

IGCP Project 469: Variscan Terrestrial Biotas and Palaeoenvironments

NEWSLETTER NO. 2



Utrecht, August 2003

The inaugural meeting of IGCP 469 took place during the International Congress on Carboniferous and Permian Stratigraphy, at Utrecht. The logic was that many members of the Project would already have funding to attend the ICCP and so this would reduce the call on IGCP funding. It would also act as a valuable 'show-case' for the Project, which would hopefully draw new participants to join us. Eighteen existing members of the Project were in fact able to attend, and a further four people joined us during the meeting.

The IGCP part of the Congress fell in to two parts. Firstly, there was a Business Meeting,



IGCP 469 Team at International Congress on Carboniferous and Permian Stratigraphy, Utrecht (August, 2003).

where we discussed plans for the initial phases of the project. It was agreed that our first priority must be to establish what data are already available, especially the already existing palaeontological collections. In particular, this should record the quality of the collections, in terms of numbers of specimens available from individual localities. This is particularly important for the palaeobotanical collections, as morphological variation has to be taken in to account for reliable identifications. It is also essential that we locate collections of relevant fossil faunas (principally insects and arachnids). We also discussed the stratigraphical and geographical limits of the Project. This will be dealt with later in this Newsletter.

The second IGCP session was held on the Thursday afternoon, where a series of oral presentations relating to the Project were given. These included:

Introduction to IGCP 469: Variscan terrestrial biotas and palaeoenvironments by C. J. Cleal

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

Palaeozoic in situ spores studies: history and developments by J. Bek

Progress report on Late Pennsylvanian peccopterid palaeobiology: Czech Republic – Canada by J. Pšenička, E. L. Zodrow, J. Bek & C. J. Cleal

Variscan palaeoentomology and entomogeography by E. A. Jarzembowski

Climatic and tectonic history of the Variscan foreland and adjacent areas during the late Westphalian – early Stephanian and their effect on changes of vegetation pattern by S. Opluštil

Abstracts of these presentations can be found in the ICCP Abstracts volume, and their full text will be published as part of the Congress proceedings.

Stratigraphical and geographical limits of the Project

During the Utrecht meeting, several Project members asked for clarification of exactly what stratigraphical intervals and geographical areas were being studied in IGCP 469.

Stratigraphy

The underlying aim of the project is to get a better understanding of what was happening in the Variscan area in the run-up to the disruption of the tropical forests there during the Cantabrian Age. The Project will therefore be mainly looking at the Cantabrian and Westphalian D Stages. However, in order to give a stratigraphical foundation to the work, we will also be looking at the upper Bolsovian Stage, as this is when the area of the coal forest habitats show the first signs of contraction across the Variscan Foreland, such as in the Pennines Basin of northern England.

Geography

The areas to be dealt with in IGCP 469 fall into three groups.

1. The Variscan Foreland

- Dobrudzha Coalfield, Bulgaria
- Upper Silesia, Poland
- NE Germany
- Ruhr
- The Netherlands
- Nord-Pas-de-Calais, France
- Pennines Basin, UK
- Central England (including Forest of Dean & Oxfordshire), UK
- South Wales UK
- Sydney Coalfield, Canada

2. Variscide Intramontane Basins

- Romania
- Central Bohemia, Czech Republic
- Zwickau, Germany
- Saar-Lorraine, France & Germany

3. Appalachian Foreland

- West Virginia

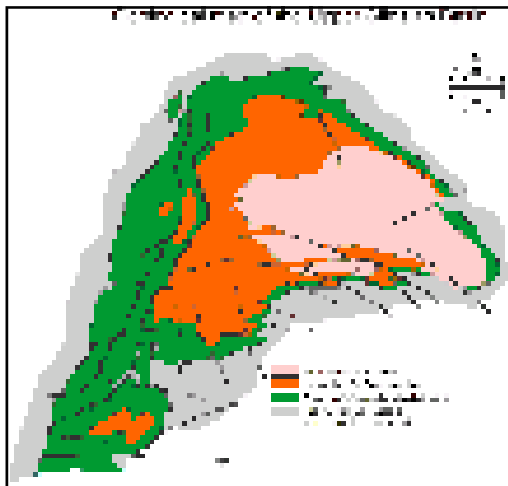
Upper Silesia

Stanislav Opluštil and Marek Doktor

(On behalf of the Czech and Polish teams)

The IGCP 469 Project provides an ideal platform for anyone who wants to co-operate with researchers from other countries who are dealing with Variscan terrestrial biotas and palaeoenvironments. The main advantage is obvious: it provides an opportunity to gain experience and learn the opinions from those working in other coal basins, to study their flora, and to discuss the problems in a much more efficient way than reading of any paper.

