins of rivers) and in inhabited rock shelters. In Basutoland it is difficult to distinguish contemporary Smithfield and Wilton. It could be that this mountainous country served as a refuge, as all other mountainous countries in the world, for the last Palaeolithic hunter-gatherers and artists and that they are intimately mixed, especially at the time of the Hottentot and then Bantu invasions in about 1000 A.D., and finally the Europeans after 1652.

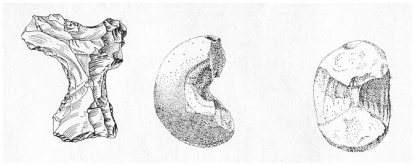

Fig. 30. - (As Fig. 28). - *left:* composite scraper with three notches, deep blue chalcedony (Fobane). - *Right:* small spherical stone (sandstone) pierced by Bushmen in the 19th century and broken before completion showing the piercing technique (shelter of the famous Christol fresco, after Hermon). - X 1/2.

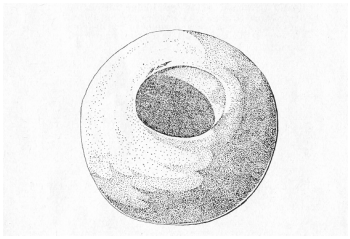

Fig. 31. - (As Fig. 28). - A pierced basalt stone, for a digging stick (Leribe).

At the entry to their many shelters, the last Stone Age people (Bushmen and Bochimans) discarded many thumbnail scrapers in their ash and cooking refuse, plus all the artefacts typical of Smithfield B of the Orange:

- Teardrop scrapers.
- Scrapers with the cutting edge at the end of a flake.
- Thick lateral oval-shaped scrapers.
- Triangular and rectangular scrapers.
- "Waisted" blade raspers.
- Composite: scraper, rasp, piercing tools.
- Various burins.
- Large numbers of used blades and flakes.
- Ostrich shell beads and their polishers and piercing tools.
- Pierced spherical stones (for collecting termites and smoking cannabis).
- And in the most recent times many quern stones for crushing grain taken from the Bantu and for grinding ochre.

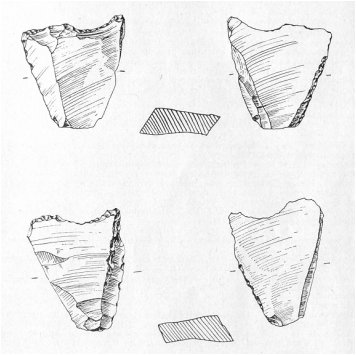

Fig. 32. - (As Fig. 28, and in other open-air camps). - Associated with 19th century often bichrome art, a large number of thumbnail scarpers are found (Wilton). - Here are two examples of composite tools made in the 19th century by the Tchere Bushmen: scraper, rasper and knife. Brown flint, Maphutseng P.E.M.S.

c) *Wilton.* The almost contemporary Wilton in Basutoland occurs almost always mixed with Smithfield in caves. It is characterised by the small size of the tools: simple and double crescents, that are rare in Basutoland: piercing tools, arrowheads, bone arrows, etc.

5) The Art. Together with V. ELLENBERGER, we have undertaken a work of recording the rock art frescos in Basutoland. A note will describe the preliminary results of this survey which was already the subject of an exhibition

at the Museum of Man in 1952 (45). We have established several chronologies relating to the age of these paintings by studying their respective superimpositions. In some cases (e.g. the Pokane cave) there are up to fourteen successive ages (46). A forthcoming series of excavations will, we hope, lead us to study the successive layers that occur in the floors of these caves (47).

6) The life of the last almost contemporary Palaeolithic or prehistoric people in southern Africa, who disappeared only 50 years ago in Basutoland, has been the subject of many major works (48). In most cases we have been able to discover the individual name of the artist who painted a given cave, or who made carvings in Basutoland using a Wilton thumbnail scraper in about 1870. The last "Eland" was painted in red, black and white at Phamong in 1890.

CONCLUSION

In conclusion, thanks to exceptional circumstances - notably topographic and climatic - the series of industries that I have discovered and described in Basutoland will undoubtedly from now on be worthy of being ranked among the few major classic series of the African Quaternary; perhaps it is currently even the most complete. My current research will continue to enrich the classification of a profusion of varied, and sometimes convergent, industries, whose chronology will only be decipherable by the application of detailed stratigraphical and sedimentological techniques.

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(45) In collaboration with Abbot H. BREUIL.

(46) A similar finding was formulated by VAN RIET LOWE (*S.A.A.B.*, 1948, p. 27), who exceptionally recorded the superimposition of six ages of paintings.

(47) We also report the discovery of ancient art (engravings on a horizontal slab) that we made at Morija in 1957, art which could date from the Pre-Smithfield (Note in preparation).

(48) V. ELLENBERGER. - "La Fin tragique des Bushmen." Amiot-Dumont, Paris (out of print).

Additional note. - The drawings of the stone tools accompanying this note are the work of Mr Guy Tamain, whom we thank.

- Mr Tamain has told us of the curious similarity between the small finely-worked trapezoidal scrapers (in the form of false crescents) of the Magosian C of Basutoland, and a Mid-Palaeolithic tool of the Quina, found at Villejuif (Seine, France) in 1958. However, the latter, of larger size, seems to have been derived from a typical Mousterian point, thinned by removing the region of the percussion site, whereas the Magosian tool is made from a flake.

SUMMARY

The author gives the main results of his study on the Quaternary of Basutoland (South Africa) and the stone implements discovered within. The study of the lithological facies and topographical situation enables him to divide the Quaternary formations into several principal cycles which are in very narrow relation to climatic modification, cyclic themselves.

A typical cycle is divided thus:

1) A period of sinking down of river beds: dry, cold climate, with summer stormy rains.

2) Lengthy stabilisation of the base level, formation of a broad alluvial plain of pebbles and gravel (it will eventually become a terrace) = cold and damp climate in winter (pluvio-glaciation).

3) Blanketting by non-stratified silts of eolian origin; filling up of the thalwegs (with marshes) = dry climate in winter, wet and mild in summer).

4) Slight to moderate denudation (sheet erosion), with loosening and surface eolisation of stones = accentuation of the preceding climate, dry and cold winter, very dry and hot summer with scarce and late rainfalls.

The study of the Quaternary all over Basutoland, but mainly about Maphutseng (Mohale's Hoek district), has enabled the author to discover numerous stone cultures (a), in the alluvial terraces, (b) in the eolian silts (which can be observed even as weathered remnants, in the three last main cycles), and (c) mixed up in the residual gravel beds left on the eroded country rock or previous Quaternary deposits, after the washing out during erosion periods.

A remarkably complete scale is thus obtained, that stretches from the Pre-Stellenbosch (Oldowan) crude implements in terrace IV, to the tools cut by the Bushmen up to the last century. The last cycle alone is quite complex: three phases of successive filling up by silts alternating with erosion, with numerous cultures (the author also draws attention to a rich deposit of Insects in terrace number I, about the end of the last pluvio-glaciation).