

Figure 1. Location of fossiliferous localities on Maboko adapted from Pickford (1984 figure VIII-2), as well as enlarged map of Bed 1-7 exposures at Maboko Main and Maboko Cliffs. Pickford was the first researcher to map Maboko deposits, earlier attempts by the 1973 Yale-Kenya team having been thwarted by extensive vegetation and maize fields on the Island (Andrews et al., 1981). Shallow excavation units by the Yale-Kenya team were carried out in Bed 3 (Quarry 1) to the west of the large southeast trending trench (Leakey's Trench, but referred to as "Owen's Trench" by Andrews et al., 1981) that photographs in the KNM archives (seen by BB) indicate was dug by L.S.B. Leakey's team between 1949 and 1951 (Pickford, 1986). The 1973 team also placed a 70 cm deep 4 square meter excavation in Bed 5 at the eastern edge of Leakey's Trench (Andrews et al., 1981).

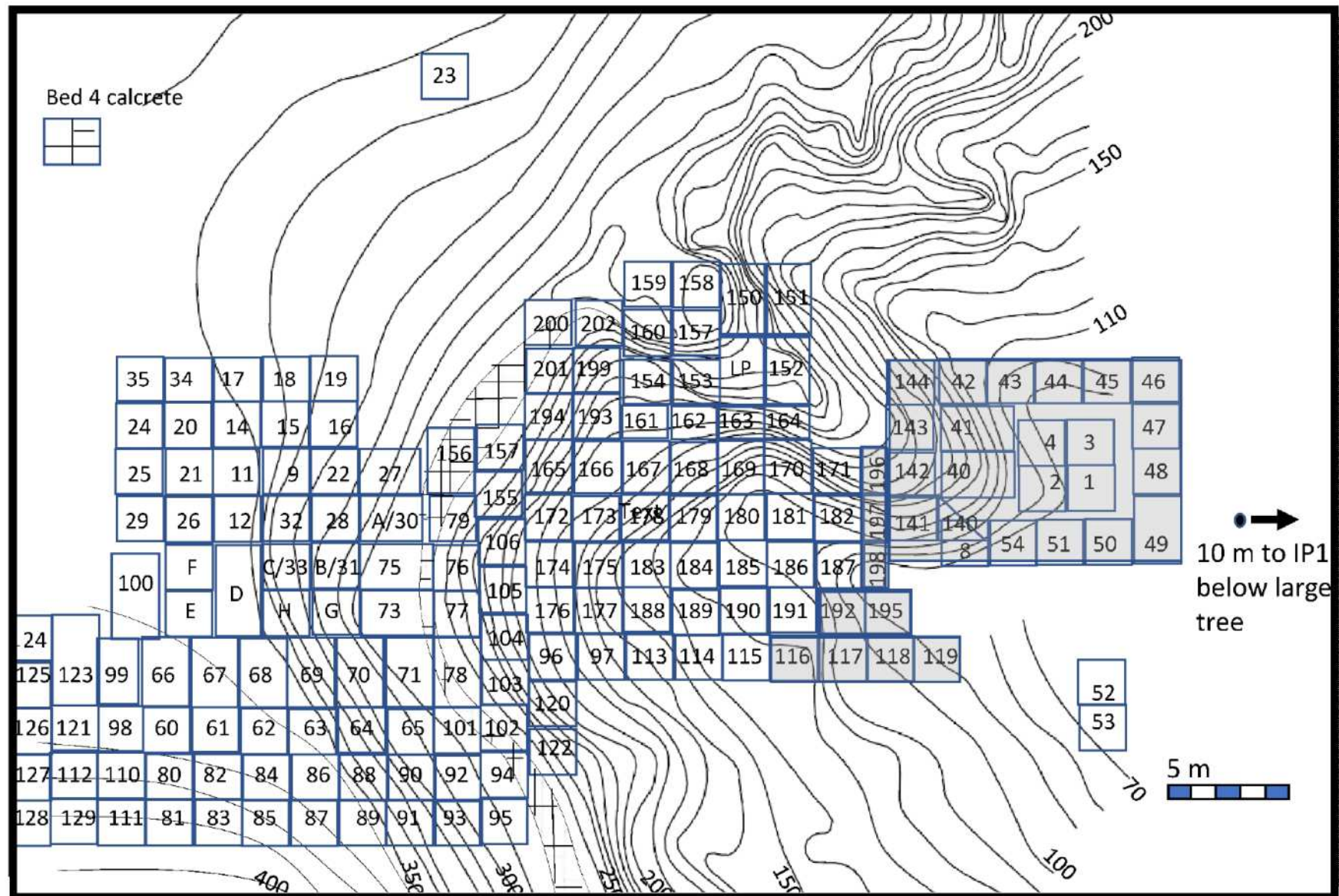


Figure 2. Revised map of 1987-1997 excavation units based on photographs and rediscovered field maps, showing pits to be oriented along a single axis rather than skewed (Geraads et al. 2012; Arney et al., 2022). The orientation, but not location of the pits has changed. Bed 5 only occurs above and to the east of the natural exposure of Bed 4 limestone layer, in pits to the east of its natural exposure as indicated on the map. Grey shaded excavation units indicate where only Bed 5 was excavated.

Figure 3. Photograph taken during excavation in January 1989 of the southern walls of (from left to right) Pits G, H, and D. Note the Bed 3 greensand overlies the naturally undulating bentonite surface, above which (from lower to higher) are a dark brown paleosol, loosely solidified limestone, brownish layer of sandy clay, a more solidified limestone layer, and topsoil composed of disturbed Miocene sediment.





Figure 4. Photograph taken in July 1993 of the southern wall of excavation Pits (from left/east to west) 95, 93, 91, 89, 87, 85, and 83. A: Bed 3 yellow greensand in Pit 95, B: undulating surface of Bed 2 pale mottled bentonite with thin brownish paleosol surface (as described by Andrews et al (1981) for their Quarry 1 fossils) in Pits (from south to north) 102-105, C: 170 cm thick resistant Bed 4 limestone above Bed 3, D: topsoil, and E: one of several paleosols running through Bed 3 greensand. Bed 3 greensand in Pits 94-95 was a meter thick, occurring 460-560 mm below IP1. Bed 3 greensand was only 10-56 cm thick in Pits 102-106, with the surface of Bed 2 located 495 cm below IP1 in Pit 102 and 464 below IP1 in Pit 106 toward the north.