An example of such co-operation is now coming into reality. Czech and Polish teams are now focusing on the Upper Silesian Coal Basin, which straddles the border between these two countries. This basin has a coal-bearing sequence that is nearly 7,000 m thick, ranging



from the lower Namurian (Arnsbergian) to the upper Westphalian D, and is the key basin for the eastern part of Central Europe. A long history of mining activity and of research (it is the classical area of Stur, Šusta, Gothan, Dybová-Jachowicz, Stopa, Kotas, Gradzinski and many other researchers) has provided an enormous set of different types of data, which until now has still not been fully investigated.

Polish and Czech geologists plan to develop co-operation through projects sponsored by their national grant agencies. The projects will focus on changes in biotas and sedimentary environment during the deposition of the Cracow Sandstone Series (Bolsovian – Westphalian D). Initially, the existing data will be re-evaluated, in an effort to standardise the information, and to identify gaps in our knowledge. Where such gaps exist, new data will be obtained.

We will be trying to determine which data best indicate the changes in those parameters (subsidence, climate, sediment supply etc.) that controlled the changes in biotas. This will then help us standardise the data obtained from the other basins being studied in IGCP 469, so that we have available a set of internally comparable data.

In particular, the following information will be evaluated concerning basin characteristics and floristic evolution.

Basin characteristics

Subsidence curves derived for particular time intervals

There are several ways of deriving subsidence curves, and it is essential to use a standardised approach. We prefer the construction of:

- idealised subsidence curves – derived from the maximum thickness of particular units
 - real subsidence curves – derived from thickness of particular units in actual boreholes
- Several boreholes (lacking tectonic reduction) should be selected in each basin. Boreholes should be located in different parts of the basin, and their number will vary depending on how complicated the basin is.

Subsidence curves will be constructed in each basin for particular lithostratigraphical units and/or time intervals (Bolsovian, Westphalian D, etc). Hiatuses have to be taken into consideration.

Simple curves can be obtained by plotting the thickness of particular lithostratigraphic unit against the time of their deposition. More sophisticated curves are obtainable using special

‘backstripping’ software, which gradually decompacts the sedimentary column. However, this method requires knowledge of the lithological character of each unit, expressed as percentages of sand, etc.

Sedimentary environments of particular lithostratigraphical units/time interval

This mainly concerns a revision of the published data, mainly the characteristics of their sedimentary environment (fluvial style, etc.), main facies, etc.

Petrological composition of coal seams

The project will investigate the mean petrographical (maceral/lithotype) composition of as many coal seams as possible. This does not require the detailed, time-demanding petrographical study of many coal seams, divided into several segments (usually lithotypes), but only the maceral/microlithotype analysis of one sample for the whole seam thickness. However, attention must be paid to the sampling procedure. Ideally, the whole-thickness sample should be taken from the available coal seams – the same volume of coal from each lithotype. If it is not possible to sample a continuous profile of the seam (especially if it is thick), then several samples of the same size should be taken from various stratigraphic levels in accessible parts of the seam. These samples should be homogenised to prepare a ‘mean’ sample. To exclude influence of local developments, two profiles from one coal seam from different parts of the basin/mines/mining field should be tested.

Floristic and palynological data

Palynological spectra of coal seam and /adjacent clastics

The same samples as used for coal petrography will be used for palynology, to provide the mean miospore spectrum of each studied coal seam. In addition, the palynology of the roof shale or of any mudstone horizon between the coal seams would be very important. Samples should be localised (for example 1.5 m above coal seam No. etc.).

Floristic changes (biostratigraphy)

This will involve the investigation of the floristic record, based mostly on material from collections of various institutions, *in situ* spore studies and, if possible, collecting the flora at coal tips, etc.

Hexapod perspective

E.A.Jarzewowski

This newsletter article is a follow up to my talk entitled 'Variscan palaeoentomology and entomogeography' given to the IGCP session at the ICCPS, Utrecht, on 14th August, 2003. The discussion at this inaugural meeting narrowed down the project to an approximately seven-million-year time interval from the late Bolsovian (Westphalian C) to the Cantabrian/early Stephanian. The Variscan belt under consideration will extend from Canada (Sydney Coalfield) to Bulgaria (Dobrudzha). In the United Kingdom, Silesian (Upper Carboniferous) coalfields South of the Highland Boundary Fault, i.e. England and Wales, will be included. A preliminary literature survey suggests that cockroaches (Arthropoda: Insecta: Blattodea) will prove most useful for international correlation. There are about one hundred Silesian insect species known from the UK.

However, only five of these are known from outside England and Wales in the Bolsovian-Stephanian interval and they are all cockroaches:

Archimylacris belgica South Wales, Belgium, France; Bolsovian.

