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The Ruins in Mashonaland

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Haddington rises in successive volcanic terraces. Captain Larsen, of the Norwegian ship *Jasen*, landed on the island to the north of Snow Hill, which may be called Seymore Island, and obtained there a number of fossils—specimens of which are now in the hands of Prof. James Geikie. They are mostly jurassic forms. Captain Larsen reports that he found no traces of vegetation there, the surface being formed of volcanic *débris* and numbers of these fossils.

One more note with regard to land. We were not in a position to see the land described by Mr. Bruce as lying to the south-west of Cape Lockyer, but Captain Larsen reports having seen land in the same place. I am inclined to think that this is the eastern shore of Graham's Land, that is to say, part of the mainland or continent itself. The probability is that the rest of the land seen forms a group of islands lying to the north of this mainland.

Ross did not reach the latitude of 65° on this meridian, being stuck in pack-ice lying off Cape Lockyer. My impression is that round this cape is a complex series of currents, which collects pack-ice and so forms a barrier impenetrable by any ship without steam. Two of the steamers—the *Diana* and the *Jasen*—worked through this and approached nearly to the 65^{th} parallel. They both report that they could easily have gone further had they seen any advantage to be gained from it, there being plenty of water-channels through the ice. This was in the end of January, or beginning of February, a short time after a long-continued southerly gale, and it is interesting to note that the pack met with by them at this time was wholly composed of sheets of thin bay ice. Out to the eastward lay a continuation of the long chain of bergs to which I referred before.

An expedition composed of two ships devoted solely to scientific pursuits could do an immense amount of work here. I have talked this matter over with various men interested in whaling, and have come to the conclusion that such an expedition could be undertaken for one season at the very small expense of £4000 for each ship. It is useless to trust to the sealers for exploring purposes, for as long as they can fill their ships with blubber in latitude 64° they will never penetrate to 65° .

THE RUINS IN MASHONALAND.

MR. SWAN has made several discoveries of fresh ruins on his way up to Fort Victoria, and writes as follows to Mr. Theodore Bent:—

July 13th, 1893.—At the Lotsani I found one set by the side of the road and about $\frac{3}{4}$ mile from the drift, and about 200 yards from the Limpopo. Another set was nearer the Limpopo and the drift. Besides these I found several shapeless heaps of stones. I was delighted

to see that they were of the Zimbabwe period, although the workmanship was not quite so good as at the great temple. The courses were fairly regular, and the battering back of each successive course and the rounding of the ends of the walls were very cleverly done. The walls were built on circular curves, and of the same gneissose granite as Zimbabwe. The doorways had places for stakes. I found that the length of the radius was equal to the diameter of the Lundi temple, or the circumference of the great tower. I then proceeded to orientate the temple. The sun was nearly set. I sat on the centre of the arc, and was delighted to find that the sun descended nearly in a line with the main doorway. I then recollected that the winter solstice was only seventeen days past, and on allowing for the difference in the sun's declination for that time, I found that a line from the centre of the arc through the middle of the doorway pointed exactly to the sun's centre when it set at the winter solstice. The other ruin is also orientated to the setting sun.

July 16th, 1893.—I found two ruins and several heaps of fallen stones on the left bank of the Lotsani River at its junction with the Limpopo, both built in the same style as Zimbabwe. Having but little time, I devoted myself entirely to the smaller of the two, and found that the sun, when setting at the winter solstice, would shine through the middle of one of the doorways on the centre of the arc. This, I fancy, places our theories regarding orientation and geometrical construction beyond a doubt.

August 7th, 1893.—I have a really splendid bagful of ruins. At the Lotsani there were two (which I have already described), in the Lipokole Hills two, near Semalali four, and one actually within 300 yards of the mess-room at Maclutsie. I am going to see one on a ridge above the Makalanga village, up the Shashi, which you visited with Captain Nisbet. I also hear of one lot on the Ipagi River, this making a dozen in all. I was able to fix the radii of two curves of the one at Maclutsie, and of four curves near Semalali, and they are all constructed on the Zimbabwe plan. The two on the Lipokole Hills are fortresses, and are not built on the plans of the temples. The temples generally seem to consist of two curves only, and are in half-moon shape, and seem never to have been complete enclosures. I have not been able to settle the orientation of any of them yet. I shall send plans later. Although all these temples are built of very rough stones, no good ones being obtainable, yet the curves are extremely well executed, and are generally true in their whole length to within one or two inches.

I made some excavations in a small tumulus at the great ruin near Semalali. The tumulus consisted of wood-ashes, stones, soil, and much pottery and bones. I found the little sun images of terra-cotta, and some fragments of *very fine* pottery. Some pieces were peculiar in shape. One, not a very fine piece, had curious decorations on a *concave*

part. Another was a very curious nozzle of a jar, and another had one of those holes for suspension like the Antiparos pots. I also got a fragment of an ivory bracelet (plain).

