

# Ladies in Red – mining and use of red pigment by Himba women in Northwestern Namibia

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## Zusammenfassung

Der halbnomadische Stamm der Himba in Nordnamibia und Südafrika gehört zu den wenigen afrikanischen Stämmen, die rotes Hämatitpigment zur Ganzkörperfärbung nutzen, das allgemein als roter Ocker, von den Himba jedoch als »otjize« bezeichnet wird. Ursprünglich gehörten die Himba zum viel größeren Stamm der Herero, die im 16. Jh. nach Südafrika, insbesondere aber nach Nord- und später weiter nach Zentralnamibia einwanderten. Die gemeinsamen Wurzeln von Himba und Herero zeigen sich bis heute in ihrer gemeinsamen Sprache. Später trennte sich der ursprüngliche Stamm in die deutlich kleinere Gruppe der halbnomadischen Himba und die größere der sesshaften und überwiegend Viehwirtschaft betreibenden Herero. Die Hererofrauen ihrerseits adaptierten einen speziellen Bekleidungsstil, indem sie die stoffreichen Kleider der europäischen Missionarsfrauen auf imposante Weise und in geradezu übertriebenem Maß nachahmten und damit zu einem markanten eigenen Stil entwickelten. Heute leben die Himba relativ separat von anderen ethnischen Gruppierungen und haben dadurch die Tradition ihrer Gebräuche und ihrer spärlichen Kleidung weitgehend beibehalten, obwohl sich dies durch den Schulbesuch der Kinder der Himba inzwischen immer stärker ändert.

Das rote Hämatitpigment wird offenbar seit Ankunft der Himba in dieser Region Namibias aus einem einzigen kleinen Bergwerk gewonnen, das zwischen Sesfontein und Opuwo liegt und ebenfalls Otjize genannt wird. Das in der Tiefe viel größere Eisenerzvorkommen, zu dem die Otjize Mine gehört, wird in der geologischen Literatur »Ovihende« genannt (Telfair 1954; Roesener and Schreuder 1992), was sich allerdings von der korrekten Himbaschreibweise »Ovihende« unterscheidet. Das Bergwerk besteht aus einem einzigen Schrägschacht, der inzwischen etwa 10–12 m tief ist und regelmäßig von weiblichen Bergleuten der Himba besucht und betrieben wird. Der Erzabbau geschieht mit einfachsten mechanischen Werkzeugen, wie alten Metallteilen, die als Hammer dienen, oder langen Eisenstangen als Hebel. Die Erzbrocken werden in Säcken abtransportiert und im gesamten Gebiet der Himba gehandelt, wobei der Preis dieses Rohstoffs mit zunehmender Entfernung zur Lagerstätte deutlich ansteigt.

Der pulverisierte Hämatit ist von intensiv dunkelviolet-roter Farbe und wird mit Butterfett, Kräutern und Harzen zu einer färbenden Creme, dem Otjize verarbeitet, den die weiblichen Himba auf ihre Haut, ihr Haar und sogar auf Lederbekleidung und Metallschmuck auftragen. Die rote Creme und das Bergwerk werden mit demselben Wort oder Namen bezeichnet, was sich möglicherweise daraus erklärt, dass die Mine einerseits der Lieferant der wichtigsten Zutat der Salbe ist und andererseits das Innere des Bergwerks sowie die Erd-

## Summary

The semi-nomadic Himba people of Northern Namibia and Southern Angola are one of the few African groups that use red ochre, i.e. red haematite pigment, as a red full-body make-up called otjize. The Himba originally belonged to the larger group of the Herero, who migrated into Southern Angola and particularly into Northern and then Central Namibia during the 16<sup>th</sup> century. The common language of Herero and Himba still attests to these shared roots. Subsequently this larger group divided into the smaller ethnic group of the semi-nomadic Himba and the sedentary, predominantly cattle-herding Herero; the women of the latter group also adopted a specific style of adornment, in that they copied (and even exaggerated) the imposing dress of the European missionaries' wives of the 19<sup>th</sup> century. Today the Himba live comparatively separated from other ethnic groups, having largely maintained their traditional customs and dress code, although this is changing as more and more Himba children attend school.

