

of the well-built walls turns outward, as is shown in the plan. The worse-built walls of all the temples do not show any of the peculiarities of design so characteristic of the better walls, except in two instances, where they seem to be rough reconstructions of older walls. We may, therefore, assume that these poorer



COIN OF BYBLOS SHOWING THE ROUND TOWER

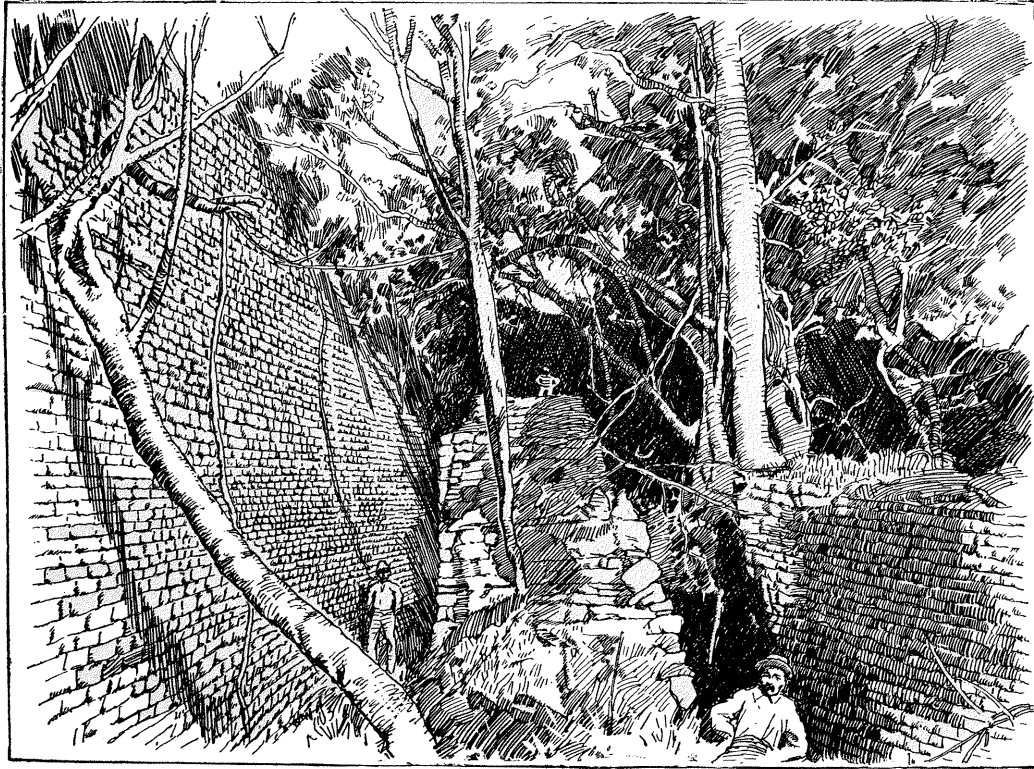
walls are not of the original period, and that they were built by a people who either did not practise solar worship or who did not do so under the original forms. We will, therefore, disregard the poor walls in studying the plans of the temples. It is much to be regretted that we could recover no plan of the western side of the original outer wall, as

it might have made clear to us the meaning of many of the features of the eastern wall.

The most important feature in the interior of the temple is, of course, the great tower, which is a marvel of workmanship in rough material, and in the truth of its lines almost as wonderful as the column of a Greek temple. We could at first discover no reason for its being built in its peculiar position. It has not been placed with any reference to the points of the compass nor to the bearing of the sun at the equinoxes, and its position is only indirectly connected with the position of the sun at the solstices. But it is in the middle of the space marked off by the two inner doorways, and the more easterly of these two doorways is at the point where the sun would appear when rising at the summer solstice when regarded from the central altar, as will be shown further on; and the other doorway is at the point where the decoration on the outer wall terminates, and that is at the part of the wall where the sun's rays would be tangential to its curve when rising at the same solstice. The portion of the outer wall behind the above-mentioned sacred enclosure is built in the form of a circular arc with its two extremities at B and K, and its centre at P, and the tower stands midway between these points. Close to the great tower is the little one, and no reason for its position suggests itself; but the relative proportions of the two towers are curious, and seem to offer an explanation of the plan of some other parts of

the building—in fact, the diameter of the great tower seems to have represented the unit of measure in the construction of the curves of the outer walls and of all the regularly curved inner walls in the great temple, and in all the well-built temples in Mashonaland. The diameter of the great tower at its base is 17·17 feet or 10 cubits,¹ and this is exactly equal to the circumference of the little tower. This ratio of circumference to diameter and the above measure of 10 cubits seem together to have determined either the length of the radius or diameter, or halves of these, of all the circular curves on which many of the walls are built. For instance, the radius of the curve behind the great tower is $169\frac{1}{3}$ feet, and this is equal to the diameter of the great tower multiplied by the square of the ratio of circumference to diameter; or $17\cdot17 \times 3\cdot14^2 = 169\cdot34$. The well-built partly circular enclosure to the north-west of the tower has a diameter of 54 feet, and this is equal to $17\cdot17 \times 3\cdot14$. The curve of the outer wall, from the eastern end of the sacred enclosure (at K) to A is circular, and has its centre at the altar, and its radius is $107\frac{1}{2}$ feet. This is equal to twice $17\cdot17 \times 3\cdot14$. This length of $107\frac{1}{2}$ feet is also the exact distance between the middle points of the two door-

¹ 17·17 feet is equal to 10 cubits of 20·62 inches; and as all parts of the building which we have been able to measure accurately, and all small articles which would probably be made on any scale of measure, apparently have been made in terms of a cubit of this length, it seems probable that this cubit was one of the standards of measure in use.



THE TRIPLE WALLS AT ZIMBABWE

ways at either end of the sacred enclosure. The curve of the outer wall from A to the great doorway seems to have a similar radius to the arc behind the tower, namely, $169\frac{1}{2}$ feet, but in our measurements there we hardly fixed a sufficient number of points in the line of the wall to make quite certain of this. The inner long wall is parallel to the outer one until it reaches the sacred enclosure, so it may be considered as combined with the outer wall for our present purpose. Besides these there are no well-built curved walls in the great temple, except the piece of wall near the monoliths at M, and it is too short to allow of the centre of its curve being laid down with certainty of accuracy. It does not, however, seem to belie this system of measurement.

We need hardly expect to find the same measure always applying to the buildings on the hill, for the form of these buildings is often controlled by the nature of the ground. Still they do apply, and the diameter of the curve on which the wall of the eastern temple is built is $84\frac{1}{2}$ feet, which is equal to half of $17\cdot17 \times 3\cdot14^2$. Of the two curved walls on the left hand when entering this temple from the south the diameter of the curve of one is equal to $17\cdot17 \times 3\cdot14$, and the radius of the other is 17·17 feet. The only other regularly curved wall on the hill is the western great wall with monoliths and round towers, and the diameter of the circle of which the curve of this wall forms a part is 254 feet, and this does not agree with our system of measure.

But this wall and its towers are not well built, and there is good reason to suppose that it is not the original wall, or that the outer portion of it is not original; and, in fact, we discovered the foundation of part of another parallel wall, as is partly shown in plan, six feet west of this wall. If this were the original wall, it would give a diameter of 266 feet for the circle, which is half of $17\cdot17 \times 3\cdot14^2$.

