A NEW INSIGHT INTO THE SANGIRAN FLAKE INDUSTRY

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ABSTRACT

The so-called Sangiran Flake Industry was discovered initially in the middle of the 1930's. Such tools are usually found in the gravel layer capping the Ngebung hills, in the northwestern part of the Sangiran dome. The flakes were at first thought to have been made by Javanese Homo erectus, *but such a point of view has been strongly contested by scholars during recent years because they are usually concentrated in the uppermost alluvial layers of the Sangiran stratigraphical series and their contemporaneity with* Homo erectus *is therefore doubtful. The recent discovery of several artefacts of the Sangiran Flake Industry type - flakes, blades and nuclei - within the excavations carried out in the Middle Pleistocene Kabuh layers at Ngebung gives evidence that at least part of this industry is contemporary with* Homo erectus. *The same layers have earlier yielded larger andesitic artifacts like bolas, cleavers, choppers and polyhedrons.*

During the early 1930's, Ralph von Koenigswald discovered a flake industry in the north-western part of the Sangiran dome. These small artifacts, often heavily rolled, were made of chalcedony, jasper or silicified tuff. Von Koenigswald then undertook further excavations in the Ngebung hills at Sangiran (Figure 1) and claimed a Middle Pleistocene age for the industry (Koenigswald 1936), arguing that it had been discovered in association with typical taxa of his Trinil fauna, like *Axis lydekkeri* and even "*Pithecanthropus*" (*Pithecanthropus* III). Later on, he published a descriptive typology of these so-called "Sangiran flakes" (Koenigswald and Ghosh 1973).

The problem of the age of the Sangiran flakes was later brought up Bartstra (1985), who noted that they usually occur in the uppermost alluvial layers of the Sangiran stratigraphical series, which cap the Ngebung hills. He doubted that this top gravel would have been contemporaneous with *Homo erectus*. He assumed therefore a young Middle Pleistocene or even Upper Pleistocene age. Moreover, Bartstra noticed that there are two different industries on the top of the hills: the actual Sangiran Flake Industry showing a heavy patina, together with freshly broken artifacts which might be of Neolithic affinity.

THE NGEBUNG STRATIGRAPHY

Recently, extensive stratigraphical and archaeological excavations have been undertaken at Ngebung by an Indonesian and French team (Museum National d'Histoire Naturelle and National Research Centre of Archaeology), following the discovery of a human occupation surface within the Kabuh series (Lumley *et al.* 1993; Sémah *et al.* 1992; Simanjuntak 1992). The Ngebung stratigraphy has been revealed by more than 20 meters of trenches, the most complete one cutting through the northern part of the Ngebung hill. The stratigraphy (Figure 2) begins with the *Grenzbank* zone, which proved to be very fossiliferous at Ngebung and yielded the Kresna 11 hominid femoral diaphysis. The *Grenzbank* is covered by several metres of gray clay originating from the weathering of volcanic ash. The erosional surface of this clay layer was occupied by early humans who left traces of occupation (Sémah *et al.* 1992), above which lies a typical fluviatile Kabuh fossil-bearing sedimentary sequence. These fluviatile sandy layers are often interrupted by tuffaceous lenses but transported sands and gravels are dominant, and siliceous stones originating from the Southern Mountains of Java are numerous. The volcanic content of the sediments becomes higher towards the top of the se

