

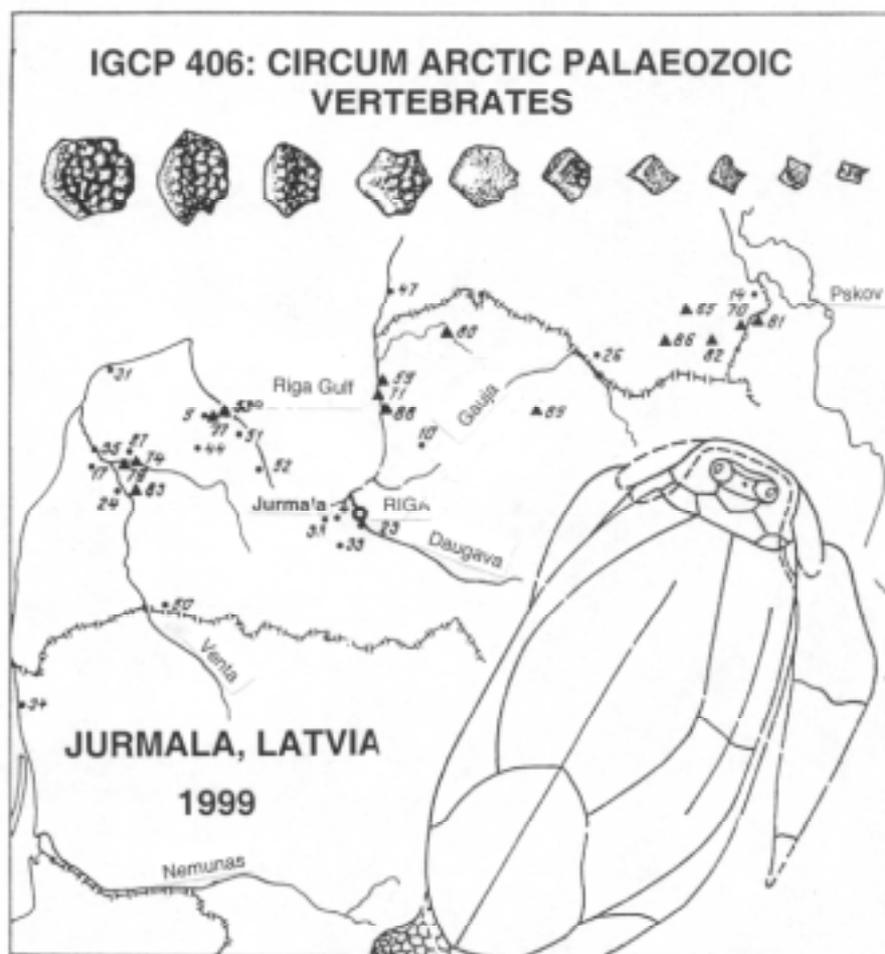


August 1999 no. 20

Ichthyolith Issues



News and views on Palaeozoic vertebrate microfossils



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Edited by Susan Turner & Andrew Simpson

THE ICHTHYOLITH SOCIETY (provisional name)

INTERNATIONAL FISH MICROVERTEBRATE WORKING GROUP

IGCP NEWSLETTER: IGCP 406, 421

TAXONOMIC DISCLAIMER

This publication is not deemed to be valid for taxonomic purposes [see Article 8b in the International Code of Zoological Nomenclature 3rd Edition (1985), eds W.D. Ride et al.].

EDITORIAL

This issue is the first in which I have had to have a co-editor - Dr Andrew Simpson from Macquarie University joined me in 1999. It has been over 18 months since I produced the last issue - partly this was necessitated by my 6 months sojourn overseas teaching at the University of Hannover which took up most of a year in preparation and returning to "normal", and partly from the necessity for me to concentrate on my own research. Please write if you feel I have "lost" any news you were hoping to see in this issue AND if you feel that the Issues is still a useful mode of disseminating information and ideas. Reports, references, and important news about meetings continue to be found on our website and others. If you do not have access to the internet please contact me if you need reference lists etc. To save space I have sent the full 1998 and 1999 reports to our web page.

Issue 19 went out in mid 1998 before the main fish/IGCP 406 meeting of the year at Warsaw which saw the production of Special Publication no. 4 - contact Dr Mark V.H. Wilson for more information about this and specials 2-5. Reports of that and other IGCP 421 and SDS meetings can be found below. Alain Blicek and I completed the final report of IGCP 328: Palaeozoic Microvertebrates which is now with Dr Peter Konigshof, the editor of *Courier Forschungsinstitut Senckenberg* (see list below); publication is planned for 2000 - **please continue to support our work by buying a copy and ordering one for your institutional library**. The third part of the Gross Symposium was published in mid 1999 as *Modern Geology* vol. 24, no. 1 and includes 5 papers.

IGCP 406: Circum Arctic Paleozoic Vertebrates met successfully in late September-early October 1999 in Latvia hosted by Dr Ervins Luksevics in conjunction with the 4th Baltic Stratigraphical Conference. Special Publication no. 5 resulted. May 2000 saw the 9th Early/Lower Vertebrates Symposium conjoined with IGCP 406 at Flagstaff, Arizona is a most successful event hosted by Prof. David Elliott and his team at the University of Northern Arizona Geology Department. The Final IGCP 406 field meeting and symposium will take place in July 2000 at Syktyvkar, Timan-Pechora Province, Russia. Consult below and the WWW site for information regarding the future meetings.

The cut-backs and retrenchments continue. In Australia the national survey, A.G.S.O., shed more of its former palaeontological unit and apparently intend to employ palaeontologists only on a contract basis. I was dismayed to meet palaeontologists in Germany, young and relatively old alike, with full professorial qualifications who did not have a permanent job and so were leaving the profession. Professor H-G. Herbig of University of Cologne, President of the German Palaeontological Association, was compiling a report on the status of palaeontologists in universities and other institutions. With such basic information groups can begin lobbying to retain palaeontological positions especially to counter the pervading "myth" I have heard again and again that palaeontology is not interesting, "relevant" or useful. At the same time Germany has one of the most active networks of amateur palaeontologists and dealers/collectors. Some of the latter can create problems within our field. Because of the past and the often unscrupulous collecting of specimens, many countries (e.g. Australia and Kenya) now have strong laws preventing the removal of cultural heritage which can include fossils. Whether we are professional or amateur we have a duty to make sure when we collect that we have permission and any relevant documentation (permits etc.) before we remove fossils just as individuals and institutions must make sure they are not in possession of "stolen goods". Even in recent times there have been blatant lapses of good practice and private landowners have become disenchanted with the plundering of their land. They in turn then deny access to key sites to *bona fide* workers as is happening at some important Scottish sites.

Some of you will know that IGCP Secretary-General, **Dr Vladislav Babuska** completed his term at UNESCO in Paris in 1999. I for one would like to put on record the immense help Dr Babuska has given to our IGCP project work on fish microfossils over the past 6 years. We wish him well in his future endeavours back in the Czech Republic.

Because of the upcoming changes in tax law in Australia I have decided to suspend subscriptions. Please continue to support this newsletter with articles, news and if possible, donations and exchanges. Thanks again to all for your good wishes during my recent illness, for continuing input and especially for sending reprints, and donations - please keep them coming! Credit card facilities are still available (see donation form on back page). These contributions are greatly appreciated to keep producing the newsletter.

Sue Turner
June 2000

Please contact me, Dr Sue Turner at the Queensland Museum (preferably send disc or by email, please - ASCII, Word or WordPerfect preferred). Fax: 617 3846 1918 or send email: <SueT@qm.qld.gov.au> and <s.turner@mailbox.uq.edu.au>.

ICHTHYOLITH ISSUES AND IGCP 406 ON THE WORLD WIDE WEB

Our World Wide Web page:

<http://gause.biology.ualberta.ca/wilson.hp/Paleozoic.html>

Palaeozoic Vertebrate Biochronology and Global Marine / Non-marine Correlation Final Report of IGCP 328 (1991-1996)

A. BLIECK & S. TURNER editors

Contents – to be published in *Courier Forschungsinstitute Senckenberg* Volume to be announced.

BLIECK, A. & TURNER, S.: IGCP 328: Palaeozoic Microvertebrates final scientific report — Introduction.- 21 + 76 p., 4 text-figs, 2 tables, include. list of referees and IGCP 328 final publication list 1991-1997 [ready for publication].

Early Palaeozoic

TALIMAA, V.N.: Significance of thelodonts (Agnatha) in correlation of the uppermost Ordovician to Lower Devonian of the northern part of Eurasia.- 8 p., 7 tables [ready for publ.].

MÄRSS, T.: Silurian vertebrate studies during 1990-1996.- 20 p., 3 text-figs [ready for publ.].

TURNER, S.: New Llandovery to early Pridoli microvertebrates including Early Silurian zone fossil, *Loganellia avonia* nov. sp., from Britain.- 32 p., 8 text-figs, 5 tables, 6 plates, + 11 p. appendix of localities [ready for publ.].

SOEHN, K.L., MÄRSS, T., HANKE, G.F. & WILSON, M.V.H.: Preliminary vertebrate biostratigraphy of the Avalanche Lake sections (Wenlock, Silurian), southern Mackenzie Mountains, N.W.T., and review of northwestern Canadian vertebrate localities of Silurian age.- 30 p., 3 text-figs, 1 plate [ready for publ.].

BLOM, H.: Silurian vertebrates from North Greenland.- 6 p., 2 text-figs [ready for publ.].

ZHU Min & WANG Jun-qing: Silurian vertebrate assemblages of China.- 9 p., 1 text-fig., 2 tables [reviewed].

BURROW, C.J. & TURNER, S.: Silurian vertebrates from Australia.- 12 p., 3 text-figs [ready for publ.].

VERGOOSSEN, J.M.J.: Acanthodian and chondrichthyan microremains in the Siluro-Devonian of the Welsh Borderland, Great Britain, and their biostratigraphical potential.- 25 p., 1 text-fig., 2 tables, 4 plates [ready for publ.].

BASDEN, A., BURROW, C., HOCKING, M., PARKES, R. & YOUNG, G.: Siluro-Devonian microvertebrates from southeastern Australia.- 40 p., 12 text-figs [ready for publ.].

Devonian: Old Red Sandstone Continent

BLIECK, A. et al.: Biostratigraphical correlations of Early Devonian ichthyofaunas of the Old Red Sandstone Continent.- [in progress;].

VALIUKEVICIUS, J.J. & KRUCHEK, S.: Acanthodian biostratigraphy and interregional correlations of the Devonian of the Baltic States, Belarus, Ukraine, and Russia.- 21 p., 10 text-figs [ready for publ.].

ELLIOTT, D.K., JOHNSON, H.G., CLOUTIER, R., CARR, R.K. & DAESCHLER, E.B.: Middle and Late Devonian vertebrates of the western Old Red Sandstone Continent.- 34 p., 3 text-figs, 1 table [reviewed].

MARK-KURIK, E.: The Middle Devonian fishes of the Baltic States (Estonia, Latvia) and Belarus.- 25 p., 4 text-figs, 3 tables [ready for publication].

GINTER, M. & IVANOV, A.: Stratigraphic distribution of chondrichthyans in the Middle and Upper Devonian of the East European Platform margin.- 27 p., 2 text-figs, 2 plates [ready for publ.].

ESIN, D., GINTER, M., IVANOV, A., LEBEDEV, O., LUKSEVICS, E., AVKHIMOVICH, V., GOLUBTSOV, V. & PETUKHOVA, L.: Vertebrate correlation of the Upper Devonian and Lower Carboniferous on the East European Platform.- 22 p., 12 text-figs [ready for publ.].

Devonian: China

WANG Nian-zhong, WANG Jun-qing, ZHANG Guo-rui & WANG Shi-tao : Devonian macro- and micro-vertebrate assemblages of China.- 14 p., 2 text-figs [reviewed].

ZHU Min: Catalogue of Devonian vertebrates in China, with notes on bio-events.- 16 p., 4 text-figs [reviewed].

BURROW, C.J., TURNER, S. & WANG Shi-tao: Devonian microvertebrates from Longmenshan, Sichuan, China: taxonomic assessment.- 88 p., 10 text-figs, 1 table, 14 plates [ready for publ.].

Devonian: Gondwana

TURNER, S. & YOUNG, G.C.: Devonian microvertebrates and marine/non-marine correlation in Eastern Gondwana.- 18 p., 4 text-figs [in progress].

LONG, J.A. & TRINAJSTIC, K.M.: An overview of the Devonian microvertebrate faunas of Western Australia.- 22 p., 2 text-figs, 1 table, 3 plates [ready for publ.].

TURNER, S., BASDEN, A. & BURROW, C.J.: Devonian vertebrates of Queensland.- 32 p., 12 text-figs, 3 tables, 4 plates + appendix 7 p. [ready for publ.].

JONES, R.K., TURNER, S. & FORDHAM, B.G.: Late Devonian fauna from the Columbine Sandstone (Coffee Hill Member), Gap Creek, central New South Wales.- 22 p., 9 text-figs, 2 plates [ready for publ.].

Carboniferous and Permian

SCHNEIDER, J.W., HAMPE, O. & SOLER-GIJÓN, R.: The Late Carboniferous and Permian: aquatic vertebrate zonation in southern Spain and German basins.- 25 p., 7 text-figs, 2 tables [ready for publication].

ZAJIC, J.: Vertebrate zonation of the non-marine Upper Carboniferous-Lower Permian basins of the Czech Republic.- 9 p., 6 text-figs [ready for publ.].

IGCP 406 "Circum-Arctic Lower-Middle Palaeozoic Vertebrate Palaeontology and Biostratigraphy"

See our Palaeozoic Microvertebrates World-Wide-Web page at:-

<http://gause.biology.ualberta.ca/wilson.hp/Paleozoic.html>

Summary of Reports for 1998 -1999

The project has grown to more than 100 participants from 18 countries.

Achievements in 1998

Since the last newsletter the main 1998 meeting was held in Warsaw, Poland. IGCP 406 was also represented at the Silurian Subcommission meeting in Spain (Märss), the ECOS VII (conodont) meeting in Italy (see report below), and SVP meetings in U.S.A. Several smaller workshops, field meetings, and field trips (funded by other agencies) were also held by project participants.

IGCP 406 Annual Meeting: Circum-Arctic Palaeozoic Faunas and Facies Geological Institute, Warsaw University, Warsaw, Poland, Sept. 3-8 1998 including Timan-Pechora and Chondrichthyan workshops.

Was hosted by Instytut Geologii Podstawowej, Wydział Geologii, Uniwersytet Warszawski (Institute of Geology, Faculty of Geology, Warsaw University); Meeting Organisers were Michal Ginter, Stan Skompski and B. Sobocińska.



Field party at Checiny Castle site (M. Ginter photo)

Edited outline of the meeting:-

1st session included Stratigraphy and invertebrates

Rostislav G. Matukhin *, Vladimir Menner, Valentina Karatajute-Talimaa, Sergey Melnikov, Tatiana Modzalevskaya, Peep Männik, Tiiu Märss - On the reconstruction of the Palaeozoic sedimentary basins and palaeotectonic conditions in the modern Arctic shelves.

Alexander V. Kanygin - Early Palaeozoic seas in Siberia on the eve of the global expansion of vertebrates: formation of multistage marine ecosystems

Tatiana M. Beznosova - Ordovician/Silurian boundary in the sub-polar Urals: biostratigraphic aspect

Natalya V. Belyaeva - Paragenetic associations of rocks reflecting incomplete structure of sequences (Late Devonian of Pechora basin)

Marek Lewandowski - Assembly of Pangea: combined palaeomagnetic and palaeoclimatic approach

2nd session: Conodonts and vertebrates

Peep Männik - Telychian sedimentary basins and conodont faunas

Alexei Kuzmin, Alexander Ivanov, Alexander Orlov - Middle to Upper Devonian boundary beds of the Timan, Russia

Tamara Nemyrovska - Bashkirian and Moscovian conodonts of the Donets Basin, Ukraine

Ieva Upeniece - The first finds of fossil parasitic flatworms (Platyhelminthes) [in fish]

Olga B. Afanassieva - New Data on osteostracans from Severnaya Zemlya (Russia)

Tiiu Märss *, Ken L. Soehn, Mark V.H. Wilson - Microvertebrate-based correlations of the Llandovery-Wenlock boundary in some sections of the Selwyn and Franklinian sedimentary basins, northern Canada

Elga Mark-Kurik - Placoderms in the Lower and Middle Devonian of Severnaya Zemlya

Daniel Goujet - Placoderms from the Lower Devonian of Arctic Canada: new anatomical features and stratigraphic distribution

Robert K. Carr*, Elga Mark-Kurik - Reanalysis of *Heterostius* and *Homostius* (brachythoracid arthrodiere: Placodermi): Implications on systematics and paleogeography.

