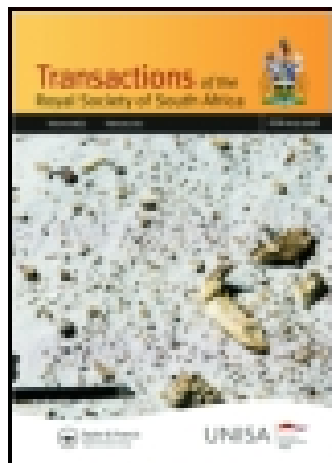


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### II. On the Stone Implements of South Africa

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entirely, and proves that Magyar was right. We have seen that the unknown writer of the "Argus" article agrees also in the position of the confluence of the two streams with regard to Tjikongo's place, Bunja and Libebe, and therefore Darico is Bavico or Libebe. The Rev. Dr Hahn who has lived many years in South-West Africa and has travelled much, who was one of the first who reached the Cunène from the south, expresses himself very favourably for Magyar and believes him to be highly trustworthy.

Both rivers are navigable for cargo-boats, and Andersson has also shewn that the Teoghe is navigable from Lake Ngami.

The writer cannot understand why Magyar should have been misunderstood by great geographers, though his papers shew that he carried instruments, and being a naval officer he very likely was accustomed to their use.

From the Okavango an Omuramba branches off not far from the point where its course becomes entirely east near Bunja. This Omuramba is called Sheshongu and it joins the Teoghe. It is mentioned by Green and is also shewn on Mr Palgrave's map of Damaraland.

For the present the writer will say no more about the subject until he is able to lay the map before the Society, and will then go more minutely into the question of the river-system of South-Western Africa, and will shew his sources of information more clearly.

## II. *On the Stone Implements of South Africa.* By E. J. DUNN, F.G.S.

[Received March 25, 1880.]

Enough work has not yet been done nor have sufficient implements been collected to admit of generalizing, but in a field so extensive as South Africa where instruments and weapons of stone abound, not only distributed over the surface, but imbedded in the soil to a depth of many feet, the necessary interest is certain eventually to be excited and the material obtained for more elaborate work than is at present possible.

Collections have been formed by Dr Dale, who discovered and made known the remarkably well-formed and varied types of implement found on the Cape Flats near Salt River; the discovery was made about sixteen years ago, and numerous examples have been forwarded to Europe. Representative specimens are deposited in the South African Museum, the Christy Collection, the Oxford Museum, and in the private collections of Sir J. Lubbock and

Professor Busk : Dr Dale contributed an article with illustrations to the Cape Monthly Magazine for October 1870.

Among the best-known collectors of stone implements in South Africa are Mrs Barber, Commandant Bowker, Mr T. Bain, and Mr M<sup>c</sup>kay of East London.

As the Kaffirs adopted iron for cutting and piercing instruments from remote antiquity, and as they brought the art of working that metal with them from their more northern homes, all such implements of stone may safely be attributed to other races. As proving who the makers of the stone implements were, there is the fact of their employment, even now, by the remnant of the Bushmen ; and in the case of the Stormberg district, where numerous rock-paintings, and dwelling-places on the hill sides with refuse heaps consisting of ashes, charcoal, fragments of bones of game, valves of unio, stone implements, &c. occur, there are still inhabitants who remember when these places were the haunts of the little red men, whose passion for the Boers' cattle and horses led to their extermination ; this district has never been inhabited by either Hottentots or Kaffirs, and therefore the remains may be considered of genuine Bushman origin.

In South Africa, where no flint is found, its place is supplied in the manufacture of implements by such hard silicious rocks as quartz-rock, milky-quartz, rose-quartz, cherty sandstones, chalcedony, agate, jasper, silicified wood, and most frequently of all, over the Karroo area, a black description of hornfels formed from shale or fine sandstone where in contact with intrusive rock. This substance is admirably adapted for cutting-tools, and is easily shaped as it breaks with subconchoidal fracture.

On the Cape Flats, near Salt River, a cherty sandstone, in some cases extremely close grained, in others the grains very coarse but cemented together by silicious matter, was more generally used for implements ; it is of Tertiary age, and obtainable near the tenth mile-stone, *in situ*, the farm where Langalabilele is confined, and at several other localities on the downs. Agate, jasper and rose-quartz have been most commonly used along the course of the Orange River ; on some of the flat topped isolated hills along its course, flakes and chips are plentifully strewn, at an elevation of two to three hundred feet above the stream.

