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Pollen and Climatic Change

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Preface

This volume contains the proceedings of two symposia held during the 8th International Palynological Congress, September 6 to 12, 1992 in Aix-en-Provence, France. It concerns the symposium "Extra-tropical paleoclimates in the Western Hemisphere" convened by V. Markgraf, C. Villagran and P.J.H. Richard, and the symposium "Tropical palynology and global changes" convened by R. Bonnefille, P.A. Colinvaux and A.P. Kershaw.

The aim of these symposia was to present and discuss new data provided with accurate chronology in order to improve the understanding of local to regional climatic fluctuations as a response to

global change. Specific questions concerned tests for astronomical theory of climatic changes, timing and nature of the climatic changes in the two hemispheres, analysis of high resolution time series for local effects of climatic variables on the continent, and the relation of climatic signals in pollen records with vegetation dynamics.

In the present volume a selection of oral and poster presentations is included. The study areas are mapped in Fig. 1. The N-S transect through the Americas, as well as the tropical belt over the globe, being the topics of both symposia, can easily be recognized.

For Alaska (Edwards and Barker), Eastern

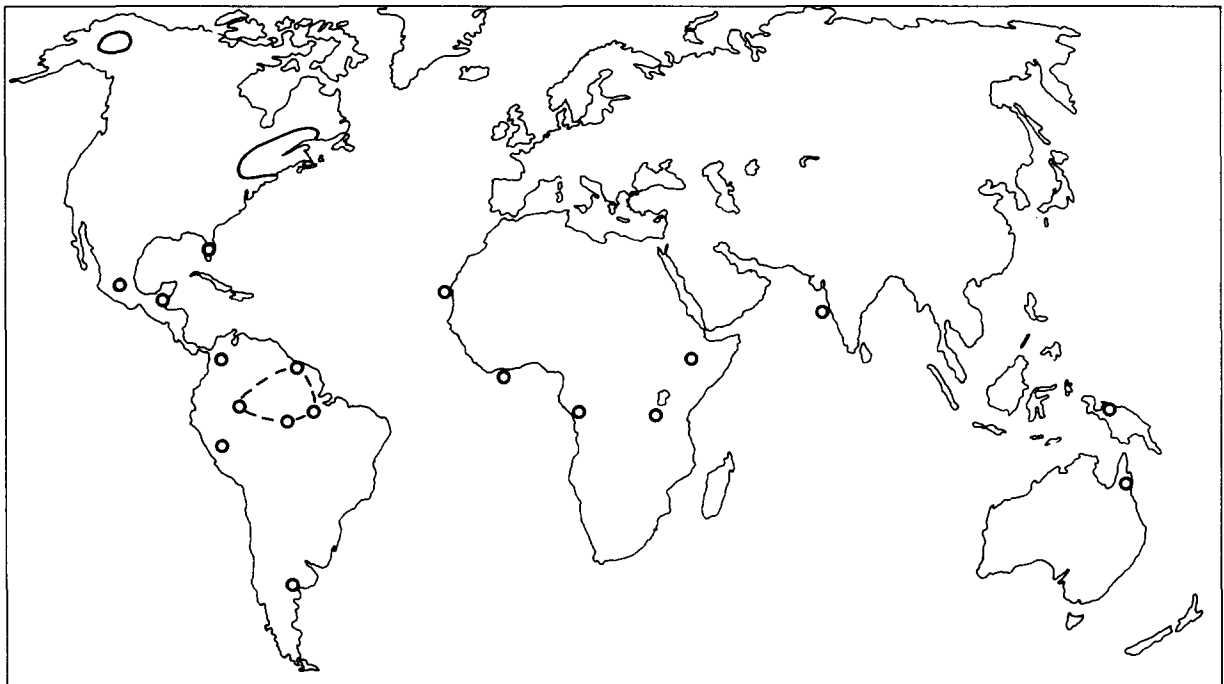


Fig. 1. Study areas of the papers presented in this volume.

