

NEW LIGHT ON THE PREHISTORY OF THE SOUTHERN MOUNTAINS OF JAVA

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ABSTRACT

The Southern Mountains of Java, especially the eastern part which extends from the Oyo River to the easternmost part of Java, are a very important area in terms of prehistoric research. The limestone formations which occur in Gunung Sewu, at Campurdarat near Tulungagung and near Puger contain caves and rockshelters, most inhabited in prehistoric times. Early investigations include the discovery of "the Sampung bone industry" in Lawa cave, Sampung, by van Es in 1926 and by van Stein Callenfels in 1928-1931. Research conducted since the early 1990s in caves in several limestone areas of the Southern Mountains, including Braholo cave in the western part of Gunung Sewu, Song Keplek cave in the eastern part of Gunung Sewu, Song Gentong near Tulungagung and some caves in Puger have revealed a chronology from the early Holocene to 4500 BP. All these caves were once inhabited by groups of people with similar archaeological assemblages and of "Australomelanesian" biological affinity. Based on similar finds in the northern part of the Southern Mountains, for instance from Ponorogo, Bojonegoro, Tuban and Situbondo, we can conclude that this cultural complex was widely distributed in the eastern part of Java. In some caves it is likely that it extends back into the Late Pleistocene.

GEOLOGICAL SETTING AND HISTORY OF RESEARCH

The Southern Mountains of East Java, which form the focus of this paper, have the structure of an elevated block tilted towards the south. The maximum width of the mountain belt is 55 km south of Solo, while south of Blitar it measures only 25 km across. The western region, between the Opak River and Pacita, consists partly of limestone karst and is called

Gunung Sewu (Thousand Mountains in Javanese). The Southern Mountains in the eastern part of Java are discontinuous, but there are extensive formations of reef limestone south of Malang, on Nusa Barung, around Puger, and on the Blambangan Peninsula.

These limestones are probably the equivalent of the Wonosari limestones, which are considered upper Middle Miocene. After they were formed a regression of the sea took place and the region remained slightly above sea level until the Pleistocene, when it was elevated and tilted during the uplift of the Java anticline. In the Gunung Sewu region no less than 60 caves and rockshelters have been found so far (Simanjuntak 1998a:5). In the Puger area with its smaller limestone formation there are seven (Nurani pers. comm.), while in the Campurdarat area near Tulungagung there are only a few caves, of which some have now been destroyed by limestone quarrying.

Since the beginning of the 20th century, Gunung Sewu in particular has attracted the attention of scholars. In 1927 van Stein Callenfels (1932:27) reported more than 100 open-site Neolithic workshops in the Punung area. In 1935, von Koenigswald and Tweedie discovered a Paleolithic site in the Baksoka valley, near Punung, with a lithic assemblage later to be known as the "Pacitanian" (Bartstra 1976:75). Interest in the caves began with van Heekeren, who explored several caves in the Puger area in 193-1935. These explorations were stimulated by the discoveries of van Es in Lawa cave (Gua Lawa) in the Ponorogo area in 1926, research continued by van Stein Callenfels in 1928-1931. Van Heekeren labelled his findings the "Sampung bone industry", reflecting the large numbers of bone tools discovered (van Heekeren, 1972:92). In his search for the distribution of the Sampung Bone Industry, van Heekeren explored more caves in the limestone hill areas of East Java, discovering the Sampung Bone Industry in caves in the Puger area in association with flexed burials, flake-blade tools and faunal remains (Figure 1).

Cave research in the Gunung Sewu area started in 1936 when von Koenigswald excavated a location on the eastern slope of Gunung Cantelan near Punung, possibly the shelter now known as Song Agung. This excavation yielded flake tools, including arrowheads with convex bases, shell ornaments and loose human teeth (Erdbrink 1954:27). In 1953, Soejono and Basuki excavated Song Terus and found stone tools, bone and shell tools and faunal remains (van Heekeren 1972:41).