Some of the stone implements are of great antiquity ; there is great difficulty in deciding as to the age of any particular specimen, unless the conditions under which it occurs yield the information ; it does not follow that because an implement is found on the surface it is therefore of recent make, for the ground might be hard and thus prevent its becoming buried ; on the other hand, the discovery of flakes and pieces of pottery at considerable

depths, in undisturbed slowly accumulating deposits, justifies the assumption of remoteness proportionate to the conditions of the accumulation.

During a trip through Bushmanland, stone flakes, &c. were frequently seen, and occasionally in great abundance, very often associated with enormous quantities of ostrich egg-shell, as at Klaver Vley, Nauta, Leeuweklip, &c. At "Process Font," near Victoria West, the river has cut a channel in the plain, exposing the following section in descending order:

Loose red drift sand .....	1 foot,
Dark clay .....	3 feet,
Hard calcareous bed .....	2 feet,
Fine gravel .....	2 feet.
	8 feet.

The floor is of Karroo shale and intrusive rock. From the top of the red sand to the bed rock, chips and flakes of black hornfels are disseminated; in the calcareous layer, a sharp blow with a hammer is necessary to free the flakes from the matrix. I did not observe any scrapers. Considering the nature of the adjacent country, which is very flat, and the nature and appearance of the deposits, it is reasonable to assign a considerable age to the implements in the lower strata.

At another and distant locality, viz. between Queenstown and Molteno, on Judd's farm "Kloppers Fontein," flakes of similar material to those observed at "Process Font," and up to five inches in length, occur on the surface and down to the bed rock, a depth of twenty-five feet. In this case, the valley is narrow and filled with loam and gravel; the rate of accumulation was, no doubt, more rapid than it would have been in a broader valley, but even making all allowances, the implements cannot be considered as of modern age. The section is exposed through the water having cut a gulch in the soil; like most similar instances the running of stock was the means of starting the erosive action.

In the Camdeboo district, on the farm "Osse Hoek," close to its junction with the west side of "Lange Fontein," is a marshy piece of ground from which a spring issues; during the drought of 1878, an effort was made to increase the supply of water by cutting a deep trench up to the eye of the spring, where the eye was tapped; the cutting was nine feet deep, and here, in beds that appear never to have been disturbed—for they have a rude kind of bedding—was found a small Bushman pot of baked clay; it was below several pieces of rock, probably placed there to prevent game from drinking, as was the custom with the old Bushmen.

The position of the marshy ground is at the base of a low ridge and by no means favourable to rapid growth of sediment.

The section is as under :

Black marshy soil full of roots.....	3 feet,
Grey marshy soil with decayed roots	4 „
„ „ without roots .....	2 „
	9 feet.

Pot of baked clay under stones.

From appearances, it is probable that a considerable period has elapsed since the vessel was dropped or placed in its position.

At Constantia, perforated stones have been dug out at a depth of three to four feet below the surface; similar stones were dug out on the flank of Devil's Peak, above Rondebosch; and at Oaklands, Claremont Flats, a small irregularly shaped perforated stone and numerous flakes were found resting immediately on the white clay (decomposed granite) at a depth of 1 ft. 6 in. below the bottom of a vley.

In many places on the Cape Flats, there is a stratum of gravelly material reposing on the decomposed granite or on the tertiary beds, it is from six inches to one foot thick; flakes, chips, and rudely formed implements are common in it.

Covering this layer is from one to two feet of soil in which no flakes or chips occur.

Near Salt River, flakes, chips, and spear-heads are imbedded in the bog iron ore that abounds on the flats.

Some implements found on the surface wear the aspect of great age; examples were numerous around the margin of Du Toits Pan and several other vleys at the Diamond Fields, in the early days of the diggings; flakes, spear-heads, &c. formed of extremely hard lydianized shale, were quite rounded in outline, and on fracture shewed a thin decomposed shell on the outside, indicating a lengthened exposure to the atmosphere. Much-weathered implements are met with throughout the Karroo country.

A broken borer or rimer, found on the farm "Weltevreden," Stormberg Spruit, supplies evidence of the great age of some stone implements; it is made of the usual black intensely hard altered shale, and was used long ago for perforating stone; it was lost or discarded, and after a considerable lapse of time again found, and used for the same purpose; the friction broke off some small chips, and by some means the rimer also broke across at three inches from the point, and was of course of no further use; the fracture on the end of this piece is black and quite fresh-looking, while the remainder of the stone, where not rubbed by its last employment, is covered by a decomposed grey shell about four times the thickness of a sheet of foolscap; now, the last fracture is certainly not less than forty years of age, for the Bushmen were driven out of, or shot, in the Stormberg district about that time; if forty years have

made so little impression on this stone, how long must the original implement have been exposed to become so much weathered?

