

## THE STERKFONTein VALLEY AUSTRALOPITHECINE SUCCESSION\*

by

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### ABSTRACT

If we knew the kinds and relative frequencies of animal species belonging to a natural living community, we would be able to predict the supporting environment with some accuracy. Unfortunately for the palaeoecologist the equivalent parameters of a fossil assemblage usually differ substantially from those of the ancient living parent community. This distortion results from the action of a number of taphonomic factors during the passage of remains "from the biosphere to the lithosphere". The major steps of palaeoenvironmental reconstruction from fossils follow a circuitous route of erecting hypotheses upon hypotheses:

1. *Analyses of taxonomy and relative frequency.*
2. *Recognition of environmental indicators (EI):* Which fossil groups are environmentally specialized (i.e. good EIs); and precisely what kind of environments do they indicate? (estimated from modern analogy).
3. *Recognition of taphonomic biases:* Have the proportions of EIs in the original community been distorted by preferential inclusion and survival in the assemblage? Such bias or distortion may be caused by many factors, for example seasonality and duration of deposition, geographic area sampled, mode of death, transport and accumulation, species death rate, and so forth.
4. *Estimation of EI proportions in the original community* by correcting where necessary for taphonomic biases.
5. *Interpretation of taxonomic and morphologic change:* Let us assume that estimates of original EI proportions, resulting from steps 1-4, can be seen to change significantly in chronologically successive strata in one area like the Sterkfontein Valley. Must such morphologic/taxonomic change necessarily imply a change in the ecosystem, or may it imply no more than the passage of time?

A particular palaeoenvironmental study on fossil assemblages from Sterkfontein, Swartkrans and Kromdraai is followed through steps 1-5 to its conclusion.

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