During the 1990s, intensive research was carried out in the caves of Brahoho and Song Keplek (Figure 1), funded by the Toyota Foundation (Simanjuntak 1998a, 1998b:1); in Song Terus, as a joint expedition between the Department of Prehistory, National Research Centre of Archaeology (Puslitarken) and the French Muséum National d'Histoire Naturelle (Simanjuntak *et al.* 1994); and in Song Agung, a joint venture between Puslitarken and the University of Auckland. Other research was carried out in Song Gentong in the Campurdarat area, Tulungagung, by Puslitarken in collaboration with ORSTOM (Marliac and Simanjuntak 1996). At the same time, caves in the Puger area have been investigated by Balai Arkeologi in Yogyakarta. All of this research has given new understanding of the prehistory in this area, particularly during Holocene times.

CHRONOLOGY

The C14 dates obtained so far show habitation from around 16,000 to 2000 bp. However, the oldest and youngest cultural layers have not yet been dated. Current dates are listed in Table 1.

Further excavation into the lowest layers of these caves is expected to produce more Pleistocene determinations, given that many other Southeast Asian caves have been occupied for the past 40,000 years or more. Examples of such Pleistocene sites include the Niah caves in Sarawak, Tabon cave in the Philippines, Lang Rongrien shelter in southern Thailand, Golo cave in Maluku, Leang Burung 2 in South Sulawesi and Leang Lemdubu in Aru (Anderson 1990; Harrison 1957; Fox 1970; Glover 1981; Bellwood *et al.* 1998). The latest studies in Song Terus suggest that the lowest

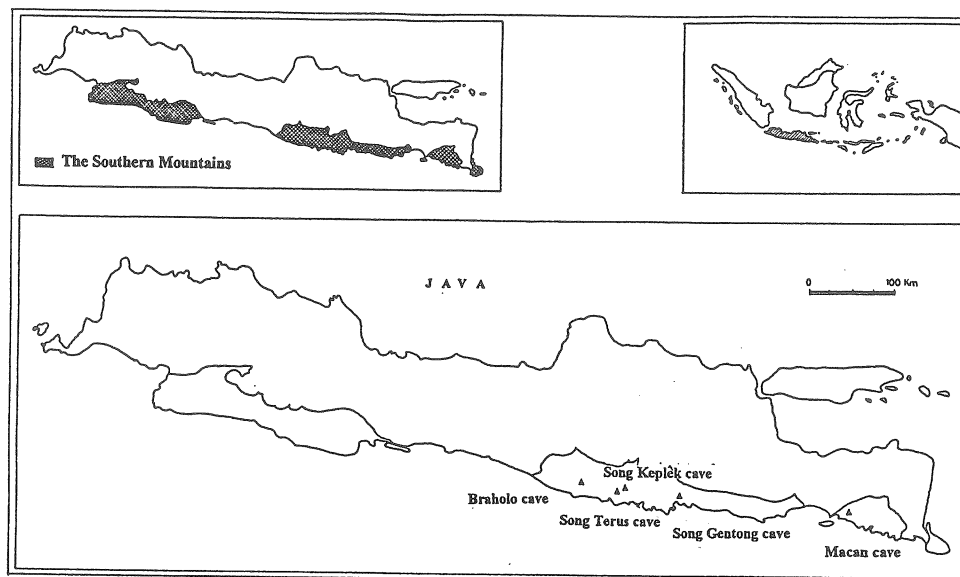


Figure 1: Selected excavated caves in the Southern Mountains of Java.

layer with artefacts may date from about 150,000 years ago (Sémah *et al.* in press).

(Note submitted in press: The current excavations conducted by the Indonesian-French team in Song Terus give further interesting results. More than 15 m of stratigraphy have been recovered in this cave. The lower part, below 4 m depth, is of clay covered by coarse alluvial deposits including sands, gravels and pebbles which have undergone weathering. This lower layer contains animal bones [rhinoceros, tapir, cervid] and lithic artefacts [flake tools, but almost no pebble tools] that are generally rolled. The dating of the animal bones by the uranium-thorium method, from a depth of 750 cm, is $151,000 \pm 12,000 / -10,000$ bp. The habitation layers commence above the middle of the section (between 4 and 1.5 m in depth), and the lowest level of this middle part is dated to $39,000 \pm 3000$ bp [Sémah *et al.* in press; Hameau 1999]).

CULTURAL CHARACTERISTICS

The excavations in Brahoho cave, Song Keplek, Song Gentong and caves in the Puger area have yielded finds that in general have much in common. Differences tend to be in densities, percentages of lithic elements and raw materials. Faunal remains are generally rich and the lithic industries comprise tools, "fabricators", cores, waste flakes and chunks. There are no microliths. Bone tool industries are widespread and there are also antler and shell tools. Plant remains, mainly seeds, are rare and restricted to the upper layers. Human remains include both formal flexed burials and loose finds.