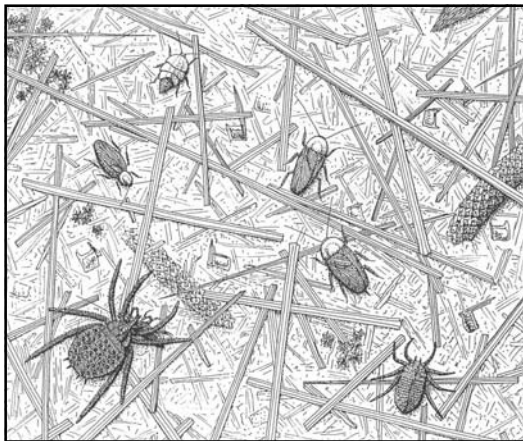
Mylacris moriensis South Wales, Germany, North America; Westphalian D.

Sooblatta boltoniana South Wales, Germany...; Westphalian D.

Sooblatta villeti South Wales, northern France; Westphalian D.

Soomylacris deanensis South Wales, western England; Westphalian C/D.

Redescription and illustration of the Silesian insect types is necessary to facilitate modern revisions (with the help of George Schneider, Germany). Furthermore, fossil insect systematics needs supplementing with modern stratigraphical data and additional records are



Lycopsid forest leaf litter with cockroaches and arachnids, Westphalian D, southern England. Drawn by Chris Proctor.

needed for the Fossil Insect Database (being produced by Tony Mitchell, UK). The immediate challenges are accurately linking old local lithostratigraphies with modern biostratigraphical and chronostratigraphical schemes. Also we need all coalfield insect records and not just the few relatively well-documented species and specimens.

There is some urgency in the project, e.g. the Carboniferous is an 'endangered' system in Southeast England where coal mining is extinct and fossiliferous colliery tips are not protected from obliteration. The number of borehole insect finds during exploration of the Kent Coalfield suggests that many more have been missed at the surface. This could well be true of all coalfields.

Please let me know if you have any Upper Carboniferous insect records (EdJarzembowski@maidstone.gov.uk).

Team Members

Following the Utrecht meeting, we now have additional people that have expressed interest in joining the team. The current membership is as follows.

Team	Contributor	Affiliation
Western Europe	Dr C.J. Cleal	Nat. Museum & Galleries of Wales
	Miss H.E. 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	Univ of Manchester

Team	Contributor	Affiliation
Western Europe cont.	Prof. E. Jarzembowski	Maidstone Museum
	Dr D. McLean	University of Sheffield
	Dr O.A. Abbink	TNO, Utrecht
	Dr J.H.A van Konijnenburg-van Cittert	Utrecht
	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
	Institute of Geol. Sci.	Kraków, Poland
	Dr S. Schultka	Mus. für Naturkunde, Berlin
	Dr E. Kahlert	Mus. für Naturkunde, Berlin
	Dr J. W. Schneider	Bergakademie, Freiberg
	Dr R. Rössler	Mus. für Naturkunde, Chemnitz
Eastern Europe	Prof. Y. Tenchov	Bulgarian Acad. Sci., Sofia
	Dr T. Kh. Dimitrova	Bulgarian Acad. Sci., Sofia
North America	Dr M. Popa	Univ. Bucharest
	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

Workshops and Business Meetings

- Upper Silesia. The first workshop is planned to be held in November 2003 in Kraków, where the projects will be prepared. We believe that the approach arising from this collaboration could be used also in other coal basins.
- Eastern Europe. A Business Meeting of the Eastern European project members will be held in Sofia, at the Geological Institute, between the 17th and 19th November 2003.
- Eastern Europe. A joint meeting between IGCP 969 and the Bulgarian Academy of Sciences is to be held at the Geological Institute, Sofia between the 21st and 24th April 2004. Full details will be circulated shortly, but the meeting will include a day of aural presentations, a day of workshops (including opportunities to examine the collections from the Dobrudzha Coalfield) and a day excursion to the Svoge Coalfield and the Ishtar Gorge (near to Sofia). There will also be a Training Workshop for local students, and a touristic guided tour of central Sofia.

We can have accommodation in the Academy of Sciences Hotel, which is 5-10 minutes walk from the Institute. This is modern, hotel-standard accommodation (en suite facilities in all rooms, restaurant, bar) at the extremely good price of US\$23 per night including breakfast. However, we need to book the room by early January. Please let us know (helen.fraser@nmgw.ac.uk) by the end of December if you require room(s) here. There are other hotels in the vicinity but they are a little expensive.

We are now inviting IGCP team members to submit topics for talks at the Sofia meeting. The talks are to be 20 minutes long. They can deal with any topic relevant to IGCP 469, although if we have to make a choice preference will be given to those titles relevant to eastern or central Europe. Proposed titles should be sent to Helen Fraser, the Project Administrator (helen.fraser@nmgw.ac.uk) by the end of December. Abstracts will be needed by the end of March.

- Romania. An IGCP 469 meeting is being planned here for September 2005. Further news will be announced shortly.