September 5th.—Near the 'Msingwani River are seven lots of ruins, and of these at least three were by the Zimbabwe people. I measured the radii of three curves here—17: 17, 27, and 27 feet respectively, and they were laid off with wonderful accuracy.

The ruin at the Lundi River, which we did not measure accurately on our way up, is also very interesting. One door is to the north, and the other 128° and a fraction from it; so that the line from the centre to the sun rising at midwinter bisects the arc between the doorways. If one could measure the circumference of this arc with sufficient accuracy, we could deduce the obliquity of the ecliptic when the temple was built. I made an attempt, and arrived at about 2000 B.C.; but really it is impossible to measure with sufficient accuracy to arrive at anything definite by this method, although from it we may get useful corroborative evidence.

September 8th.—I hope to spend two days and a night at Zimbabwe.

Major Sir John C. Willoughby has written a short record* of five weeks' work at the Mashonaland ruins in continuation of that done by myself in 1891. A few additional objects have been found, but in the list of things found, which Sir John places at the end of his pamphlet, I see hardly anything except duplicates of those found by me. One object, however, may be of use in considering the question of the original constructors of these ruins, which Sir John describes as "a piece of copper about six inches in length, a quarter of an inch wide, and an eighth of an inch thick, covered with a green substance (whether enamel, paint or lacquer, I am unable to determine) and inlaid with one of the triangular Zimbabwe designs." Also some very fine pottery was discovered and crucibles with specks of gold in them, similar to those found by me. Sir John objects to Mr. Swan's theories respecting the construction of the temples, but, as he says, "Mr. Swan has chiefly based his theory of the orientation of the temple" on the existence of a hole in the wall, he shows that he has not grasped the point at all. The said hole in the wall had nothing whatever to do with Mr. Swan's theories, but was the basis of an entirely subsidiary theory, which from want of data to go upon was abandoned. Mr. Swan writes that on his journey up to Victoria he has measured no less than twelve ruins, and since they all agree with his theory respecting the orientation and curves of the great Zimbabwe ruin, all doubt is removed from his mind concerning their accuracy. Sir John attacks me on a few points connected with the natives,

* 'Further Excavations at Zimbabwe,' by Major Sir John Willoughby. Philip & Son.

but again he appears to have read my statements inaccurately. "Mr. Bent," says Sir John, "refers to the word *piccanini* as a term of native origin . . . *piccanini* is not a term proper to the native dialects, but one which was introduced by the white man and adopted by the native." On the contrary, I say ('Ruined Cities of Mashonaland,' p. 58), "Anything small they term *piccanini*; the word is universal and points to intercourse with other continents." Again Sir John quarrels with me because I call *Muali* a god, whereas Sir John says "it is a spirit." The solution of this disputed point had perhaps better be referred to the missionaries. Sir John also disputes the altitude of Fort Victoria as given by Mr. Swan, preferring the value 3600 feet to 3200 feet. Mr. Swan writes that he confidently hopes to do some more work at the ruins after the present troubles are over and the rainy season past.

J. THEODORE BENT.

FORMOSA.

A FOREIGN Office Report (Commercial No. 11 (1893)), "On the Island of Formosa, with special references to its Resources and Trade," has been written by Mr. Hosie. It is a document of very great value geographically and commercially, dealing with the island as a whole; and it reaches us together with a series of photographs of native types, and a new map of Formosa.

The island is now an independent province of the Chinese Empire, the governor being directly responsible to the central government. The governor resides at Tai-pei Fu, in the north, and the island is divided into three prefectures—those of the north (Tai-pei Fu), south (Tai-nan Fu), and centre (Tai-wan Fu). The railway which was commenced some years ago with the intention of connecting the western part of the island with the port of Kelung, on the north-east, has never been actually open along its whole length, but it is being pushed towards the south, where there are prospects of a better return, and the new administration of the province is pursuing a wise and economical industrial policy.

Data are still wanting to construct a complete physical geography of the island; the composition of the high axial range which runs from north to south and culminates in Mount Sylvia (11,300 feet) and Mount Morrison (12,850 feet) is still unknown. Throughout the island there are immense carboniferous deposits. At some remote period, the plain in which Tai-pei lies was the bottom of a lake, until the pressure of the water burst the barrier of the three connected spurs of the Ta-tung Shan and Kuan-zin Shan, which rise to a height of from 1700 feet to 2800 feet. Artesian wells have been sunk in this plain to a depth of 200 feet, through strata of clay, sand, shells, and gravel. In the north-east of