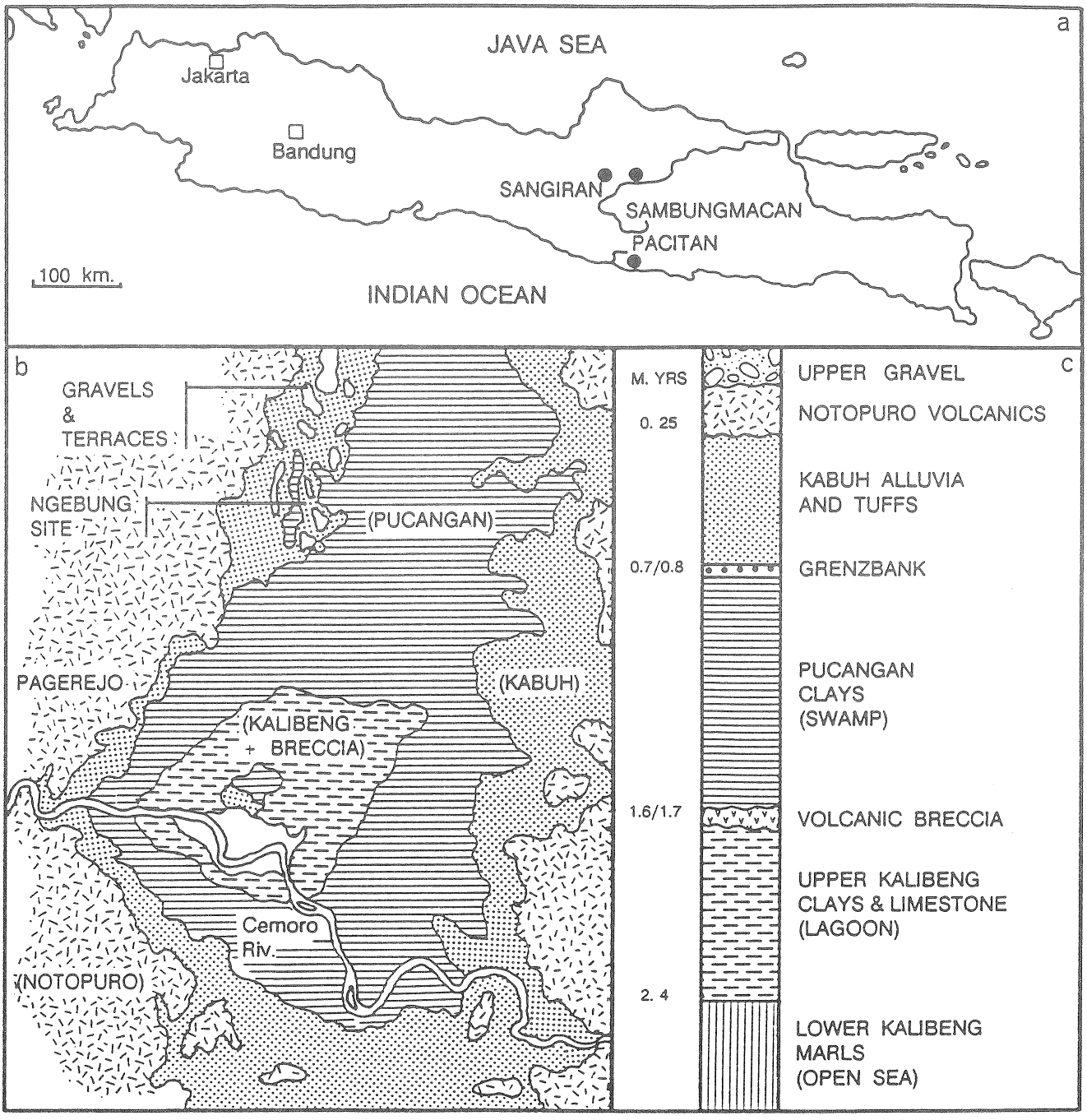

Fig.1: a) Localities mentioned in the text; b) Simplified geological map of the Sangiran dome showing the location of the Ngebung site (simplified from Watanabe and Kadar 1985); c) synthetic geological section (not to scale) of the Sangiran area series.