At Matindela the only regularly curved piece of wall is that about the principal doorway, but it is so rough in its construction that one hesitates to deal with it, and we can only say that it seems to be built on a curve of $107\frac{1}{2}$ feet radius = twice $17\cdot17 \times 3\cdot14$. The whole appearance of this wall and the slight inaccuracies in the orientation of the decorations which it carries, suggest that it is a more recent wall built roughly as a copy of an original wall on the same foundation.

The ruin at the Lundi River is circular in form and well built, and its diameter is fifty-four feet, which is equal to $17\cdot17 \times 3\cdot14$.

Of course all the above measurements refer to the outside of the walls at the base, as this is the way in which the tower itself was measured.

The same principle of measurement applies to the curves which determine the shape of the two towers themselves, and this explains why it is that the little tower tapers much more rapidly towards the top than does the great one. If we describe a circular curve with its centre on the same level as the base

of the great tower and its radius equal to twice 17.17×3.14 on $107\frac{5}{8}$ feet, we find that it exactly fits the outline of the great tower as it is shown in our photographs. Also, a curve described in a similar way but with a radius equal to twice the diameter of the little tower multiplied by 3.14 ($5.45 \times 3.14 \times 2 = 34.34$ feet) will correspond to the outline of that tower.

The towers when built were doubtless made complete in their mathematical form and were carried up to a point as we see in a coin of Byblos, where we have a similar tower represented with curved outlines. Their heights as determined by these curves would be 42.3 and 13.5 feet respectively, and these numbers also bear the same relation to each other that the circumference of a circle does to its diameter.

We have no explanation to give of the position of the little tower relatively to the great one, but there probably was some meaning in it which might appear had we a plan of the original walls around the towers. It is very doubtful that these walls, which now mark off the sacred enclosure, are of the same period as the towers. They are shaded darkly in our plan because they are fairly well built; but although they are better built than most of the secondary walls, yet they are not equal in point of execution to the great outer wall and the towers, and their lines, too, are not so regular as those of the original walls generally are. It seems probable that they are rough copies of some old walls which had fallen, and are wanting in some

of the essential features of their originals. We can only say that the centre of one tower is distant 17·17 feet from the centre of the other, within a limit of error of two inches.

The angular height of both the towers measured from the centres of the curves which determine their forms is the same—namely $23^{\circ} 1'$.

None of the angular values of the arcs seem to have been of any special significance, except perhaps the angle at the altar in the great temple, which is subtended by the arc AK. The value of this angle is about 57° , and is equal to our modern unit of the circular measure of an angle, which is the angle at the centre of any circle that is subtended by an arc equal to the radius. It is hardly likely that it can have had this meaning to the builders of the temple, and the probable cause of the coincidence is that at A they meant to halve the angular distance between K and the doorway. Besides, the sun's rays, when it rises at the summer solstice, do not fall directly on the part of the wall beyond A, and this probably had some connection with their reason for changing the radius of the arc at this point.

There is no evidence that any of the trigonometrical functions were known to the builders of Zimbabwe; not even the chord, which was probably the earliest recognised function of an angle, for the chords of the various arcs bear no simple relation to each other. The only interesting mathematical fact which seems to have been embodied in the archi-

texture of the temples is the ratio of diameter to circumference, and it may have had an occult significance in the peculiar form of nature worship which was practised there. We do not suppose that it was intended to symbolise anything of an astronomical nature, and it is extremely improbable that the builders of Zimbabwe had any notion of mathematical astronomy, for their astronomy was purely empirical, and amounted merely to an observation of the more obvious motions of the heavenly bodies. When the minds of men were first interested in geometry it would at once occur to them that there must be some constant ratio between the circumference of a circle and its diameter, and they would easily discover what this ratio was, and they may have considered this discovery so important and significant that they desired to express it in their architecture. Analogous instances of an embodiment of simple mathematical principles in architectural forms will occur to every one.

The centres of the arcs seem generally to have been important points, and altars were sometimes erected at them from which the culminations or meridian transits of stars could be observed, and on which sacrifices were probably offered to the sun when it was rising or setting at either of the solstices.

Around the outside of the wall of the great temple, between the points marked A and B on plan, there extend two bands of a kind of chevron pattern, formed, as will be seen from the illustrations, by placing stones on their edges. This pattern seems to have been

symbolical of fertility, and it extends along the part of the wall which receives directly the rays of the sun when rising at the summer solstice. It reminds one of the Egyptian hieroglyphic symbol for water, and of how naturally the idea of water would be associated with fertility in the mind of a solar worshipper. It also resembles the symbol for the zodiacal sign of Aquarius, and we might suppose that the temple was built when the sun was in this sign of the zodiac at the summer solstice, did such a supposition not carry us back to too remote a period. Besides, the sun is generally believed to have been in Capricornus at the December solstice at the period at which the zodiac was invented, and when its signs received their names.

One hundred and seven and four-fifths feet from A and the same distance from K and from B is the centre of the arc AK, and at this point is some ruined masonry which seems once to have formed an altar. Zimbabwe is in South latitude $20^{\circ} 16' 30''$, and consequently the sun, when rising there at the summer solstice, would bear East 25° South were the horizon level. But Mount Varoma interposes itself between the temple and the rising sun at this time, so that the sun attains an altitude of 5° before its rays reach the temple. Then its amplitude will be more nearly 24° , and a line produced in this direction from the altar will pass across the doorway of the sacred enclosure, where the curve of the wall changes its radius, and, roughly speaking, through the middle

of the chevron pattern. The same line drawn in an opposite direction for seventy-three feet would fall on a tall monolith which we there found lying by its well-built foundation. Where the pattern ends at A and B the rays of the sun are nearly tangential to the wall, so that all parts of the wall, and those parts only, which receive the direct rays of the sun when rising at the summer solstice are decorated by this symbolical pattern.

The sun's rays would not fall on the altar at this time, and it seems strange to have an altar devoted to solar worship under the shadow of a wall; but the same objection would apply to every part of the interior of the temple, and we can hardly suppose that the priests at Zimbabwe performed their ceremonies of worship outside of the temple, as some tribes of Arabs do with some stone circles at the present day, neither is there any sign of such ceremonies having been performed on the top of the broad wall. The monolith, seventy-three feet from the altar, was sufficiently tall to receive the rays of the sun when it rose over Mount Varoma, and the shadow of a monolith erected on the wall at K would fall on it at the same time, thus marking with great accuracy the occurrence of the solstice. Monoliths had been erected at intervals along the decorated part, and only on this part, of the wall, and these may have served to indicate other periods of the year in a similar way.

Near the top of the great tower, which at present

stands thirty-two feet high, there is a dentelle pattern, which may be described as a chevron pattern laid on its side, and which resembles a common Egyptian pattern. This extends partly round the tower, but it is impossible to determine its aspect with accuracy as so much of it has fallen away. It seems, however, to have faced the setting sun at the winter solstice.