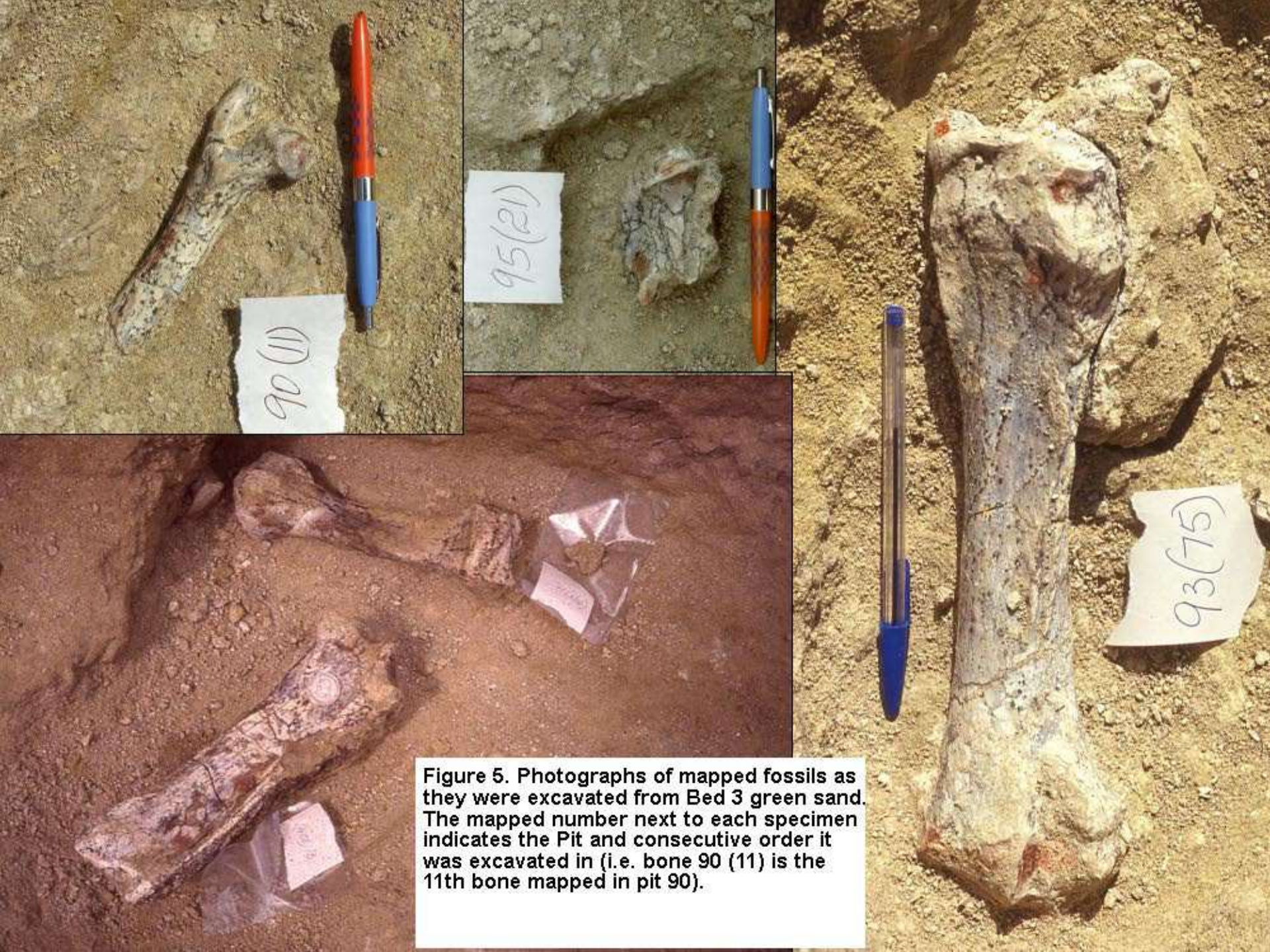


Figure 5. Photographs of mapped fossils as they were excavated from Bed 3 green sand. The mapped number next to each specimen indicates the Pit and consecutive order it was excavated in (i.e. bone 90 (11) is the 11th bone mapped in pit 90).

Figure 6. Photograph taken in 1992 of Victoriaceros femur KNM-MB 25713 during excavation from upper Bed 3 in Pit 71 with Blasto Onyango, Lucas, and Paul Asola, as well as two additional more darkly stained Bed 3 specimens. Note that all Bed 3 specimens have a waxy outer surface regardless of color.





Figure 7. Photograph taken in December, 1989 of eastern wall of Pits 46 (below BB), (from east to west/foreground) 45, 44, 43, and to the southwest of Pit 43 is Pit 41. Bed 5 white clay is clearly exposed in Pit 44 and the white clay interspersed with dark brown slicken slides in Pit 41. Disturbed topsoil at the surface is dark brown, but intact Miocene sediment overlying the white clay is seen above and below the orange layer on the southern side of Pit 46. A more detailed sediment profile of the Maboko Main and Maboko Cliffs sequence is given in Retallack et al., 2002: figures 6 and 7.

