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## EXCAVATION AT THE FOSSIL-HOMINOID-BEARING LOCALITY, SITE-SH22 IN THE SAMBURU HILLS, NORTHERN KENYA

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**ABSTRACT** An excavation has been carried out at the SH22 locality where a fossil of a large hominoid (KNM-SH-8531) was found in 1982. This site is located in the Samburu Hills, northern Kenya and dated back to upper Miocene. During the 1984 field season, a large number of new fossils were recovered at this locality. These fossils and sedimentological analysis revealed that the fossil bed at the SH22 locality may be a marginal deposit of an abandoned channel on a dried lake floor.

### INTRODUCTION

In 1982, a fossil upper jaw of a large hominoid (KNM-SH-8531) was discovered at the SH22 fossil site in the Samburu Hills, northern Kenya by the team of the Joint Japan-Kenya Expedition to the Samburu Hills led by H. Ishida (Ishida *et al*, 1984). This specimen is quite important for the reconstruction of the hominoid phylogeny because the fission track and K-Ar datings (Matsuda *et al*, 1984; Itaya & Sawada, 1986) and biostratigraphic analysis (Pickford *et al*, 1984) have given an age for the fossil intermediate between those of kenyanthropines and australopithecines. The third Japan-Kenya Expedition was carried out in 1984. One of the research activities in this season was to extend the area of excavation at the SH22 locality, in order to obtain new hominoid materials and to reveal the depositional condition of the site. In this report, we describe the outline of the excavation at the SH22 locality and summarize the findings in this excavation.

### GEOLOGICAL SETTING

The SH22 fossil site is located in the central part of the eastern uplift of the Gregory Rift called the Samburu Hills. The rift valley in this area is called the Suguta valley, which lies from the

Turukana lake to the south. In the vicinity of the SH22 locality, the upper reach of the Asanyanait dry river runs, joining with the Nakaporatelado river, and pours into the Suguta valley. Around the SH22 locality, there are numerous exposures of upper Miocene sedimentary rocks. These outcrops had been surveyed by the same team in the 1982 field season. The geographical and stratigraphical report of this area has been presented by Makinouchi *et al.* (1984). The hominoid horizon is situated in the upper part of the sedimentary system termed the Namurungule Formation. Although the Namurungule Formation was found in a wide area around the SH22 locality, hominoid-bearing sedimentary rock (HBSR) was found only at this locality. The fission track datings of apatite crystals from the tuffaceous sediment overlying the HBSR have given  $6.7 \pm 2.0$  and  $15.0 \pm 4.0$  Ma (Matsuda *et al.*, 1984). K-Ar age determinations of the lavas collected systematically from the Samburu Hills have indicated that the age of the hominoid fossil is somewhere between  $7.1 \pm 0.5$  to  $10.7 \pm 0.6$  Ma (Itaya & Sawada, this volume).

#### OUTLINE OF THE EXCAVATION

The SH22 locality is situated at the end of a short ridge which is branched off from an innominate main ridge. The latter lies between the Lokirilyanga and Asanyanait rivers, tributaries of the Nakaporatelado river. Two small terraces are formed at the end of the short ridge. The fossiliferous sediment from which KNM-SH-8531 fossil seems to have originated is truncated by a valley and exposed at the edge of the lower terrace. The HBSR was divided into two units. During the 1982 field season, the upper unit was excavated in  $4 \times 4$  square meters and the lower in  $1 \times 1$  square meter at the northwestern corner of the large square. At that time, one side of the excavated square was oriented at 21 degrees NE. The excavated area has been extended to  $8 \times 4$  square meters in the 1984 field season based on the plan of the previous excavation and divided by grids of 2 by 2 meters square. The collected fossils were mapped, and the matrix of each grid has been kept for screening. Since the HBSR dips toward the upper terrace, an immense thickness of overburden lies on the HBSR. This overburden was concurrently removed by using picks and shovels, checking each sedimentary unit. During the removal of overburden, several small faults were found. These faults did not affect the HBSR. By the end of the 1984 field season, about one third of the overburden had been removed. The plan and section of the site are shown in Figs. 1 and 2, respectively.