Pierre-Yves Gagnier, Mark V.H. Wilson, Gavin F. Hanke - A new acanthodian from the Early Devonian of the Northwest Territories, Canada

Hans-Peter Schultze - The primitive actinopterygian *Dialipina*

Yuri M. Gubin - Permian amphibians of northern Russia.

Mikhail A. Shishkin *, Evgeniya K. Sytchevskaya - New data on the endemic vertebrate assemblage from the Permo-(?)Triassic Bugarikta Formation of the lower Tunguska River Basin, central Siberia.

Poster session included:

Tatiana Beznosova - Ordovician-Silurian boundary at the Subpolar Urals: biostratigraphic aspects

Michal Ginter - Taxonomic problems with Carboniferous "cladodont-level" sharks' teeth

Alexei Kuzmin - Fammenian conodonts from Climeniyevi Cape of Novaya Zemlya

Alexei Kuzmin, Alexander Ivanov - Late Givetian - Frasnian conodont and vertebrate assemblages of the Middle Timan, Russia.

Markus Otto - A new antiarch from the Devonian of Ellesmere Island, Arctic Canada

Vladimir Tsyganko - Fauna and eustatic changes of the Frasnian sea on the north Pechora plate

3rd session: Chondrichthyans

Gavin F. Hanke *, Mark V. H. Wilson – Structure and variation of acanthodian and chondrichthyan scales from the Lower Devonian of the Mackenzie Mountains, Canada

Mark V. H. Wilson *, Gavin F. Hanke – Body form and fin spines in species with scales of chondrichthyan growth pattern from the Lower Devonian of the Mackenzie Mountains, Canada

Valentina Karatajute -Talimaa *, Roma Mertiniene – Morphogenetic types of squamation of Devonian and Early Carboniferous chondrichthyans

Claire Derycke *, Zarela Herrera, Patrick R. Racheboeuf, Roland Trompette – Oldest Middle Palaeozoic ichthyofauna from Mauritania

Kate Trinajstić - Frasnian sharks from the Gneudna Formation, Western Australia

Alexander Ivanov - Late Devonian - Early Permian chondrichthyans of Russian Arctic

Michael Williams - Tooth retention in cladodont sharks

Rodrigo Soler-Gijón – Heterochrony and the evolution of the xenacanth sharks

Martha Richter - Dental histology and its bearing on the systematics of the Xenacanthiformes (Pisces: Chondrichthyes)

Oliver Hampe - British Xenacanths

Andrea Tintori - New Chondrichthyan fauna from the Guadalupian (middle Permian) of the Sultanate of Oman

Gary D. Johnson – Dentitions of Late Palaeozoic *Orthacanthus* species and new species of *?Xenacanthus* (Chondrichthyes: xenacanthiformes) from North America

More than 50 participants from 16 countries (Australia, Canada, Estonia, France, Germany, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Russia, Sweden, Ukraine, U.K., U.S.A.) attended. The main emphasis was on palaeobiological and biostratigraphic studies of both vertebrates and invertebrates in the Canadian, Russian, Danish, and Norwegian Arctic. Two workshops were held: geology of the Timan-Pechora region, and the early fossil record of Chondrichthyes. The field excursion on Sept. 6-7 visited important Devonian localities in the Holy Cross Mountains.

The meeting provided a forum for reporting of significant advances in biostratigraphical and paleobiological research. Some 41 extended abstracts were published in the conference volume: M. Ginter and M.V.H. Wilson (eds). 1998. Circum-Arctic Palaeozoic Faunas and Facies. Warszawa, Poland, 1998. *Ichthyolith Issues Special Publication 4*, 62 pp and a field guide (Skompski, 1998).



What has Valya found at Ostrowka Quarry? (Ginter photo)

Several participants brought manuscripts for the Severnaya Zemlya volume, which will be published, in Paris, as a special issue of *Geodiversitas*. These papers cover Ordovician to Devonian thelodonts, anaspids, and conodonts, and involve confirmation of biostratigraphic zonation as well as significant revisions to accepted stratigraphy. Other manuscripts were published as a special 1999 conference issue of *Acta Geologica Polonica* **49 1-2** and elsewhere.

Papers dealing with new taxa and assemblages included one by Pierre-Yves Gagnier *et al.* on a new acanthodian found in Lower Devonian strata of northern Canada during IGCP 406-related field work in 1996. Marcus Otto reported a new antiarch from the Devonian of Ellesmere Island, Arctic Canada, while Daniel Goujet demonstrated higher than expected diversity of placoderms after IGCP 328 - sponsored field work in 1994 and 1995 in the Canadian Arctic Archipelago. Bob Carr and Elga Mark-Kurik presented their joint research on systematics and palaeogeography of arthrodires, and Elga reported 7 chronological placoderm assemblages in the Lower and Middle Devonian of Severnaya Zemlya. Olga Afanassieva illustrated her recent findings on osteostracans from Severnaya Zemlya. Tiiu Märss *et al.* correlated thelodont-bearing Llandovery-Wenlock boundary beds of Selwyn-Root and Franklinian basins. Hans-Peter Schultze announced exciting findings on the early actinopterygian fish *Dialipina*, based on IGCP 406-related field work at the Anderson River, northern Canada, in 1997. Valya Talimaa compared Silurian and Devonian vertebrate faunas in the Circum-Arctic region and found that the late Silurian - early Devonian vertebrate assemblages from Timan-Pechora, Northern and Polar Urals, Novaya Zemlya and Severnaya Zemlya belong to Young's (1981) Cephalaspid Vertebrate Province, pointing to the close relationship of these regions to the Baltica and Laurentia palaeocontinents. On the other hand, the Early Devonian vertebrates from Taimyr and Novosibirsk Islands represent the Amphiaspid Vertebrate Province characteristic of the Siberian palaeocontinent. Data from distribution of shelly fauna and conodonts

support these conclusions. Marek Lewandowski presented a series of palaeogeographic maps for Gondwana, Baltica, and Laurentia for the early Ordovician - early Permian time span. Tatiana Modzalevskaya reported on similar isotopic signatures in Ludlow brachiopods from the Timan-Pechora region and Gotland; Tiiu Märss added that the carbon isotope curve found by her student, T. Martma, in sections from Baillie-Hamilton and Cornwallis islands is very similar. Peep Männik contributed conodont age data for the Canadian island sections, and recognized two Telychian conodont faunal provinces - one connected with northern and northeastern parts of Baltica and Laurentia, and the other with the southeastern parts of the same palaeocontinents.

Timan-Pechora Workshop

Topics discussed:

- the state of studies of Lower-Middle Palaeozoic strata in the region;
- publication;
- IGCP 406 future meeting in Syktyvkar and excursions to the Timan-Pechora region, July 2000.

During recent decades extensive geological studies (palaeontology, sedimentology, mineralogy, geochemistry etc.) have been carried out in the Timan-Pechora region. Many outcrops and core sections were studied in detail. Conferences and field-meetings (e.g. 1983, 1987), many papers and monographic studies have been published (T. Beznosova) or prepared (A. Abushik and L. Shamsutdinova; S. Melnikov in press) - unfortunately, almost all in Russian. All participants agreed that the main task now is to publish in English. To begin with, 4-5 papers dealing with general problems of Silurian and Devonian palaeontology, stratigraphy, sedimentology and palaeogeography will be published at the end of 1999 in Estonia (in the ***Proceedings of the Estonian Academy of Sciences, Geology Series***). Also, some authors are thinking about the possibility of re-publishing their monographs in English. As the Timan-Pechora region is one of the easiest, and least expensive of the Arctic regions to reach, and as the Palaeozoic strata are well exposed and studied there, it was chosen as best region for the last IGCP 406 field meeting. The specialists working in the region accepted this suggestion enthusiastically and preparations began - see Circulars of the meeting "**Palaeozoic pan-Arctic Tectonics, and Evolution of Basins and Fauna**" Syktyvkar, Russia, July 12-15, 2000 (CAPV-2000) (see web site).

Workshop on Early Fossil Record of Chondrichthyans

This attracted many scientists and graduate students with interests in early fossil

chondrichthyans, including several who had not previously participated in IGCP 406 meetings. Participants had the opportunity to examine brought specimens as well as the microvertebrate collections of the Geology Institute, Warsaw. Technical papers were presented; examples being Hanke and Wilson on a diverse assemblage of acanthodian-like chondrichthyans and chondrichthyan-like acanthodians from the Lochkovian MOTH locality in northern Canada; Karatajute-Talimaa and Mertiniene on morphogenetic types of Devonian and Carboniferous chondrichthyan scales. Undoubted Devonian chondrichthyans were presented by M. Williams, K. Trinajstić, and C. Derycke; and Late Palaeozoic chondrichthyans by A. Ivanov, R. Soler-Gijón, O. Hampe, and G. Johnson.

New Working Group:

Early and Middle Palaeozoic Basins in the Circum-Arctic Region: Palaeotectonics and Palaeogeography

V.V. Menner and P. Männik proposed this working group at the business meeting. The new group's objective would give special attention to comparative analysis of data from different parts of the Circum-Arctic region, with the aim of reconstructing the palaeogeographical situation, and to evaluating and improving palaeotectonic reconstructions.

Studies would focus in the following directions:

1. Improvement of global correlations of Silurian and Devonian sequences (based on detailed studies of some selected intervals, particularly of the series boundaries).
2. Comparative analysis of the evolution of the Silurian and Devonian sedimentary basins in Canada, Greenland, NE Europe (Timan-Pechora region) and the northern part of central Siberia.
3. Comparison of associations of Silurian and Devonian faunas (brachiopods, ostracodes, conodonts, vertebrates, etc.) from different palaeobasins in the Circum-Arctic region.
4. Improvement of biogeographical subdivision of the studied regions.
5. Evaluation and improvement of palaeotectonic reconstructions.

A more detailed program is found on the web site; as of September 1999, however, little interest had been shown. **Please contact organisers of you wish to participate.**

IGCP 406 1999 Meeting, Jurmala, Latvia

The 1999 Annual Meeting of IGCP 406 was held in September, in connection with the 4th Baltic Stratigraphical Association in Jurmala, near Riga, Latvia. The meeting was ably co-organised by members of the Latvian University, Dr Ervins Luksevics and team.

Ichthyolith Issues Special Publication 5
 resulted [more in Issue 21 and see web site]

IGCP 406 ~ 2000

Meetings for 2000, the final year of the project, include a workshop in association with the Early Vertebrates meeting in Flagstaff, Arizona, together with field excursions to the southwestern USA, and the final Annual Meeting to be held in Syktyvkar, Russia, which will include a field excursion to the Ordovician through Carboniferous of the subpolar Urals (see web site).

IGCP 421 & ECOS VII: Pre-symposium field trip (and cultural delights) - Sardinia 20-22 June 1998

29 workers from 10 countries attended this trip. They set off with their newly acquired ECOS VII rucksacks to the first locality, in the Upper Ordovician of Cea Brabetza, near San Basilio, which was some way up a small track; minibuses were used lest the conodont workers should have to walk too far in the Sardinian sunshine. Detailed explanation of the geology and conodonts of the roadside outcrop was given by Annalisa Ferretti, Enrico Serpagli, Francesco Leone and Alfredo Loi (with occasional translation by Gian Luigi Pillola).

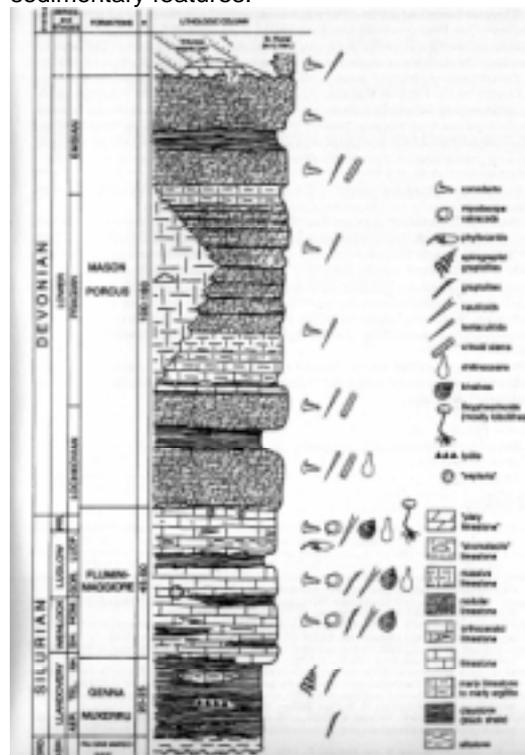
We walked to Locality 2 in Silurian rocks 500m east of Silius Village, using a field path that had been generously cleared by the local farmers. Sample bags and hammers at the ready, we listened as Enrico, Carlo Corradini and Annalisa describe geology and conodonts with the aid of some finely crafted posters. Samples were taken, and sunblock applied as the sun rose further into the cloudless sky.

Staying in the Silurian Ockerkalk, the next locality featured nodular limestone with loboliths. Lunch followed in a small farmhouse where we were greeted by the (soon to become familiar) smell of barbecued sucking pig - the vegetarians among us found this a trifle difficult to cope with, even the omnivorous Chief Panderer Dick Aldridge.

A slight leap up the stratigraphic column took us to the Upper Devonian (Famennian) near Villasalto village where two sections were examined. Carlo and Gian Luigi provided yet another superb explanation of the geology before we embarked on possibly the most strenuous walk of the day, which actually involved a slight incline. People marvelled at the climbing expertise of the younger Repetski (Rocco, age 12). After a wonderful first day we sat on the terrace sipping drinks kindly bought by the Mayor of Villasalto.

Day two began in the Cambrian Cabitza Formation of southwest Sardinia, where the conodont faunas have been completely remineralised to a fetching shade of green

due to diagenetic preservation in clinochlore. The type-section of the Iglesias Group (Lower Cambrian - Tremadoc) was next, although no conodonts have been recovered. Trilobites were also hiding, so the party inspected the sedimentary features.



Section from Sardinian fieldguide

Near Fluminimaggiore small, but attractive, exposures of *Orthoceras* Limestone (Wenlock-Ludlow) impressed everyone with the macrofossils (nautiloids, graptolites and bivalves). Once again, the quality of posters used to aid description of the outcrop and a further repast of gargantuan proportions, accompanied by plenty of wine and water, fulfilled us.

The last geological stop was a Lower Devonian section near Fluminimaggiore. The 14m outcrop of limestones and mudstones contains an abundant conodont fauna and a variety of macrofossils from the Mason Porcus Formation (*delta* Zone). Samples were enthusiastically collected before return to the bus, where Gian Luigi and Alfredo provided an impromptu water flinging entertainment in a horse trough.

It is not possible to visit Sardinia and concentrate solely on geological aspects, so a deviation into archaeology concluded the day. The Nuraghe settlement dating back to between the XIII and IX centuries BC consisted of a large central cone-shaped tower, surrounded by, and connected to, five smaller towers around which a town was built. Barry Fordham posed a pertinent question on the subject of the symbolic statues and the relevance of the number of breasts these possess. The answer is, for those of you who are interested, that most female statues have

two breasts, but some represent an androgynous condition and only have one.

The last day took us back to SW Sardinia. The first stop in the Upper Ordovician of Cannamenda was to two trenches which exposed the Punta S Argiola Member of the Domusnovas Formation. The richest Ordovician conodont fauna in Sardinia is found here, but only, to quote the guidebook, in the thin fossiliferous horizon (4-4.5cm) with no lateral continuity and poorly exposed as small sparse pieces in the field. The only redeeming feature is its distinctive pink colour.

We returned again to the Devonian. Of all the outcrops we visited, this was the most unconvincing, in that it appeared to be a loose block set in the hedge between two fields. Nevertheless, important conodonts have been collected, representing the only Middle and Late Devonian faunas collected in SW Sardinia.

There was a final look at the Silurian *Orthoceras* Limestone before we slipped into the Cambrian Gonessa Formation for a spot to eat. The venue - a restaurant next to an enormous cave; lunch (ample cold meat, anti-pasta and suckling pig) had an added bonus - our first taste of famous Italian ice cream. Absolutely mouth-watering!