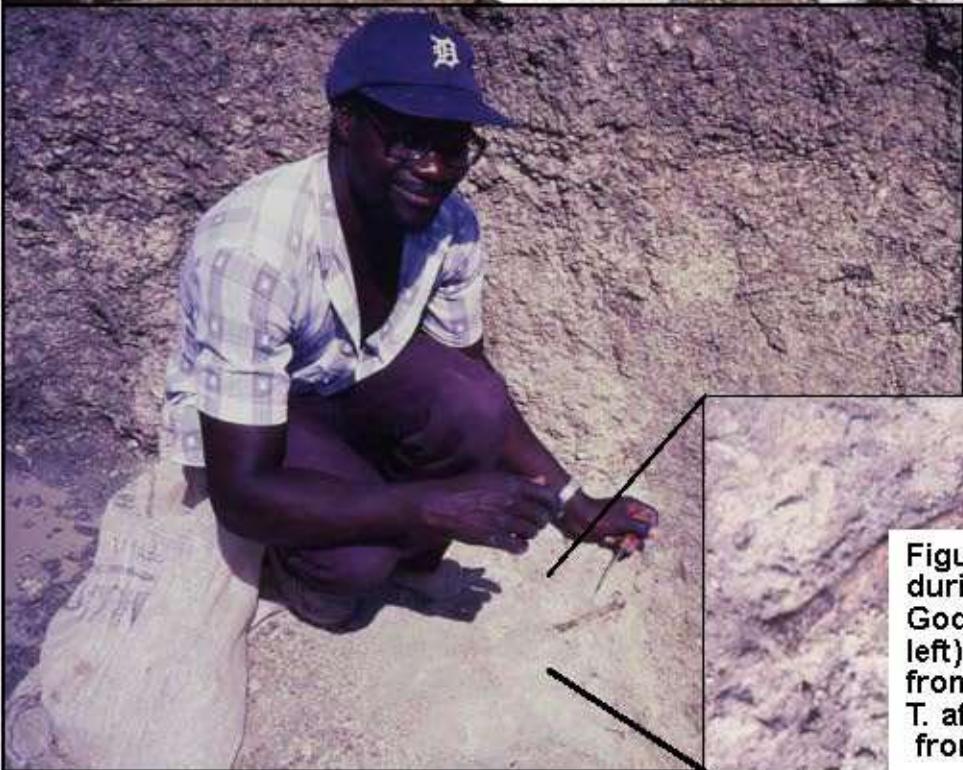


Figure 8. Photographs taken in 1987, 1988 and 1989 of fossils during excavation of Bed 5 white clay from Pit 40 (upper), with Godfrey Wadem Dondo in the Balk between Pits 1 and 3 (lower left), Pit 45 (lower middle), and craniofacial fossils of *V. macinnesi* from Pits 4 and 3 after cleaning have coloring similar to *T. africanus* NHMUK 15544 which could have been collected from Bed 5w or Bed 3.

Figure 9. Photograph taken from the north in 1996 showing the excavation of Bed 5 brown clay. Note the more convoluted structure of the Bed 4 limestone in the foreground below Pits 161-164 (from left to right) which is indicative of hydraulic activity, and the softer contact between Bed 5 brown clay and convoluted Bed 4 limestone. The transition from lighter to darker brown sediments from east to west led to some Bed 5b fossils to be mistakenly identified as being from Bed 5 "white clay" on KNM accession tags and field notes. This mistake is rectifiable because Bed 5w is superimposed over Bed 5 b (see Supplementary Figure 11). The actual Bed 5w white clay occurs at a depth of 140-180 cm below IP1 but the lighter brown more granular Bed 5b sediment at 200-300 below IP1.



Figure 10. Photographs taken in 1996 of the eastern walls of Pits (from left/north to south) 171, 182, 187 and to the east of them 195 showing the superposition of Bed 5w white clay and associated dark brown slicken slides over the lighter brown Bed 5b sediment. A dark brown dthero paleosol surrounded by cobbles occurs in a densely fossiliferous area just above Bed 4 in Pits 171-182 (Retallack et al., 2002).



Figure 11. Photograph taken from northwest in 1996 of Pit 171 during excavation.





Figure 12. Photographs taken in 1996 of Bed 5b fossils in the process of excavation from Pit 179 (left column) and Pit 171 (right column).

Figure 13. Photographs taken in 1996 and 1997 of the Maboko excavation. Upper left: eastern wall of Pits 171 (left), and Pits 182, 187, 19 and 195 to the south showing backfill over the excavated area in 1996. Retallack et al. (2002) sampled the Bed 5b dthero paleosols of this wall (referred to as "Eastern Wall, Maboko Main Eastern Excavation in their figure 2) and on the northern wall of Pit 171 (referred to as the Northern Wall).; Lower left: view toward south of same area as above, but showing intact resistant limestone on the southern wall of Pits 186 (left) and 185 in which Bed 3 greensand is being excavated; Lower right; Lower right: eastern wall of Pits 171-192 after excavation in 1997.



Figure 14. *T. africanus* specimen NHMUK 15544 (left column) and *K. pickfordi* specimen NMHUK 15543 collected at Maboko and sold to the museum between 1933 and 1935 by Archdeacon W.E. Owen. Horns of both specimens were likely complete prior to collection. L.S.B. Leakey was aware of Owen's clumsy excavation skills and sent D.G. MacInnes to assist him on Maboko (Cole, 1975). MacInnes made his own collections on Maboko during the 1930 and in 1947, but refers to the island by its local dho Luo name Kiboko (meaning hippopotamus) (MacInnes 1936, 1943), and labeled his fossils with the abbreviation KB (KB. A). Some of the fossil MacInnes collected are at the NHMUK and others at the KNM. Two areas were identified as potential places where Owen may have collected NHMUK 15543. The most likely is at the mouth of Leakey's Trench where a large mass of backfill was uncovered during the excavation of Pit 160 and other in the southwestern area of the excavation where a large area of backfill was located





