Ancient Pakistan, Vol. XIV

Black Chert Source Identified at Nammal Gorge, Salt Range

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Introduction

In November of 2000 the authors of this report conducted a period of collaborative fieldwork in order to identify rock and mineral resources from the Salt Range in Punjab, Pakistan, that might have been utilized at the prehistoric site of Harappa (ca. 3300 to 1700 BC), over 200 kilometres to the south. Although a full report is forthcoming (Law and Baqri *in preparation*), we are taking this opportunity to describe a source of black chert suitable for tool production that has been identified in an Eocene limestone locally called as Sakesar Limestone exposed at Nammal Gorge in the Western Salt Range. We believe that this material is the same chert that is characteristic of Kot Diji Period (2800-2600 BC) levels at Harappa.

Most of the chert found at Harappa during the Mature Harappan Period (2600-1900 BC) is thought to have come from the lenticular beds of brown-grey chert found in the Rohri Hills of Sindh (Kenoyer 1995: Figure 6). Indeed, the identification of numerous quarries and knapping areas suggests that chert tools were produced in the Rohri Hills on an industrial scale during the Harappan period (Biagi and Cremaschi 1991). However, prior to 2600 BC several different varieties of chert are present at Harappa indicating that other sources were also utilized during that time. Black chert is one such variety and has been used in the past at Harappa as an indicator of Early Harappan (Kot Diji period, 2800-2600 BC) levels (Dales and Kenoyer 1991). Black cherts are known to occur in Baluchistan (Aubrey *et al*. 1988) and, uptil now, material of this type found at Harappa was thought to have originated from there (Kenoyer *personal communication*).

Sakesar Chert in Nammal Gorge

During our field studies chert was observed and collected from several different formations throughout the Salt Range such as Jutana Dolomite (Cambrian age), Amb, Wargal, Chiddru Formation (Permian age) and the Namal and Sakesar Formations of Eocene age. Amb Formation and Sakesar Limestone display abundant chert nodules and lenticular beds as compared to other lithological rock units. The Amb formation occurs only in the central and western salt range while the Sakesar Limestone is exposed throughout the eastern, central and western salt range. The colour of the cherts found in the Amb Formation is mostly light brown, greenish brown, greyish brown and brownish grey. The colour of the cherts observed in Sakesar Limestone is mostly brownish grey to dark black and appears to be the most prospective horizon for black cherts. All of the cherts from the east and central portions of the range were highly fractured in nature and would have been completely unsuitable for tool making purposes. However, in the western portion of the range, unfractured chert nodules were found in Sakesar limestone. Sakesar limestone runs the length of the Salt Range (Figure 1) but thickens rapidly in the west where chert is located in the upper portion of the formation (Gee 1980). Nodules ranging from 3 to 75 cm were observed in Nammal Gorge near the modern town of Musa Khel (Figure 2). Although nodules on weathered limestone surfaces and those that had fallen into the streambed were fractured, nodules from relatively fresh exposures of limestone were unfractured (Figure 3). Ten nodules from a fresh exposure above Nammal Dam were collected for further study. Experimental knapping at the Harappa Archaeological Research Project's field laboratory confirmed that this chert was excellent blade tool material (Kenoyer *personal communication*).

Using a Munsell Rock-Colour Chart the Sakesar chert of Nammal Gorge can be characterised as follows: The darkest varieties range in colour from N1 Black to 5 YR 2/1 Brownish Grey. Some of the nodules are of this uniform dark colour throughout, while others lighten towards the centre becoming N5 Medium Grey to 5 YR 4/1 Medium Grey. The cortex of most nodules tends to be 5 Y 8/1 Yellowish Grey in colour. Freshly flaked surfaces have a matt-like quality and overall the chert tends to be fairly opaque even along thinly chipped edges.

Evidence for Nammal Gorge as a Source for Black Chert

The following observations lead us to believe that 1) Sakesar chert was procured from Nammal Gorge during the prehistoric period and 2) that Nammal could potentially be the source of the black chert found in early levels at Harappa.

First, numerous broken but unfractured chert nodules, along with flakes and an apparent tool perform (Figure 4), were found concentrated in a broad area of Nammal Gorge nearly two kilometres downstream from the Sakesar formation (Figure 2). Very little black chert was found between these two locations and the unfractured nature of the material indicates that it was not carried by water through the streambed to its present location. We suggest that the wide flat area where these materials are concentrated might have been the location of a processing station of some kind where chert nodules were reduced into tool preforms before being transported out of the gorge.