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As an example of the faunal richness, the bone assemblage from Song Keplek contains the following species (identified by Rokhus Due Awe):

Primates	<i>Homo sapiens</i> , <i>Macaca</i> sp.
Artiodactyla	Bovidae, Cervidae, Suidae, Tragulidae
Carnivora	Canidae, Ursidae, Viverridae, Mustelidae, Telidae
Rodentia	Hystriidae, Muridae, Sciuridae
Proboscidae	Elephantidae
Periodactyla	Rhinocerotidae, Tapiridae
Chiroptera	Chiropteridae
Aves	Galliformes, Gallidae
Pisces	Pisces, Carcharidae
Marsupialia (?)	Phalangeridae (uncertain identification)
Reptilia	Chelonidae, Testudinidae, Varanidae, Boaidae
Amphibia	<i>Rana</i> sp.
Insectivora	Soricidae

It is interesting to note that *Macaca* sp. was the most dominant animal, particularly in the upper layers in all caves excavated in the Gunung Sewu area (Song Keplek, Brahoho, Song Terus) and in Tulungagung (Song Gentong). In the lower layers, large mammals including Elephantidae, Bovidae, Cervidae and Rhinocerotidae were more common. This correlates with the presumed environmental changes in the early Holocene when the large fauna decreased in numbers. Noteworthy also is the presence of various kinds of marine shells in some caves up to 15-17 km from the coast, although quantities decrease as one moves inland. Both candlenut and *Canarium* shells occurred commonly in the upper layers

of the caves, in layers generally postdating 6000 BP. Unidentified fibres were found in Brahoho cave adjacent to some skeletons, perhaps of clothing or shrouds. Traces of fern leaves were also observed.

Chert, found in abundance in the eastern part of Gunung Sewu, was the main raw material for tool manufacture. Some flakes have regular shapes with sharp edges directly used with no retouch. However, the most common raw material in Brahoho cave was limestone, perhaps because of the lack of good tool stone in the vicinity. Song Gentong has tools of jasper, chert and andesite (Marliac and Simanjuntak 1996:5). Most of the tools were produced from small and irregular flakes, but the tools produced in Macan cave near Puger include massive choppers, chopping-tools and cleavers, generally of limestone (Nurani 1996:16). Similar tools were found in Brahoho cave.

The bone and antler industry includes items identified as spatulae, points and needles. Shell artefacts include polishers, burins and scrapers, as well as perforated ornaments. Uniquely, Brahoho produced a number of bipoints averaging 2 cm in length (Simanjuntak 1998b:4). One bipoint was also found in Song Gentong near Tulungagung, but morphologically and metrically it differs from the Brahoho specimens and resembles the "Muduk Points" found in the caves of South Sulawesi (Soejono 1984:140-142).

The technique of working antler was usually very simple, involving creation of a monofacial cutting edge on the ends of tines. Most examples come from Brahoho cave. Cut shell pieces are shaped as triangles, rectangles, ovals and circular discs, some furnished with one or more holes. The most popular shells for making ornaments were *Turbo* sp., Nautilidae, Tellinidae and the landsnail *Amphidromus* sp.

Table 1: Radiocarbon dates obtained up to 1999 for cave/rockshelter sites in southeastern Java

Site	Laboratory	C14 dating (uncal.)	Layer	Context
Song Keplek cave (Eastern Gunung Sewu)	P3G-98	15880±540 BP	Layer 5	Flakes, faunal remains (less abundant)
	P3G-98	8870±210 BP	Layer 4	Structure of Pebbles
	P3G-96	8230±220 BP	Layer 4	Hearth
	P3G-96	7580±210 BP	Layer 3 (lower)	Human burial, hearth
	Batan-96	6466±140 BP	Layer 3 (middle)	Flakes, faunal remains
	P3G-96	5900±180 BP	Layer 3 (upper)	Human burial
Brahoho cave (Western Gunung Sewu)	Beta 69689	4510±90 BP	Layer 2	Flakes, bone tools, fauna (abundant)
	P3G-97	12060±180 BP	Layer 4 (middle)	Flakes, bone tools, fauna
	P3G-97	9780±230 BP	Layer 3 (lower)	Human burial, hearth
	P3G-97	8500±230 BP	Layer 3 (middle)	Hearth, flakes, bone tools
Song Gentong	P3G-97	6620±110 BP	Layer 3 (upper)	Hearth, flakes, bone tools
	ANU-10584	8760±190 BP	Layer 3 (lower)	Fauna, flakes
Gua Macan, Puger	OBDY-1754	7690±70 BP	Layer 3	Human burial
	-	2490±90 BP	Layer 2	Massive tools and shells