Since man's appearance in South Africa, the surface of the country has undergone very considerable alteration; in fact, there are direct proofs, from the presence of stone implements, that the aborigines roamed over this country before the soil, covering the bed rock of many of the present valleys, was washed down from the hill-sides; and here it is worthy of note that the alluvial deposits were accumulating and continually filling up the valleys higher until the old and natural order of affairs was disturbed by the presence of the white man and his unnatural method of depasturing stock, since which time, the storms have cut into and are rapidly removing these alluvial deposits; especially along the base of such mountain-ranges as the Stormberg. It is in these rifts the implements are now laid bare.

Speaking geologically, it appears that stone implements have been in use since the beginning, or nearly so, of the Recent period, but none have been found in the later Tertiary deposits.

In all probability, fragments and pebbles of stone were first utilized by primitive man; very soon it would be discovered that more efficient tools might be formed by chipping stones into shape; the art of perforating, grinding, and polishing stone would follow. The most suitable descriptions of stone for different purposes would be taught by experience.

The cutting implements of this country are very similar in form to those found in the River Drift of Great Britain, as figured in Dr J. Evans' work; but little art appears to have been exercised in their manufacture; only one instance of an axe having been slightly ground at the edge has come under my notice; it is represented in Fig. 22, but the ground edge is not well shewn; I found it myself, or I should have felt some doubt about it. The beautifully shaped highly finished greenstone axes of the Australian blacks are works of art, compared with the rude Bushman implements of the same kind; the difference may have arisen from the fact that the blacks dwelt in a country of forests, and obtained much of their food from trees, while in South Africa the general absence of trees rendered good axes almost superfluous.

The objects figured and enumerated are in my collection, and have nearly all been personally discovered.

With regard to the spear-heads, &c. found on the Cape Flats, there appears good ground for hesitating in attributing to them a Bushman origin, for in the haunts we know to have been occupied by the genuine race, no such highly worked examples are found; possibly they belong to a branch of the Hottentot family.

There is some difficulty in deciding what were Bushman and what Hottentot implements, especially in tracts once occupied by both.

The types of implement already met with comprise the following:

Hammers	Spear-heads
Cores	Arrow-heads
Chips	Axes
Flakes or Knives	Flat stones for grinding on
Saws	Mullers or grinders
Scrapers	Rubbing stones
„ notched	Grooved stones
Borers or rimers	Perforated stones

#### *Hammers.*

One of the first applications of stone would be for striking with, and when sharp flakes were required a hard pebble was no doubt soon found to be a convenient and efficacious tool in detaching them from a piece of stone. Such hammers, with bruised ends, are of common occurrence; they are generally of quartz-rock, quartz, hard sandstone, jasper or some other equally compact material.

Frequently the stones used as mullers, &c. are battered on one end from use as hammers. In some cases implements, on which some work has been bestowed, have been used as hammers, such as Fig. 25; but there is uncertainty about the original intention of the maker, it represents a quartzite implement from "Van der Walt's Kloof," Camdeboo; there is a shallow circular depression on opposite sides, and it looks as though originally intended for a perforated stone, but the material proving so refractory, the intention was abandoned, and the stone utilized as a muller, as is clearly shewn by the wearing down of one side, and also for hammering, as the battered sides prove.

#### *Cores.*

When the qualities of different rocks had been learnt, such as combined hardness with a conchoidal fracture were selected for the manufacture of knives, scrapers, spear-heads, &c., and when a fitting piece of stone was secured, as many flakes as possible were detached, and the central piece was discarded; such remnants are called cores, and are found from the Cape Flats to beyond the Transvaal. They are most commonly similar in form to Fig. 17, some are more spherical, such as Fig. 18; the former is from "Twee Fontein," Stormberg, the latter from "Weltevreden," same district.

These cores are sometimes found at considerable distances from the site of the parent rock; it is probable that a small block of specially good stone formed part of the kit of these primitive men, and was used for making knives, arrow-heads, &c., as occasion required.

*Chips.*

Artificially detached fragments of stone without definite form are more abundant than shaped implements, as would be expected, for in the process of making some implements, many small chips would be struck off, and many failures would occur in forming even the simplest implements, such as arrow-heads, &c.; as a matter of fact, hundreds of such shapeless fragments are met with to one complete instrument.

In the vicinity of the vleys near Salt River, and sometimes on the floors of the vleys, are sites that appear to have served as manufactories of stone implements, judging from the numbers of chips imbedded in the soil and strewn on the surface; they are principally of the cherty sandstone of Tertiary age, and quartz, with a few pieces of rose quartz.