After lunch Cambrian material was collected from the roadside. The last part of the day was spent travelling around the spectacular coast of SW Sardinia. The Sardinian Unconformity, described by Cocozza as the most beautiful in the world, and to this day known to Italians as "La Discordanza", was our last stop. Upper Cambrian laminated shales (Cabizta Formation) are overlain by boulder-bearing conglomerates of the Ordovician Monte Argentu Formation, an unconformity definitely as spectacular as any I have seen. The return to Senorbí heralded another huge meal. The main course fish had interesting crushing dentition, some of which was dissected by Phil Donoghue. The after dinner entertainment arrived in the form of a joke-telling session chaired and dominated by Rocco Repetski, with encouragement from Dick Aldridge and Andrew Simpson.

Our last day began with Ordovician localities, and some of the steepest walks of the week; not necessarily a bad thing after all the eating! The outcrops at Umbrarutta yield the best -preserved Ordovician faunas found in Sardinia, so last samples were collected, and we finished the geological part of the field trip. We then headed west to the archaeological ruins of Tharros, grabbing a last chance to do some geology by studying basaltic blocks used in its construction.

The final seafood meal was fantastic and the wine flowed freely. Dick Aldridge gave the speech of thanks to the organising committee aided and abetted by Norman Savage's helpful suggestions. We all heartily agreed that the trip had been an enormous

success, and raised our glasses to the organisers.

From: Karen Cochrane, University of Birmingham [edited from Pander Society newsletter]

ECOS VII: Scientific sessions, Bologna-Modena June 24-26, 1998



Participants to the ECOS VII in front of the Department of Geological-Environmental Earth Sciences, Bologna, Italy.

The scientific sessions for the 7th International Conodont Symposium in Europe (ECOS VII) took place at the University of Bologna (claimed as the world's oldest) in the Dipartimento di Scienza della Terra e Geologico-Ambientale.

Congress President, Professor Enrico Serpagli, noted the large number of participants (109 from 27 nations), many who had dipped into their own pockets, despite the generally gloomy global picture of declining funding for palaeontological research. During the welcome we were reminded that the University has a proud tradition of stratigraphic research in the Carnic Alps and the Dolomites, dating back to Pollini last century. The University was also the site of the 2nd International Geological Congress in 1880. There is obvious pride in the Department's Geological and Palaeontological Museum (visited by delegates the previous evening), that houses a fully reconstructed *Diplodocus*. The museum was only recently saved from extinction and opened to the public in 1988. The President of the Italian Palaeontological Society reiterated the words of welcome, and noted that despite technological and geochemical advances, fossils are still needed for accurate and viable age determinations.

Dick Aldridge (Univ. Leicester), presented the invited lecture on conodont palaeobiology, reviewing the developing concepts and summarising current knowledge since the discovery of the whole animal in a museum draw in the early 1980s. He noted

that, prior to that discovery, palaeobiological ideas were essentially unconstrained. The study of bedding plane assemblages, growth and wear of elements, and modelling of multielement architecture gives a framework on which to develop palaeobiological concepts; he noted that the issue of zoological affinity is a subject that interests a large number of people. He presented evidence for paired sensory organs, ray-supported caudal fin, extrinsic eye musculature, and his lines of argument supporting chordate affinities.

Papers then covered evolution, palaeobiology and geochemistry. Hubert Szaniawski (Polska Akademia Nauk) discussed evolutionary relationships between the earliest protoconodonts, paraconodonts and euconodonts based on interpretations of element morphology of some unusual forms such as *Coelocerodontus*. Karen Cochrane (Univ. Leicester) pursued the issue from a histological perspective challenging the traditional view of euconodont evolution from protoconodonts via paraconodonts. She used an unusual presentation graphic representing 'white matter' in black. Petrovna Kasatkina (Russian Academy of Sciences, Vladivostok) argued from soft tissue homology and analogy that euconodonts are more appropriately considered as close to chaetognaths and proposed a new superphylum the Chaetodonta consisting of euconodonts and chaetognaths. Stephanie Barrett (Univ. Leicester) outlined her work on functional morphology of the feeding apparatus via the study of occlusion patterns in prioniodontid Pa elements and speculated on the impact of this on evolutionary patterns during the Ordovician.

Two geochemical papers were cautionary in tone. Studies of rare earth elements in Triassic conodonts by Yasmin Haunold (Inst. Paleol., Vienna) concluded that variations reflect only very local conditions. A study by Julie Trotter (CSIRO Division of Petroleum Resources, Australia) of strontium isotopes from conodonts from the Early Ordovician Emanuel Formation of the Canning Basin show remarkable heterogeneity within single elements; this has serious implications for the development of a global strontium curve. This paper generated the most intense and varied discussion of the session, if not the conference.

The next session ran concurrently with the first IGCP 421 meeting, wherein the general state of the project was assessed. Focus then went on the early Palaeozoic and dealt with more traditional conodont topics of biostratigraphy and taxonomy: three biostratigraphic papers spanning the Cambrian and Ordovician; conodonts from the central Appalachians (John Repetski, U.S.G.S.), conodonts from the subsurface western Canada and Williston Basins (Godfrey Nowlan, Geol. Surv. Canada), and Cambrian-Ordovician of the Argentine Precordillera (Guillermo Albanesi, Museo de

Paleontología, Univ. Nacional Cordoba). Two papers focussed on Upper Ordovician conodont faunas from opposite sides of the Atlantic; from Wales (Annalisa Ferretti, Univ. Modena), and central Nevada (Walter Sweet, Ohio State Uni.). The final two papers focussed on palaeoecology and taxonomy: Zhang Jianhua (Univ. Stockholm) presented analysis indicating the Ordovician conodont *Spinodus spinatus* is a deep-water indicator and Anita Löfgren (Lund Uni.) presented a septimembrate reconstruction of *Cornuodus*.

Day 2 dealt with Silurian conodonts and biostratigraphy. Peep Männik (Inst. Geol., Tallinn) carved up the late Llandovery and early Wenlock *celloni* and *amorphognathoides* zones into 10 new zones based on the *Pterospathodus* lineage. Carlo Corradini (Univ. Modena, our energetic Sardinian guide) presented a Silurian zonal scheme for Sardinia similar to the classic approach of Walliser (1964). Viive Vira (Inst. Geol., Tallinn) subdivided the Baltic Ludlow to Pridoli using the '*remscheidensis*' group. Andrew Simpson (then Univ. Queensland) presented Silurian conodont faunas from the Jack Formation of northern Australia.

The Early Devonian followed: Jose Ignacio Valenzuela-Rios (Univ. Valencia) reinterpreted the *A. eleanore* lineage; Pierre Bultynck (Inst. Roy. Sci. Naturelles de Belgique) showed the facies relationships of Moroccan Emsian to Eifelian conodonts (*dehiscens* to *partitus* zones). Other Devonian studies by Bill Kirchgasser (State Uni. New York) reported on biostratigraphic implications of the widespread discovery of "North Evans" conodont faunas. Willi Ziegler (Forsch. Senckenberg) reviewed recent developments in high-resolution conodont biochronology in the Devonian noting that it was more useful than sequence stratigraphy, graphic correlation or alternate zonal schemes, and tying their phylogenetic-zone concept to recent radiometric data. Charles Sandberg (U.S.G.S.) focussed on the use of conodonts in establishing the timing of the Late Devonian Alamo Impact Meggabreccia. Gilbert Klapper (Dept Geol., Univ. Iowa) compared the original 13-fold Frasnian conodont zonation based on the Montagne Noire sequence with 9-fold "standard" zonation of the German and Great Basin sequences, highlighting taxonomic and methodological differences. This offering generated the most biostratigraphic "heat" of the meeting. Willi Ziegler (Forsch. Senckenberg) presented conodont data through the Frasnian-Famennian boundary of the Rheinisches Schiefergebirge. Immo Schülke (Univ. Hannover) reviewed early Famennian conodonts of the Montagne Noire. Norman Savage (Univ. Oregon) completed with a report on Late Devonian conodont faunas from Timan.

A break in the conodont flow followed with a session dedicated entirely to IGCP421: Alison Basden (MUCEP) covered Early Devonian fish of the Tyers-Boola area of

Australia; Alain Blicq (Univ. Lille) et al. the Devonian to Early Carboniferous of the Carnic Alps; and Claire Derycke (Univ. Lille) the Devonian of Mauritania. These microvertebrate studies have resulted mostly from earlier IGCP 328 work and from sequential sampling associated with refined biochronological conodont investigations, the exception being the Mauritanian study where fish were found as a result of a review of Devonian chonetid brachiopods.

Tamara Nemyrovska (Ukrainian Acad. Sciences, Kiev) presented phylogenetic data on *Gnathodus bilineatus* from the Rheinisches Schiefergebirge. Then came the Carboniferous: Glenn Merrill (Univ. Houston) presented biostratigraphic analysis of *Neognathodus* and Peter von Bitter (Roy. Ontario Museum, Toronto) reconstructed *Gondolella* from Illinois. The moveable feast then shifted location to the University of Modena.

Cooler conditions prevailed and the last day began with a large batch of papers concerning Ordovician conodont faunas. Tatiana Tolmacheva (VSEGEI, St Petersburg) reported on basal Upper Cambrian to Middle Ordovician conodont clusters. Jerzy Dzik (Pol. Acad. Sciences, Warszawa) reported on Ordovician climate modelling on conodont data from the Holy Cross Mountains. Chris Barnes (Univ. Victoria) drew together a vast array of circum Laurentian Late Ordovician conodont data into a regional biofacies synthesis. Oliver Lehnert (Univ. Erlangen-Nürnberg) reported on middle Ordovician faunas from Argentina. Stig Bergström (Ohio State Uni.) reported on some Late Middle Ordovician conodonts from Norway with Laurentian affinities; this palaeogeographic anomaly indicated the potential of geochemical studies (particularly neodymium) in unravelling puzzles of provinciality. Sven Stouge (Geol. Surv. Denmark and Greenland) considered the suprageneric taxonomy of some Ordovician lineages.

John Talent and Ruth Mawson (Macquarie Uni., Sydney) presented Carboniferous conodont data from northeastern Australia permitting some stratigraphic realignments. Anna Somerville (Univ. College, Dublin) showed three upper Viséan sections from Ireland; Tamara Nemyrovska (Ukrainian Academy of Sciences, Kiev) on faunas from the Donets Basin, Ukraine, and Alexander Alekseev (Moscow State Uni.) on faunas from the Moscow Basin. The final offering was from Bruce Wardlaw (U.S.G.S.) on Permian faunas from the Salt Range, Pakistan. Heinz Kozur (Budapest) reported the Permo-Triassic biotic crisis. Selan Meco (Univ. Politeknik, Tirana) covered the Triassic of Albania and Mike Orchard (Geol. Surv., Canada) reviewed on Triassic multielement gondolellids.

The final session returned to the palaeobiological theme. Richard Krejsa (California Polytech.) expressed his biological concerns about basal bodies. Kim Freedman

(Univ. Leicester) discussed the taphonomy and function of the *Promissum* apparatus. Phil Donoghue (Univ. Birmingham) resolved the paradox of growth and function in conodont elements with a study of internal discontinuities. Mark Purnell (Univ. Leicester) built on knowledge of form and function of conodont apparatuses to undertake a broad trophic analysis. Karsten Weddige (Forsch. Senckenberg) produced a "scissor and basket" model for Lower Devonian spathognathodid apparatuses.

In many ways this ECOS was one of consolidation of the primary biochronologic utility of conodonts. There were a large number of high quality poster presentations mostly covering biostratigraphic issues, but also including biofacies analysis, thermal analysis, palaeobiology and palaeogeography. Unlike some previous ECOS conferences that have sparked a revolution in scientific thinking about conodonts and generated passionate debate both during and outside of scientific sessions (such as multielement taxonomy - ECOS 1, zoological affinities - ECOS 4), or held out promise of new insights through geochemistry (ECOS 5), this conference was dominated by the traditional applications of conodontology. This is not to say that ECOS 7 was any less significant than previous events. Quite the opposite, in fact, as the vast array of new data demonstrates the intrinsic international strength of modern conodont research. Conference organisers are to be congratulated for developing a scientific program that showed how conodont research continues to gather momentum across a broad range of geological and biological applications. The organisers were also responsible for producing a social program that can only be described as breath taking in scope and style. This program acted as an excellent catalyst for collaborative international communication and will be a hard act to follow for future ECOS organisers.

The IGCP421 project meeting benefited enormously through its concurrence with ECOS 7. Nine of the 108 conference abstracts, principally those dealing with other fossil groups, were specifically marked as exclusive contributions to IGCP421. The vast majority of the papers presented, however, were directly relevant to IGCP421 project outcomes as they dealt with high-resolution Palaeozoic biochronology and inter-regional correlations of direct relevance to the north Gondwana margin. This project continues to generate an enormous volume of data and foster the international collaboration essential for the ambitious synthesis to follow.

See also the British Micropalaeontological Society Newsletter (http://www.nhm.ac.uk/hosted_sites/bms), reports in *Geochronique* (by Catherine Girard and Marie-France Perret) and in *Nachrichten Deutsche Geologische Gesellschaft* (by Dieter Stoppel).

Fish papers from the ECOS VII Abstracts volume:-

- Basden, A. 1998. Early Devonian microvertebrates from the Tyers-Boola area of central Victoria, Australia. In G. BAGNOLI (Ed), ECOS VII Abstracts, Bologna-Modena, 1998, 11-12, Tipografia Compositori Bologna.
- Blieck, A., Derycke, C., Perri, M.C. & Spalletta, C. 1998. Devonian - Lower Carboniferous vertebrate microremains from the Carnic Alps, northern Italy: a preliminary report. *Op. cit.*, 18-19.
- Derycke, C., Herrera, Z., Racheboeuf, P.R. & Trompette, R. 1998. Palaeozoic vertebrate microremains from Mauritania: first results. *Op. cit.*, 29-31.
- Kirchgasser, W. & Vargo, B. 1998. Middle Devonian conodonts and ichthyoliths in an Upper Devonian limestone in New York: implications for correlations around the Givetian-Frasnian boundary. *Op. cit.*, 52-53.

Andrew Simpson, Macquarie University

IGCP 421 - North Gondwana Bioevent\Biogeography Patterns in Relation to Crustal Dynamics - Islamic Republic of Iran, Dec. 5-20 1998

The 4th IGCP 421 meeting was held in the Islamic Republic of Iran under the auspices of the University of Isfahan, IUGS and UNESCO. The organising hosts were Dr Mehdi Yazdi (Univ. Isfahan) and Dr Mohammad Dastanpour (Shahid Bahonar Univ. Kerman). Overseas participation was good, as numerous joint research projects with Iranian geologists are being conducted. Most overseas delegates travelling to the beautiful city of Isfahan were routed via Tehran, and the travel and accommodation arrangements were mostly free of problems, although some delegates carelessly parted from their luggage en route to Isfahan. The meeting consisted of three field trips, scientific sessions and numerous ancillary functions and events. The weather was unseasonably warm, and there were opportunities to see city sights, purchase Persian crafts and wares.

The preconference field trip (Dec. 6-16) was to the Tabas region, in east central Iran. Palaeozoic sequences of the Shotori Range and the Derenjil Mountains were examined. This region made famous by the pioneering studies of Huckriede et al. (1962) and Ruttner et al. (1968), based on UNESCO-sponsored field work commencing with the formation of the Geological Survey of Iran in 1959. The area is now the focus of more detailed studies. Travel was by coach from Isfahan to Tabas, via Nain and Anarak, with a delightful lunch at the Kalhlak lead mine following a brief stop at a pre-Islamic base

metal mine. The focus included the Devonian Bahram and Shishtu Formations, the Carboniferous Sardar Formation and the Permian Jamal Formation in the Howz-e-Dorah area, and the Shishtu and Sardar Formations of Kale Sardar and the Carboniferous and Permian of Shirgesht. All were examined with ample macrofossil collecting and some significant new finds. A small breakaway group spent one half day looking at the Cambrian-Silurian of Dahaneh-e-Kolut, some 40 km N of Tabas. The return journey via the city of Ardakan had numerous cultural stops.

The scientific sessions at the University of Isfahan on December 13th and 14th was attended by 56 delegates from 10 nations with large contingents from Australia and France. Many undergraduate students from the University of Isfahan attended. Considerable interaction with postgraduate students was welcomed, and will lead to further research cooperation. 48 papers and posters were presented on middle Palaeozoic themes; Devonian ones the most numerous. Conodont faunas (14 papers) received the most attention, with brachiopod faunas (9 papers) the most frequently-discussed macrofossil group. Microvertebrate and vertebrate faunas (5 papers) and general middle Palaeozoic sedimentology and stratigraphy (5 papers) were also recurring themes. Other topics were corals, ammonites, palynomorphs, stromatoporoids, trilobites, crinoids, tectonics and diagenesis/metamorphism. The dominance of conodonts and shelly faunas in the program produced some highly useful correlations between middle Palaeozoic platform sequences. In particular there were new insights into the biochronological relationships between conodonts, brachiopods and vertebrate faunas.