Our second observation comes from the archaeological site of Nan Sultan, the local name of the mound first reported by A.H. Dani (1970-71:32) near the town of Musa Khel, District Mianwali, Punjab. The mound clearly contains material from both the Kot Diji and Mature Harappan periods and is located 3½ kilometres southwest of the entrance to Nammal Gorge (Figure 2). All of the lithic materials observed on the site's surface were attributable to local Salt Range sources. Among these materials were found numerous examples (Figure 5) of Sakesar chert in the form of flakes, blade fragments, and blade cores. The colour ranges of these chert artefacts, including the cortex where it could be seen, were visually identical to those of nodules collected in Nammal Gorge.

Discussion

The two observations above indicate that black Sakesar chert was being procured from Nammal Gorge and utilized, at least on a local scale, during the Kot Diji and Harappan periods. That Sakesar chert may have been traded more widely is suggested by the fact that the mound at Musa Khel, as well as other Kot Dijian sites found in the vicinity of the Salt Range (Dar 2001), are located along the natural route between Harappa and Sarai Khola, the northernmost known site of the Kot Diji phenomenon. This visually distinctive material, as well as other rock and mineral resources from the Salt Range such as alabaster, and salt (Law and Baqri *in preparation*), could have easily been traded along this route to consumers at sites to the north or south. The black chert from pre-2600 BC levels at Harappa is visually identical to that found in Sakesar limestone.

The Nammal Gorge source is not the only location where black chert can be found in the region, it is just the one closest to a known prehistoric period site. Fatmi (1973:47) noted abundant chert nodules in the Sakesar limestone near Mari Indus. The Sakesar limestone continues to thicken, with its chert lenses correspondingly increasing in number, as the formation appears west of the Indus in the Surghar Range (Shah 1977:80). Nodule fragments collected from Chichali Nala in the Surghar Range are identical in color and texture to those of Sakesar chert from Nammal Gorge. It

should be noted, however, that other varieties of chert are present in the Sakesar formation. Whole nodules and fragments of light-grey to white chert were observed eroding from the Sakesar Limestone in Buri Khel nala, 20 km northwest of Nammal Gorge. Examples of this variety were also observed on the surface at Nan Sultan and have been reported from the site of Kallu Walla Der (attributed to the Kot Diji Period) on the northern side of the Salt Range (Dar 2001).

Black chert artefacts identical to the Sakesar variety are present in abundance in the surface collections from sites in the Gomal Plain kept at the Peshawar University Museum of Archaeology and Ethnology and in published site-reports. From Rehman Dheri numerous examples of trimming flakes with cortex (Figure 6) suggest that Sakesar chert nodules were transported to that site in whole form and then processed there. Black chert resembling the Sakesar variety have also been identified at Hisam Dheri and at the late Neolithic/early Chalcolithic site of Jhandi Babar 1. The site report from Gumla notes the presence black chert artefacts from Periods 1, 2, and 3 (Dani 1970-71:98-100). Black chert cores and scrapers were also found at Hathala (*ibid*:101). Based on this evidence it appears that the inhabitants of these and other Kot Diji Period and earlier sites in the region might well have obtained black chert from the Western Salt Range.

Or they might have been getting it from Baluchistan. Although black chert artefacts from Harappa and Gomal Plain sites much more closely resemble Sakesar Chert than they do black varieties from Baluchistan, visual comparison alone is insufficient to differentiate chert sources (Luedtke 1979). Petrographic and geochemical studies comparing black cherts from Baluchistan with those of the Salt Range are in the planning stages. However, the identification of this source at Nammal Gorge, the clear evidence of its local exploitation at Nan Sultan, and its apparent presence at Harappa and Gomal Plain sites does raise the possibility that the Western Salt Range was an important alternate source of chert to sites in the northern Indus Valley region prior to the Mature Harappan period.

Acknowledgements

The authors would like to gratefully acknowledge the support of the United States Educational Foundation in Pakistan, the Harappa Archaeological Research Project, the Pakistan Museum of Natural History, the Pakistan Science Foundation and the Department of Archaeology, University of Peshawar, and its Sir Sahibzada Abdul Qayyum Museum of Archaeology and Ethnology.