The Namibian Himba have extracted the red haematite pigment from one single mine, called Otjize, between Sesfontein and Opuwo, allegedly ever since they arrived in Namibia. In geological literature the iron ore deposit present at Otjize Mine, and below ground over a much wider area, is referred to as Ovihende (Telfair 1954; Roesener/Schreuder 1992), though the correct Himba spelling is Ovihende. The mine consists of an inclined shaft which is now some 10–12 m deep and is visited and used at irregular intervals by female Himba miners. The ore is mined with very basic tools such as pieces of scrap metal used as hammers or pick axes and iron bars as levers. Chunks of haematite ore are carried away in sacks and traded in the entire Himba region, with the price of this special commodity increasing markedly with the distance from the mine. The powdered haematite is of an intensely dark violet-red colour and, mixed with butterfat and herbal resins, it is prepared as otjize, an ointment used by female Himba on their skin, hair and even on leather and metal jewellery. The ointment and the mine share the same name, possibly for the obvious reasons that the mine is the source of the most crucial ingredient of the ointment and that the mine and the immediate surroundings of the shaft mouth are coloured entirely red by pulverised haematite.

To date, no detailed mineralogical or ethnological research has been carried out to ask why haematite is used only from two specific locations. One mine is situated at the southern fringe of the Namibian part of the Himba region and the other within the Angolan part. However, seemingly similar haematite ore is exposed widely across tens of kilometres elsewhere in the Kaokoveld region.

oberfläche der näheren Umgebung der Schachtöffnung von pulverisiertem Hämatit intensiv rot gefärbt sind.

Bisher fehlen detaillierte mineralogische oder ethnologische Untersuchungen des Bergwerks und des hier gewonnenen Hämatits, als dass erklärbar wäre, warum die Himba Hämatit nur aus zwei spezifischen Vorkommen abbauen und verwenden. Das eine Vorkommen befindet sich am südlichen Rand des namibischen und das andere im angolanischen Verbreitungsraum der Himba, obwohl man scheinbar ähnlichen Hämatit in weiten Teilen des Kaokoveldes finden kann.

## Introduction

Studies of pigments found in excavations of prehistoric contexts and artefacts commonly address visual properties, mineralogical composition and the natural, i.e. geographic or more rarely geological, provenance. Provenance studies typically rely on mineralogical and geochemical or isotopic similarity and – if successfully applied – can yield high probabilities that a certain location was the source for a particular pigment (Froment et al. 2008; Macdonald et al. 2012). However, the actual site of the extraction, i.e. the mine, of the mineral pigment is rarely identified and almost never preserved. As a consequence, we have only a vague idea about the size, layout and geomorphological situation of the actual mine, and know even less about the living and working conditions of the miners. The present paper presents a description and photographic documentation of recent mining of red ochre, i.e. haematite ore, by women of the

*The use of otjize has been locally adopted by neighbouring ethnicities as a cosmetic skin protection from the sun. The application of otjize by some Ovambo men on newly purchased luxury items, such as motor vehicles, documents both a modern adaptation and the spiritual aspect of such a brightly visible red pigment.*

semi-nomadic Himba tribe in Northwestern Namibia. The powdered haematite is used, when mixed with butterfat and herbal resins, as full-body make-up by the Himba women (Fig. 1) for protective as well as decorative purposes. Although the location of the mine can probably be deduced from the images of Google Earth, no coordinates are given in a detailed location map, in order to avoid unwanted disturbance of the site. The exact location details can be provided by the authors for scientific purposes.

## History of the Himba and their migration into Southern Africa

The Himba and Herero people originally belonged to the same ethnic community and share a common language. This larger group is believed by some authors (e.g. Klenkler/Klenkler 1990) to have migrated between the 10<sup>th</sup> and the



Abb. 1 Young Himba women at the Ovihende haematite mine with traditional red body make-up, hairstyle, and metal and leather jewellery. Otjize, the red paste composed of powdered haematite and butter fat, is used in different mixtures for the three different applications.