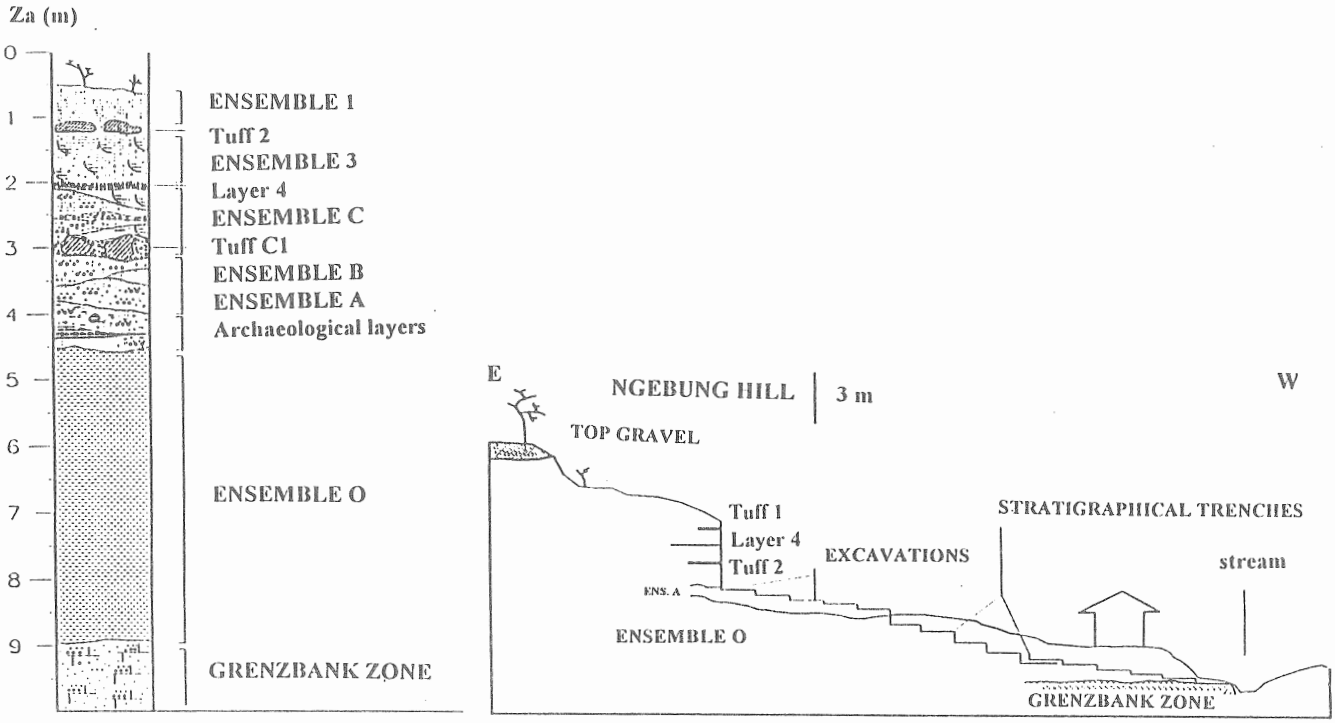

Fig.2: A synthetic profile of the excavated area of the Ngebung site (after Sémah et al. *1992).*

ries, with somewhat thick tuffaceous layers still containing fossil mammals.

RECENT DISCOVERIES IN THE NGEBUNG EXCAVATIONS

We have differentiated several stratigraphical ensembles in the Ngebung archaeological site. Ensemble O represents the sterile clay just over the *Grenzbank* zone. Ensemble A above represents a true archaeological layer. Ensemble B above this is reworked and contains a lot of materials from Ensembles O and A. The higher Ensembles C, 3 and 1 do not contain such reworked sediments.

All the sedimentary ensembles were carefully excavated with particular attention being paid to broken stones, whatever their sizes. Everything was also seived through a 5 mm mesh. As noted by Bartstra, it is obviously difficult in such a fluviatile environment to separate true artifacts from pseudo-artifacts. Nevertheless, several undoubtable items were found throughout the Ensembles.

Twenty stone artefacts are listed in Table 1, all stratigraphically distributed between Ensemble A and Ensemble 1 (at the top of the sequence). Striking platforms of the flakes are usually flat and narrow with large bulbs of percussion; some flakes have facetted striking platforms. Cortical flakes are rare and the majority have dorsal longitudinal flake scars due to core preparation/ utilization. Only six of the pieces show retouching or notching, originating from intentional shaping or use, and these are classified as tools.

Table 1: Stratigraphic distribution of the Ngebung artefacts.

Level	Nuclei	Flakes	Blades	Totals
Ensemble A	2	5 (2 retouched)	1 (retouched)	8
Ensemble B	-	1	1 (retouched)	2
Ensemble C	-	7 (1 retouched)	-	7
Ensemble 3	-	1	1	2
Ensemble 1	-	1 (retouched)	-	1
Totals	2	15	3	20

Ensemble A

Two nuclei, five flakes and one blade were recovered from Ensemble A, made of yellowish brown chalcedony (mean dimension 3 cm), except for one heavily rolled larger piece of red jasper. All the flakes have narrow

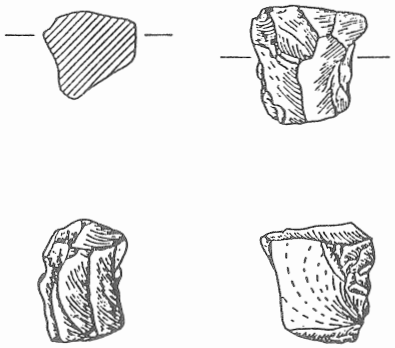

Fig.3: A nucleus from Ngebung Ensemble A. 67% of natural size.

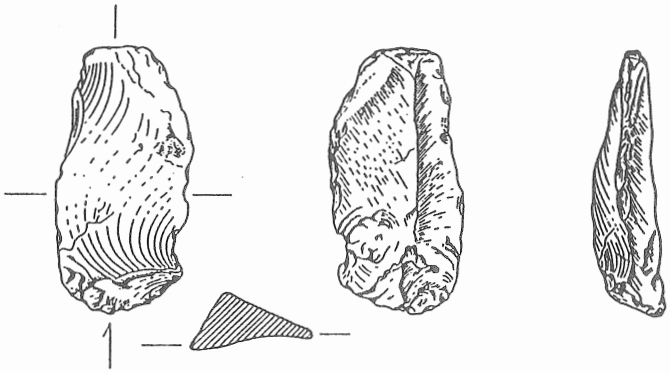

Fig.5. A retouched blade from Ngebung Ensemble B. 67% of natural size.