At the temple at the east end of the fortress on the hill similar means are provided for observing the summer solstice. Only a small part of the decorated wall remains, the middle part, which was of great height, having fallen, so that we do not know how far the decoration may have extended towards the south. On the other side it terminates at the doorway, which is placed close to the high cliff which forms the northern side of the temple. We discovered the altar, with several phalli and many little terracotta images of the solar disc lying near it, and some among the stones of the altar. This altar is not at the centre of the arc, but is placed ten feet nearer the rising sun at the solstice, and its position seems to be due to the position of the break in the cliff, which is true north of the altar, so that the meridian can be observed through this passage from the altar in its actual position, and it could not have been observed from the altar were it placed at the centre of the arc. It was impossible to describe the arc with the altar as its centre owing to the position of some rocks which would have interfered with the building of the wall. At the summer solstice the sun

rises here on a level horizon and bears East 25° South, and a line drawn from the altar in this direction passes through the pattern, and continued for ten feet in the opposite direction it would fall on the centre of the arc.

The great curved wall at the western end of the fortress, which is surmounted by little round towers and erect monoliths, faces the setting sun at the winter solstice. If we suppose the altar was placed here, we have on an eminence marked A, fifty feet true north of the altar, a tall monolith which would enable the meridian transits of northern stars to be observed from the altar, and a line drawn from this altar towards the setting sun at the winter solstice would seem to have passed through the middle of the line of towers and monoliths. This great wall is not so well built as the walls at the eastern temple, and it seems probable that it is a restoration of an old wall which was originally parallel to this, and whose foundations we discovered as already mentioned. Possibly on the original wall the round towers and monoliths were aligned between the altar and the setting sun at certain definite periods of the year. At present they do not seem to mark any important periods, but the position of the setting sun at the summer solstice is well marked by a round tower on the wall overhanging the high cliff, and this is undoubtedly a wall of the best period.

At this western end of the fortress we have two instances of parts of walls which faced the setting

sun at the winter solstice being decorated by a dentelle pattern.

The disposition of the ornamental patterns on the little round ruin at the Lundi River is interesting. It faces the rising sun at the winter solstice, but the place had been inhabited by Kaffirs, and all vestige of an altar, if it ever existed, had been destroyed. The nature of the patterns here is different from that of those at Zimbabwe. The one near the top of the wall is composed of two rows of little squares alternating with blank spaces, and a little way below this are two rows of a herring-bone pattern. There is a curious rounded protuberance on the outside of the wall, and the herring-bone pattern stops at this point, but the other extends right round to the south-eastern doorway.

This temple is similar in many ways to the partly circular one north-west of the great tower at Zimbabwe. They have both the same diameter and they each have two doorways which are in somewhat similar positions, although the temple at the Lundi is oriented towards the rising sun at the winter solstice, and the other, if it ever had a pattern, would have had it facing the setting sun at this solstice.

The dentelle pattern on the great tower seems to have been oriented towards the setting sun at the winter solstice, and the centre of the partly circular temple at *g* is roughly in a line between the centre of the tower and the sun at this time. When the sun is rising at the summer solstice *g* will be behind the

tower and in the middle of its shadow, in a position analogous to that of the altar behind the arc AK. The direction of the wall at the north-eastern extremity of the arc of which G is the centre is towards the rising sun at the winter solstice, and its inner side points past the centre of the arc AK¹ towards the point of the outer wall which is in a straight line between the altar and the sun when it rises at this solstice. The wall at the other extremity of the arc points to the rising sun at the other solstice.

It is perhaps worthy of remark that the centre of the great tower is distant the length of its own height (42·3 feet) from the solstitial line MK, while the centre of the little tower would be the same distance from a parallel solstitial line drawn from the south-eastern extremity of the arc of which G is the centre; and also that the centres of the great tower and the centres of the arcs AK and KB lie in one straight line.

At Matindela the general aspect of the decorated part of the building is towards the setting sun, but the masonry is so rough in its construction that we need expect little accuracy in orientation. The whole appearance of the place suggests that what exists at present is merely a rough rebuilding of an older structure. What remains of the internal arrangements of the building is very fragmentary, and we could find no trace of an altar. Over the doorway there is a herring-bone pattern facing the setting sun at the summer solstice, and adjoining this on its north

¹ This is not very accurately shown in the small scale plan.

side there is a band of ornament of the dentelle kind with a similar aspect. Above this dentelle pattern there is a loophole in the wall which may have served to pass a ray of light from the setting sun to an altar at some festival. Farther along the wall there is another pattern facing the setting sun at the winter solstice, and on the inside of the wall yet another looking towards the rising sun at the summer solstice. The construction of the doorways at Matindela is remarkable. They have been originally made of considerable width, and then been narrowed very much by square masses of masonry which were built at both sides. The direction of the doorways also seems to have some meaning, for three of them look East 25° North, and four East 25° South, thus corresponding to the direction of the sun rising and setting at the solstices.

At the Mazoe Valley, and to the north-east of Matindela, near Mount Chiburwe, there are well-built ruins of the best period of this style of architecture, but, unfortunately, too little of them remains to allow us to understand their plans. They are both very small, and are not circular, like the Lundi River ruin, but their walls seem to have been built on a series of curves like the wall of the great temple. A very extraordinary thing regarding all the older ruins in Mashonaland is the way in which the stones which once composed the walls have disappeared. They have not been covered up by soil, and there is no trace of them in the surrounding country, and yet in

these two ruins not one-twentieth part of the stones remain, and all that do remain are in their original places in the walls.

When the western wall was rebuilt at the great temple at Zimbabwe there was apparently a want of stones, and the rebuilders were too lazy to procure more, so they probably shortened the wall by decreasing the size of the temple, and also economised stones by making the new wall much less thick.

The place marked A near the western end of Zimbabwe Hill is remarkable. It is a natural eminence, the height of which has been increased by building. To the south of it is a great mass of masonry which is pierced by several roofed passages, and over which a winding stairway leads from the eastern buildings to the eminence, while a similar staircase leads from the eminence towards the buildings lying northward. To the eastward of the eminence tower great granite boulders, the termination at this end of that line of boulders which caps the hill along its whole length, and which protects the fortress on the north side. At the highest point of the eminence is erected the great monolith before referred to, which seems to have marked the meridian for the altar at R. Close to this monolith stood another made of soapstone. We found its base in its place, and its other fragments, shown in the illustration, were all discovered near. This monolith was decorated with bands of the chevron pattern running halfway round, with images of the

sun and other geometrical patterns placed between the bands. It seems probable that it served as a gnomon, and that means had been provided for measuring the length of its shadow at midday. The foundation of the monolith is twenty-five feet higher than the site of the altar, and the monolith itself was ten feet long, so that we have a total height for its summit of thirty-five feet above the base of the altar, and it stood fifty feet true north of the altar. At Zimbabwe the altitude of the upper limb of the sun at midday, at the winter solstice, is about $46\frac{1}{2}^{\circ}$, so that the top of the monolith would then throw its shadow in the direction of the altar, and to within about seventeen feet of its centre. Probably some arrangement had been made near the altar for observing the length of its shadow; and were the shadow received on an inclined plane or staircase, as seems to have been done with the dial of Ahaz, mentioned in the Old Testament, it might be lengthened to any extent and its variations in length increased in magnitude; and so the change in declination of the sun could be observed with considerable accuracy. The sun is little more than three degrees south of Zimbabwe at midsummer, and it would be difficult to measure with accuracy the short shadows then cast, and we do not find anything to show that they had been observed, and the means provided in the two other temples for observing the position of the sun on the horizon would be much more effectual for fixing this solstice.