Over the Karroo, chips are to be seen almost everywhere. Near the sparsely distributed fountains of Bushmanland, chips of stone, as well as implements of the same material, abound; they are found mingled with the débris at the mouth of the caves and shelters of the Bushmen in the Stormberg. These mounds of débris are frequently two to three feet thick, and sometimes even more, and consist of ashes, charcoal, bones of game, bits of pottery, stone implements, pieces of stone, &c.

*Flakes.*

Of the various uses to which stone was applied, none was more common than the shaping of knives; the frequency of sharp-edged flakes, similar to Fig. 1 (from the vleys near Salt River), is proof of their common use. Some are worn at the edges, but on most no direct evidence of wear is observable; it is natural to suppose that an implement detachable by a single blow was not highly valued, and would be cast aside after but little use. Even in the primitive life of the Bushmen, a constant requirement of a cutting instrument existed, nor could they have skinned game, cut up its flesh—so as to place it in their small clay pots—and made bows and arrows without one. It is quite possible that some of the sharp flakes were either rudely hafted with a piece of stick, or by having fibre wrapped over the part to be held in the hand.

*Saws.*

Flakes similar in form to those used as knives, but having one or more of the edges systematically serrated, are widely distributed; they would be of great service in severing such sticks as were used for digging with, for bows, and for arrows where reeds were not within reach; Fig. 4 represents such an implement from near Salt River, Cape Flats.



*Scrapers.*

After simple flakes, scrapers are the most numerous and widely disseminated. In form they are identical with European types, the horse-shoe form predominates. Fig. 5 is from Queenstown.

They are formed of flat flakes; one or sometimes both ends have been shaped into more or less semicircular form by striking off fine chips, the blows being given on the flat or bulb side of the flake.

Traces of use are frequent; the curved edges in some specimens are quite rounded from this cause. No doubt they served for many purposes, such as for scraping the integument from the inner side of skins; for scraping bows and arrows into shape; in the manufacture of their bone-spoons, awls, arrow tips, &c.

Near the hospital, Queenstown, they abound on the surface of the red soil, also in the vicinity of the old dwelling-places of the Bushmen, in the Stormberg, in Bushmanland, over the Karroo, in the Free State, in the neighbourhood of Buffel's River, Beaufort West railway, and more rarely on the Cape Flats; where they are usually of much larger size.

Most of the scrapers are made from highly indurated shale of black colour, but many other descriptions of stone were availed of; in fact, as with all other stone implements, the best material within reach was employed.

Some very narrow examples have been noticed. Straight-edged scrapers were also used.

*Notched Scrapers.*

Flakes, in the sides of which notches have been chipped, are not uncommon. Fig. 2 is from near Salt River, and appears to have been used or intended for a spear-head, but was subsequently turned to account as a scraper of this kind. Such an instrument might have been used for fashioning the bone points of arrows, or for rendering arrow-shafts, when formed of wood, of cylindrical shape. The notches bear evidence of having been formed by design, and not by accident, and shew distinct evidences of having been rubbed in some cases.

A larger notched implement, from the same locality as the last, is represented by Fig. 3; it is the only one of the kind that has come under my notice.

*Borers or Rimers.*

In the Stormberg, I met with numbers of implements of pointed form similar to Figs. 14 and 15. The former is from a cave, "Buffels Kloof," Stormberg, and the latter from the Cape Flats.

From an examination of several dozens of specimens, I have no

hesitation in considering them to be the tools used in perforating the spherical digging stones; they are always made of the hardest material obtainable, such as shale or sandstone that has been indurated by intrusive rock; they are trimmed into an elongated form, and are from three to six inches long. At one end, or in a few instances at both ends, the sharp edges of the chipped stone are rounded off; the points are sometimes ground into nearly cylindrical form from the rotary motion employed in using the drills. The points often bear testimony to these stones having been employed as picks, as well as for riming out the holes. Very many broken points are met with, the fracture is a sharp one, and a little consideration will explain their abundance, for the effect of riming out an irregularly shaped hole in a stone that had only been previously picked with a stone implement having projecting angles would often be to cause a jarring motion, and thus to snap off the hard but brittle material employed for drills.

These rimers have been met with in greatest numbers in the Stormberg, commingled with the *débris* that marks the sites of the old Bushmen's habitations, and are found from the surface downwards, associated with whole and broken perforated stones. As none but Bushmen dwelt there, no other conclusion can be arrived at, than that they were used by the Bushmen, and for the purpose of perforating stones; probably this operation was performed by the women, as the spherical stones are used by the women, and it is not probable that the men made them.