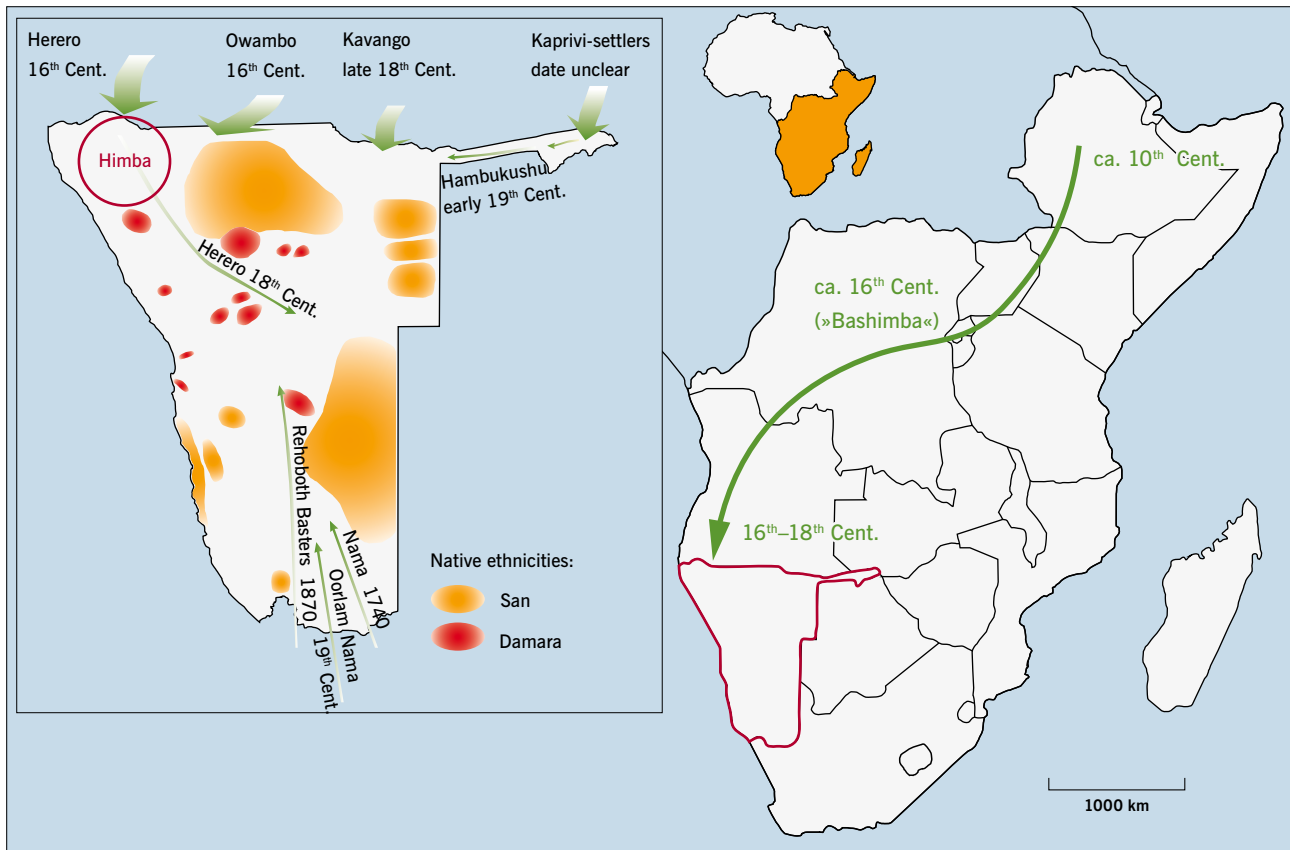


Abb. 2 Map of Eastern, Central, and Southern Africa, showing the assumed migration route of the Bashimba or Himba between the 10<sup>th</sup> and 18<sup>th</sup> century (after Klenkler/Klenkler, 1990). Insert map shows the Kaokoveld in north-western Namibia, where the Namibian Himba live today, and

the distribution of the indigenous ethnicities, i. e. the San and Damara, and the influx of migrating ethnicities between the 16<sup>th</sup> and 19<sup>th</sup> century (after Mendelsohn et al. 2002).