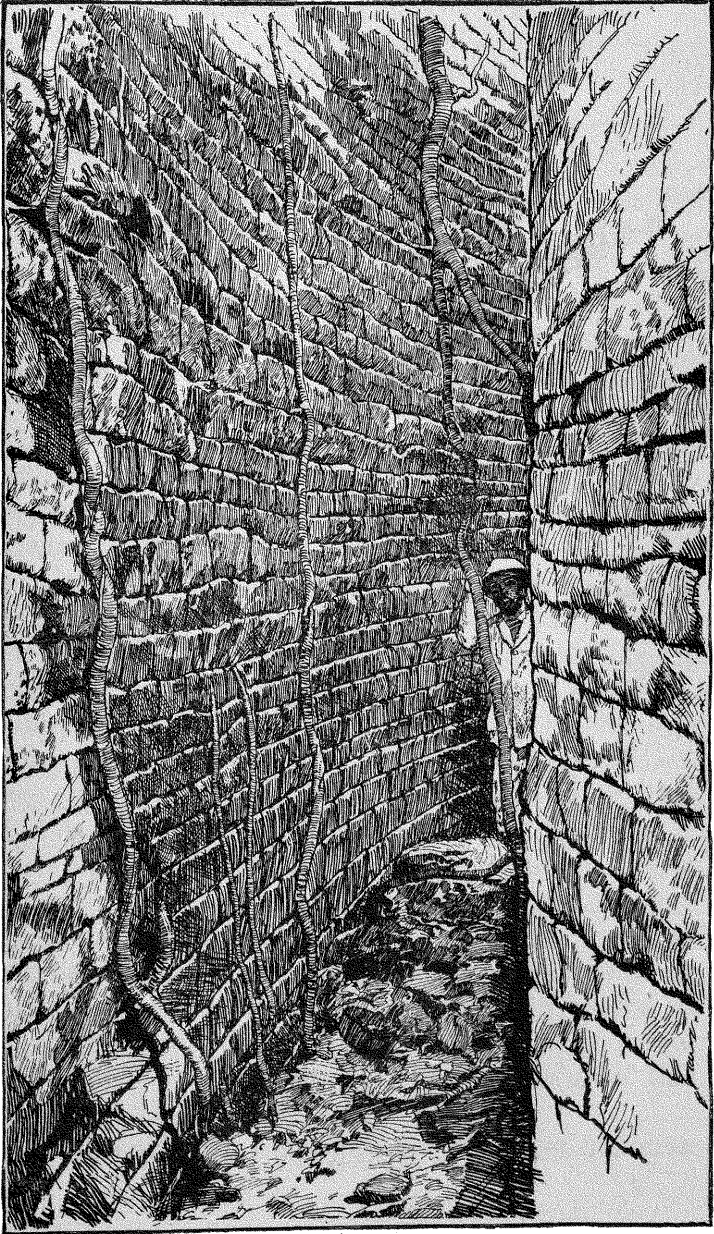
The positions of the doorways relatively to the

altars or the centres of the arcs is of interest; and we find that every important doorway in walls of the original period, with the exception of the south-eastern doorway in the temple at the Lundi, and the south-western one in the partly circular interior temple at Zimbabwe, is placed true north of the centre of an arc or of an altar, and the centre of every arc has had a doorway or some other means of marking out the meridian placed north of it. True north of the centre of the tower itself we have a doorway in the wall of the sacred enclosure, and although the wall in which this doorway is made was probably not built at the original period, yet there probably was a doorway in a similar position in the wall which it has replaced. The part of the great outer wall north of the tower seems also to have been marked, for about this point we found a great step constructed on its top about five feet high.

Above the temple at the east end of the fortress on the hill, a cliff rises perpendicularly for fifty feet, and poised on its top there stands a most remarkable great rock which may once have been an object of veneration to the worshippers in the temple beneath it. It forms one of the highest points on the hill. A line drawn true south from this rock and produced 680 yards would pass through the doorway in the great temple and fall on the altar in the centre of the decorated arc. Until this line suggested itself we were puzzled to account for the peculiar character of the doorway. It passes through a wall sixteen

feet thick, and is itself only three feet wide, and it does not pass through the wall at right angles, but cuts it somewhat obliquely, so that its axis is roughly parallel to the meridian line.

A line drawn true north from the centre of the arc at G will pass through the doorway of the small temple and the centre of the arc KB at P. This line points through the outer wall where the gap occurs, and it is probable that the opening which was made in the outer wall to allow of observation along this line, determined its fall at this point. This meridian line is thirty-six feet distant from the other from the centre of the arc AK, and it must have pointed to the same great stone. But if both these lines point to the middle of this stone, which is 680 yards distant, they will incline towards each other about one degree, and the time of the transit of a star over the stone observed by one line will differ four minutes from that observed by the other. This inaccuracy would be so obvious to the observers that we cannot suppose they would have worked in this way. The great stone measures nearly, if not quite, thirty-two feet across, and were the lines directed, not both to its centre, but one to either side, they would be parallel to each other and would both give the same time for a transit of a star. This would imply that stars were observed, not passing over the stone, but disappearing and reappearing behind it, and a star observed at the altar to disappear would at the same instant reappear to an observer at G and



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P; or if the rock were less than thirty-two feet wide the star would reappear at G and P before it disappeared at the altar. We have thus a sort of double observation of the same meridian transit.

If we admit that these meridian lines were used for the observation of stars in this way, and if we can determine what star or stars were observed, the time that has elapsed since they were observed admits of calculation. The apparent altitude of the middle of the stone as seen from the centres of the arcs is $7\frac{1}{3}^{\circ}$, and the latitude of Zimbabwe is $20^{\circ} 16' 30''$, so that we want stars having a north polar distance of about 28° . Owing to the changing direction of the pole of the earth, which produces the phenomenon of the precession of the equinoxes, the declinations and right ascensions of all the stars are undergoing a slow but regular change; but there are no stars of the first magnitude which have had approximately this polar distance since any probable date of the foundation of Zimbabwe. Of stars of the second magnitude there are four, and of the third magnitude many more, which may have been used, and they would all serve for widely different periods. In order to enable us to select the proper star from this number we must have its right ascension, and this we may yet hope to get when we have the date of some important yearly festival at Zimbabwe, and the hour at which the star would be wanted on the meridian on the night of this festival.

There are two other places where the meridian

transits of stars have been watched at Zimbabwe, and in these cases it is still the same portion of the heavens which has been observed. The altar in the eastern temple in the fortress has been placed ten feet E.S.E. of the centre of the arc, in order to permit of the meridian being observed through the gap in the rock which formed the northern doorway. Here the line laid off is much shorter than that between the rock and the great temple, but still fairly accurate observations could be made. To the north of the centre of the arc of the great wall of the western temple there is, as we have already shown, a great monolith erected, and at one side of this the stars might be observed at their culminations. As seen from the altar this monolith would mark out an angular distance of 9° of the meridian.

