3 EVOLUTION OF GRASS COVERS: AFRICA AND AMERICA

3.1 Africa south of the Sahara

3.1.1 Palaeoclimatic Hypothesis

It is possible to trace the evolution of the vegetation of Africa further back in geobotanical history. The present discussion relates to the history and evolution of the grass covers as proposed mainly by Aubreville (1962). The concepts of Jacques-Félix (1962) with regard to the tribes, genera and species of the Gramineae are given in 9.2.1.

Aubreville (1962) has proposed a palaeoclimatic origin for certain savannas which occur today in Africa. Where soil is not a factor and the influence of man did not early acquire a significant intensity, it is necessary to suggest another explanations for the vast areas of savanna now found in climates suitable for dense humid or dry forest. Some believe that the Quaternary glaciations would have brought humid conditions and only a slight fall in temperature in Africa and Latin America. Aubreville, on the other hand, considers that a polar shift of about 12.5° latitude south would have brought dry and very cold conditions to west and central Africa. This change would have been sudden, causing a retreat southwards of the forest, while its place was taken by grassland. The forest moved to the southern tip of the continent. The Angola coast remained covered in savanna and steppe in spite of being in the Equatorial zone. This was due to the desertifying influence of the Benguela current. The east African climate became favourable for the expansion of tropical forests on mountains and the high plateau, and their expansion towards the south where they approached the region of the Cape. (A possible ecological origin of the grass components of these derived African savannas is given in 5.3).

With the return of the Pole northwards and the retreat of the glaciers of the last Ice Age, Africa south of the Sahara again acquired a forest climate (Aubreville, op. cit.). This created conditions for the return of the many forest types of the region from the favourable mountain and coastal bastions where they had persisted, just as today there remain in favoured localities in southern Africa certain vestiges of the Guineo-Congolese forest. Forest regeneration proceeds along banks of watercourses, extending in corridors, taking over hills, coastal plateaux on young soils, more humid soils, and eroded areas protected from fire. Tentacles join isolating savannas, which are then colonized from the...
forest and taken over. The forest has not yet reconquered all its old do-
main (AUBREVILLE, 1968). Progression in succession is always slower than
regression; therefore this change back to forest was probably slower than
the original change from forest to savanna; it has, of course, als o been
impeded or even prevented by the actions of man in his attempts to
retain the economically valuable savanna cover.

If there had been an ancient indigenous grass flora in South Africa,
it would probably have been eliminated at this time, its place to be taken
later in the post-glaciation phase by grasses of east African origin.

When the forests returned to roughly their present position between
Gabon and Uganda, between its southern borders and the limits of the
position occupied during the Quaternary glaciation, a vast region was
invaded by grasses. Then the semi-xerophytic flora of the present dry
forests, open forests and Sudano-Zambesian wood savannas typified by
Brachystegia also pushed north into the newly ‘savannized’ region. This
progress is, however, less rapid than the withdrawal of the humid forest.
That is why there persists between the southern borders of the humid
forest and the forêts claires of Brachystegia characteristic of Angola,
Katanga and Zambia, a great expanse of grassy or poorly wooded
savannas – a biological hiatus. DUVIGNEAUD (1951) has noted that
the Angolo-Rhodesian open forest is moving north across the great
savannas, and has not yet established contact with the equatorial forest.

3.1.2 Grass Covers in Natural Vegetation

It is necessary to consider the ecological status of the grass covers of
Africa south of the Sahara in the natural vegetation (RATTRAY, 1960).
‘Dans les régions intertropicales le climax est de façon générale, constitué
par des forêts. Le fait est unanimement admis par les botanistes et les

AUBREVILLE (1962) enumerates the climax tropical vegetation types
as follows:
‘Les climax forestiers dans la zone intertropicale
Nous arrivons alors à ces conclusions générales très importantes d’écolo-
gie tropicale que dans les pays tropicaux la végétation primaire est sous
les climats humides une végétation de forêt dense, ou plus généralement
de végétation ligneuse dense et, sous les climats semi-arides, encore une
végétation ligneuse, biologiquement différente des précédentes, fermée
ou ouverte; lorsqu’elle est ouverte il y a transition vers des formes mixtes
gaminées et forestières. Dans les régions semi-désertiques, les for-
mations climax sont encore des steppes à végétation ligneuse, des sous-
airisseaux nains et des succulents, très ouvertes, où les herbacées pé-
rennes (graminées) n’ont plus une place prépondérante, alors qu’au con-