#### SEDIMENTOLOGY

The HBSR dips 15 degrees to the southeast and had been lost by erosion at the northwestern corner of the excavated area (Fig. 3). The outcrop of the HBSR was covered by the reworked sediment originating from higher layers. The thickness of the HBSR was uniformly ca. 40 cm, but became suddenly thinner to 27 cm at the northeastern corner of the excavated area. The HBSR was divided into two units. The upper unit is a brownish-gray-colored conglomerate containing angular mud clasts. The lower unit is a yellowish brown with angular mud clasts, cemented by

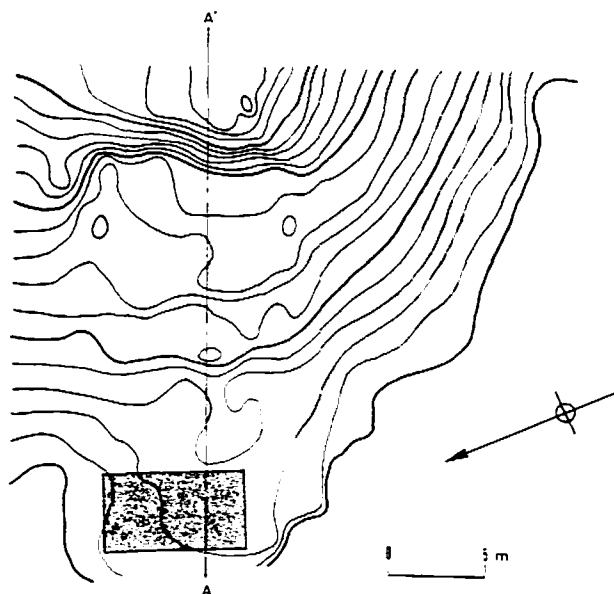


Fig. 1 Plan of the excavated area (stippled square) at the SH22 locality after removing the overburden.

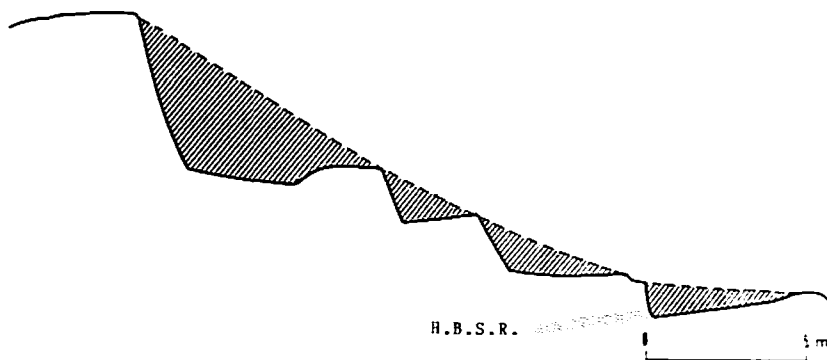







Fig. 2 Section (A-A' in Fig. 1) of the excavated area at the SH22 locality. Hatched area shows the removed rock.

calcareous matrix. A thin dark green silt layer was intercalated between them in the northern part of the excavated area (Fig. 3). The lower unit was distinguished from the upper not only by the color and size of the mud clasts, but also by the crack system which split the lower unit into blocks more than 10 centimeters in size in the northern part of the excavated area. Owing to these cracks, some fossils in the lower unit have also been broken. This crack system was restricted to a small area of the lower unit of the HBSR. At the middle of the western half of the excavated area, grooves were found on the layer underlying the HBSR (Fig. 3). These grooves were a few centimeters in width and ran parallel to each other toward the east forming loops in several places.

-  Upper unit of hominoid bed
-  Lower unit of hominoid bed
-  Dark green silt layer
-  Grooves
-  Sun cracks

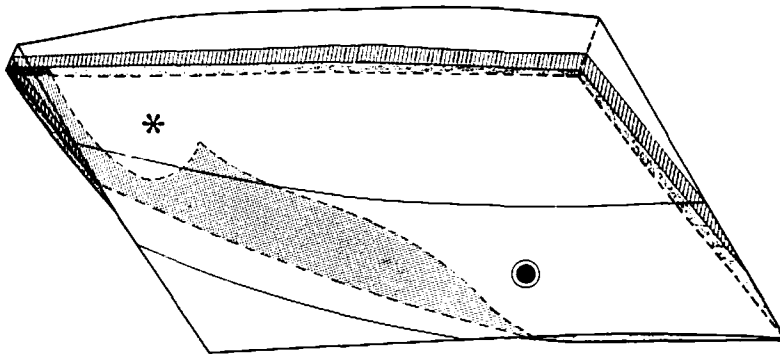


Fig. 3 Stratigraphy of the excavated area.