18<sup>th</sup> century from Northern East Africa through Equatorial Africa into Southern Angola and Northern and finally Central Namibia (Fig. 2). The Namibian pre-Himba people moved into the relatively hostile Kaokoveld, a semi-desert to desert landscape south of the perennial Kunene River, but had to flee into Angola when Nama groups plundered their cattle in the second half of the 19<sup>th</sup> century. Early in the 20<sup>th</sup> century they returned to the Namibian Kaokoveld and – only then – began to bear the name Himba, retaining contact with those Himba who stayed on in Southern Angola (Jacobsohn 1995). The bright-red full-body make-up of the Nuba and Nuer in Sudan (Riefenstahl 1990) and the Massai in Kenya and Tanzania (Ekosse 1994) have been cited to support this theory by some authors (e. g. Klenkler/Klenkler 1990). However, red and multi-coloured body and facial make-up is also known from the Nigerian Fulani (alternatively referred to as Peulh or Bororo) people in West Africa (Dupuy 1999). Within the Northern Namibian territory, the original group of the Himba-Herero split up into two groups that could hardly differ more markedly with respect to their visual appearance and lifestyle. The present-day Herero *sensu stricto* are successful (cattle) herders, some with considerable wealth, and have adopted a sedentary lifestyle. Of particularly striking appearance – although completely different from the semi-nomadic Himba – are the Herero women. They have adopted and adapted (sometimes even in an exaggerated fashion) the dress of the early European Christian missionaries' wives, with formal dresses with

wide skirts and aprons as well as a textile head-dress. In contrast, the semi-nomadic Himba *sensu stricto*, wear very little clothing, which is made from calf skin, and show large parts of their bare skin covered only in *otjize*, the red body make-up made of haematite pigment, butterfat and herbal resins. The Himba are technically only semi-nomads because they practise a pattern of transhumance and so return, for the greater part of each year, to the same dry-season base.

### Himba body painting

The red full-body painting and hair dyeing of the women among the Himba semi-nomads of north-western Namibia and the most south-westerly part of Angola is presently one of the most visible examples of red body and hair make-up in Africa (Fig. 1). Young Himba girls and women use what is called *otjize* [ɔ-dʒi-'ðe:], which is a bright red ointment consisting of a mixture of the powdered mineral haematite, butterfat and an aromatic resin from the *omuzumba* bush (one of the many *Commiphora* species of the Kaokoveld). The *otjize* is typically stored and carried by the female Himba in a small leather-coated container, called *ozonja*, which is made from cattle horn (Fig. 3). These days this ›horn‹ may just as often be a small horn-sized piece of plastic piping, complete with leather cap.

Himba men originally used to colour their skin as well, but dropped this habit in the late 1970s to mid-1980s due to a



Abb. 3 Small container (called »ozonja«) made of cattle horn, leather and (here) some wire, which is typically used to store and transport *otjize*, the red haematite-butterfat mixture (diameter 6 cm). Collection of the Namibia Wissenschaftliche Gesellschaft, Windhoek.

severe drought. This drought caused the death of some 200 000 head of cattle and threatened the survival of the nomadic Himba. Butterfat became a scarce and highly valuable commodity, used exclusively by females. As another response to the drought, many of the now destitute and stockless Himba men joined the South African Army in the bush war against the Namibian liberation army (SWAPO) and, as a consequence, had to abandon the highly visible red full-body coloration.

The mineral commodity used for the production of the *otjize* is a reddish-black-violet haematite ore, which displays a dark and intensely red colour when powdered. This haematite ore has been mined by the Himba for the past centuries exclusively from two small artisanal mine workings. One of these mines is situated in Southern Angola some tens of kilometres north of the Kunene River and the second one is located on the southern fringe of the Himba's Namibian home territory. This paper deals with the latter.