Bibliographic References

Aubry, T., Z. Ahmed, and M. K. Baloch, 1988, "A Preliminary Study of Cherts from Balochistan." *Acta Mineralogica Pakistanica*, Vol. 4: 102-112.

Biagi, P. and M. Cremaschi, 1991, "The Harappan Flint Quarries of the Rohri Hills (Sind-Pakistan). *Antiquity*, 65(246): 97-102.

Dales, G.F. and J.M. Kenoyer, 1991, "Summaries of Five Seasons of Research at Harappa (District Sahiwal, Punjab, Pakistan) 1986-1990." In *Harappa Excavations 1986-1990* New Delhi, Oxford & IBH Co. Pvt. Ltd.

Dani, A.H., 1970-71, "Excavations in the Gomal Valley." *Ancient Pakistan*, Vol. V, 1-177.

Dar, S.R., 2001, "Antiquity of the Salt Range: Pre- and Early Harappan Evidence." Paper for the *International Colloquium on Indus Valley Civilization, April 6th – 8th 2001, Islamabad.*

Fatmi, A.N., 1973, "Lithostratigraphic Units of the Kohat-Potwar Province, Indus Basin, Pakistan." Memoirs of the Geological Survey of Pakistan Vol. 10.

Gee, E.R., 1980, "Punjab Geologic Map Series Volume IV (Salt Range)." Geological Survey of Pakistan–Quetta.

Kenoyer, J. M., 1995, "Interaction Systems, Specialized Crafts and Culture Change: The Indus Valley Tradition and the Indo-Gangetic Tradition in South Asia." In *The Indo-Aryans of Ancient South Asia: Language, Material Culture and Ethnicity*, edited by G. Erdosy, pp. 213-257. Berlin, W. DeGruyter.

Law, R, and S. Baqri, (in preparation), "Rock and Mineral Resources from the Salt Range and Kirana Hills during the Prehistoric Period."

Luedtke, B., 1979, "The Identification of Sources of Chert Artifacts." *American Antiquity*, 44(4): 744-757.

Shah, S.M.I., Ed., 1977, *Stratigraphy of Pakistan*. Geological Survey of Pakistan–Quetta.

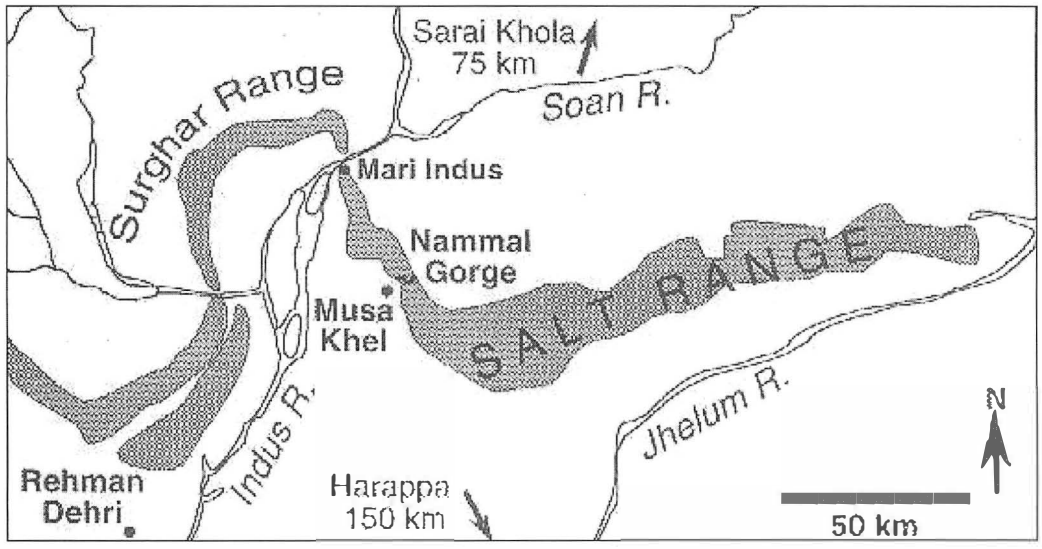

Fig 1: Northern Indus Valley Basin.