Considering the aims of IGCP421, a most gratifying aspect of the scientific program was the volume of papers (21 in total) concerned with the previously poorly-known middle Palaeozoic of Iran. Iran is thought to have occupied a position on the north Gondwanaland margin, and this location is pivotal because of the dearth of modern palaeobiogeographic and taxonomic studies of material between Afghanistan and Turkey. Most of this new data will underpin the project's ambitious biogeographical analysis, and the planned volume will go a long way towards filling a lacuna for the north Gondwana margin. We can be grateful for this in significant measure to the conference organiser, Dr. Mehdi Yazdi of the University of Isfahan who has recruited an enthusiastic band of students to make important new discoveries.

The abstracts volume compiled by Ruth Mawson and others from Macquarie University, contains much new information, as well as a useful bibliography, compiled by Tony Wright (University of Wollongong) listing palaeontologic publications on the Palaeozoic of Iran. The meeting resolved to compile a

middle Palaeozoic correlation chart for the Asian sector of north Gondwanaland for presentation at the meeting in Pakistan in 1999. This project will greatly assist in resolving complex stratigraphic alignments in an region poorly understood at the start of IGCP421.

There were two other conference field trips: a one day trip (Dec. 14) to Devonian sections at Chah-Riseh close to Isfahan, and following on from the conference we travelled on Dec. 15 by coach to an overnight stay in Shiraz after a dusk visit to the ruins of Pasargade (the ancient capital of Cyrus the Great). On the morning of Dec. 16 we visited Naght-e-Rostam (where tombs attributed to Xerxes, Darius I, Darius II and Artaxerxes are located) and finally the fabled Persepolis. Eventually we set off for Kerman (800 km) by coach, passing first the salt Tashk Lake east of Shiraz and crossing the Zagros front via Neyriz and Sirjan before being welcomed in the wee hours by Mike Bassett and Mohammad Dastanpour. In the Kerman region, our accommodation was in University guest houses, and we all enjoyed typical Persian breakfasts and delightful Persian meals in the evenings.

Finally came a 4-day field trip in the Kerman region (17-20 Dec.) examining primarily Devonian sequences yielding new macrofossil data. We visited sections at Gerik, Shams Abad, Hutk and Bidu, all exposing largely late Devonian strata with rich coral, brachiopod and stromatoporoid faunas. One cultural highlight was a visit to the mud city of Bam (famous for its black dates) where eucalypts, casuarinas and mimosas thrive in the fertile and well-watered environment. En route to Bam, we visited the Dorah Shah Cambrian limestone with its rich trilobite and stromatolite remains, and some delegates were able to study the nearby fish-bearing Late Devonian strata. In Kerman, we visited the offices of the Geological Survey and were able to organise purchase of obscure Iranian geological literature.

The logistical difficulties of organising an international conference and field trips in a nation that has been isolated from much of the rest of the world for many years are immense. The hunger for international scientific collaboration and literature was obvious; Universities, the Geological Survey of Iran, and numerous mines welcomed delegates and participated in the venture by organising local IGCP421 meetings, discussion groups, tours, or by simply hosting a function. Some delegates were interviewed by a range of media; all were welcomed into laboratories, shown numerous specimens, engaged in endless discussion by eager students, and overwhelmed by hospitality. Almost every delegate enjoyed the hospitality of the GSI in Tehran, and many visited their offices and held discussions with Iranian colleagues. The success of this venture was a great illustration of the value of UNESCO's IGCP

program. We salute our Iranian hosts and IGCP leaders, and thank them for this marvellous opportunity. A meeting volume is expected to appear in the supplement series to the *Records of the Western Australian Museum* late in 2000.

From the Isfahan Abstracts volume:-

- Hairapetian, V. & Gholamalian, H. 1998. First report on the Late Devonian fish remains and microvertebrate fragments in the Chahriseh area, north east of Esfahan, Iran. In Mawson, R., Talent, J., Wilson, G. & Cockle, P. (Editors) Abstract Book, Isfahan Meeting IGCP 421, North Gondwanan mid-Palaeozoic bioevent/biogeography patterns in relation to crustal dynamics. p. 15
- Hampe, O. 1998. Remains of Phoeobodus from the Upper Devonian (Middle Famennian) of northwestern Iran (Chondrichthys; Elasmobranchii). *Op. cit.*, p. 16.
- Schultze, H-P. Fishes from the Lower Devonian of the Canadian Arctic. *Op. cit.*, p. 32.
- Yazdi, M. & Turner, S. 1998. Vertebrates from the Early Carboniferous of the Shotori Range, Tabas, eastern Iran. *Op. cit.*, 42-43.
- Yazdi, M., Turner, S. & Manani, M. 1998. Discovery of new conodont and microvertebrate remains in the Late Devonian of the Shotori Range, eastern Iran. *Op. cit.*, p. 43.
- Young, G.C. 1998. North Gondwana Mid-Palaeozoic connections with Euramerica and Asia: Devonian vertebrate evidence. *Op. cit.*, 44-45.

John Long, Western Australian Museum
 Andrew Simpson, Macquarie University
 Tony Wright, University of Wollongong
 Gavin Young, Australian National University



SDS trip to Morocco April 1999
 Dr Michal Ginter in disguise begging for his fare home?

photo courtesy of M. Ginter

IGCP 421 - North Gondwana Bioevent\Biogeography Patterns in Relation to Crustal Dynamics : SDS at Errachidia-Rabat (Morocco). 23 April-1-May 1999

The 5th international meeting was held in Morocco by the Department of Geology, Scientific Institute, Mohammad V Agdal University, Rabat, the Faculty of Sciences, Moulay Ismail University, Errachidia, and the Geological Survey of Morocco (Midelt Regional Centre) under the overall guidance of Prof. Ahmed El Hassani of the Scientific Institute, Rabat. Associated with the meeting of IGCP 421 was a meeting of the IUGS Subcommission on Devonian Stratigraphy (SDS).

The meeting consisted of a one-day transect from Rabat across the Middle and High Atlas to Errachidia, followed by a one-day scientific meeting (24 April) at the Hotel de Ville in Errachidia during which 36 scientific papers were presented orally or as abstracts to an audience of 91 local and foreign participants. The 40 foreign participants were from Germany (9), France (9), USA (6), Italy (5), Australia (2), Czech Republic (2), Belgium (1), China (1), Iran (1), Pakistan (1), Poland (1), Spain (1) and U.K. (1). A 7-day formal excursion then ensued (25 April-1 May) during which colleagues from various institutions in Morocco and Europe demonstrated sequences of regional and global significance in the Tafilalt and Meseta regions of Morocco.

The Tafilalt region is of prime significance for IGCP 421 because of its superb sequences displaying conodont and ammonoid biostratigraphy through Devonian time, and also because of elegantly displayed sedimentary signatures for the Kacak, Chotec, Taghanic, and Lower and Upper Kellwasser events. The Kellwasser events are also well displayed in the western Meseta though in seemingly allochthonous slabs and differing in detail sedimentologically from the same intervals in the Tafilalt region. Sections through the above 5 global event-intervals demonstrate that none of them were instantaneous; all have a "historical component" involving a significant interval of time. Of special interest for IGCP 421 is the emerging realization from provinciality of Devonian faunas between the Tafilalt and Meseta regions - including the pelagic goniatite faunas that one might assume to display little or no provinciality - that the South Atlas Suture between the two regions has undergone major displacement, conceivably more than 1,000 km.

The following sample of oral and poster contributions will convey an impression of the scope of the meeting: Condensed pelagic carbonates of the Harz Mountains, Germany (Hünecke - poster prize); Comparison of the Rabat-Tiflet zone of Morocco with coeval strata in Bohemia (Hünecke & Krienke); Dislocation of the Moroccan Meseta carbonate platform (Chakiri

& Tahiri); Extensional tectonics with respect to Devonian reef building in the northern Meseta (El Kamel & El Hassini); Hercynian deformation-evolution of the Carnic Alps (Pondrelli et al.); Mid-Palaeozoics of Pakistan (Talent et al.); Early and early Middle Devonian of the Anti-Atlas (Ziegler et al.); Mid-Palaeozoic anoxic, eustatic and reef episodes (House et al.); Magnetosusceptibility stratigraphy (Ellwood); Magnetosusceptibility stratigraphy of the Anti-Atlas compared with other Gondwanan and non-Gondwanan sequences (Crick et al.); Rock magnetic characterization of the Frasnian-Famennian boundary (Bucholz & Rolf); Emsian conodont succession of NW Morocco (Benfrika & Bultynck); Late Emsian-early Givetian conodont succession in the Tiflet area of Morocco (Gouwy et al.); Goniatite zonation of the Pharciceras Stufe (House & Becker); Famennian ammonoid succession of the S MaÖder (Becker et al.); Famennian ammonoid succession of the Anti-Atlas (Korn); Pragian conodont zonation (Slavik); Emsian-earliest Eifelian succession in the conodont genus *Polygnathus* (Bultynck); Conodont biostratigraphy of the Late Silurian of Sardinia (Corradini et al.); Silurian-Early Devonian pioneer plant communities (Douglas); Mid-Givetian trilobites and the Taghanic extinction (Feist & Orth); Middle Devonian stromatoporoids from North Africa (Mistiaen); Tabulate coral biogeography of Spain and Morocco (Fernandez-Martinez); Silurian-earliest Devonian Bohemian type bivalves from the Carnic Alps (Kriz); Carboniferous brachiopods from Mali (Legrand-Blain); Asteropygid trilobites from North Africa (Morzadec); Devonian and Carboniferous crinoids from Iran (Webster et al.); Placoderms from the Late Devonian of E Iran (Yazdi et al.); Conodonts from black shale facies of Appalachia (Over & Kirchgasser); Biogeography of crinoid columnals (Le Menn); Palaeozoic sharks as facies indicators (Ginter).

The formal meeting and excursion were noteworthy for excellence of preparation and enthusiasm of the excursion leaders. The various administrative authorities were memorably kind and courteous.

Two publications were produced for the conference:

1. R. Feist, J.A. Talent & B. Orth (eds), Abstract Book Errachidia Meeting SDS-IGCP 421 (April 23rd-May 1st 1999), 48 pp. Institut des Sciences de l'Evolution, Université de Montpellier II, France.
2. A. El Hassani & A. Tahiri (eds), Excursion Handbook, Pt I: Tafilalt and Maïder (eastern Anti Atlas) (p. 1-107); Pt II: The northwestern Moroccan Meseta, (p. 107-158).. Institut Scientifique (Rabat), Faculté des Sciences et Techniques (Errachidia) & Centre Régional de Géologie (Midelt), Morocco.

A volume of refereed papers from the conference will be published in *Notes et Mémoires du Service Géologique de Maroc*.

John A. Talent, Macquarie University
Joint Coordinator IGCP 421

Sixth International Meeting of IGCP 421 North Gondwana Biogeography/Bioevent Patterns in Relation to Crustal Dynamics (8-26 September 1999), In conjunction with the First Pakistan Palaeontological Convention (18-26 September 1999).

The 6th international meeting of IGCP 421 consisted of a formal presentation of some 40 scientific reports at the University of Peshawar, 20-21 September. The pre-conference program consisted of two excursions:

1. Palaeozoics of northernmost Pakistan, especially in the watershed of the Yarkhun River and in the vicinity of the Baroghil Pass with access to the principal sections being obtained by jeep, yak and horse with some support from mule trains (21 Aug.- 7 Sept.; 30 participants; Leader: John Talent). This group continued by jeep to Gilgit en route to Kashi/Kashgar in far-western China meeting up with participants for the more formal pre-conference excursion,

2. Palaeozoics of a transect of the Tarim Block across the Karakorum Collision Zone and Karakorum Block to Gilgit and the mid-Palaeozoics of central Chitral (8-19 Sept.; 30 participants; Leaders: Sun Dong-jiang, and Chen Xiu-qin for the portion in China and John Talent for the portion in Pakistan).

The principal focus for these excursions was a recent publication by Talent et al. (1999, *Rivista Italiana di Paleontologia / Stratigrafia* 105: 201-230) and publications by the Milano group led by Prof. Maurizio Gaetani. We were fortunate to have Professor Gaetani with us in the Baroghil area during Excursion 1.

The post-conference program (22-26 Sept.; Leaders: various) consisted of examination of the Proterozoic to mid Palaeozoic succession of the Cherat Range, Nowshera area, a visit to the superb Geoscience Laboratory at the Geological Survey of Pakistan, Islamabad, examination of the famous Salt Range Permian-Triassic sequence, a structural-stratigraphic transect from Kohat to Peshawar and, finally, examination of the Devonian-Carboniferous sequence at Gundhai Sar and on-site discussion of ages of stratigraphic units along the Khyber Road between Shaghail Fort and the Afghan border at Torkham.

The opening session of the conference, attended by 190 delegates, was opened by His Excellency, the Governor of Northwest Frontier Province, Major-General Aurangzeb and the Vice-Chancellor of Peshawar University, Professor M. Qasem Jan. Highlights of the conference were

extended exposés on application of expert systems to handling biogeographic data (V.N. Yolkina et al.), Phanerozoic climate in relation to biogeography (A.J. Boucot et al.), Mid-Palaeozoic event-stratigraphy in relation to isotopic data (A.S. Andrew and others), transgression-regression patterns in the mid Palaeozoics of the Italian Alps (C. Perri & C. Spalletta), charophyte biostratigraphy (M. Feist) CAI analysis in relation to metamorphic overprint in the Carnic Alps (M. Pondrelli), transition from diagenesis to metamorphism-CAI versus IC data-in the Townsville hinterland of NE Australia (C. Brime et al.), a group of four papers on conodont biostratigraphy in relation to tectonics in Turkey (Y. Goncuoglu & H. Kozur), quantitative palaeobiogeographic implications of the silicified brachiopod faunas of the Garra Limestone of NSW (G.A. Brock & J.A. Talent), Middle Devonian trilobites from NE Australia and Late Devonian trilobites from Iran (R. Feist et al.), Devonian plants from the northern Gondwana margin (B. Meyer-Berthaud et al.) and a flock of about dozen other papers from Australian participants.

Conjoined with the conference was the 1st Pakistan Palaeontologic Convention (FPPC), an initiative suggested by us in order to increase viability of the meeting and to showcase the role of biostratigraphy in structural interpretations and, in the case of the FPPC, in hydrocarbon exploration. The conference and attendant excursions highlighted the paucity of biostratigraphically well-constrained ages throughout the mountainous region of Pakistan north of the Salt Range.

In addition to participants from Pakistan, 35 conference delegates represented 11 other countries. The Australian contingent was the largest (13); others came from France (5), USA (3), Italy (2), Spain (2), India (2), Russia (2), Iran (2), China (2), Morocco (1), Germany (1) and Hungary (1). Pivotal for the success of the conference were the enthusiasm and energies of Vice-Chancellor Qasem Jan, head of the National Centre of Excellence in Geology, Prof. Hamidullah, and staff members Fazl-i-Rabbi Khan, Mohammed Riaz, Barkat Ullah, Amjad Ali and many more who seemed to be everywhere at all times, looking after conference participants. Noteworthy was participation of two delegates from India, Drs O.N. Bhargava and A.D. Ahluwalia, both from Panjab University, Chandigarh. That they were able to take part in the conference was due to remarkable perseverance with bureaucracy by our Peshawar University friends at a time of acute border tension between Pakistan and India.

John Talent
Macquarie University

**9TH INTERNATIONAL MEETING
EARLY VERTEBRATES/LOWER
VERTEBRATES
FLAGSTAFF, ARIZONA, MAY 15-19, 2000**

ORGANIZING COMMITTEE
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The 9th International Meeting on Early Vertebrates/Lower Vertebrates was held at Northern Arizona University in Flagstaff, Arizona, USA on May 15 through 19, 2000. Many excellent presentations on Paleozoic vertebrates (fishes and amphibians) were given - reports will follow in *Ichthyolith Issues* 21. A volume of short abstracts and field guide was produced and a symposium volume is planned. A pre-meeting trip to the Harding Sandstone was cancelled but the post-meeting field-trip to Devonian localities across SW USA was successful.