Similar drills are obtainable throughout South Africa, where stone implements occur, but not in such numbers on the Cape Flats as in the Stormberg.

Small borers or awls of stone are obtainable in the Stormberg and in Bushmanland; one from the former district was formed by chipping a thin flake of hard shale to a point at one end, leaving a shoulder on each side of the boring-point; they were used for perforating the small discs of ostrich egg-shell, formerly so extensively used as beads; these small discs are about  $\frac{1}{4}$  inch in diameter, and are made by first breaking the egg-shell into small fragments about the required size, then perforating them by a hole from either side, and finally grinding them into circular shape.

Fig. 16 is of sharp gritty sandstone, and was found in the Stormberg; other slender pieces appear to have been used as files in finishing the holes in spherical stones. The point of the specimen figured has been rounded, shewing that the implement was worked in the same manner as the drills.

#### *Spear-heads.*

Rude spear-heads such as Fig. 7, from the Cape Flats, are common throughout the country; this type has been used precisely

as it left the core, without any subsequent chipping; it is about the simplest form of spear-head. A comparison of several similarly formed spear-heads renders it very apparent that more skill and care is required to form even such an implement than appears at first sight. In making such a spear-head the flake was shaped on the core by first striking off smaller flakes, at least one on each side, and one or more at the end of the implement furthest from the point; the butt end was thus thinned, perhaps with the object of inserting the spear-head in the split end of a stick, where it could be secured by means of fresh sinews; whatever the intention of thus flattening the butt of the flake, it is almost an invariable character. After the preliminary flakes or chips were struck off, the decisive blow was delivered, and the finished implement detached. Considerable skill must have been exercised in regulating not only the point at which the blow had to be delivered, but also its intensity, for a miscalculation in either direction would have marred the result.

Evincing more care in its manufacture than the preceding is the type represented in Fig. 9, from the same locality as Fig. 7; in this case, after the spear-head was detached, a better form was imparted by removing numerous fine chips from the edges. The side on which is the "bulb of percussion" in such implements is generally left untouched; this and the preceding form of spear-head are the most plentiful, they are far more abundant about the margins of the vlees near Salt River than further inland.

On the Cape Flats they are found to be most numerous in the vlees where a passage led from one to another, or under such banks as would give cover to a hunter, and from which he could hurl his weapons at the game that no doubt thickly covered the surface of these lagoons in ancient times. Many of the spear-heads found in such positions have lost their points, as though from striking some hard object.

Implements shewing an advance on Fig. 9 are met with, resembling Figs. 12 and 13, but only worked on one side, the other being flat; shewing a far higher degree of skill in manipulating stone are types such as Figs. 10, 12 and 13, they are formed of cherty sandstone of Tertiary age, and are from the Cape Flats; they are beautifully shaped and highly finished on both sides. The material is far less easy to work than flint, and taking this into account it would be difficult to find a higher degree of skill displayed in any similar implement of European manufacture.

Highly finished examples of the forms Figs. 12 and 13, but eight or nine inches long, have been discovered by Dr Dale.

Partially formed spear-heads are occasionally met with on the Cape Flats, that shew the manner in which such implements are formed from a fragment of stone.

The highly wrought spear-heads, &c. found on the Cape Flats, so far excel anything of the kind found further inland, as to render it doubtful that they were formed by the same race as we know fashioned the less perfect types. The early records of Cape Colony speak of certain Strand-loopers who lived on the Flats, but they are described as few in number and very degraded, subsisting principally on shell-fish and roots, the latter of which they are represented as procuring by means of digging-tools of iron, probably obtained from some English ship that had touched at the Cape. Perhaps the Hottentots, of whom there was a considerable population, were the makers; they were certainly much further on the road towards civilization, as we understand it, than the Bushmen were. The Hottentots in the earliest days of settlement were possessed of great wealth in horned cattle, they had comfortable mat houses, and acknowledged leaders; as from necessity they employed stone for various purposes, it seems only reasonable that they would shape it with more precision than their wilder neighbours.

There are some few facts observable on the Cape Flats, near Simons' Town, and near Cape Point, that would almost imply that the art of smelting metals, or at any rate iron, was not unknown to the original inhabitants of the peninsula; a specimen from near Simons' Town, at present in the South-African Museum, appears to be a rude nozzle of clay, such as the natives in the interior use even now in smelting iron; adhering to this nozzle is a piece of slag. I have observed one similar nozzle on the Cape Flats.

#### *Arrow-heads.*

Small triangular pieces of worked stone, evidently intended for points of arrows, are widely distributed; they are rudely formed, resembling Fig. 6, from the Cape Flats. From the same locality as Fig. 6, examples, on which more work has been bestowed, are not uncommon, such as Figs. 8 and 11.