#### FOSSIL REMAINS

The fossils from the SH22 locality are not well preserved and are fragile. Most of them are small bone fragments and badly broken teeth or enamel fragments. They were scattered all over the area. In the lower unit, fossils were fewer than in the upper. Although well-preserved fossils are rare, two humeri, a coxa, several vertebrae, and a cranium are included. At present, an almost complete lower canine of a large carnivora, a lower first molar of Hyaenidae, small tooth fragments of Giraffidae, Rhinocerotidae and *Hipparion*, and a cranium of suid have been identified. Since the materials are under investigation, other mammalian taxa may be included. Scrappy bone or teeth fragments of aquatic faunal elements such as crocodiles and turtles are abundant. In the HBSR.

long bones did not show any preferred alignment. The distribution of fossils was not uniform, i. e. the southern half contained more fossils than the northern half did, as shown in Fig. 4. Despite that the KNM-SH-8531 fossil was found by surface survey in 1982 at the southwestern margin of the excavated area, the matrix attached to the fossil indicates that it can be derived from the lower unit of HBSR.

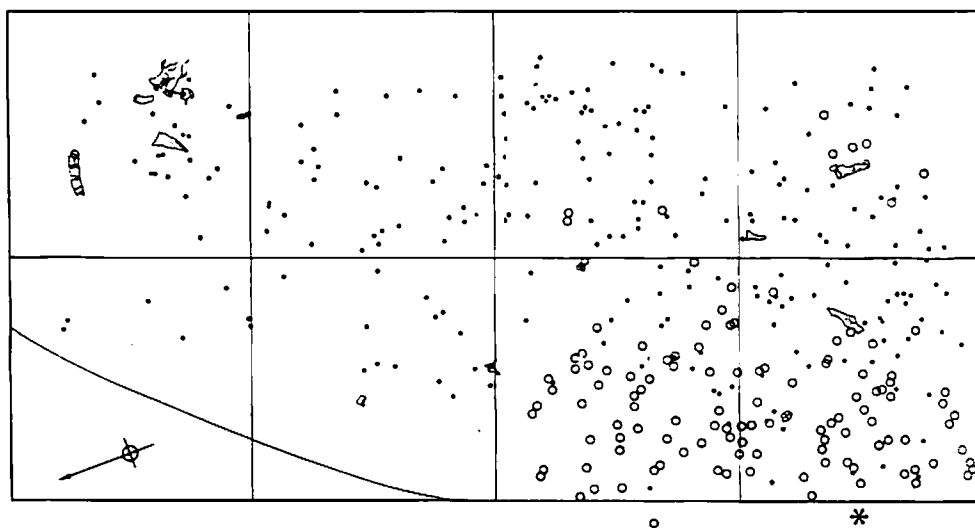


Fig. 4 Distribution of fossils at the SH22 locality. Fossils recovered in 1982 are indicated by open circles and those in 1984 by dots. The asterisk indicates the discovery locus of the hominoid maxilla (KNM-SH-8531).

#### SUMMARY AND CONCLUSION

The HBSR is restricted to the SH22 locality, whereas the overlying and underlying sediments are well developed and widely distributed around this locality. Although the excavation at the SH22 locality was carried out in a rather small area, sediments at this locality were not uniform. A thin silt layer occurred in the northern part, and grooves in the central part of the western half and a crack system at the northeastern corner were found. It is thought that the crack system might be a sun-crack because they showed a polygonal pattern and were restricted only in the fresh lower unit of the HBSR. These findings suggest that the HBSR at the SH22 locality may be the marginal deposit of an abandoned channel which was formed on a dried lake floor when the shore line had retreated. The HBSR itself seems to have dried out temporarily in part. In the fossil collection from the SH22 locality, small scrappy fragments and relatively well-preserved fossils are presented together. This indicates that there were two different processes leading to fossilization. Rather

fragile bones such as vertebra and coxa are well preserved, suggesting the short distance of transportation of these bones before fossilization. Since long bones did not show any special alignment, they seem to have deposited in a still water.

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