

Hominid Fossils and Eustasy

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The effects of eustasy (world-wide changes in sea-levels) on human/hominid and other fossils have never been recognised.

We can all appreciate the enormously destructive effect that waves have on a beach. Every beach is a giant milling machine. On most kilometres of most beaches, thousands of tons of rocks, pebbles and sand are moved along hundreds of metres each year. Any fossils that become exposed on a beach will be rapidly ground into tiny particles.

This is well known. But what is not widely appreciated is that over each 100 to 150 Kyr, beaches move inland, often for hundreds of miles, and then retreat, and advance and retreat again, and do so repeatedly. Within the broad 100–150 Kyr movements, there are dozens or hundreds of shorter-term ones, when the sea advances or retreats relatively short distances. As the coasts advance, they will chew up virtually all the soft surface soil, as well as some hard rock.

This means that for terrestrial species, such as hominids, which live at, or close to, sea-level, very few fossils will survive in their natural habitat. The only members of such species that are likely to leave fossils are those which have moved away from their habitat to higher ground, usually seeking (or migrating to) other habitable sites. They are often likely to die en route on such high ground, and will sometimes leave fossils in such locations — giving an entirely misleading impression of the nature of their normal habitat to those who discover them.

Eustatic sea-levels are shown at this site:

http://en.wikipedia.org/wiki/Sea_level_rise#Local_and_eustatic_sea_level

It might be thought that the fossils of hominid (and other such species) could be located at sites just above the point of the highest recorded sea-level. Unfortunately, the time concerned is likely to have been so brief as to barely register. Instead of finding fossils from the whole of, say, a 5 Myr record, we are obliged to look for them in a layer which is only about one thousandth as deep.

Fossils of hominids and other similar species are likely to survive most often in geographical locations which have experienced continuous uplift since they were deposited — thus enabling them to escape coastal erosion. That is probably why the Afar region is so rich in fossils.

Paul.

• *Follow-Ups:*

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◇ *From:* Mario Petrinovich

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