These arrow-heads appear to have been intended for insertion in a groove cut in the end of the arrow shaft, any tendency to split in the shaft being prevented by a binding of sinew such as used by the existing Bushmen.

While in Bushmanland an old Bushwoman, living on Leek River, shewed me one of the methods adopted in affixing stone tips to arrows; two small triangular flakes were detached from a piece of hard stone, they were as nearly alike as possible, the point of the shaft was then flattened and coated with resin obtained from a small pelargonium, this resin is softened by heat, and the two flakes pressed on the opposite sides of the flattened tip of the shaft, the points being carefully brought together; the bases of the arrow-heads were some distance apart. The use of iron has entirely superseded stone for arrow-heads among the Bushmen of

the Orange River, a small triangular piece of tinned plate being found far more effectual than a stone flake.

Since none of the Kafir tribes use bows and arrows, the arrow-heads met with may be safely considered as of either Hottentot or Bushman origin.

No notched, barbed, or tanged arrow-heads have been noticed.

#### *Axes.*

Most examples met with are of very rude form, some strongly resemble European River Drift types. There are two prevalent shapes, the one like Fig. 23, but generally more pointed (the top of the figure is the pointed end); such weapons could not have been of much service for cutting, but perhaps were mounted in a handle and used as offensive weapons. Fig. 23 is made of indurated shale, it has been so long made that a thick shell has decomposed, it was found at "Oorlogs Kloof," Stormberg. Fig. 24 is of the same material, and comes from "The Junction" between Queenstown and Molteno, it represents the other form; the broad end has a sharp edge, and was evidently designed for chopping. Such axes may have been held in the hand, for in some examples care has been taken to batter the sharp edges where they would come in contact with the hand in holding the stone.

One unique specimen is shewn in Fig. 22; it is of highly indurated silicious sandstone of dull greenish colour, and was found by myself in the main kloof of "Maynard's Hoek," Camdeboo; it differs from any other specimen I have seen in having both faces near the cutting edge slightly ground, it also shews proofs of long-continued use, for notches in the edge that could not have been ground are smooth from friction. Had there been an urgent need for hatchets among the aborigines of South Africa, such as existed in the case of the Australian blacks, it is highly probable that better shaped, more highly finished types would have been manufactured; their absence would countenance the view that this country has been destitute of forest since its occupation by man. It would be of great interest to ascertain if better axes were used in the tracts of country where forests exist.

Axes are found of both types on the Cape Flats and also inland. The broad-edged type was most likely found of service in severing the limbs of game, and in some cases for cutting wood.

#### *Flat stones for grinding on.*

Mealing stones are among the commonest of relics left us by the preceding inhabitants: unlike most of the others they are not confined to the yellow-skinned races, but the forms of those used by Kafirs differ on the whole from the Bushman and Hottentot type.

A slab of sandstone or dolerite is generally selected, the depressions on each side sometimes have met, and the stone as a consequence has been rendered useless; especially is this the case with Kafir mealing stones, the Bushmen or Hottentots seldom had enough grinding to do, to wear out the stones.

On the Cape Flats, many of the mealing stones are unusually small, some not more than 8 inches long, and about half as broad; such small examples are generally formed from a flat pebble procured from the neighbouring shingle beach, they are most numerous in the vicinity of the old dwelling-places of the former inhabitants.

In the Stormberg district, small slabs of stone are common with one or both sides abraded, suggesting the use to which they have been put; very rarely are they worn into troughs.

In the Camdeboo, along the valleys such stones are plentiful; they are turned up in ploughing and thrown outside the ploughed spaces by the farmers; most are of sandstone, some are trough-like, but more have concavities with diameter equal in every direction. In Bushmanland, I have observed that bosses of gneiss, especially where in isolated positions they protrude through the sand, have been utilized by the Bushmen, and slight hollows or abraded surfaces shew where grinding operations have been carried on; about the bases of some of the bosses such places are numerous, as for instance Leeuwe Klip. The Bushmen obtained stores of grass seeds by robbing ants' nests, they ground them, cleaned away the husks, and prepared them for food by boiling to a sort of porridge in their clay pots.

Another article of food with the Bushmen consisted of locusts; these were roasted in the fire and then ground to a paste and mixed with fat, forming a delicacy that was greedily devoured.