It is remarkable that only stars of the northern hemisphere seem to have been observed at Zimbabwe, for in the great temple itself the culminations of southern stars could quite as easily have been observed as those of northern ones, and in the fortress all view of the northern sky is almost completely shut off by the cliffs and huge boulders which form its northern line of defence; yet every point from which northern stars could have been observed has been used for this purpose, and there is no temple there from which northern stars were not observed, while at the same time the openly displayed southern sky has been left unregarded. This, of course, points to a northern origin for the people, and suggests that before they

came to Zimbabwe they had acquired the habit of observing certain stars—a habit so strong that it led them to disregard the use of the southern constellations, though they must have known that they would equally well have served to regulate their calendar; it even seems to indicate that they attached ideas of veneration to certain stars, and rendered them worship. It seems a plausible supposition that while the great temple itself was devoted to solar and analogous forms of worship, the little circular, or partly circular, temples within its walls, of which we found one fairly well preserved and fragmentary remains of several others, were dedicated to the cult of particular stars.

There is no sign in the temples of any observation of anything external to the temples themselves, unless of the heavenly bodies; and no features of the surrounding country, such as prominent mountain-peaks or great isolated rocks, of which there are many striking instances near the temples, have had any regard at all paid to them. The outer walls, with the exception of the decoration towards the solstices, are featureless and blank, and the doorways, where one might expect ornament, are extremely narrow and entirely plain. When one is within the great temple one realises how fitting a place it is in which to observe the starry sky, for the high walls around exclude all view of the landscape, and the only objects which attract one's attention are the heavenly bodies above one; and at night-time one feels how easily the

thoughts of a star-worshipper could be concentrated on their proper object.

It is incredible that such a style of architecture as we have described, and such a civilisation as it signifies, could have originated and developed in South Africa, for such a development would have required a very long time, and would have implied at least a long and peaceful settlement in the country; and although the builders of Zimbabwe may have long possessed the place, yet it is apparent that they never considered the country was their own. This is clear from the nature of their defences and the strength of their fortifications. Had they lived long enough in the land to alter or develop any of their arts independently of their mother country, they would have left a deeper mark on their surroundings than they have; besides, living as they must have lived, they could not have increased in civilisation, nor developed any of its arts, and we may assume that they had their architecture as well as their religion in common with their mother country. The balance of probabilities seems to be in favour of that country being South Arabia; and when it and Abyssinia, with which it was so long associated, are better known, we may find temples which are built of similar small stones and with similar mathematical and other peculiarities in their construction. Our information of these countries is meagre, but some of those buildings which are known in Yemen, which seem to combine temple and fortress in one, as on Zimbabwe Hill,

may have been built by the same race that constructed Zimbabwe; and the elliptic temples at Marib and Sirwah, and the one at Nakab al Hajar, with its north and south doorways seeming to indicate an observation of the meridian, may embody some of the mathematical principles illustrated by the ruins of Mashoualand.

When the original builders of Zimbabwe have been traced to their home, it will remain to discover who were their successors in Mashoualand that rebuilt the western wall of the great temple and some portions of other buildings, for this certainly was not done by any of the present negro races.

There is nothing to show that even these walls do not belong to a now far distant time; for although they would not long remain in this country, yet at Zimbabwe they might endure for an indefinite period, for there, in a clear atmosphere free from dust, and a tropical climate with its yearly torrential rains, no soil can accumulate among the stones to support vegetation which would destroy the walls. The few small plants which grow even on the oldest walls are of species which do not require much mineral matter for their growth, and whose roots are so soft that they mould themselves to the shape of the interstices in the walls, but do not press asunder the stones. Besides, the present inhabitants of the country do not use stone in any of their constructions, and never trouble themselves to remove stones from any existing walls, so that more stones have probably been disturbed

during the two years of British occupation of the country than the Kaffirs would disturb in as many centuries; and under the old conditions the walls might endure for an indefinite time.¹

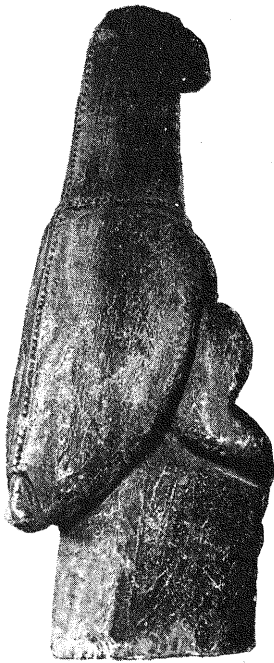
¹ There are many astronomical points in these buildings still to be considered, and the results of further investigation will be published later.

CHAPTER VI

THE FINDS AT THE GREAT ZIMBABWE RUINS

IN this chapter I propose to discuss all the objects discovered during our excavations in the ruins as apart from the buildings themselves, and to analyse the light that they throw on the original constructors and their cult. All these objects were found, with a few minor exceptions, in the eastern temple on the fortress. As I have said, traces of a recent Kaffir habitation will account for the absence of objects in the lower buildings, but the upper ruin, sheltered from the sun and hidden by trees and lofty boulders, was a spot repugnant to the warmth-loving Kaffir, and to this fact we owe the preservation of so many objects of interest belonging to the ancient inhabitants. The most remarkable feature in connection with the finds is that everything of a decorative nature is made of a steatitic schist or soapstone. This stone is found in the country, and is still employed by natives farther south in making pipes for smoking dokha or hemp; it lends itself easily to the tool of the artist, and is very durable.

First, let us take the birds perched on tall soapstone columns, which, from the position in which we found most of them, would appear to have decorated the outer wall of the semicircular temple on the hill. These birds are all conventional in design. The tallest stood 5 feet 4 inches in height, the smallest about half a foot lower. We have six large ones and

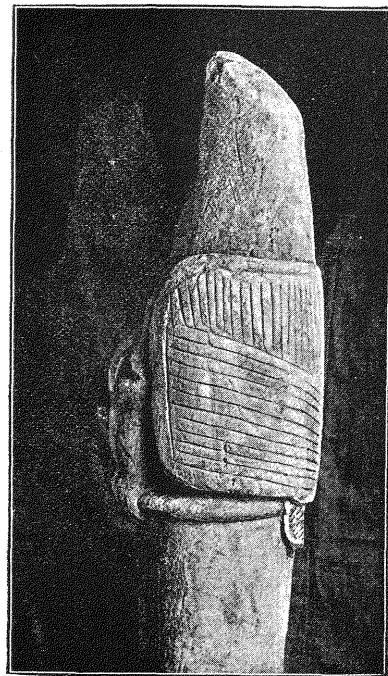
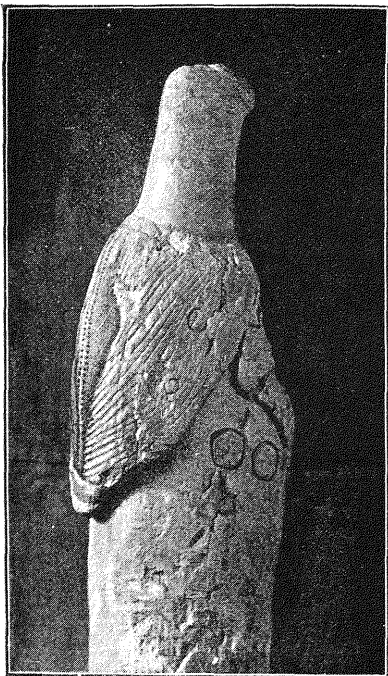


SOAPSTONE BIRD ON PEDESTAL

two small ones in all, and probably, from the number of soapstone pedestals with the tops broken off which we found in the temple, there were several more. Though they are all different in execution, they would appear to have been intended to represent the same bird; from the only one in which the beak¹ is preserved to us intact, we undoubtedly recognise that they must have been intended to represent hawks or vultures. The thick neck and legs, the long talons and the nature of the plumage point more distinctly to the vulture; the decorations on some of them,

namely, the dentelle pattern at the edge of the wings, the necklace with a brooch in front and continued

¹ *Vide* illustration, p. 181.