The meeting included the following symposia:

Interrelationships of thelodonts
Agnathan interrelationships
Placoderm interrelationships
Chondrichthyan interrelationships
Actinopterygian interrelationships
Sarcopterygian interrelationships
Paleozoic vertebrate biostratigraphy
Open and poster session

Post-Meeting Field Trip
May 20 - 27, 2000

Day 1 -May 20

Flagstaff, Arizona - Cedar City, Utah

This part of the trip is mostly scenic, and will include a stop at Lake Powell. The geology is mostly Mesozoic.

Day 2 -May 21

Cedar City, Utah - Eureka, Nevada

Visit to Egan Range locality outside Ely, Nevada (D.K. Elliott) - Lower Devonian Sevy Formation.

Day 3 -May 22

Eureka, Nevada -Elko, Nevada

Will spend most of the day at the Red Hills locality (H.-P. Schultze) - Middle Devonian Denay Limestone.

Day 4 - May 23

Elko, Nevada - Salt Lake City, Utah

Stop at Lakeside Mountain locality (D.K. Elliott, H.-P. Schultze) - Lower Devonian Sevy

Day 5 - May 24

Salt Lake City, Utah -Logan, Utah

Visit to Logan Canyon localities (H.-P. Schultze, H.G. Johnson) -Lower

Devonian/Middle Devonian Water Canyon Formation

Day 6 - May 25

Logan, Utah

Spend most of the day in Black Smith Fork (Denison locality) - Lower Devonian/Middle Devonian Water Canyon Formation

Day 7 - May 26

Logan, Utah - Moab, Utah

Different return route to Flagstaff, to view more of western United States. Rocks mostly Mesozoic.

Day 8 - May 27

Moab, Utah -Flagstaff, Arizona

Trip leads through Mesozoic outcrops, including massive Navajo Sandstone. Most of the journey will be on the Navajo Reservation.

Reports in next issue and see web site.

Memorial

**Dr HANS LUDOLPH JESSEN,
1935 - 1999**



Hans Jessen (pictured far right above with a group at the Naturiska Riksmuseet in Stockholm in the 1960s - photo by Alex Ritchie) died in early 1999 after suffering years of a debilitating illness. I met him only once, during my visit to the Naturhistoriska Riksmuseet in Stockholm in 1970; he was very kind and explained to me the ins and outs of the museum. Sadly, I was not able to meet him again when I went to the University of Cologne in November 1998. Hans went to that University in 1957 receiving his undergraduate degree in geology in 1960. During the summer of 1959 he met Dr. Tor Ørvig (NHRM, Stockholm) and joined his excavation of the Upper Devonian fish sites at Bergisch Gladbach, a town east of Cologne. This stimulated his interest in fossil fish, which remained the main focus of research. His body of work on osteichthyans provides a fine legacy to us all.

INDIVIDUAL NEWS

¶- new students or workers

For full listing of all 1998 and early 1999 papers see our web site - We can offer these as a paper, disc or e-mail copy if you have no internet access - please apply to the editor.

Dr Olga AFANASSIEVA, Paleoichthyology Lab., Paleontological Institute of Russian Academy of Sciences 123, Profsoyuznaya St., Moscow, 117647, RUSSIA
Tel: 7 (095)339-74-88, Fax: (095)339-12-66
NEW EMAIL: oafan@paleo.ru

Olga with Tiiu Märss spoke at the Jurmala meeting with a paper on the recognition of osteostracan microremains and showing their increasing use for biostratigraphy.

Paper of note:

Afanassieva, O.B. & Märss, T. 1999. New data on osteostracan microremains from the Silurian of Severnaya Zemlya, Russia. Ichthyolith Issues Special Publication 5, 4-5.

Paper in press:

Afanassieva, O., and Karatajute-Talimaa, V. Osteostracans. In: Mathukhin, R.G., and Menner, V.V. (editors) Stratigraphy of Silurian and Devonian of Severnaya Zemlya Archipelago. [In Russian]

Dr Per Eric AHLBERG, Department of Palaeontology, Natural History Museum, Cromwell Road, London SW7 5BD, U.K.
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Per hosted a meeting on Early Vertebrates in April 1999 (to be published as a special volume of the Systematics Association). He has been working with Zerina Johanson of the Canowindra Fish Kill site in Australia on the Late Devonian rhizodont fishes. At Jurmala he considered Devonian correlations between Scotland and the Baltic.

Paper of note:

Ahlberg, P.E., Ivanov, A., Luksevics, E. and Mark-Kurik, E. 1999. Middle and Upper Devonian correlation of the Baltic area and Scotland based on fossil fishes. In: Luksevics, E., Stinkulis, G. & Kalniya, L. (eds.) The 4th Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. Riga, 6-8.

Dr. DONALD BAIRD, 4 Ellsworth Terrace, Pittsburgh, PA 15213-2808, USA

Upper Carboniferous fish fauna of Five Points, Ohio.

Don Baird and Bob Hook (Austin, Texas) report the completion of their 9-year collecting

campaign at Five Points in Mahoning Country, Ohio. This locality is now extinct, with the strip-mines reclaimed and the remaining canal buried in landfill. All 1600-plus specimens have been accessioned at the Carnegie Museum of Natural History, Pittsburgh.

The high-diversity Five Points fauna - 15 fish genera, 16 amphibian genera plus one fragmentary reptile - comes from the Lower Kittanning Coal of the Allegheny Group, Middle Pennsylvanian (early Westphalian D, H Mazon Creek). The assemblage and its coal-swamp ecology resemble (with differences) those of the classic Westphalian D sites of Linton, Ohio, and Nyrany, Bohemia. Faunal compositions differ but where genera concur, the species are practically identical. Thus many provincial names need to be synonymized. There are many more names than taxa in the Carboniferous!

For sharks we have an abundance of the xenacanth *Orthacanthus*, including intact dentitions, male claspers, and stomach contents; 223 teeth of *Ageleodus*; and some fragmentary specimens of the long-snouted ctenacanth *Bandringa*, much larger than any described. Late-surviving *Gyracanthus* has left us pectoral and prepectoral spines. Palaeoniscoids are rare: "*Elonichthys*" *peltigerus*, *Platysomus*, and a variety of haplolepid. Lungfishes include the common *Sagenodus*, *Conchopoma* with its (heterodox) marginal dentition well displayed, and rare, queer little *Palaeopichthys*. Unlike Linton the rhipidistians *Megalichthys* and *Rhizodopsis* are present. Plus, inevitably, quantities of the coelacanth *Rhabdoderma*. For us, of course, the tetrapods are the best part, but you fisherpersons don't want to hear about them!

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Werner is working at the University of Hannover on glacial erratic (geschiebe) boulders from the Devonian of the East Baltic area (Bartholomäus 1999, Solcher 1999). In Germany the "Geschiebekunde" (scientific examination of erratics) has an old tradition. Some past publications did deal with fish remains, mainly of Palaeozoic age. Nowadays the activities are organised by the "Gesellschaft für Geschiebekunde" in Hamburg. Its main periodicals are the "*Archiv für Geschiebekunde*" and "*Geschiebekunde aktuell*". Both journals are funded in continuation of the former "*Zeitschrift für Geschiebeforschung ...*", published in Berlin/Leipzig. This journal ends in the year 1948.

At the moment there is little activity on fish remains in Devonian sandstones of Baltic derivation. I am working at the

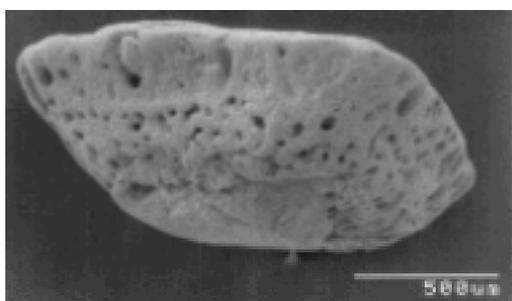
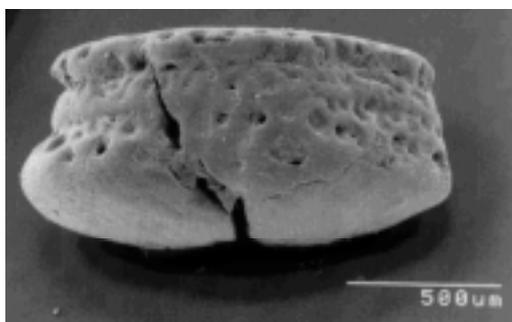
University of Hannover on erratics of this type ("Kugelsandstein", "Old-Red-Sandstein"). The main questions concern the petrography, cement type and diagenesis. Because much of the erratics in North Germany are rich in apatitic remains (Arthropoda, Heterostraci, Crossopterygii and other fishes) that I have also examined them along the way. Because I have no experience in working with fossil fishes, I made contact with fish workers especially in the Baltic States.

Several groups of fishes can be deduced from scales: acanthodians with a problematic scale fauna and Psammosteiformes. The scale *Porolepis posnaniensis* points to a lower Middle Devonian age. A complete unknown for Werner is the scale shown in the photo below. Does anyone has an idea, about the taxonomic position of this scale? Please send relevant reprints.

[NB see also Otto & Laurin 1999 - ed.]

Bartholomäus, W.A. 1999. Petrology of Ball Sandstone geschiebes (Devonian) and their apatite remains. In 4th Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. Riga, 11-12.

Solcher, J. 1999. Fish fauna and origin of a geschiebe of the Old Red Sandstone. In: 4th Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. Riga, 102.



Alison BASDEN, Centre for Ecostratigraphy and Palaeobiology, Macquarie University, New South Wales, 2109, AUSTRALIA
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Alison is working on her Ph.D. thesis which includes a new palaeoniscoid braincase from the Taemas district of New South Wales. She is currently working for the Geological Society of Australia

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Papers of note:

Basden, A. 1999. Emsian (Early Devonian) microvertebrates from the Buchan and Taemas areas of southeastern Australia. Recs Western Australian Museum Supplement No. 57:15-21.

Basden, A. 1999. Early Devonian microvertebrates from the Tyers-Boola area of central Victoria, Australia. In IGCP 421 Bologna-Modena volume. Boll. Soc. Paleont. It. 37 (2-3), 527-541

Basden, A., Young, G.C., Coates, M.I. & Ritchie, A. 2000. The most primitive osteichthyan braincase? Nature, Lond. 403, 185-188.

In press

Basden, A., Burrow, C., Hocking, M., Parkes, R. & Young, G. 2000. Siluro-Devonian microvertebrates from southeastern Australia. Courier Forschungs-Institut Senckenberg

Patrick BENDER, Museum of the Council for Geoscience, Private Bag X112, Pretoria, 0001, SOUTH AFRICA

Patrick is finishing off his Ph.D. thesis after a stay in Western Australia with supervisor John Long.

Papers of interest

Anderson, M.E., Long, J.A., Evans, F.J., Almond, J.E., Theron, J.N. & Bender, P.A. 1999. Biogeographic affinities of Middle and Late Devonian fishes of South Africa. Recs Western Australian Museum Supplement No. 57: 157-168.

Bender, P.A. 1999. First documentation of similar Late Permian actinopterygian fish from Australia and South Africa. Recs Western Australian Museum Supplement No. 57:183-189.

Evans, F.J. & Bender, P.A. 1999. The Permian Whitehill Formation (Ecca Group) of South Africa: a preliminary review of palaeoniscoid fishes and taphonomy. Recs Western Australian Museum Supplement No. 57: 175-181.

Jan L. den BLAAUWEN, University of Amsterdam, E.C. Slater Instituut, Plantage Muidergracht 1018 TV AMSTERDAM, The Netherlands

Professor de Buissonjé, retired palaeontologist of the University of Amsterdam, and Jan are

working on Middle Devonian vertebrate material from Scotland and Orkney. Research started in 1974, collecting not only articulated material but also disarticulated material from non-fish beds. More specifically the latter included coprolites, hundreds of which have been thin-sectioned revealing the prey, mainly acanthodians but also invertebrates. Proper identification of the acanthodians was difficult because of lack of detailed information on scales etc. from literature. In order to fill this gap, we started destructive investigation on articulated specimens: making serial thin sections of spines and scales. Of great value was articulated fossil material from the Moray Firth area donated by Bob Davidson [See previous *Ichthyolith Issues* and Burrow below - ed]. It is this part of our research that will be published in the near future. Regional information concerning the distribution of coprolites and their contents will follow the publication.

Dr. Alain BLIECK, Université des Sciences et Technologies de Lille Sciences de la Terre, U.R.A. 1365 du C.N.R.S., F-59655 Villeneuve d'Ascq Cedex, FRANCE
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Alain spoke about Severnaya Zemlya heterostracans at Jurmala - co-operative work with Valya Talimaa. Following the meeting he went to Lithuania. He writes: My stay in Vilnius was very successful. I have heterostracans from all over the Russian Arctic to work on! Severnaya Zemlya + Timan-Pechora and others. I will certainly need a second life ...

In his report to IGCP 406 this year Alain writes:

The French Group of IGCP 406 (A. Blieck, P.-Y. Gagnier & D. Goujet) has mainly worked on the taxonomy, biostratigraphy and palaeobiogeography of Devonian vertebrates from the Canadian, European (Spitsbergen), and Russian Arctic:

- 1) heterostracan pteraspidomorphs from the Lower Devonian of Severnaya Zemlya (Russia);
- 2) acanthodians from the Lower Devonian of the Mackenzie District (NWT, Canada);
- 3) placoderms and thelodonts from the Lower Devonian of Spitsbergen. Most results confirm close palaeobiogeographical relationships between the "northern" margin of the Old Red Sandstone Continent (Canadian Arctic), the Barentsia block (Spitsbergen), the Kara-Tajmyr block (Severnaya Zemlya), and even with the northern part of Siberia (Central Tajmyr and Noril'sk region).

Books of note:

Blieck, A. Turner, S., Fraser, N. & Wimbledon, W. (eds.) 1999. Gross Symposium part 3. *Modern Geology* 24, 1-2, 108pp.

Blieck A., & Turner S. (eds) 2000. Palaeozoic Vertebrate Biochronology and Global Marine / Non-Marine Correlation. Final Report of IGCP 328 (1991-1996). Courier Forschungs-Institut Senckenberg 22X. [It's coming!].

Papers of note:

- Blieck A., & Janvier P. (1999).- Silurian-Devonian vertebrate-dominated communities, with particular reference to agnathans.- In: Boucot A.J., & Lawson J.D. (eds), *Paleocommunities: a case study from the Silurian and Lower Devonian* [IGCP 53 Project Ecostratigraphy Final Report]. Cambridge Univ. Press, Chapter 9: 79-105.
- Blieck A., & Karatajute-Talimaa V. N. 1999. Devonian heterostracan pteraspidomorphs (Vertebrata) from Severnaya Zemlya (Russia) - A preliminary report. *Ichthyolith Issues* Special Publication 5, p11.
- Malvesy T., & Blieck A. (1999).- A quoi sert un inventaire ? Les collections géologiques du Musée d'Histoire Naturelle de Lille.- In: II Journées Nationales du Patrimoine Géologique (Soc. Géol. Nord – Musée Hist. Nat. Lille – Cons. Sites Nat. Nord-Pas-de-Calais; Lille, 16-18 juin 1999). Poster et résumé, 1 p.

Field guide:

Blieck A. (1999).- UPRESA 8014 Workshop: vertebrate Famennian localities (Upper Devonian) of the Ardenne massif: stratigraphy – palaeoenvironment – palaeobiogeography (Villeneuve d'Ascq and Belgium, 11-12 June 1999).- Field Trip Guidebook, 8 p. [mimeographed].

Papers in press

- Blieck, A. & Turner, S.: IGCP 328: Palaeozoic Microvertebrates final scientific report — Introduction.- incl. list of referees and IGCP 328 final publication list 1991-1997. *Courier Forschungs-Institut Senckenberg*.
- Blieck, A., Cloutier, R., with contributions of Elliott, D.K., Goujet, D., Loboziak, S., Reed, R.C., Rodina, O., Steemans, P., Valiukevicius, J.J., V'yushkova, L., Yolkin, E.A. & Young, V.T.: Biostratigraphical correlations of Early Devonian vertebrate assemblages of the Old Red Sandstone Continent. *Courier Forschungs-Institut Senckenberg*.
- Blieck A., Malvesy T., Candilier A.-M., Cloutier R. & Poplin C. Les collections du Musée d'Histoire Naturelle de Lille. 2: Vertébrés paléozoïques.- *Ann. Soc. Géol. Nord*, 2série, 7: 1-41; Villeneuve d'Ascq.
- Blieck A., Turner S., Young G.C., with contributions of Luksevivs E., Mark-Kurik E., Talimaa V.N. & Valiukevicius J.J. (in press).- Devonian vertebrate biochronology and global marine/non-marine correlation.- In: Bultynck P. (ed.), *International Devonian Correlations. Volume II. Cour. Forsch.-Inst. Senckenberg*.

