

**IGCP Project 469: Variscan Terrestrial Biotas and
Palaeoenvironments**

NEWSLETTER NO. 1



Welcome to the first Newsletter of IGCP Project 469. The Newsletter will be issued periodically, to disseminate news of activities and results of the project. To minimise costs, it will be circulated via e-mail, but members of the team are free to make hard copies for circulation within their country. Items for future Newsletters will be welcomed from team members. They should be sent to the project administrator in Cardiff (helen.fraser@nmgw.ac.uk).

Aims of the Project

This project will investigate late Westphalian (Pennsylvanian) palaeoecological changes that took place across the Variscan Foreland and Mountains, during a critical time in the Palaeozoic evolution of Europe and Eastern North America. The Variscan Orogeny affected large parts of this region, as Gondwana and Laurasia collided during the Late Carboniferous. The resulting tectonic activity disrupted the lowland swamp habitats that had occupied much of the Variscan foreland, as well as causing the development of intramontane basins within the adjoining Variscan Mountains. However, our understanding of the environments in these basins is still limited. What were the relative elevations of the different basins? What were their relative subsidence-rates and sedimentation-rates? What was the rate of down-draw of carbon in each basin and what was the effect, if any, on global climatic change?

Plants are known to be one of the most sensitive environmental indicators of terrestrial habitats and so the palaeobotanical record is an ideal tool with which to investigate this problem. The project aims to develop an integrated palaeofloristic database for each of the main late Westphalian and earliest Stephanian coal basins in this area. By bringing together palaeobotanical and palynological specialists from the various countries where these coal basins occur, it is intended to develop for the first time an agreed taxonomy for the plant macro- and microfossil species. A floristic distributional database will be developed using this consistent taxonomic nomenclature, and will be investigated by multivariate statistical analysis. It will also include estimations of species abundance, which will help with judging endemic or provincial species. This floristic evidence will be integrated with sedimentological

evidence of depositional regimes in the various basins. The resulting synthesis will provide the most complete environmental picture to date of these Variscan-affected habitats, and will have important consequences for our understanding of the evolution of the Variscan Orogeny.

Marine deposits are virtually absent from these sequences, and so there is effectively no evidence from marine faunas. Terrestrial faunas of this age are generally rare and of uncertain value for palaeoenvironmental interpretation. The only significant exceptions are insects and spiders, whose remains occur reasonably abundantly in the Upper Carboniferous of the Variscan Foreland and Mountains. The project will therefore attempt to incorporate these groups into the biogeographical database.

Historical Background

The origins of this project lie in an earlier investigation into the late Westphalian - early Stephanian floras of the Variscan Foreland. This had involved collaboration between palaeontologists in the UK (Barry Thomas and Chris Cleal), Canada (Erwin Zedrow) and Bulgaria (Yanaki Tenchov and Tatiana Dimitrova), and was funded as part of the NATO Science Programme. Also at this time, a series of collaborative research programmes was developing between members of the NATO Team and palaeobotanists in the Czech Republic, including Stanislav Opluštil, Jiří Bek and Zbyněk Šimůnek. We all shared a common interest in the systematics of late Westphalian - early Stephanian floras across the Variscan Foreland and the adjacent intramontane basins, and what this could tell us about the changing environments in the palaeotropics. The time therefore seemed ripe to widen the scope of the collaborative work to include all those active in the palaeobotany of these deposits.



Members of the NATO-Funded project during their inaugural meeting in Sydney, Nova Scotia (September 2000). From left to right: Prof. Yanaki Tenchov, Dr Tatiana Dimitrova, Dr Chris Cleal, Professor Barry Thomas and Prof. Erwin Zedrow.

Our collaborative work had also indicated the importance of palynology for understanding the palaeoenvironment of these deposits. Palynology has of course been extensively studied in these rocks, but mainly from a biostratigraphical stand point. Using palynology for understanding Late Carboniferous vegetational changes has been hindered by our limited understanding of what pollen and spore morphotypes were produced by what plants. However, the situation here has changed significantly through the work of palynologists such as Jiri Bek, and is well demonstrated through Balme's 1995 catalogue of *in situ* pollen and spores, published in *Review of Palaeobotany and Palynology*. Preliminary studies by Tatiana Dimitrova in Bulgaria, Britain and Canada has shown palynological data can be translated into meaningful vegetational trends, which could obviously be critical for understanding palaeoecological changes occurring at this time.