Figure 15. Photograph (upper left) taken in 1994 of the eastern wall of Pits 151 and 152. The large mass of screened backfill sediment in the foreground likely fills a quarry dug by W.E. Owen between 1933 and 1935. The complete skulls of *Victoriapithecus macinnesi* (upper right) came from Pit 152 just north of the ladder of the crocodile *Kinyang mabokoensis* (lower right) 2 m southeast of the mass in Pit LP, and of *Victoriaceros kenyensis* (lower left) 50 cm south of the mass in Pit 160. Videos of the 1994 excavation, including of these skulls can be viewed at: <https://youtu.be/Ti0i3LrHRXU>; <https://youtu.be/u-Q5anZMmjg>; https://youtu.be/ooP_k6Nkqxm. Retallack et al. (2002) identified Mogo paleosols above the Bed 3 greensand in this area which likely experienced high hydraulic forces sometime after the deposition of Bed 3.





Figure 16. Photograph taken in July 1993 of the eastern (left) and southern walls of excavation Pits (from upper left to lower right) 95, 93, 91, 89, 87, 85, 83, and 81. Note the disturbed sediment in the western half of Pit 81 that we suspect is backfill from W.E. Owen's 1933-35 quarries. In 1992 Benefit and McCrossin's team excavated a proximal humerus of *Kenyapithecus africanus* (KNM-MB 24729) from disturbed sediment 5cm below the surface of Pit 66. The broken end of this bone perfectly conjoins the jaggedly broken proximal end of humerus shaft NHMUK 16334 (McCrossin 1994; McCrossin and Benefit 1994, 1997; Benefit and McCrossin 1995; McCrossin et al. 1998: fig 10). Interviews with the wife of W.E. Owen indicate that their son first brought the Maboko ape humerus to Hopwood at the then British Museum of Natural History (Cole, 1975). We assume that Owen tossed the proximal end of the bone from his quarry, the edge of which begins in Pit 181, onto an adjacent backfill heap on the top of Pit 66.

Figure 17. Upper: view of Maboko Cliffs (toward right) and Maboko Cliffs East (toward left) on the northern shore of the island. Lower: Bed 3 radiometrically dated tuff at Maboko Cliffs.





Figure 18. Surface survey of Bed 12 at Maboko Southeast with BB, C. Feibel (upper) and J. Onyango Miumi (lower).