SOAPSTONE BIRDS ON PEDESTALS. ZIMBABWE

down the back, the raised rosette-shaped eyes, and the pattern down the back, point to a high degree of conventionality, evolved out of some sacred symbolism of which these birds were the embodiment, the nature of which symbolism it is now our object to arrive at. Two of the birds, similar in character,



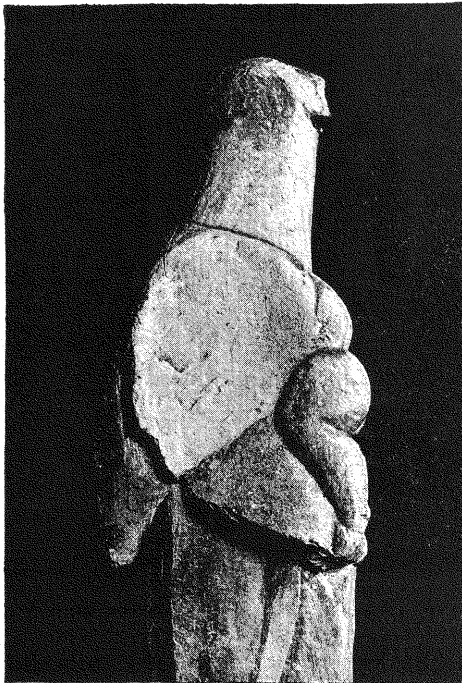
FRONT AND BACK OF A BROKEN SOAPSTONE BIRD ON PEDESTAL

with straight legs and fan-shaped tails different from the others, are represented as perched on zones or cesti; two others have only indications of the cestus beneath their feet; a fifth, with nothing beneath its feet, has two circles carved under it and two on the wings¹; a sixth is perched on a chevron pattern

¹ *Vide* Illustration, p. 181.

similar to that which decorates the large circular temple; hence there is a sort of similarity of symbolism connecting them all.

We have now to look around for comparisons



BIRD ON PEDESTAL

by which we may hope to identify the origin of our birds, and I have little doubt in stating that they are closely akin to the Assyrian Astarte or Venus, and represent the female element in creation. Similar

birds were sacred to Astarte amongst the Phoenicians and are often represented as perched on her shrines.

Of the maternal aspect in which the ancient Egyptians held the vulture we have ample evidence. Horapollo tells us (I. 11) that the vulture was emblematic of 'Urania, a year, a mother,' whilst Ælian goes so far as to suppose that all vultures were females, to account for their character as emblems of maternity. The cesti and the circles point obviously to this, and these birds in connection with phallic worship are interesting as emblems, signifying incubation. Let us now consult Lucian, who in his work 'De Syriâ Deâ' describes a temple at Hierapolis, near the Euphrates, which, as we have seen, has much in common with these temples at Zimbabwe. In § 33, p. 479, he mentions a curious pediment, of no distinctive shape, called by the Assyrians 'the symbol,' on the top of which is perched a bird. Amongst some of Dr. Schliemann's discoveries at Mycene, there are also images surmounted by birds which differ from the ξόανον in the 'De Syriâ Deâ' solely in the fact that they are not shapeless, but represent a nude female figure. The goddess of this shrine was evidently Astarte, and wore a cestus, 'with which none but Urania is adorned.'¹



BIRD ON PEDESTAL
FROM THE ZODIAC
OF DENDERAH

¹ Lucian, *De Syriâ Deâ*, p. 477.

On a Phœnician coin found in Cyprus we have the dove on the betyle or pedestal as the central object.¹ In Egyptian archæology we also come across the bird on the pedestal, more particularly in the curious zodiac of Denderah, where a bird perched on a pillar, and with the crown of Upper Egypt on its head, is, as Mr. Norman Lockyer tells me, used to indicate the commencement of the year; also from the Soudan we have a bird on a pedestal carved on some rude stone fragments now in the Ashmolean Museum. It is just possible that the birds at Zimbabwe had some solstitial meaning, but as their exact position on the temple walls is lost, it is impossible to speak on this point with anything like certainty. Also in the difficult question of early Arabian cult, which was closely bound up with that of Egypt, Assyria, and Phœnicia, we find the vulture as the *totem* of a Southern Arabian tribe at the time of the Himyaritic supremacy, and it was worshipped there as the god Nasr, and is mysteriously alluded to in Himyaritic inscriptions as 'the vulture of the East and the vulture of the West,' which also would seem to point to a solstitial use of the emblem.²

The religious symbolism of these birds is further attested by our finding two tiny representations of the larger emblems; they, too, represented birds on pillars, the longest of which is only three and a half inches, and it is perched on the pillar more as the

¹ Perrot and Chipiez's *Phœnicia*, p. 281.

² Kremer, *Akademie der Wissenschaft*. Wien.

bird is represented in the zodiac of Denderah. Evidently these things were used as amulets or votive offerings in the temple. Lucian alludes to the phalli used as amulets by the Greeks with a human



MINIATURE BIRDS ON PEDESTALS

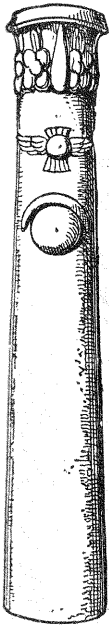
figure on the end, and he connects them with the tower thirty cubits in height.