Terrestrial biotas in the palaeotropics at this time were dominated by plant life, and so palaeobotany and palynology will play a major role in our studies. The most significant part of the zoological biotas preserved in the fossil records are insects. The potential of palaeoentomology for palaeoecological interpretation has never been properly developed. However, we hope to change this by co-ordinating our work with the palaeoentomological database being developed by Ed Jarzembowski. Arachnid data will also be incorporated in collaboration with Paul Selden. Whether vertebrate palaeozoology will be relevant will have to be seen.

Marine biotas are of little relevance to our studies as marine influence was very limited across the Variscan Foreland at this time. Freshwater biotas have a potential role but there is currently little active work on these fossils.

Team Members

There are currently 30 people that have joined the Project, and these are divided into 4 groups based on geographical area.

Team	Contributor	Affiliation
Western Europe	Dr C. J. Cleal	Nat. Museum & Galleries of Wales
	Miss Helen Fraser	Nat. Museum & Galleries of Wales
	Mr B. Evans	Nat. Museum & Galleries of Wales
	Prof. B. A. Thomas	Univ. Wales, Aberystwyth
	Dr A. Hemsley	Univ. Wales, Cardiff
	Dr I. Glasspool	Univ. Wales, Cardiff
	Dr H. Falcon-Lang	Univ. Bristol
	Dr B. Besly	Univ. Keele
	Dr P. Selden	University of Manchester
	Prof. E. Jarzembowski	Maidstone Museum
	Prof. J.-P. Laveine	Univ. Sci. Tech. Lille
	Prof. J. Broutin	Univ. M. & P. Curie, Paris
Central Europe	Dr S. Opluštil	Charles Univ., Prague
	Dr Z. Šimunek	Czech Geol. Surv., Prague

	Mr Milan Libertin	Czech Geol. Surv., Prague
	Dr Jana Drabkova	Czech Geol. Surv., Prague
	Dr J. Bek	Czech Acad. Sci, Prague
	Mr J. Pšenička	W. Bohemia Museum, Plsen
	Dr A. Kotas	Sosnowiec, Poland
	Dr A. Kotasowa	Sosnowiec, Poland
	Dr S. Schultka	Mus. für Naturkunde, Berlin
	Dr E. Kahlert	Mus. für Naturkunde, Berlin
	Dr R. Rössler	Mus. für Naturkunde, Chemnitz
Eastern Europe		
	Prof. Y. Tenchov	Bulgarian Acad. Sci., Sofia
	Dr T. Kh. Dimitrova	Bulgarian Acad. Sci., Sofia
	Dr M. Popa.	Univ. Bucharest
North America		
	Prof. E. L. Zodrow	Univ. Coll. Cape Breton
	Dr J. Utting	Geol. Surv. Canada
	Mr B. M. Blake	W. Virginia Geol. Surv., Morgantown
	Dr P. McA. Rees	University of Arizona

Forthcoming Meetings

Inaugural Meeting

During the *International Congress on Carboniferous and Permian Stratigraphy* (10-16 August 2003), a half-day session is being devoted to IGCP Project 469. The session will include a series of oral presentations on themes related to the project. So far, the following presentations have been accepted.

Climatic and Vegetational Changes in the Late Carboniferous tropical belt
by C. J. Cleal, Y. G. Tenchov, T. Kh. Dimitrova, B. A. Thomas & E. L. Zodrow.

Tectono-sedimentary development, palaeogeography and general floristic changes in coal basins during the Late Carboniferous by S. Opluštil
[exact title to be finalised].

A review of current knowledge of Carboniferous in situ pollen and spores
by J. Bek [exact title to be finalised].

Progress Report on Late Pennsylvanian pectopterid palaeobiology: Czech Republic-Canada by J. Pšenička, E. L. Zodrow, J. Bek & C. J. Cleal.

Variscan palaeoentomology and entomogeography by E. Jarzembowski.

There will also be a business meeting held to review current activity within the project and to plan future work.

Eastern European Meeting – Sofia March 2004

The second project meeting is planned for early next year, to be held at the Academy of Sciences in Sofia. Further details will be given in the next newsletter.