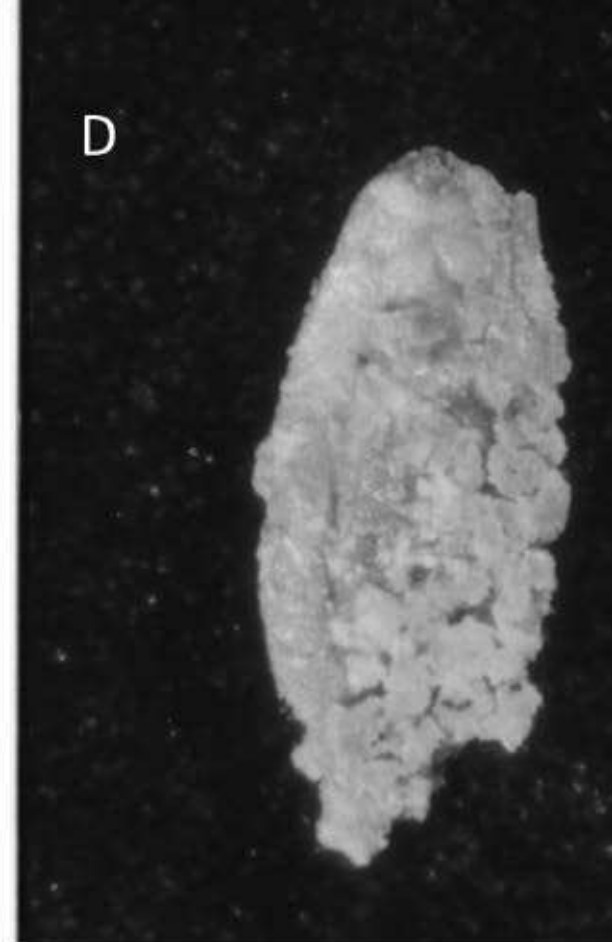
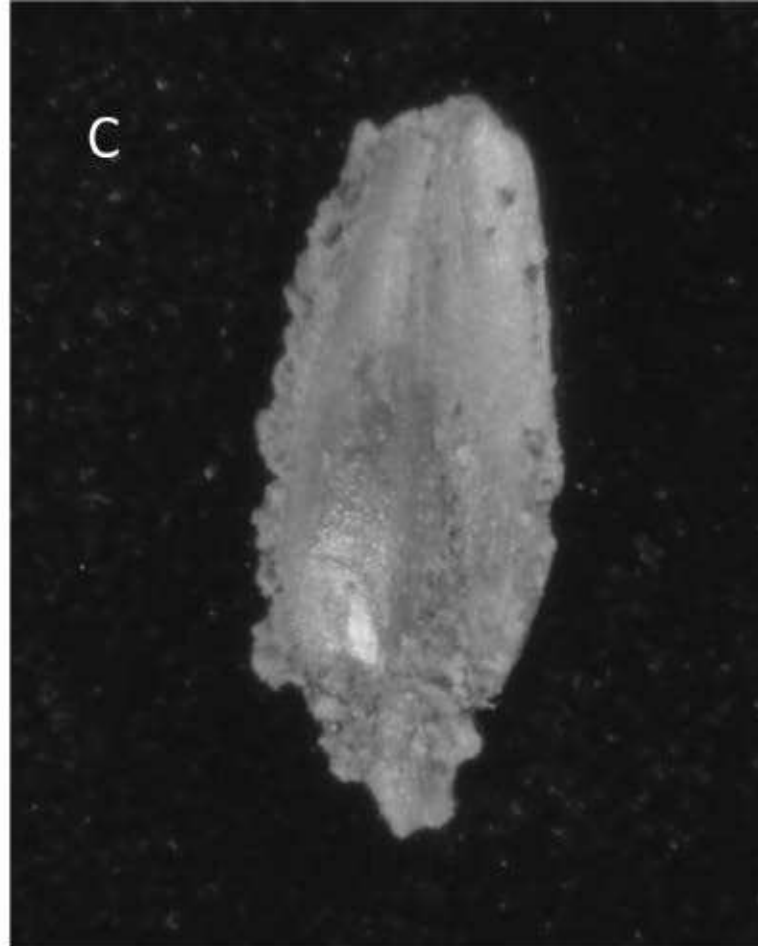
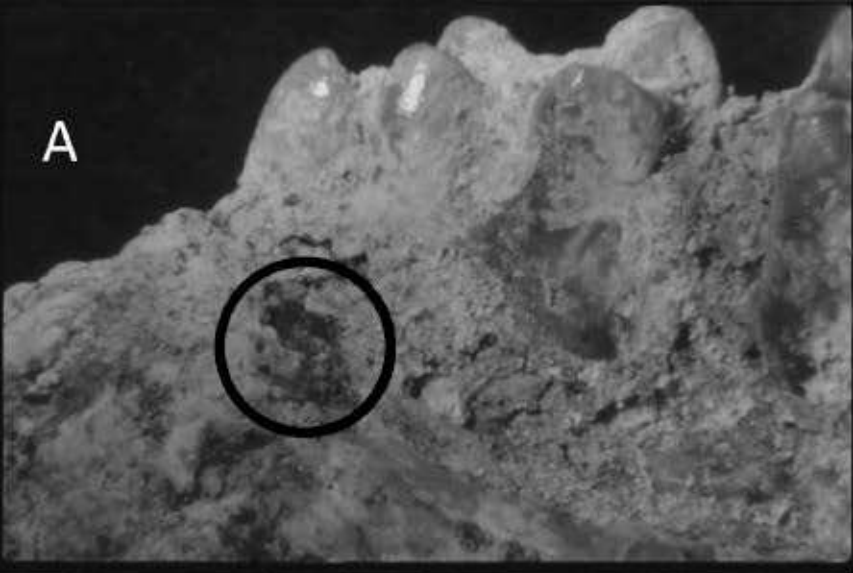


Figure 19. Maboko Miocene grass seed from Bed 5 white clay found attached to excavated *Victoriapithecus* specimen KNM-MB 18736 from excavation Pit 1. Each image is a scan of a 35 mm negative (24x36 mm).

A, circle indicating location of seed on mandible,

B, circled area taken through stereoscope at 6x magnification;

C and D, grass seed taken at 25x. Seed measures ~0.9 mm in length and 0.3 mm in width.