The Kafir mealing stones are much larger than the preceding; they are from 18 to 24 inches long, and from 12 to 15 inches broad, and 3 to 6 inches thick: hard sandstone or dolerite are preferred for the purpose, they are often deeply worn. The Kafir women kneel at one end of the slab, and taking the large muller in both hands, they lean over the mealing stone so as to throw weight on the muller, which is moved backwards and forwards, at the same time a rolling motion is imparted to the muller by a movement of the wrists. These mealing stones are used for grinding maize and millet, also for making snuff; they are to be seen at every Kafir kraal; whole and broken examples are met with wherever old kraals have existed. In the valley of Steelport River, near the Cobalt Mine, Transvaal Territory, ruined kraals built of magnetite abound, they were occupied by the older tribes of Kafirs or Macattees who fell a prey to the incursions of the later Zulu tribes, as they pressed down from the north; about these old kraals are

great numbers of mealing stones. In the valley of Sand River just to the south of Spitz Kop, Gold Fields, Transvaal, these stones also abound. These mealing stones are of peculiar interest, as they appear to be almost universal; examples found in Europe are precisely such as are found in South Africa: no doubt such simple implements for grinding preceded the use of querns &c. in every country.

#### *Mullers or Grinders.*

Small hand grinders are as widely disseminated as the mealing stones, being equally indispensable; they are generally formed of the hardest stone within reach, often they are pebbles ground on the side, or where dolerite in a decomposing state occurs a small undecayed nodule is thus applied. The grinding faces of these mullers are seldom flat, they are generally convex, often saddle-shaped.

A peculiarity observable on those from the Cape Flats, and absent on the Stormberg and other inland specimens, is that the centre of the grinding face has a slight hollow picked in such a manner that the substance to be ground would be retained; in fact this was the operation represented by the grooving of mill-stones as now employed. Mullers such as Fig. 20, from "Witte Kop," Stormberg, were held between the points of the fingers and the ball of the thumb in grinding. Long forms such as Fig. 21, from "Streep Fontein," Stormberg, were held as a pestle would be, and were most probably used for grinding up the colours with which they painted themselves, and the figures on the rocks; only some colours would have been ground thus, for in the case of red, I have several small pieces of red hematite that have been ground on another piece of stone, and one small palette of sandstone shewing considerable use. The grinding face of the long implements is always oblique to the longer axis of the stone, for they are more comfortably worked when slightly inclined than when held vertically.

Long rolled pebbles from the beach of Table Bay, the ends of which are bruised or ground, proving them to have been used as mullers, are numerous on the Cape Flats.

The Kafir muller is formed of a piece of sandstone or dolerite from five to eight inches long, half as broad, and slightly tapering at either end. The grinding face is somewhat convex, and is generally roughened by picking; in use the longer axis of the muller is at right angles to the longer axis of the mealing stone.

#### *Rubbers.*

Flat pieces of soft sharp sandstone, three to five inches long and two to three inches broad by about one inch thick, having

a convex surface on one side, similar to Fig. 19, are of frequent occurrence in the Stormberg District, and elsewhere. The material as well as the shape render it highly improbable that such stones were used as mullers for grinding food, it is far more probable that they were used for dressing skins, for in such an elevated region as that of the Stormberg, it is not likely that the Bushmen endured the cold without some kind of dress. These implements are found around the old dwelling-places under the steep ledges of rock.

#### *Arrow-straighteners.*

Wherever Bushmen have been known to live, implements of stone for straightening the reeds used for arrow-shafts are met with; they are still to be found in the kit of most Bushmen in Bushmanland. Frequently they are formed of a small pebble, or are shaped like one as in Fig. 27, from "Leeuwe Fontein," Stormberg. The material in this case is dolerite, others are formed of quartz-rock or sandstone, and rarely steatite is employed.

On one side a groove is cut, as represented in the illustration.

Fig. 26 is of quartz-rock, it is from "Vreede," Camdeboo: less shapely pieces of stone are grooved and used as straighteners, and it is no uncommon thing to find the same stone serving as a straightener, a muller and a hammer, among the remnants of the Bushmen along the Orange River.

The groove appears to have been formed by first picking along the line intended, and afterwards grinding it smooth by means of a piece of sandstone.

No instance of such a grooved stone has been observed on the Cape Flats.

These stones are used by first heating them in the fire, and then rubbing the fresh-cut reed along the groove until it is rendered sufficiently straight; the groove is frequently quite polished from this operation.