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Henning is reviewing anaspid scales with Tiiu Märss and Giles Miller. He gave a talk on their findings at Jurmala. They have sorted out scale types on the well-known articulated specimens from Norway and can now relate isolated remains to these and recognise new taxa.

Papers of note:

- Blom H. 1999. *Loganellia* (Thelodonti, Agnatha) from the Lower Silurian of North Greenland. *Acta Geologica Polonica*, 49(2):97-104.
- Blom H., Märss T. & Miller G.C. 1999. Affinity, classification and distribution of Silurian and Lowermost Devonian birkeniid anaspid scales in the Circum-Arctic, Baltoscandia and Britain. *Ichthyolith Issues Special Publication* 5, p12-13.
- Blom, H. 2000 in press. Silurian vertebrates from North Greenland. *Courier Forschungs-Institut Senckenberg*

Wim van der BRUGGHEN, 20 Watchmeal Crescent, Fairfley, Clydebank, Glasgow G81 5EB, SCOTLAND.

Wim is still pursuing and finding beautiful Silurian thelodont specimens in Scotland. He is working on the internal squamation of *Loganellia scotica*.



Wim and ed. had a mini-workshop on Scottish thelodonts in Glasgow, Jan. 1999

Carole BURROW, Vertebrate Palaeontology Laboratory, Department of Zoology & Entomology, University of Queensland, St Lucia, Q4072, AUSTRALIA.
E-mail: CBurrow@zoology.uq.edu.au

Carole had a very useful meeting with Bob Davidson and Nigel Trewin up in the wilds of the Midland Valley of Scotland Tillywhanland quarries in March 1999. She came back with

a bag of Scottish fossil fish (mostly acanthodians) to prepare. Otherwise she is working on her thesis. She writes:

Heard a few interesting talks in London (NHM meeting), and now know, amongst other things, a few molecular biol/genetics/systematics etc buzz-words and that lungfish are more closely related to us than coelacanth. Cyclostomata are a real entity again; and oral/pharyngeal denticles AREN'T the same as scales according to some - oh well! back to the drawing board!

Papers of note:

- Burrow, C.J. & Trinajstić, K. 1999. Fish microfossils. In Yasin, A.R. & Morey, A.J. (comps) Yaringa East 1 well completion report Gascoyne Platform South Carnarvon basin Western Australia. *Geol. Surv. WA Record* 1997/7, 30-31.
- Burrow C.J., & Turner, S. 1998. Devonian placoderm scales from Australia. *Journal of Vertebrate Paleontology* 18, 677-695.
- Burrow C.J. & Turner, S. 1999: A review of placoderm scales, and their significance in placoderm phylogeny. *Journal of Vertebrate Paleontology* 19, 204-219.
- Burrow C.J. & Young, G.C. 1999. An articulated teleostome fish from the Late Silurian (Ludlow) of Victoria, Australia. *Recs Western Australian Museum Supplement* No. 57:1-14.
- Burrow C.J., Vergoossen J.M.J. & Turner S., Thorsteinsson R. & Uyeno T. 1999. Microvertebrate assemblages from the Late Silurian of Cornwallis island, Arctic Canada. *Canadian Journal of Earth Sciences*, 36:349-361.

Papers in press

- Burrow C.J. & Turner, S. Silurian vertebrates from Australia. *Courier Forschungs-Institut Senckenberg*
- Burrow C.J., Turner, S. & Wang Shi-tao: Devonian microvertebrates from Longmenshan, Sichuan, China: taxonomic assessment. *Courier Forschungs-Institut Senckenberg*

Ken S.W. CAMPBELL, Department of Geology, The Australian National University, Canberra, ACT 2600, AUSTRALIA
ken.campbell@anu.edu.au
Ken and Dick Barwick are still busy in 'retirement' working on various lungfish.

- Campbell, K.S.W. & Barwick, R.E. 1999. Dipnoan fishes from the Late Devonian Gogo Formation of Western Australia. *Records of the Western Australian Museum Supplement* No. 57:107-138.
- Campbell, K.S.W. & Barwick, R.E. 1999. Middle Devonian Dipnoan tooth-plates from Estonia. *JVP* 19(2): 220-233.

†**Benita CHAMBERS**, 9 Panek Crescent Mount Isa, Queensland 4825, Australia

benita_chambers@hotmail.com

Benita is doing her Master's at James Cook University, Townsville, on some Lower Carboniferous shark material from the Utting Calcarentite that Alex Cook (Queensland Museum) collected. She may convert to a Ph.D. later on.

Please send relevant reprints.

Dr Mike COATES, Dept of Biology, University College London, Medawar Bldg, Gower St., London WC1E 6BT, U.K.
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In Edinburgh, Mike presented a poster on his *Stethacanthus* work with his current ideas on so-called primitive chondrichthyan phylogeny [but just what constitutes a primitive shark is the problem - ed]. Mike has a new student, Sam Davis, who is going to work on early vertebrates.

Mike will be moving to University of Chicago in the near future.

Papers of note:

Coates M.I., & Cohn, M.J. 1998. Fins, limbs, and tails: outgrowths and axial patterning in vertebrate evolution. *BioEssays* 20(5):371-381.

Coates, M. & Sequeira, S.E. 1999. Primitive sharks and the interrelationships of gnathostomes. In Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 8.

Coates, M.I. 1999. *Stethacanthus* and primitive conditions for chondrichthyan neurocrania. Abstracts of papers, 59th Annual Meeting of Vertebrate Paleontology Adams Mark Hotel, Denver, Colorado, October 20-23, 1999. JVP 19(3) September 1999, p39A.

Ted DAESCHLER, Academy of Natural Sciences of Philadelphia, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103, USA

Papers of interest

Daeschler E.B. 1998. A primitive actinopterygian from the Late Devonian Catskill Formation at Red Hill, Clinton County, Pennsylvania, U.S.A. JI Vert. Paleontology, SVP Abstracts 37A.

Daeschler, E.B. & Cressler, W. 1999. Sampling an early continental ecosystem: Late Devonian bone beds at Red Hill, Clinton County, PA. Abstracts of papers, JVP 19, Supplement to 3, September 1999, 41A.

Davis, M.C., Shubin, N.H., and Daeschler, E.B. 1999. A juvenile rhizodont from the Late Devonian Catskill Formation at Red Hill, Clinton County, Pennsylvania, USA. SVP Abstracts, JVP 19, Supplement to 3, September 1999, 41A.

Dominique DELSATE, Musée nationale d'histoire naturelle, Bibliothèque/Exchange 25, rue Münster, L-2160 LUXEMBOURG
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Delsate D. 1997. Un Arthrodire Brachythoraci (Placoderme) du Dévonien inférieur (Emsien) de Lellingen (Grand-Duché de Luxembourg). Note préliminaire.- In: Maubeuge P.L. & Delsate D. Notes paléontologiques et biostratigraphiques sur le Grand-Duché de Luxembourg et les régions voisines. *Trav. Scient. Mus. natn. Hist. nat. Luxembourg*, 27: 1-15.

Kim DENNIS-BRYAN, 29 East End Road, Finchley, London, N3 2TA, UK.
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Kim wrote (1998!): "Kate (Trinajstic) is still here and at this very moment photocopying various papers to take back to Perth. I doubt however she can equal Bob Carr who was carrying 36 kilos of reprints in his luggage. It was fun to see everyone again in Warsaw and catch up on what everyone has been doing (some people I haven't seen since Paris). Kate says the Australian contingent (that means Kate) produced a brilliant paper and discussion - need I say more. Actually I think she is more likely to be remembered for her quest for poppy cake throughout the patisseries of Warsaw."

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Also 7 Braemor Park, Rathgar, Dublin 14, Ireland.
Tel: 353-1-4922442

Mags finished writing up her Ph.D. thesis on Lower Carboniferous microremains of Ireland but attended the Warsaw and Jurmala meetings. Thesis defense on March 3rd was successful! Now for the job.

¶ **Vincent DUPRET**, Laboratoire de Paléontologie, 8, rue Buffon, 75 005 PARIS, FRANCE.
e-mail: vdupret@hotmail.com

I'm presently preparing a thesis on Arthrodiros (Placoderms) of Podolia, under Daniel Goujet's direction, at the National Natural History Museum of Paris. Alain Blicek may be my co-tutor.

Please send me a list of addresses and e-mails of the people working with *Ichthyolith Issues* - That would facilitate my work and getting the links with the searchers.

Dr Dave ELLIOTT, Northern Arizona University, Department of Geology, PO Box 4099, Flagstaff, AZ 86011-4099, U.S.A.
Fax (602) 523-9220

Dave successfully ran the 9th Early/Lower Vertebrates meeting in Flagstaff in May 2000 (more of this in next issue) - he also 'retired' as editor of JVP and is having a well-earned rest. He wrote last year:

The situation concerning my students is that Randy Reed completed his work on the Water Canyon last year and graduated. He is still job hunting and in the meantime is teaching courses here and acting as the dept. technician. We have collaborated on a couple of biostrat papers and we are now working on the description of a new *Alloccryptaspis* from the WC (plus a complete revision of the reconstruction of cyathaspidid mouthparts--Denison got it all wrong I'm afraid), and on his work using sea level curves to relate the WC to the curves previously calculated for the Devonian of Euramerica and then to the conodont zonal scheme.

Jack Evans is now in Oregon after a spell in Nevada and may be starting work on his thesis again. He is picking the Iowa collections we made some time back.

Heide Johnson and I just submitted a placoderm paper to the Linn Soc and we are now working on a description of the Yahatinda fauna (collected by Dave Dineley in the '60s). My main aim over the next year is to describe all the cyathaspidids from the western US that I've collected in the last ten years. There are at least 15 new species and they are important to the biostrat correlations that I've been doing.

My other main task is to co-operate with Ray Thorsteinsson on his arctic faunas from Cornwallis Island. I was in Calgary in mid-November last year to start the work.

Paper of interest

Elliott, D. K., E. J. Loeffler, and Liu, Y. 1998.

New species of the cyathaspidid *Poraspis* (Agnatha: Heterostraci) from the Late Silurian and Early Devonian of Northwest Territories, Canada. *Journal of Paleontology* 72:360-370.

Elliott, D.K. 1999. The heterostracan head.

Abstracts of papers, Fifty-ninth Annual Meeting of Vertebrate Paleontology Adams Mark Hotel, Denver, Colorado, October 20-23, 1999. *JVP* 19(3) Sept. 1999, p43A.

Paper in press

Elliott D.K., Johnson H.G., Cloutier R., Carr R.K. & Daeschler E.B.: Middle and Late Devonian vertebrates of the western Old

Red Sandstone Continent. *Courier Forschungs-Institut Senckenberg*

Dr Pierre-Yves GAGNIER, Grand Galerie de l'Évolution, Museum National d'Histoire naturelle, 36 rue Geoffrey Saint-Hilaire, F-75005 Paris, FRANCE.

E-Mail: gagnier@mnhn.fr

At Jurmala, Pierre-Yves gave a preliminary report on acanthodian microremains in the Baillie Hamilton and Cornwallis Islands sections of Arctic Canada.

Papers of note

Gagnier P.-Y. 1998. Review of Five Kingdoms: An Illustrated Guide to the Phyla of Life on Earth, by Margulis, L. & Schwartz, K.V. éditeurs. Third edition. W. H. Freeman and Compagny, New York. 1998, 520 p.- Ecologie.

Gagnier P.-Y. 1999. Evolutionary patterns of the acanthodian head. Abstracts of papers, 59th Annual Meeting of Vertebrate Paleontology Adams Mark Hotel, Denver, Colorado, October 20-23, 1999. *JVP* 19(3) September 1999, p45A.

Gagnier P.-Y. 1999. Sensory Structures in Vertebrates / Eyes.- In: R. SINGER (ed.), *Encyclopedia of Paleontology*. Fitzroy Dearborn Publishers.

Gagnier P.-Y. 1999. Chordate and Vertebrate Body Structure: Dermal Skeleton, Postcranial.- In: R. SINGER (ed.), *Encyclopedia of Paleontology*. Fitzroy Dearborn Publishers.

Gagnier P.-Y. 1999.- Ornamentation in Vertebrates.- In: R. SINGER (ed.), *Encyclopedia of Paleontology*. Fitzroy Dearborn Publishers.

Gagnier P.-Y., Hanke G. & Wilson M.V.H. 1999. *Tetanopsyrus lindoei* gen. et sp. nov., an Early Devonian acanthodian from the Northwest Territories, Canada. *Acta Geologica Polonica*, 49(2):81-96.

Ray GARTON, WV Geological Survey, PO Box 200/600 Saxman Street, >Barrackville, WV 26559, USA

Ph: 304/366-1810, Fax: 304/366-8019.

E-mail: museum@geosrv.wvnet.edu, or

garton@mammoth-geo.com

Ray's question on the net generated a fair amount of mail:

"I've seen many illustrations of *Cladodus* sp. teeth and body reconstruction illustrations in various publications of Romer and Moy-Thomas. Does anyone have photos or know of actual specimens showing most if not all of the animal?"

Dr Michal GINTER, Fac. Geol., Al. Zwirki i Wigury 93, 02 089 Warsaw, Poland.

E-mail: fiszbit@geo.uw.edu.pl

Michal ran a very successful meeting in Warsaw in September 1998 (see reports above) and then edited the manuscripts for *Acta Geologica Polonica* now out as volume 47 with an additional paper by Gary Johnson in volume 47.3.

Special Publication of Note:

Ginter, M., and Wilson, M. V. H. (Editors).
1998. IGCP 406 Circum-Arctic Palaeozoic Faunas and Facies. Faculty of Geology, Warsaw University, Warsaw, Poland, September 3-8, 1998 *Ichthyolith Issues Special Publication 4*:1-62.

Papers of note:

- Ginter M. 1998. Taxonomic problems with Carboniferous "cladodont-level" sharks' teeth. pp. 14-16. In: *Ichthyolith Issues Special Publication 4*.
- Ginter M. & Turner S. 1999. The early Famennian recovery of phoebodont sharks. *Acta Geologica Polonica*. 49(2):105-117.
- Ginter M. 1999. Late Famennian pelagic shark assemblages. *Ichthyolith Issues Special Publication 5*, 18-20.
- Ginter, M. 1999, Famennian – Touraisian chondrichthyan microremains from the Eastern Thuringian Slate Mountains, *Abhandlungen und Berichte Fur Naturkunde*, 21, 25-47.

Papers in press:

- Esin D., Ginter M., Ivanov A., Lebedev O., Luk_evi_s E., Avkhimovich V., Golubtsov V. & Petukhova L.: Vertebrate correlation of the Upper Devonian and Lower Carboniferous on the East European Platform. *Courier Forschungs-Institut Senckenberg*
- Ginter, M. & Ivanov, A.: Stratigraphic distribution of chondrichthyans in the Middle and Upper Devonian of the East European Platform margin. *Courier Forschungs-Institut Senckenberg*

Dr Daniel GOUJET, Lab. de Paléontologie, Museum National d'Histoire Naturelle, 8 Rue Buffon, F-75005 Paris, FRANCE.
E-Mail: goujet@mnhn.fr

Daniel participated at Jurmala with a talk on arctic placoderms and also in a spirited dance with the Latvian University folk company.

Papers of note

- Goujet D. 1999. Placoderms and basal gnathostome apomorphies.- In: Ahlberg G. (conven.), Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development (joint Systematics Association / Natural History Museum meeting, 8-9 April 1999, London): 11 [abstract].
- Goujet D.F. 1999. Placoderm distribution and Devonian paleogeography in the Circum-Arctic.- In: 4th Baltic Stratigraphic Conference & IGCP 406: Circum-Arctic Palaeozoic Vertebrates meeting, Jurmala,

Latvia, Sept. 27 – Oct. 2, 1999).- *Ichthyolith Issues, Spec. Publ.* 5: 20 [abstract].

Papers in press

- Goujet D. ed. (in press).- Palaeontology and stratigraphy of the Silurian-Devonian of Severnaya Zemlya, Russia [provisional title].- *Geodiversitas*, 15 papers; Paris (13 papers submitted and accepted, 2 papers in progress).
- Goujet D. (in press).- Placoderms.- In: McMillan Encyclopedia of Life Sciences.