In the centre of the temple on the hill stood an altar, into the stones of which were inserted and also

scattered around a large number of soapstone objects representing the phallus either realistically or conventionally, but always with anatomical accuracy which

unmistakably conveys their meaning, and proves in addition that circumcision was practised by this primitive race; 'its origin both amongst the

Egyptians and Ethiopians,' says Herodotus, ii. 37, 104, 'may be traced to the most remote antiquity.' We have seen in the previous description of the tower the parallel to Lucian's description of the phalli in the temple at Hierapolis. Here, in the upper temple, we found no less than thirty-eight



PHŒNICIAN COLUMN
IN THE LOUVRE



ORNATE PHALLUS.
ZIMBABWE

miniature representations of the larger emblem; one is a highly ornate object, with apparently a representation of a winged sun on its side, or perchance the winged Egyptian vulture, suggesting a distinct Semitic influence. There is a small marble column in the Louvre, twenty-six inches in height, of Phœnician origin, with a winged symbol on the shaft like the one

before us ; it is crowned by an ornament made of four petalled flowers. This winged globe is met with in many Phœnician objects, and MM. Perrot and Chipiez, in their work on Phœnicia, thus speak of it as 'a sort of trade-mark by which we can recognise as Phœnician all such objects as bear it, whether they come from Etruria or Sardinia, from Africa or Syria.' And of the stele in the Louvre the same authors say, 'We may say that it is signed.' A carefully executed rosette with seven petals forms the summit of our object found in the temple. Now the rosette is also another distinctly Phœnician symbol used by them to indicate the sun. We have the rosette on Phœnician sepulchral stelæ in the British Museum in conjunction with the half-moon to indicate the heavenly luminaries, and here at Zimbabwe we have this object surmounted by a rosette, rosettes carved on the decorated pillars, and the eyes of the birds, as before mentioned, are made in the form of rosettes. The fact of finding these objects all in close juxtaposition around the altar and in the vicinity of the birds on pillars is sufficient proof of the nature of the objects and their religious symbolism. Thus we have in both cases the larger emblems and their miniature representatives, the tower and the smaller phalli, the large birds and the tiny amulets, proving to us that the ancient inhabitants of the ruins worshipped a combination of the two deities, which together represented the creative powers of mankind.

A curious confirmation of this is found in the



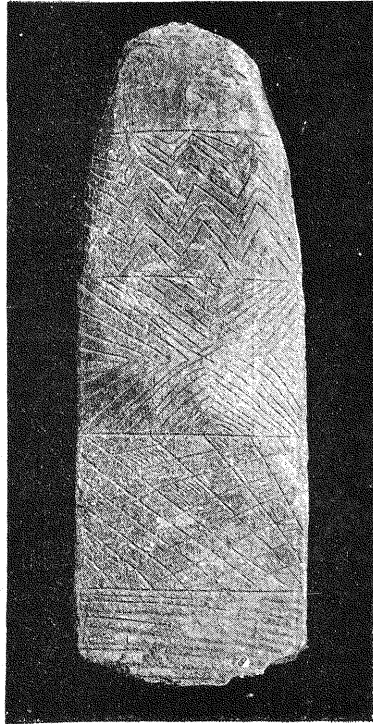
LONG DECORATED
SOAPSTONE BEAM
IN TWO PIECES

pages of Herodotus, who tells us¹: 'The Arabians of all the gods only worshipped Dionysus, whom they called Ourotalt, and Urania;' that is to say, they worshipped the two deities which, in the mind of the father of history, represented in themselves all that was known of the mysteries of creation, pointing to the very earliest period of Arabian cult, prior to the more refined religious development of the Sabæo-Himyaritic dynasty, when Sun-worship, veneration for the great luminary which regenerated all animal and vegetable life, superseded the grosser forms of nature-worship, to be itself somewhat superseded or rather incorporated in a worship of all the heavenly lumi-

¹ *Herod.* Bk. III. § 8.

naries, which developed as a knowledge of astronomy was acquired.

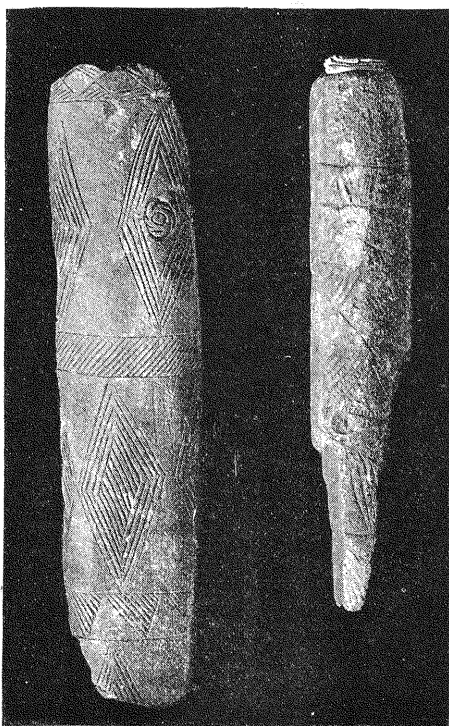
We have already discussed the round towers and the numerous monoliths which decorated the walls and other parts of the Zimbabwe ruins; excavation yielded further examples of the veneration for stones amongst the early inhabitants. One of these was a tall decorated soapstone pillar 11 feet 6 inches in height, which stood on the platform already alluded to, and acted as a centre to a group of monoliths; the base of this pillar we found *in situ*, the rest had been broken off and appropriated by a Kaffir to decorate



DECORATED SOAPSTONE BEAM

a wall; it was worked with bands of geometric patterns around it, each different from the other and divided into compartments by circular patterns, one of which is the chevron pattern found on the circular

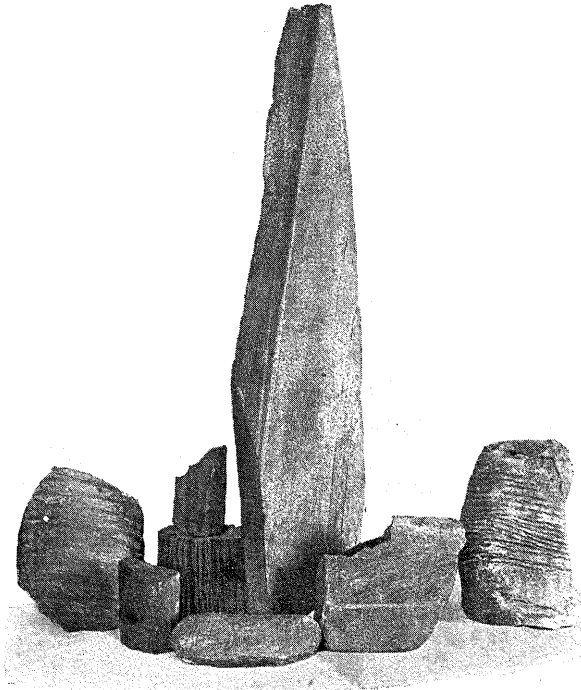
ruin below ; it only runs round a portion of the pillar ; and may possibly have been used to orient it towards the setting sun. Besides this tall pillar we found two



DECORATED SOAPSTONE BEAMS

fragments of other similar pillars decorated one with geometric patterns and the other with an extraordinary and entirely inexplicable decoration. On these pillars the rosette is frequently depicted, and it

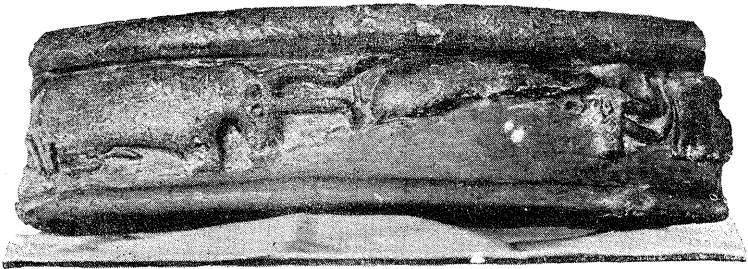
would seem that they all came from the same place, namely, the platform decorated with monoliths. Here also we found several stones of a curious nature