### Previous publications on the use of *otjize* and haematite mining by Himba

The striking red body painting displayed on bare skin by the Himba has prompted both intensive and extensive photographic documentation and also scientific attention. Numerous coffee-table books (e. g. Förg 2004) are complemented by a smaller number of well-researched descriptions of the nomadic lifestyle of the Himba (e. g. Jacobsohn 1986, Jacobsohn 1988; Jacobsohn et al. 1998; Crandall 2000). A large number of scientific ethnological studies have been published on the Himba's mixed matrilineal and patrilineal society and many other aspects of their interaction with their natural environments (e. g. van Wolputte 2000; van Wolputte/Verswijver 2004). However, the source of the Himba's most distinctive visual characteristic, the *otjize* and the red ochre or haematite used for this make-up, has hardly ever been documented in detail. Rare exceptions to this rule

are the books by Esterman (1976), von Koenen/von Koenen (2004) and Sherman/Ruguier (2009).

Different disciplines, such as Experimental Psychology and Cognitive Psychology, have recently focused on the Himba and their recognition, perception and naming of colours (Roberson et al. 2000, 2005, 2006). In a highly surprising contrast to our acquired recognition and distinction of colours, the Himbas group colours very differently. Particularly, the colour red is encompassed by what is referred to as either *zoozu* (comprising red, blue, green and violet) or *dumbu* (comprising green, red and brown) (Roberson et al. 2000). Additionally, the Himba use the more functional term *otjizerandu* for the red of *otjize*, i. e. haematite-red. It could be argued that recognition of colour requires language or a specific vocabulary, a thought that could have far-reaching implications for the archaeological interpretation of pigments and colour used by prehistoric and/or non-literate societies.

### The *otjize* haematite (red ochre) mine

The territory that the Himba have chosen for their semi-nomadic lifestyle is located in the most north-westerly part of Namibia and the most south-westerly part of Angola (Fig. 2), where several starkly contrasting climatic, morphological and botanical environments border each other. In the west, the Himba's living space is limited by the cold current of the Southern Atlantic, the Benguela Current and the northern coastal Namib Desert, the »Sand Sea« of the Skeleton Coast. The landscape towards the east is the Okualudhi area, inhabited by the Oshivambo and the Themba people near Ruacana. The northern natural border of the territory of the Namibian Himba people, which is also the political border with Angola, is marked by the perennial Kunene River with its waterfalls and rapids at Epupa and Ruacana. The landscape between these natural boundaries is arid to semi-arid, locally steep and mountainous, with gravel and sand plains



**Abb. 4** Close-up image of haematite-magnetite banded iron formation, exposed at Omupokko, some 12 km west of the Ovihende haematite mine. The weathering colour of the haematite-dominated ore is dark bluish-grey but the rock turns bright red when powdered. Hanging magnet (for scale)

indicates that the banded iron formation here contains some magnetite as well. Pink granite clasts are erratic glaciogenic »dropstones« (see text for details).



**Abb. 5** Two young female Himba miners (left) and one Damara girl (right) at the mouth of the haematite mine. The main gravel road runs immediately behind the hill in the foreground.



**Abb. 6** Two young female Himba miners with sacks of extracted haematite ore (left) at the mouth of the inclined shaft. Note that this is the only entrance to the mine workings at the surface.

as well as some rocky and locally sandy high plateaus. There are deep valleys with usually dry and sandy rivers (wadis) with camel thorn trees and various shrubs. Water often lies below the surface of such dry river beds, or rises in the larger river beds as linear oases. Rainfall varies drastically from less than 50 mm per year at the coast to between 400 mm around Ruacana and 500 mm around Ondangwa (Mendelsohn et al. 2002, 84). More characteristic for the core territory of the Himba is rainfall in the order of 150–250 mm per year (Mendelsohn et al. 2002, 84).