Eileen D. GROGAN Adelphi University, Biology Dept, Garden City, NY 11530, USA.
E-mail: egrogan@sju.edu

Dick Lund and I have new cochlodonts identified, have been constantly revising a cladogram of chondrichthyan relationships, last upgrade (presented during April meetings in London), follows my reexamination of *Helodus*) and analyses of jaw and cranial evolution. We're also revising a manuscript which proposes a model to explain the depositional features of the Bear Gulch and the quality of fossil preservation. You can access the Bear Gulch website at:

www.adelphi.edu/~lund

Papers of note

- Grogan E.D. 1999. On the anatomy and relationships of *Helodus simplex*. Abstracts of papers, 59th Annual Meeting of Vertebrate Paleontology, Denver, Colorado, October 20-23, 1999. JVP 19(3) September 1999, p48A.
- Lund R., & Grogan E.D. 1999. The cranial anatomy and relationships of some Carboniferous euchondrocephalans. Abstracts of papers *op. cit.*. JVP 19(3) September 1999, p60A.

Dr Oliver HAMPE, Museum fur Naturkunde, Zentralinstitut der Humboldt-Universitat zu Berlin, Invalidenstr. 43, D-10115, Berlin, Germany

Oliver is studying the histology of xenacanthoid teeth and has been sorting out the British Carboniferous xenacanth teeth - now completed - the final report was given at Jurmala.

Papers of note:

- Hampe O. 1999. Revision of the Xenacanthida (Chondrichthyes: Elasmobranchii) from the Carboniferous of the British Isles: final results. *Ichthyolith Issues Special Publication 5*, 20-21.
- Hampe, O. & Long, J.A. 1999. The histology of Middle Devonian chondrichthyan teeth from southern Victoria Land, Antarctica. *Records of the Western Australian Museum Supplement No. 57*:23-36.

Paper in press
Schneider J.W., Hampe O. & Soler-Gijón, R.
The Late Carboniferous and Permian: aquatic
vertebrate zonation in southern Spain and
German basins. *Courier Forschungs-Institut
Senckenberg*

Simon K. HASLETT, Faculty of Applied
Sciences, Bath College of Higher Education,
Newton Park, Newton St. Loe, Bath BA2 9BN,
U.K.

Paper of interest:
Haslett S.K. 1998. Biostratigraphic synthesis
of vertebrate and plant occurrences in the
Lower Old Red Sandstone (Siluro-Devonian)
of southern Gwent, Wales, UK. *N. Jb. Geol.
Palaeont. Mh.* 3:182-192.

Maria & Dirk HOVESTADT, Merwedelaan 6,
4535 ET Terneuzen, The NETHERLANDS
NEW tel 0115 648567.
Fax 0115 648566.
E-mail: dmhovest@zeelandnet.nl

...had a successful trip to Australia last year
and did co-operative work with Sasha Ivanov
this year on shark teeth histology.

**Dr Robert ILYES, [DOES ANYBODY HAVE
AN ADDRESS FOR ROBERT???] Norway**

Some time ago he sent this message:

I am now working as a science teacher at a
school just outside Oslo. I do not have my
own email address yet because the school
cannot afford to have separate addresses for
all the teachers. I'm still doing some research
on early vertebrates, and Natascha Heintz
and I am in the progress of finishing up a
paper on the Gigantaspids from Spitsbergen.

Natascha is retired now. The
universities in Norway no longer find
Palaeozoic vertebrates very interesting, and
it does not seem like they will hire any fish
people at all. Hopefully I can keep in touch
with you guys on the 406 project as good as I
can. I'm sorry that it goes down the drain with
early vertebrates in Norway, and other places
too [e.g. the NR in Stockholm where Ulf
Borgen lost his position in May - ed.]. Please
send my best to everybody!!!!

NB Natascha did visit Australia in September
1998.

Wayne ITANO, 1995 Dartmouth Ave,
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Phone: 1 (303) 499-4248, fax: 1 (303) 497-
7375
E-mail: <witano@sni.net>
Home Page: <http://www.sni.net/~witano>

Research interests: Paleozoic fish,
particularly Chondrichthyes from the
Pennsylvanian of Colorado.

I'm an atomic physicist working at the
National Institute of Standards and
Technology. Paleontology is my hobby. One
of my projects is a website consisting of
photographs and descriptions of fossils found
by me or by other members of my family. The
home page of the fossil section is

<http://www.sni.net/~witano/fossils.htm>

My interest in Paleozoic fishes really began
with finding a largely complete *Ctenacanthus*
fin spine. To see a picture and description,
follow the links from my main fossil page to
the Minturn Formation page and then the
Ctenacanthus page. John Maisey has it now,
but he sent me a cast. Last summer, I took
on the project of finishing up a publication on
Pennsylvanian sharks from the Minturn
Formation of Colorado. Hence, I'm trying to
collect any and all references that could be of
use in this. I have easy access to the
University of Colorado library, but it lacks
quite a few things that look interesting,
including *Ichthyolith Issues*.

The publication started out in about
1984, when Martin Lockley (Univ. of Colorado
at Denver) found a large number of shark
teeth at a locality in the Minturn Formation in
Colorado. Practically nothing has been written
on the subject. There were several teeth that
had never been reported from Colorado, and
one, *Lagarodus*, that was practically unknown
in North America. There were also several
fin spine taxa represented. After I finish this
project I might try to do some work on the
microvertebrates from the same locality.

Publication in progress:
"Shark remains from the Pennsylvanian
Minturn Formation, Eagle County, Colorado,"
(tentative title), with Martin Lockley, Karen
Houck, Michael Hansen, Barbara Stahl

Alexander O. IVANOV, Lab. of Paleontology,
Institute of Earth Crust, University of St-
Petersburg, 16 Linija 29, St Petersburg
199178, Russia
Email: aoi@duxnet.dux.ru

Alexander spent 6 months in Lille as a
European visiting scientist working with Claire
Derycke and Alain Blieck.

Papers of note:
Belyaeva N.V. and Ivanov A.O. 1998. Lyaiol' -
a treasury of fossil vertebrates. *Vestnik
Institutu Geologii Komi Nauchnogo Tsentra
RAN*, 6, 14-15. [in Russian].
Ahlberg P.E., Ivanov A., Luk_evi_s E. and
Mark-Kurik E. 1999. Middle and Upper
Devonian correlation of the Baltic area and
Scotland based on fossil fishes. In: 4th

- Baltic Stratigraphical Conference Abstracts. R_ga, p6-8.
- Ivanov A.O. 1999. Late Devonian - Early Permian chondrichthyans of the Russian Arctic. *Acta Geologica Polonica*. 49(3):267-285.
- Ivanov A.O. 1999. Tooth internal morphology of Palaeozoic symmorid sharks. *Ichthyolith Issues* Special Publication 5, p21-22.
- IVANOV A. & DERYCKE C. 1999. Distribution of Givetian *Omalodus* shark assemblage. *Ichthyolith Issues* Special Publication 5, p22-24.

Papers in press

- Esin D., Ginter M., Ivanov A., Lebedev O., Luk_evi_s E., Avkhimovich V., Golubtsov V. & Petukhova L.: Vertebrate correlation of the Upper Devonian and Lower Carboniferous on the East European Platform. *Courier Forschungs-Institut Senckenberg*.
- Ginter M. & Ivanov A.: Stratigraphic distribution of chondrichthyans in the Middle and Upper Devonian of the East European Platform margin. *Courier Forschungs-Institut Senckenberg*.

Dr Philippe JANVIER, U.R.A. 12 du CNRS, Lab. de Paléontologie, MNHN, 8 rue Buffon, 75005, Paris, FRANCE
janvier@cimrs1.mnhn.fr

Papers of note:

- Janvier P. & Villarroel A.C. 1998. Los Peces Devónicos del Macizo de Floresta (Boyacá, Colombia). Consideraciones taxonómicas, biostratigráficas y ambientales. *Geologia Colombiana*, No 23. pp. 3-18.
- Janvier P. 1999. Ostracoderms and the shaping of gnathostome characters. In Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 17.
- Zhu Min Y-X & Janvier P. 1999. A primitive fossil fish sheds light on the origin of bony fishes. *Nature* 397, 607-610.

Zerina JOHANSON, Macquarie University Centre for Ecostratigraphy and Palaeobiology, School of Earth Sciences, Macquarie University, NSW 2109, AUSTRALIA.

This year Zerina joined Sue Turner and Anne Warren in sorting out the sarcopt fishes of the Early Carboniferous Ducabrook Formation, Queensland. She visited the site with Alex Ritchie in June '99 and collected yet more rhizodont material. A first paper on the strepsodont was submitted to *Geodiversitas*. She is currently working on sarcopts from a series of late Devonian fish sites in New South Wales; in Edinburgh she spoke about her work on a Late Devonian rhizodont.

Papers of note:

- Ahlberg P.E., and Johanson Z. 1998. Osteolepiforms and the ancestry of tetrapods. *Nature* 395:792-794.
- Johanson Z. & Young G.C. 1999. New *Bothriolepis* (Antiarchi: Placodermi) from the Braidwood region, New South Wales, Australia (Middle-Late Devonian). *Records of the Western Australian Museum* Supplement No. 57:55-75.
- Johanson, Z. & Ritchie, A. 2000. A new Late Famennian lungfish from New South Wales, Australia, and its bearing on Australian-Asian relations. *Alcheringa* 24, 99-118.
- Johanson, Z., Turner, S. & Warren, A. 2000. First East Gondwana record of *Strepsodus* (Sarcopterygii, Rhizodontida), from the Lower Carboniferous Ducabrook Formation, Central Queensland, Australia. *Geodiversitas* 22(2): 161-169.

Assoc. Pr. Gary D. JOHNSON, Dept Earth Sciences & Physics, University of South Dakota, 414 East Clark Street, Vermillion SD, USA
Fax: 1 605 677 6121

Paper of note:

- Johnson G.D. 1999. Dentitions of Late Palaeozoic *Orthacanthus* species and new species of ?*Xenacanthus* (Chondrichthyes: xenacanthiformes) from North America. *Acta Geologica Polonica* 49 (3): 215-266.

Dr Valentina KARATAJUTE-TALIMAA, Lithuanian Institute of Geology, Sevcenkos 13, 2600 Vilnius, LITHUANIA
Fax: (370 2) 23 67 10

Valya has had research visits from Moya Smith, Alain Blicek and Daniel Goujet and with others is working on the Severnaya Zemlya volume. She made presentations at the 3rd and 4th Baltic Symposiums. Her major methodological paper concerning thelodonts, chondrichthyans etc. was published in Berlin. She has worked with Tiiu on a survey of thelodonts for the upcoming revision of Obruchev's Fundamentals of Palaeontology. In mid August 1999 she was busy being a grandmother again!

Papers of note:

- Karatajute-Talimaa V. 1998. Determination methods for the exoskeletal remains of Early Vertebrates. *Mitteilungen aus dem Museum für Naturkunde in Berlin. Geowissenschaftliche Reihe* 1: 21-51.
- Karatajute-Talimaa V., Brazauskas A. & Valiukevi_ius J. 1999. Vertebrate assemblages of the Silurian/Devonian boundary beds and the section completeness in the Baltic Syncline. In: 4th Baltic Stratigraphical Conference. Problems and

Methods of Modern Regional Stratigraphy. Abstracts. R_ga, p42-43.
Karatajute-Talimaa V. & Smith M.M. 1999. Scales of the oldest acanthodians (morphology, histology and growth types). *Ichthyolith Issues* Special Publication 5, p24-25.

Papers in press

Afanassieva O., & Karatajute-Talimaa V. Osteostracans. In: Mathukhin, R.G., and Menner, V.V. (editors) Stratigraphy of Silurian and Devonian of Severnaya Zemlya Archipelago. [In Russian]

Karatajute-Talimaa V. Lower Devonian (Lochkovian) thelodonts from the October Revolution Island (Severnaya Zemlya Archipelago). *Geodiversitas*.

Karatajute-Talimaa V. & Blicek A. [Heterostracans].- In: Matukhin R.G. & Menner V.V. (eds), Stratigrafiya silura i devona arhipelaga Severnaya Zemlya [Stratigraphy of the Silurian and Devonian of the Severnaya Zemlya archipelago]; Novosibirsk [In Russian].

Karatajute-Talimaa V., and Märss T Upper Silurian thelodonts of Severnaya Zemlya Archipelago. *Geodiversitas*.

Karatajute-Talimaa V., & Märss T. Thelodonts. In: Mathukhin, R.G., and Menner, V.V. (editors) Stratigraphy of Silurian and Devonian of Severnaya Zemlya Archipelago. [In Russian]

Karatajute-Talimaa V.N.: Significance of thelodonts (Agnatha) in correlation of the uppermost Ordovician to Lower Devonian of the northern part of Eurasia. *Courier Forschungs-Institut Senckenberg*

Dr Anne KEMP, Centre for Microscopy and Microanalysis, University of Queensland, St Lucia, Qld 4072, Australia
E-mail: a.kemp@mailbox.uq.edu.au

PLEASE NOTE NEW ADDRESS.

Anne is continuing with projects on conodonts and lungfish.

Paper of interest

Turner S., Kemp A. & Warren A. A., 1999. First Early Carboniferous lungfish (Dipnoi, Ctenodontidae) from central Queensland. *Alcheringa* 23, 177-182.

Dr Natasha KRUPINA, Paleochthyology Lab., Paleontological Institute of Russian Academy of Sciences 123, Profsoyuznaya st., Moscow, 117647, RUSSIA
Voice: (095)339-74-88, Fax: (095)339-12-66, e-mail: nkrup@paleo.msk.su

I completed a paper (given to the *Paleontological Zhurnal* in October 1995) "The shoulder girdle and opercular series of *Andreyevichthys epitomus*, a Late Devonian dipnoan from the Tula Region of Russia". The

shoulder girdle and opercular are interpreted as structures taking part in breathing with consequent evolutionary transformations of the dipnoan exoskeleton related to their adaptations from gill- to lung- breathing.

With Moya Smith and Robert Reisz (Erindale Campus, Biology, University of Toronto) I have begun to work on a paper on dental plates of Early Devonian lungfish *Ichnomylax* from Taymyr Peninsula. This lungfish had peculiar dental plates which grew in an unusual way and possibly could have special histological structure. The genus was established by John Long in 1994 on the material from the Lower Devonian of Victoria, Australia (type species - *Ichnomylax kurnai*). Dental plates of both Taymyrian and Australian forms look extremely similar, but undoubtedly belong to different species.

Papers of interest:

Krupina N.I. and Reisz R.R. 1999. Reconstruction of dentition in hatchlings of *Andreyevichthys epitomus*, a Late Famennian dipnoan from Russia. *Modern Geology*, 24:99-108.

Krupina N.I., Reisz R.R. & Smith M.M. 1999. Discovery of petrodentine in tooth plates of an Early Devonian dipnoan from Northern Siberia. *Ichthyolith Issues* Special Publication 5, p27.

Dr Elga KURIK, Institute of Geology, Estonian Academy of Sciences, Estonia PST 7, E-10105 Tallinn, ESTONIA
kurik@gi.ee

Elga produced coloured models of certain fishes for a special exhibition in Estonia and also seen at the Natural History Museum in Riga: included are anaspid *Rhyncholepis*, placoderms *Tiaraspis*, *Bothriolepis*, and acanthodian *Culmacanthus*.

Publication update:

Mark-Kurik E. 1995. Muistsed kalad ja nende kivistised Eestis [Ancient fishes and their fossils in Estonia] *Eesti Loodus* No. 8, August, 226-228 (In Estonian, Engl. summ. p. 229).

Mark-Kurik E. 1999. Psammosteid microremains from the Middle Devonian of Estonia. *Modern Geology*, 24(1):1-21.

Mark-Kurik E. 1999. Some Middle Devonian and Emsian Correlation problems. In: 4th Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. R_ga, p58-60.

Mark-Kurik E., Blicek A., Loboziak S. & Candilier A.-M. (1999).- Miospore assemblage from the Lode Member (Gauja Formation) in Estonia, and the Middle-Upper Devonian boundary problem.- *Proc. Eston. Acad. Sci., Geol.*, 48 (2): 86-98, 2 fig., 1 pl.; Tallinn [with Estonian and Russian abstracts].

Marshall J.E.A., Astin T.R., and Mark-Kurik E. 1999. An integrated palynostratigraphy and

lithostratigraphy of the Middle Devonian Lacustrine sediments of the Orcadian Basin, Scotland and their correlation with the Baltic area. In: 4th Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. R_ga, p62-63.