#### *Perforated Stones.*

Stones of spherical form and perforated occur throughout South Africa, they vary in size from a little more than one inch up to more than seven inches in diameter. The larger specimens weigh seven to eight lbs. Though spherical forms such as Fig. 31, which is of sandstone picked into shape, and from "Kust," Camdeboo, are most common; there are many divergences from what may be considered this normal type. On the Cape Flats and elsewhere irregular pebbles have been found with a hole drilled through them. In Bushmanland very irregular forms are met with. A fragment of a small perforated disc of sandstone neatly ground and less than half an inch thick, is from "Klip Font," Stormberg



(Fig. 29). Fig. 30 represents a disc of hard sandstone, a little under one inch thick, from "Lange Font," Camdeboo. Fig. 25, from "Van der Walt's Kloof," Camdeboo, was also probably intended for a perforated stone.

Another form of perforated stone of rarer occurrence, is quoit-shaped, generally of soft slaty rock; they were perhaps worn as armlets, judging from the size of the hole.

Besides the previously specified rocks, many varieties of sandstone, shale, dolerite, limestone, &c. were employed in making the perforated stones.

Where nodules exist, as in some sandstones and dolerites, the nodules were availed of, at other times pebbles answered the purpose, or rough pieces of rock were used and dressed into shape.

From many examples observed in various stages of finish, it appears that when a suitable nodule or block for a spherical stone was secured, it was picked over the surface with a sharp-pointed stone, until of the desired form and size. The hole was then commenced from opposite sides, and also picked out by means of pointed stones. (The marks of the implement, in one example of an unfinished stone from "Schiet Fontein," Graaff Reinet Railway, prove the worker to have been right-handed.) As the holes deepened, more slender picks were required, and once the holes met, the work of enlarging was accomplished by means of such tools as are figured as borers or rimers, and the finish imparted by the use of slender files of sandstone. Some holes are nearly cylindrical, but all digging-stones bear more or less evidence of the hole having been commenced from opposite sides. The holes are from  $\frac{3}{4}$  to  $1\frac{1}{2}$  inch in diameter. No ornamentation has been observed on any specimen. Fine grooves sometimes occur, caused by the sharpening of tinned plate arrow-heads on them.

The examples from the Stormberg—where the users are known to have been the small Bushmen—are conspicuously smaller than those generally met with.

So far as the common forms are concerned, there is little difficulty in comprehending the uses of such perforated stones, for they are still employed by the Bushwomen, in Bushmanland, as make-weights for their digging-sticks; they insert a straight stick about one inch thick and from three to four feet long—the point of which has been sharpened and hardened in the fire, or else shod with a straightened spring-bok horn—for half its length through the perforated stone, a small piece of stick is driven into the hole on the under side of the stone acting as a wedge and preventing the stone from slipping down when a blow is struck. This implement is grasped by one hand above the stone, and by the other below, and as a digging tool for uprooting "numtjes" and "camberoo," it would be difficult to devise a

better without the use of metal. When the gems-bok was more plentiful, one of the horns was inserted instead of a stick.

Such implements must have been, as they now are, almost indispensable to a race like the Bushmen, who depend to a considerable extent for their sustenance on the roots gathered in the field.

That these perforated stones were made by the Bushmen or rather women, there is every reason for believing, for in the Stormberg, where considerable mounds of débris are found in front of rock shelters they inhabited, these stones are found occurring with the implements used in their manufacture; the implements are frequently broken, implying that the work of perforating the stones was carried on where the pieces are found.

An opinion is held by some that the Bushmen utilize these digging-stones but are not the makers; there appears no good ground for this view, which has probably originated in the fact that they are not manufactured *now*; but the Bushmen are so reduced in numbers, and such stones are so abundant, that there exists no necessity for making fresh ones. The knowledge of the manner in which they are made, however, remains; for the same old Bushwoman that shewed me the manner of affixing stone flakes to arrow-shafts, described the method and particularly mentioned the long pointed stones of hard material, which she said were obtained from the Kiljan Veldt. Stones suitable for the purpose do occur there, and since then I have found in the Stormberg numbers of rimers answering her description. Besides, there is no evidence that any other race preceded Bushmen in South Africa.

It is evident from their size, that all perforated stones were not used as make-weights for digging-sticks. Some of the small ones are smoothly ground and may have been used as ornaments or as toys. I have met with small polished stone hatchets in Australia that in form and material were the counterpart of the larger ordinary weapons, but too minute to be of any practical use for chopping.

The Hottentots no doubt also used these perforated stones.

III. *On the Languages of the Mozambique and of the South of Africa in their relation to the Languages of Australia*\*. By HYDE CLARKE, Vice-Pres. Anthropological Institute; Vice-Pres. Statistical Society; Vice-Pres. Society of Arts; Corr. Mem. American

\* This has been printed by the Royal Society of Victoria (read, Nov. 13, 1879). "On the Yarra Dialect and the Languages of Australia in connection with those of the Mozambique and Portuguese Africa" is the title there given.