The haematite mine of the Namibian Himba at Ovihende is situated on a shallow ridge trending north-northwest to south-southeast, west of a valley that runs parallel to the ridge for a considerable distance. The strongly elongated valleys and mountain ridges of this region are caused by the hard and weathering-resistant banded iron formations that include the haematite ores. The mine is located at the northern tip of one of these sub-parallel ridges and lies to the northwest of a small settlement of cattle herders with wood-mud huts and cattle kraals fenced in by cut branches of thorn bush. However, there is no formal relationship (e.g. ownership) between the inhabitants of these huts and the haematite mine.

The Namibian haematite mine is called Otjize by the Himba, and Ovihende (or erroneously Owihende) in geological literature (Telfair 1954; Roesener/Schreuder 1992), and is situated between the settlement of Sesfontein and the village of Opuwo. The mine is located west of a gravel road, which runs along the axis of a valley, a natural route for

travel and migration. The mine workings are about 10–12 m deep and consist mainly of one steeply sloping, irregularly shaped, unsupported shaft with a diameter of approximately 10 m at the entrance, narrowing to a mining width of about 2 m at the bottom.

The haematite-dominated iron ore is part of a ca. 750 million year old, so-called banded iron formation, which occurs on the surface in numerous places within the Kaokoveld of Namibia (Fig. 4). The haematite(-magnetite) rocks display a characteristic dark blackish to violet colour and thus contrast markedly with the typical light-orange colour of local sand dunes, the other type of natural red colour in the region.

The haematite ore is mined exclusively by Himba girls and women, who typically visit and excavate the mine in small groups of three to five individuals (Figs. 5–6), commonly under the guidance of one more mature woman. The women use very basic »tools« to loosen and break the haematite ore. The mining process inadvertently pulverises part of the ore, dusting and colouring the entire operation to an intense deep red colour (Figs. 5–8). Younger men sometimes accompany the mining women but only to protect them from wild animals such as lions, leopards or hyenas. All mining, hoisting, breaking and transport of the haematite ore in the form of big blocks or chunks, typically up to 20 cm in diameter, is done by the Himba women. It is a ritual custom of the women to leave a present at the mine each time they come to extract haematite ore. The ore is traded over the entire Namibian territory of the Himba with the price



**Abb. 7** View down the inclined pit or shaft, which is entirely composed of red haematite ore. Note that there are no ropes or handrails attached to the walls of the shaft; the Himba climb up and down the shaft on bare feet.

increasing markedly with distance from the mine. Klenkler and Klenkler (1990) give a price of one goat for a »head-size« piece of haematite in Opuwo, the next town, and the same price for a flat piece the size of a hand in the most north-westerly part of Namibia, close to the mouth of the Kunene River.

### Geology and mineralogy of the red pigment

The banded iron formation that makes up the ore deposit at Ovihende is part of the Late Proterozoic Chuos Formation (Roesener/Schreuder 1992). Banded iron formations represent submarine, chemically precipitated, alternating layers of iron oxides (haematite  $\text{Fe}_2\text{O}_3$ , and/or magnetite  $\text{Fe}_3\text{O}_4$ ) and quartz ( $\text{SiO}_2$ ), both of which originally settled on the sea floor as hydrous gels, with very little clastic input from distant continental land masses. Subsequently the iron formation has been strongly folded by tectonic events and crops out at the surface in up to four sub-parallel narrow bands, which commonly dip steeply and form prominent morphological ridges. The iron formation is exposed for some 1.8 km, running in a north-northwest to south-southeast direction, and measures some 500 m in width (Roesener/Schreuder 1992; Telfair 1954).

The pigment-forming minerals of the iron ore at Ovihende, as well as at the neighbouring, much larger deposit of Ongaba, consist predominantly of haematite, some manganese dioxide, and a smaller amount of magnetite. According

to Telfair (1954) the ore contains 61.1 % ore minerals, which in turn consist of 83 % haematite, 14 % manganese dioxide and 3.3 % magnetite. This particular mixture of iron and manganese oxides results in the particularly deep red colour of the pigment, also referred to as red ochre, which is obtained by powdering the ore.