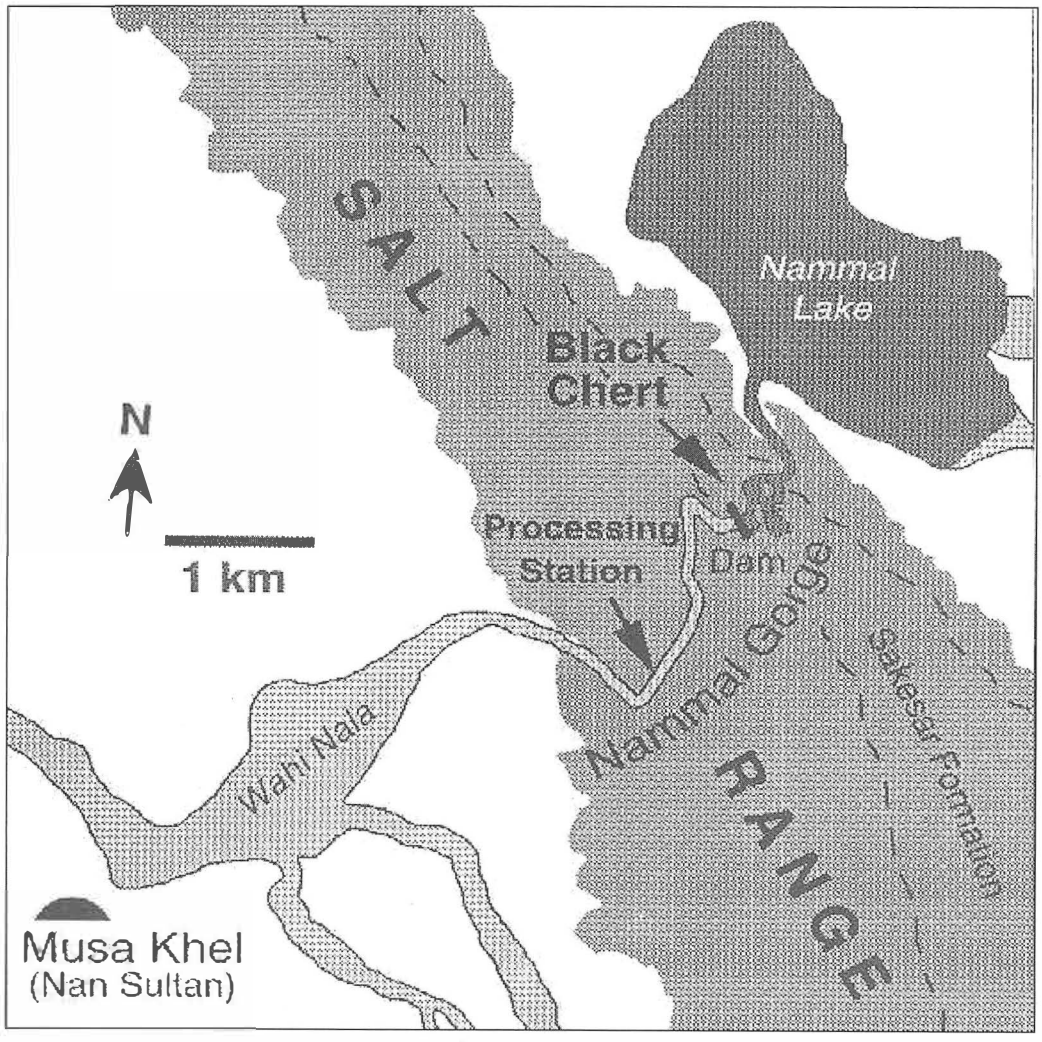

Fig 2: Musa Khel and Nammal Gorge Area.

Fig 3: Nodules of Black Chert in the Sakesar Limestone
Above Nammal Dam.