Some of the caves contain hearth areas, in the case of Braholo totalling 2.5 m in thickness and consisting of layers of hearth ash alternating with volcanic ash, a circumstance which indicates the occurrence of several volcanic eruptions during the period of habitation of the cave. The hearths themselves consisting of burnt clay linings with ash and charcoal above. C14 dating indicates use of the hearth area in Braholo cave from 10,000 to around 5000 BP. A similar hearth area in Song Keplek has a thickness still undetermined because it continues into an unexcavated level.

In general, the dead were buried in flexed positions, one on its back in Braholo in an east-west direction with the head in the west. Both legs are flexed with the heels approaching the buttocks. The left arm is flexed on the chest and the right arm straight, touching the knee. Stones were placed over the corpse from the chest to the abdomen, as in Gua Marjan, Puger (van Heekeren 1972:105). About 3 m away from this burial, but some 70 cm higher in the same layer, there was a secondary burial with part of the skull and the pelvis.

A burial in Song Keplek was laid northwest-southeast, with its head in the southeast facing to the east. The right arm was flexed with the fingers touching the cheek and the left arm was flexed on the chest. Both legs are flexed with heels touching the buttocks. This burial is a female over 50 years old at death, and charcoal found around the skeleton gave a date of 5900±180 BP.

A flexed burial in Song Gentong was laid north-south on its back, with both legs flexed and hands below the chin. Red ochre was spread around this skeleton and not far from the legs was found a round ball of haematite. Such use of red ochre was not observed in Braholo. A flexed burial was also found in Marjan Cave, Puger, oriented east-west with the head in the west, facing north. Both legs were flexed, but cementation with limestone did not allow the arm positions to be observed. The corpse was covered by blocks of limestone, as in Braholo cave (Nurani pers. comm.).

Within Java, flexed burials are not restricted to caves in the Southern Mountains, occurring also in Gua Lawa near Sampung and in a cave in Besuki. The Southern Mountains sample of burials is summarised in Table 2.

Table 2: Human burials with associated dated from caves in southeast Java

Site	Burial type	Identification	Date
Gua Braholo	Primary, complete	Male >50 years	9870±230 BP
Gua Braholo	Secondary: skull and pelvis	Female >50 years	c. 7000 BP
Song Keplek	Primary, complete	Female >50 years	5900±180 BP
Song Keplek	Skull	Male >35-40 years	4510±90 BP
Song Keplek	Skull	Male	c.4500 BP
Song Keplek	Skull	Child 7-9 years	c.4500 BP
Song Gentong	Primary, complete	Adult	7690±70 BP
Gua Marjan	Primary	Under analysis	undated

According to Harry Widiyanto (pers. comm.), who has analysed all the human bone, these human remains all reflect Australomelanesian affinity being characterized by dolichocephalic skulls, relatively vertical parietal walls, pronounced prognathism, thick alveolaris mandibularis, large teeth and overall robustness. The same combination of characteristics has also been found in other caves in East Java, particularly in Gua Lawa and in the caves in Besuki (van Heekeren 1972:98-102).

SOME FURTHER REMARKS

The aforementioned findings made it clear that habitation of the Southern Mountains of Java started from at least the early Holocene. This area, in particular the limestone hills with their caves and shelters and rich natural resources, was intensively inhabited by people of close biological affinity, with similar material cultures and hunting and gathering economies, burying their dead in similar ways. Within a wider geographical expanse, these cultural characteristic have also been found in other limestone hill regions in East Java, in caves in the regions of Ponorogo, Tuban, Bojonegoro and Besuki (Situbondo). As to when the cave habitation started, this a question that cannot be answered with certainty. Excavations are still continuing in several caves, and others are planned.

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