The haematite ore at Ovihende was formed during one of the most remarkable periods in the evolution of our planet, in an extreme climatic state that is now known as the »Snowball Earth«.

The »Snowball Earth Concept« was proposed by J. Kirshvink (1992) and achieved widespread attention through the work of P. Hoffmann et al. (1998). The concept envisages a strong depletion of  $\text{CO}_2$  in the global atmosphere due to tropical, weathering-related  $\text{CO}_2$ -capture in the soils of one large supercontinent (Rodinia), which at the time (some 750 million years ago) was located near the Equator. The resulting growth of the polar ice caps and their strong reflection of sunlight caused a so-called »runaway albedo« and, in consequence, the rapid and extreme cooling of our planet. This situation eventually led to the spread of the glaciation to equatorial regions until glaciation and sea ice covered the entire continent and all oceans, resulting in the so-called »snowball earth«.

The ocean underneath the ice cover became depleted of free oxygen, due to i) the lack of exchange with the atmosphere, and ii) hydrothermal discharge of iron into the oceans at mid-oceanic ridges and vent sites. Once the remaining free oxygen was precipitated as iron hydroxides, the



**Abb. 8** Female Himba miner, extracting haematite ore in the deepest stope of the mine with a geological hammer borrowed from the author. The stope face has acquired such a smooth, round shape that the extraction of chunks of ore has become extremely difficult without fire-setting.

The tool otherwise used is a piece of broken blade spring from a truck, weighing approximately 4 kg. Note the striking colouring effect of the haematite pigment, rendering the Himba miner almost invisible.

ocean water became more and more enriched in dissolved iron in the chemically reducing seawater. The oceans thus acted as huge reservoirs of the iron released by submarine hydrothermal vent sites.

The glaciation was terminated by the sudden release of large volumes of CO<sub>2</sub> into the atmosphere from strong volcanism, caused by a new phase of tectonic crustal break-up, rifting and subsequent drifting of the fragments of the former Rhodinia supercontinent. The rising CO<sub>2</sub> levels in the atmosphere led to warmer climates and the melting of the oceanic ice cover. The oceans again came into contact with the atmosphere and became more oxygenated. This oxygenation of the oceans led to very widespread precipitation of (»glaciogenic«) iron hydroxides (banded iron formations), such as the one at Ovihende. Icebergs from the retreating glaciation »rafted« onto the open oceans and – upon melting – released the clastic debris they contained far away from the continental coastlines. As a consequence, the icebergs dropped erratic clasts – or »dropstones« (Fig. 4) – into the distal deep sea chemical sediments of the banded iron formations. Figure 4 shows a particularly striking example of such a glaciogenic granite dropstone as an erratic clast in a deep marine, chemically precipitated banded iron formation from Omupokko, located in the Kaokoveld northwest of Ovihende.

The haematite ore at the Otjize Mine does not differ macroscopically from the banded iron formations elsewhere in the Himba territory of Northwestern Namibia. There may be

specific favourable petrological properties of the haematite pigment from this location, e.g. the particular crystallinity of the minerals or the ratio of haematite to manganese dioxide to magnetite, which determines the characteristics of the colour (hue, saturation, brightness or chroma). However, no detailed comparative microscopic or geochemical studies have been carried out yet that could explain why the Himba mine haematite from this particular location only.

### Modern adaptations

Presently, the use of *otjize* has been partly adopted by some members of the neighbouring groups, such as the Ovambo, living east of the Himba. Amongst these groups, the use of *otjize* may be restricted to exposed parts of the skin only. An unusual modern adaptation by Ovambo men with a more technical affinity is the occasional ritual application of *otjize* onto the bonnet of newly bought cars. This highly visible lucky charm is commonly left on the bonnet to disappear naturally and is not deliberately washed off, at least for some time.

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## Rot – Die Archäologie bekennt Farbe

*5. Mitteldeutscher Archäologentag vom  
04. bis 06. Oktober 2012 in Halle (Saale)*



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