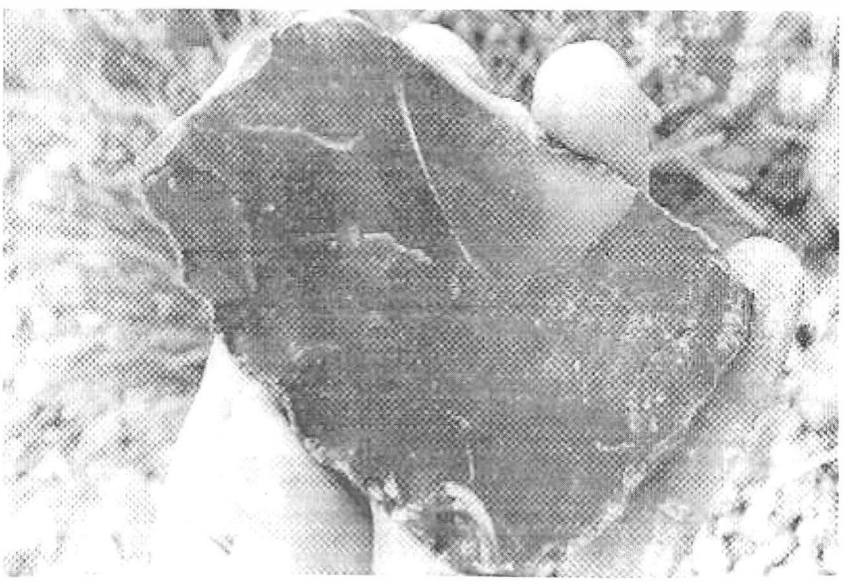

Fig 4: Tool preform found in nala two kilometers downstream
from Sakesar Formation, Nammal Gorge.

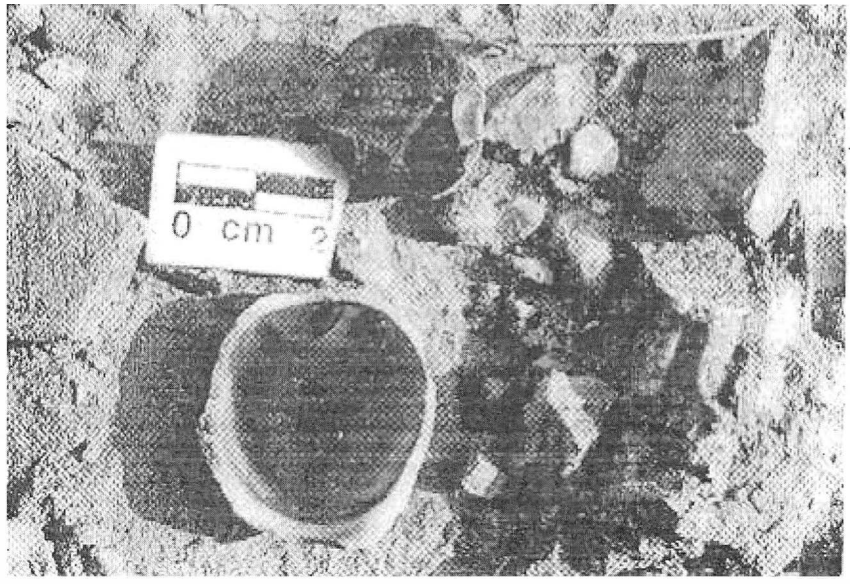

Fig 5: Flakes and cores of Sakesar Chert on the surface of the mound at Musa Khel, 4 kilometers from Nammal Gorge.

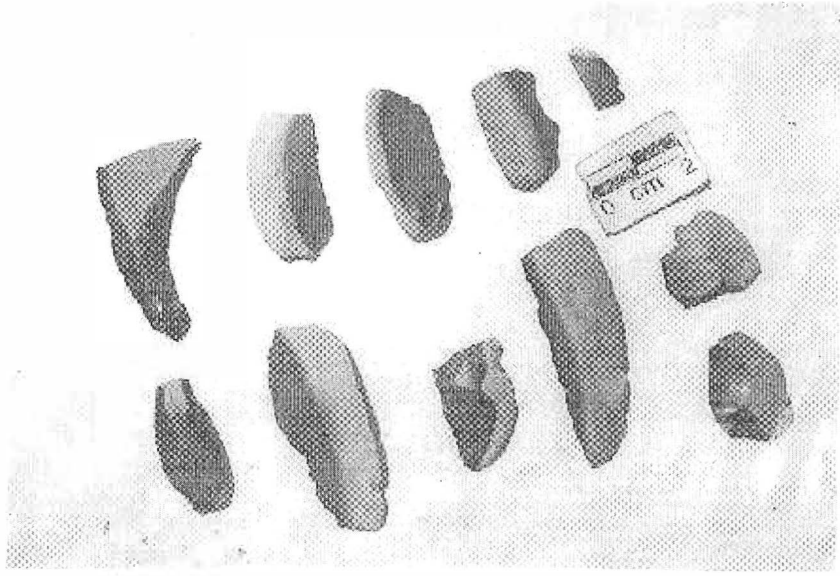

Fig 6: Nodule trimming flakes. Rehman Dheri surface collection.