COLLECTION OF STRANGE STONES

and entirely foreign to the place. Two of them are stones with even bands of an asbestiform substance, a serpentine with veins of chrysolite, the grooves being caused by the natural erosion of the fibrous

bands. Another stone is an irregular polygonal pillar-like object of coarse-grained basalt, the smooth faces of which are natural points, the whole being a portion of a rough column or prism. Another, again, is a fragment of schistose rock, apparently hornblendic; also we found several round blocks of diorite in this place. The collection here of so many strange geological fragments cannot be accidental, and points to a veneration of curious-shaped stones amongst the



FRAGMENT OF BOWL WITH PROCESSION OF BULLS

earlier inhabitants of the ruins, which were collected here on the platform, a spot which, I am convinced, will compare with the *βαιύλια* or betyles of the Phœnicians, and of this stone cult we have ample evidence from Arabia. El Masoudi alludes to the ancient stone-worship of Arabia, and leads us to believe that at one time this gross fetichism formed a part of the natural religion of the Semitic races. Marinus of Tyre says they honoured as a god a great cut stone. Euthymius Zygabenus

further tells us that apparently 'this stone was the head of Aphrodite, which the Ishmaelites formerly worshipped, and it is called Bakka Ismak;' also, he adds, 'they have certain stone statues erected in the centre of their houses, round which they danced till they fell from giddiness; but when the Saracens were converted to Christianity they were obliged to anathematise this stone, which formerly they worshipped.'¹ Herr Kremer, in his account of the ancient cult of Arabia, makes frequent allusions to the stone-worship. In the town of Taif a great unformed stone block was worshipped, identical with the goddess which Herodotus calls Urania; and one must imagine that the Kaaba stone at Mecca resembles the black schistose block which we found at Zimbabwe; it is an exceedingly old-world worship, dating back to the most primitive ages of mankind.

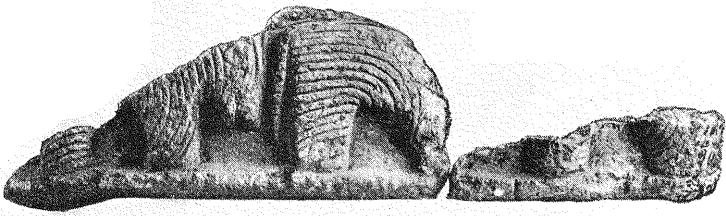
The next series of finds to be discussed are the numerous frag-



FRAGMENT OF BOWL WITH HUNTING SCENE

¹ *Akademie der Wissenschaft.* Wien, 1890.

ments of decorated and plain soapstone bowls which we found, most of them deeply buried in the immediate vicinity of the temple on the fortress; and these bring us to consider more closely the artistic capacities of the race who originally inhabited these ruins. The work displayed in executing these bowls, the careful rounding of the edges, the exact execution of the circle, the fine pointed tool-marks, and the subjects they chose to depict, point to the race having been far advanced in artistic skill—a skill arrived at, doubtless, by commercial in-

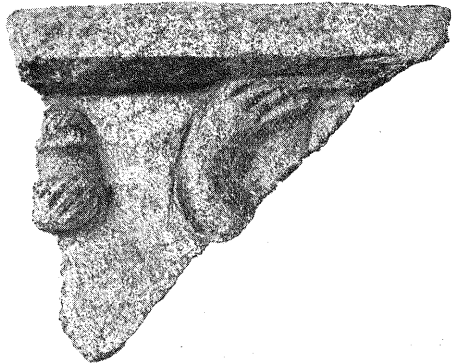


BOWL WITH ZEBRAS

tercourse with the more civilised races of mankind. Seven of these bowls were of exactly the same size, and were 19·2 inches in diameter,¹ which measurements we ascertained by taking the radii of the several fragments. The most elaborate of these fragments is a bowl which had depicted around its outer edge a hunting scene; it is very well worked, and bears in several points a remarkable similarity to objects of art produced by the Phœnicians. There is here, as we have in all Phœnician pat-

¹ Equal to two Egyptian spans of 9·58 inches.

terns, the straight procession of animals, to break the continuity of which a little man is introduced shooting a zebra with one hand and holding in the other an animal by a leash. To fill up a vacant space, a bird is introduced flying, all of which points are characteristic of Phœnician work. Then the Phœnician workmen always had a great power of adaptability, taking their lessons in art from their immediate surroundings, which is noticeable all over the world, whether in Greece, Egypt, Africa, or Italy. Here we have the same characteristic, namely, a procession of native African animals treated in a Phœnician style—three zebras, two hippopotami, and the sportsman in the centre is obviously a Hottentot. The details



FRAGMENT OF SOAPSTONE BOWL WITH PROCESSION

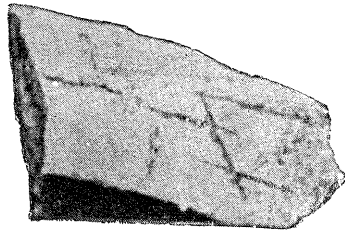
in this bowl are carefully brought out, even the breath of the animals is depicted by three strokes at the mouth. There is also a fragment of another bowl with zebras on it similarly treated, though somewhat higher and coarser. The fragments of a large bowl, which had a procession of bulls

round it, is also Phœnician in character.¹ The most noticeable feature in the treatment of these bulls is that the three pairs of horns we have preserved to us are all different.

There are three fragments of three very large bowls, which are all of a special interest, and if the bowls could have been recovered intact they would have formed very valuable evidence. Search, however, as we would, we never found more of these bowls,



FRAGMENT OF SOAPSTONE BOWL
WITH EAR OF CORN

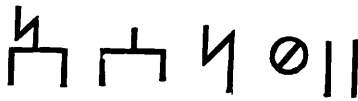


FRAGMENT WITH LETTERING
ON IT

and therefore must be content with what we have. The first of these represents on its side a small portion of what must have been a religious procession; of this we have only a hand holding a pot or censer containing an offering in it, and an arm of another figure with a portion of the back of the head with the hair drawn off it in folds. Representations of a similar nature are to be found in the religious functions of many Semitic races, and it is much to be regretted that we have not more of it for our study.

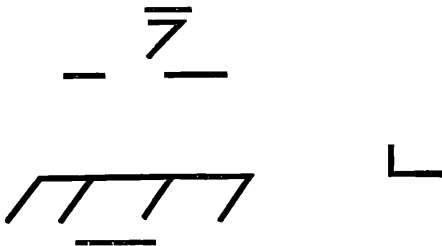
¹ *Vide* illustration, p. 194.

The second fragment has an elaborate design upon it, taken from the vegetable world, probably an ear of corn ; it was evidently around the lip of the bowl and not at the side ; it is a very good piece of workmanship, and of a soapstone of brighter green than that



LETTERS FROM PROTO-ARABIAN ALPHABET

employed in the other articles. The third fragment is perhaps the most tantalising of all ; it is a fragment of the lip of another large bowl which must have been more than two feet in diameter, and around which apparently an inscription ran. The lettering is pro-



LETTERS ON A ROCK IN BECHUANALAND, COPIED BY
MR. A. A. ANDERSON

vokingly fragmentary, but still there can be no doubt that it is an attempt at writing in some form : the straight line down the middle, the sloping lines on either side recall some system of tally, and the straightness of the lettering compares curiously with the