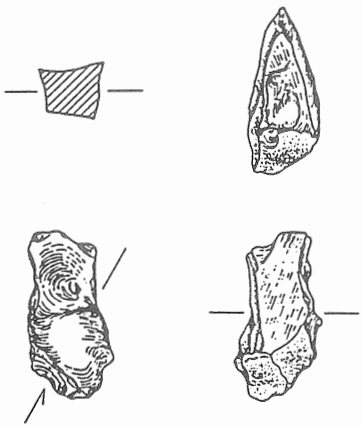

Fig.4: A flake from Ngebung Ensemble A. 67% of natural size.

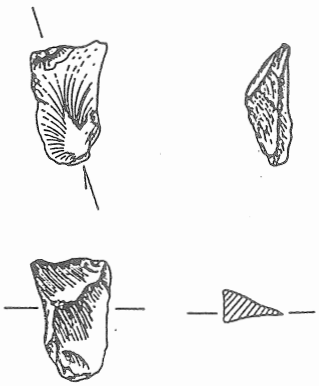

Fig.6. A flake from Ngebung Ensemble C. 67% of natural size.

striking platforms and a flat bulb. The two triangular prismatic nuclei have flat extremities and are small, at around 2 x 2 x 1.5 cm (Figure 3). Their flake scars are also small. Two retouched flakes are classified as tools. One of them (D9/15: Figure 4) is elongated, with high dorsal relief and cortex on its proximal part. Its distal extremity shows bifacial retouching and it resembles the flakes with small bevelled edges described by Koenigswald and Ghosh (1973). The other flake (I7/1) is sub triangular and shows micro-retouching on its distal end. Of the three other unretouched flakes, two have cortex on their dorsal surfaces. The parallel-sided blade has a large and flat striking platform and a large bulb. This tool has been unifacially retouched from the dorsal surface on one of its sides for a length of 1.8 cm. The retouch scars are quite large and flat.

Ensemble B

In Ensemble B we found only one flake and one blade made of chalcedony. As with the Ensemble A items these artifacts are abraded but not heavily rolled. The unretouched flake has a large and flat striking platform with a large and thick bulb. The flake enlarges towards its distal extremity, giving it a sub-triangular shape. Its dorsal face shows irregular flake scars and some cortex. The blade (G6/39: Figure 5) has three ventral side-originating notches on one side. The striking platform of this tool is narrow and the large bulb is flat. Two longitudinal flake scars can be observed on the dorsal surface, giving the artifact a flat triangular cross-section.

Ensemble C

In Ensemble C we found seven sub-triangular small (1.8 to 3.6 cm) flakes made of chalcedony and jasper. They

have thick triangular cross-sections, narrow and flat striking platforms and large and flat bulbs, except for G5/20 (Figure 6). Some have cortex on their dorsal surfaces. The G7/12 flake shows alternating bifacial marginal retouch along one side. This sub-triangular jasper tool has a triangular cross-section, its dorsal surface comprising one longitudinal flake scar and cortex. It was heavily rolled and abraded before deposition.

Ensemble 3

One flake and one blade were recovered from Ensemble 3, both made of chalcedony. The striking platforms of these artifacts are flat and narrow, their bulbs are large and they are not retouched. The flake has a sub-triangular shape enlarging towards its distal extremity and an elevated dorsal surface with some cortex. The blade has abrupt sides giving it a rectangular cross-section. Both items have been rolled but do not show evidence of intensive transportation.

Ensemble 1

This ensemble yielded a small flake tool of chalcedony with a large striking platform and a thin, faint bulb. The shape is sub-triangular and the transverse section triangular. Smaller unarranged retouch scars originating from the dorsal surface can be observed along one side of this rolled item.

CONCLUSION

These Ngebung finds open the way to a new appraisal of the Sangiran Flake Industry. We now have evidence that at least some of these items are contemporary with the Kabuh hominid-bearing layers of Sangiran. Radiometric dating recently undertaken at Ngebung confirms this point of view. The Sangiran Flake Industry can be found throughout the Kabuh stratigraphic series at Ngebung, provided one undertakes extensive excavation and sieving. Given their small mean size and their patina it is obvious that these items underwent at least some transportation before being embedded at Ngebung. But the degrees of abrasion observed, with some artifacts showing a somewhat 'fresh' aspect, seem to indicate that they were made on locally-occurring pebbles not very far from the site.

A study of the Ngebung artefacts found *in situ* will help us to get a better understanding of the technology and reduction sequence from crude core to retouching. Sufficient stratigraphically well-located artifacts are not available as yet, but we hope to progress in such an analysis during further fieldwork. One important question is to ascertain whether the observed retouch had an intentional character or originated from use-damage. At the present state of the research, artifacts seem to be most numerous within Ensemble A, the main archaeological layer of the Ngebung site. There is therefore a possibility that the makers of the large andesitic artifacts found at Ngebung during recent years (Sémah *et al.* 1992) were also the makers of the Sangiran Flake Industry.

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