Canada (Richard) and the Amazon Basin (Van der Hammen and Absy) regional studies, based on a number of sites, are presented. Other papers are based on few sites, or even one single location, but for many locations authors claim that the results in terms of vegetational and climatic change, are representative of a larger area. Especially the papers of Leyden et al. (Yucatan), Hansen (Peru), Schäbitz (Argentinian Patagonia), Bonnefille and Mohammed (Ethiopia), Elenga (Congo), Jolly et al. (Burundi) and Hope and Tulip (Irian Jaya, Indonesia) provide new data in up to now poorly investigated areas. They contribute considerably to our understanding of the spatial pattern of the response to global climatic change. However, the environmental history of certain areas, such as the tropical rain forests in the Amazon Basin and Western equatorial Africa, is already for many years in debate and need urgently a substantial effort to enlarge the available data within short time.

Two studies (by Caratini, concerning West India and by Bonnefille and Mohammed, concerning Ethiopia) focus on the last 3500 years whereas six concerning Alaska (Edwards and Barker), Eastern Canada (Richard), Peru (Hansen et al.), Argentinean Patagonia (Schäbitz), Congo (Elenga et al.) and Burundi (Jolly et al.) cover the Holocene or reach even to the last glacial maximum. Pollen records covering some 35 to 60 ka are presented for Florida (Watts and Hansen), Yucatan (Leyden et al.), the Amazon Basin (Van der Hammen and Absy) and Irian Jaya (Hope and Tulip). Long continental records are from Colombia, covering the interval 27,000–735,000 years B.P. (by Hooghiemstra and Ran), Gulf of Guinea, covering the last 225 thousand years (Fredoux), West Africa, covering the period from 1.8 to 3.7 million years B.P. (Leroy and Dupont) and Australia, covering the period from 9000 to 190,000 years B.P. (Kershaw).

The time windows of many papers meet the intervals that have special attention in the Past Global Changes programme (PAGES), viz. the past 2000 years, and the glacial–interglacial cycles

in the Late Quaternary. In this respect many contributions presented at the congress in Aix-en-Provence are also a contribution to the Past Global Changes programme of the International Geosphere–Biosphere Programme (IGBP).

A task of increasing importance in palaeo-environmental studies is to link the observed vegetational change and the inferred climatic change to changes in atmospheric circulation. Palynologists have most success with inferring the factor temperature from their proxy data although estimates for changes in paleoprecipitation will become soon available. Changes in effective humidity generally are somehow related to changes in atmospheric circulation and orbital forcing. If palynologists improve methods to test reconstructed patterns of past atmospheric circulation on the basis of regional to subcontinental studies that include a grid of well-studied sites, they could play a more important role in the palaeoclimatological model approach. This is a challenging task and in this respect the paper of Leyden et al. is as provocative as informative.

We like to thank the organisers of the 8th IPC for their respectable dedication to make this conference so well-organized and such a success. The field excursions play an important part in the understanding of the published paleoenvironmental data and should be considered as essential for scientists who have to make use of these data, whether in scientific studies or for lecturing.

The following scientists kindly participated in the review process: D.P. Adam, H.J.B. Birks, R. Bonnefille, E. Cushing, M. Davis, P.A. Delcourt, L. Dupont, J.R. Flenley, J. Guiot, A. Graham, L. Heusser, H. Hooghiemstra, G. Hope, A.P. Kershaw, V. Markgraf, B. Messerli, D. Peteet, J.C. Ritchie, A. Street-Perrott, D. Taylor, L. Tessier, L. Van Campo, T. van der Hammen, A. de Vernal and W.A. Watts.

We like to thank especially Vera Markgraf, Carolina Villagran, Paul Colinvaux and Peter Kershaw for their contribution in organizing the above mentioned symposia.

Raymonde BONNEFILLE (Marseille) and
Henry HOOGHIEMSTRA (Amsterdam)