Nessov, L.A. and Mark-Kurik, E. 1999. *Tropinema*, a Middle Devonian arthodire with high median dorsal crest from east Baltic. Russian Academy of Sciences, Proceedings of the Zoological Institute, St.-Petersburg, 277:58-66.

Paper in press:

Mark-Kurik E.: The Middle Devonian fishes of the Baltic States (Estonia, Latvia) and Belarus. *Courier Forschungs-Institut Senckenberg*.

Mark-Kurik E. (In press) Arthrodires. In: Mathukin, R.G. & Menner, V.V. (editors). Stratigraphy of Silurian and Devonian of Severnaya Zemlya Archipelago. (in Russian).

Poster:

Mark-Kurik E., Karatajute-Talimaa V. & Otto M. 1998. Chondrichthyan remains from the Middle and Late Devonian of the Baltic area. IGCP 406 Annual Meeting, Warsaw.

Dr Oleg LEBEDEV, Paleontological Institute of RAS, 123 Profsoyusnaya, Moscow 117647, RUSSIA. Voice (095)3391988, Fax 7 095 339-0622 or 339-1266.

Email: pbul@paleo.msk.su, <http://www.paleo.ru>

Oleg is still busy with his thesis, "Vertebrate assemblages of the D/C boundary of Central Russia" and hopes to finish the text by the end of the year.

I finished my chapter for the Middle Carboniferous vertebrates of the Moscow Syncline for the volume by Alekseyev et al (in prep.) and am currently working on the revision of the chondrichthyan materials (PZ-Recent) from the CIS territory for the future volume of the new Fundamentals of Paleontology (6 volumes of vertebrates from the territory of CIS and Mongolia) also in prep. The Russian version is supposed to be finished in 2000, and will probably be translated later (of course if we find a publisher and a sponsor).

Paper in press

Esin D., Ginter M., Ivanov A., Lebedev O., Luk_evi_s E., Avkhimovich V., Golubtsov V. & Petukhova L.: Vertebrate correlation of the Upper Devonian and Lower Carboniferous on the East European Platform. *Courier Forschungs-Institut Senckenberg*.

David LINDLEY, Department of Geology, Australian National University, Canberra ACT 0200
Ph: 02 6249 2061
e-mail: lindley@leme.anu.edu.au

I'm presently working on a systematic study of ischnacanthid acanthodian fish faunas at three levels in the late Pragian-Emsian (ca. 16 Ma time span) Murrumbidgee Group limestones in the Murrumbidgee and Goodradigbee valleys. Acanthodian jawbones are relatively rare in the limestones and accordingly little work has been completed on this group to date. Intensive collection by the writer at specific stratigraphic levels has assembled a relatively large number of well preserved jawbone specimens. Fin spines and scales have also been recovered from residues.

Progress to date:

1. The ischnacanthid fauna from the Cavan Bluff Limestone, at the base of the Murrumbidgee Group, has been prepared and described (Lindley 2000).
2. Ischnacanthid fauna from the Currajong Limestone-lower Bloomfield Limestone, approximately mid level in the Murrumbidgee Group, prepared and described. Plates being prepared.
3. Collection of highest level in sequence - Warroo Limestone and/or Crinoidal Limestone - about to commence.

Lindley, I.D. 2000. Acanthodian fish remains from the Lower Devonian Cavan Bluff Limestone (Murrumbidgee Group) Taemas district, New South Wales. *Alcheringa* 24, 11-35.

Dr John A. LONG, Western Australian Museum, Francis St., Perth, WA 6000, AUSTRALIA
E-mail: long@museum.wa.gov.au

The CAVEPS 97 volume was printed in May 1999 as a *Records of the Western Australian Museum* Supplement no. 57 with 424pp with mostly fish papers (14 plus abstracts). Another *Records* for the SDS/IGCP 421 Esfahan meeting in almost ready.

Orders and inquiries from Ann Ousey, Publications Department, The Western Australian Museum, Francis St., Perth, Western Australia, 6000; e-mail: ouseya@museum.wa.gov.au; fax is +61-8-94272882

Our new fossil and mineral gallery is now in full swing. We plan to have more real fossils on display than any other museum in Australia-due to open in August. I'm doing an entire cabinet on early fishes (Ordovician fishes and agnathans in general), plus putting all the best Gogo fishes on display, plus a cabinet devoted to fish-tetrapod transition (with fantastic casts of the East Greenland

material which arrived this morning!). It's keeping Ken, Alex and I very very busy! I have no time available for research until this gallery opens.

However, John Long had a successful trip to Japan and Okinawa - he is now a grand master (martial arts) so don't mess with JOHN! (manuscript reviewers beware).

Book

Baynes A. & Long J.A. 1999. Papers in Vertebrate palaeontology. *Records of the Western Australian Museum*, Supplement no. 57, 424pp.

Papers of note:

Anderson M.E., Almond J.E., Evans F.J. & Long J.A. 1998. Devonian (Emsian-Eifelian) fishes from the lower Bokkeveld Group (Ceres Subgroup) of South Africa. In Almond J., Anderson J., Booth P. Chinsamy-Turane A. Cole D., De Wit M., Rubridge B., Smith R. & Van Bever Don J. (Editors) Special Abstracts Issue Gondwana 10: Event Stratigraphy of Gondwana. *Journal of African Earth Sciences* 27: 7-8.

Long J.A. 1999. A new genus of fossil coelacanth (Osteichthyes: Coelacanthiformes) from the Middle Devonian of southeastern Australia. *Records of the Western Australian Museum* Supplement No. 57:37-53.

Long J.A. & Ahlberg P.E. 1999. New observations on the snouts of rhizodont fishes (Palaeozoic Sarcopterygii). *Records of the Western Australian Museum* Supplement No. 57:169-173.

Paper in press:

Long J.A. & Trinajstić, K.M.: An overview of the Devonian microvertebrate faunas of Western Australia. *Courier Forschungs-Institut Senckenberg*.

LU Liwu, Associate Curator of Paleontology, National Geological Museum of China, Xisi, Beijing 100034, P.R.CHINA
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Thank you very much for *Ichthyolith Issues*, It is very helpful for my work. In the past decades, apart from the Palaeozoic fishes, I have studied fossil fishes from the bird-bearing beds in North China. Last month, I finished a successful dig in the Carboniferous of Ningxia collecting fossil fishes in the Namurian of northwest China. Many fishes, both macro- and microfossils, have been found. Our program was supported by NSFC. Is there new information on Carboniferous fossil fishes, especially from the Namurian stage?

Papers of interest:

- Lu Liwu 1994, A new paddlefish from the Upper Jurassic of Northeast China. *Vertebrata Palasiatica*, 32(2):134-142.
- Ren dong, Lu Liwu & et. al., 1995, Fauna and stratigraphy of Jurassic-Cretaceous in Beijing and the adjacent areas. Seismological Publishing House, Beijing.
- Lu Liwu, 1996, New Data of *Bothriolepis sinensis* (Placoderm:Antiarch) from Middle Devonian of Central Hunan, China. Geological Museum Study, 1996, pp.69-77. Seismological Publishing House, Beijing.
- Pan Jiang, Lu Liwu, Ji Shu'an, 1996, A brief review on Chinese palaeo-geography of vertebrates during the middle Palaeozoic. *Journal of Southeastern Asian Earth Science*, 13(3-5): 185-190.
- Ren Dong, Lu Liwu & et al., 1996, Mesozoic Fauna assemblages of Yanliao area, North China and its paleoecological and paleogeographical significance. *Acta Geoscientia Sinica*, V17. sup. 148-154.
- Pan Jiang & Lu Liwu, 1997, *Grammaspis*, A new antiarch (Placoderm) from Early Devonian of Jiangyou, Sichuan Province. In Tong Y.S. et al.(eds), Evidence for Evolution-Essays in Honor of Prof. Chungchien Young on the Hundredth anniversary of His birth. Ocean Press, Beijing.
- Pan Jiang, Lu Liwu & Zeng Xiangyuan, 1998, Report of *Remigolepis* (Placoderm) from Upper Devonian, Hunan, S. China. In Wang Y.Q & Deng T.(eds), Proceedings of the 7th Annual Meeting of the Chinese Society of Vertebrate Paleontology. Ocean Press, Beijing.
- Lu L., Pan, J. (1998). New Galeaspids (Agnatha) and placoderm Fish Fossils from the Silurian of the Tarim Basin, Northwest China. *Journal of Vertebrate Paleontology*, Abstract Papers, 58th Annual Meeting Society of Vertebrate Paleontology. p59A.

Ervins LŪKSEVIKS, Institute of Geology, University of Latvia, Rainis Blvd 19, Riga LV-1586, LATVIA
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Ervins and his colleagues at the University of Latvia are to be congratulated for organising a most successful joint IGCP 406 symposium and the 4th Baltic Symposium in Jurmala.

Books of note:

- Luk_evi_s E., Stinkulis _ & Kalni_a L. (eds.) The Fourth Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts, 126pp., R_ga.
- Luk_evi_s E., Stinkulis _ and Wilson M.V.H. (eds.) Lower -Middle Palaeozoic Events Across the Circum-Arctic. A joint Baltic Stratigraphical Association/IGCP 406 Project meeting. J_rmala, Latvia, September-October 1999. *Ichthyolith Issues Special Publication* 5, 67pp., Riga.

Papers of note

Luk_evi_s E. 1999. Stratigraphic occurrence of vertebrate remains in the Upper Devonian of Severnaya Zemlya (Russia). *Acta Geologica Polonica* 49(2):125-131.

Paper in press

Esin D., Ginter M., Ivanov A., Lebedev O., Luk_evi_s E., Avkhimovich V., Golubtsov V. & Petukhova L. Vertebrate correlation of the Upper Devonian and Lower Carboniferous on the East European Platform. *Courier Forschungs-Institut Senckenberg*

Kurshs V., Luk_evi_s E., Upeniece I., & Zupins I. (In press). Late Devonian marine deltaic clastics and associated fish remains in Lode quarry (Latvia). *Latvijas Geologijas Vestis*.

Luk_evi_s E., & Sorokin V. (In press). New species of placoderm fish *Bothriolepis* (Placodermi, Antiarcha) from the Upper Devonian of North Timan. *Paleontologicheskij Zhurnal*. [In Russian]

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London, shark teeth and stuff

I managed to get to the latest London conference (NHM, April 1999). What I have to say is not necessarily a proper report in the strict sense of the word, but my impressions of the highlights of the meetings, which were extremely stimulating and very successful. I do urge the conveners to assemble more meetings of the disciplines of molecular, developmental, and paleontological folks.

The molecular geneticists run into severe and understandable problems when they try to deal with 3-4 extant species and a large number of extinct taxa. They might as well use an ouija board; there are far too many pieces of the puzzle missing. Oh yes, and many have this wonderful habit of using one, just one, teleost, amphibian, reptile, bird, and mammal. The topology of the branches of a tree provides vital information; without this information one just gets a Hennig's Ladder, which is not at all informative. It certainly does not work well with a problem like the agnathan-gnathostome transition. By contrast, the lamprey head is yielding marvellous and useful information to the developmental people. It is turning out to be just about exactly like a gnathostome in all the early stages that matter. This definitely puts lampreys very close to the gnathostomes. There was some elegant developmental work presented by several Japanese colleagues and some of Andrew Lumsden's students as well.

Michael Coates presented a paper claiming that the holocephalans originated from between the sister species of the

stethacanthids *Damocles* and *Falcatus*, and thus that the holocephalans are sister taxa of those two but not the other stethacanthid cladodonts. This result is singularly difficult to accept.

Hans-Peter Schultze presented a paper on *Dialipina*, which has rhombic ganoid peg-and socket scales, submandibulars, the skull arrangement of something non-actinopterygian, the body of an onychodontid, the fins of an onychodontid, the tail of an onychodontid, and claimed that it was a stem group actinopterygian. C'est possible.

Mark Wilson did his usual brilliant, understated, and simple, thing, presenting startling new animals with startling new information, that unsettled me and gave me lots to think about. BUT, and this is directed at all of us, he took two essentially identical species of fish and claimed that one is a chondrichthyan and one an acanthodian, on the basis of the scales. Sorry, there is something fundamentally missing from our information about the development and distribution of scales if this result could have emerged. It is material such as Mark's, plus modern developmental studies, that will unlock the secret of stem-group gnathostomes.

Psarolepis is an interesting fish, like the proverbial camel (built by a committee). Much was presented to think about here. The authors are confident that the bits and pieces all belong to the same animal, and so I have to tentatively accept this. But I believe the cladistics every bit as much as Xiaobo does. That, incidentally, may not be saying an awful lot, as he demonstrated in his talk on playing strategies for the cladistics computer game.

Meanwhile, having reexamined the *Helodus* specimens that Moy-Thomas used, Dr. E.D. Grogan and I presented two poster sessions, one on the already published embryological analysis of *Callorhynchus* jaws and skull, the other on *Helodus* and a raft of new paraselachians that conform, in fundamental ways, with the skull plan of *Helodus*. Moy-Thomas' original study did not fare too badly here. However, the ethmoid of *Helodus* is completely roofed over, with excellent ethmoid canals, and there are very large and long tooth-bearing adsymphysials, upon which the '*Diclitodus*' teeth are borne. And no, there are no tooth plates in those specimens; none at all, just families of *Helodus* teeth. And, as Moy-Thomas noted (and Barbara Stahl), there is no synarcuum. So here Eileen Grogan and I are with the Paraselachii, a group name I coined long ago in an ill-advised moment of desperation and have tried to ignore ever since, but it is now filling up with fascinating fish, with fascinating arrangements of heterodont teeth. Watch the Journal of Morphology in the new year for the first of these fish.

The Barbara Stahl Holocephalan volume (Handbook Vol. 4, F. Pfeil, Munich) is now out, and she has done a masterful job on all those isolated teeth and tooth plates. I do

have one important correction, and a few other miscellaneous ones. The modern chimaeroid jaw developmental analysis was done by Eileen D. Grogan, but attributed to Dominique Didier (Dagit) in the volume. Also note that the pectoral fin of *Chondrenchelys problematica* illustrated in Fig 33 A is that of a male; the females have pectoral endoskeletons essentially identical to *Harpagofututor volsellorhinus* (Fig. 33 B). Finally, "*Similharriotta dabasinskas*" is a junior synonym for the cladodont elasmobranch *Bandringa*, although I do not know which species. It is not a holocephalan. It has cladodont teeth.

Ian MACADIE, Canterbury Museum, Rolleston Ave, Christchurch, NEW ZEALAND.

Ian discovered thelodonts in the Lower Devonian of Reefton this year and at the Edinburgh VPCA meeting in September 1999 spoke about the various microassemblages and the difficulties of arresting them from the clutches of the South Island temperate rainforest.

Dr John G. MAISEY, Department of Vertebrate Paleontology, American Museum of Natural History, Central Park West at 79th Street, Pullman, New York, NY 10024-5192, U.S.A.

John attended the SVPCA meeting in Edinburgh and gave an interesting overview of Devonian sharks from the Malvinokaffric province of Gondwana featuring a little shark braincase from Brazil which he and Eric Anderson are studying.

Maisey J. 1999. A primitive chondrichthyan braincase from the Middle Devonian of Bolivia. In Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 21.

Maisey J.G. 1999. A stem chondrichthyan braincase and its phylogenetic significance. Abstracts of papers, Fifty-ninth Annual Meeting of Vertebrate Paleontology Adams Mark Hotel, Denver, Colorado, October 20-23, 1999. JVP 19(3) September 1999, p61A.

Dr Jon MALLATT, Department of Zoology, Washington State University, Pullman, WA 99164-4236, U.S.A.
Fax 509-335-3517.

Paper of note:

Mallatt J. 1998. Crossing a major morphological boundary: The origin of jaws in vertebrates. *Zoology* 100: 128-140.

Dr Tiiu MÄRSS (Co-Leader IGCP 406), Institute of Geology, Estonian Academy of Sciences, Estonia PST 7, E-10105 Tallinn, ESTONIA

Email: tiiu@pzgeol.gi.ee>

I have finished the biostratigraphic paper on Severnaya Zemlya vertebrates (version in Russian for Novosibirsk volume) with Valya Talimaa, and the taxonomical work on the thelodont species now in press with Geodiversitas should be in Paris. A new Canadian Arctic thelodont *Boothialepis* is also described (in *Paleontology*). Now we are working on the thelodont chapter for the new edition of Obruchev's *Osnovi Paleontologii "Fundamentals of Paleontology"* Agnatha & Fish volume being produced by PIN and the Russian Academy of Science.

Papers of note:

Märss T., Caldwell M., Gagnier P.-Y., Goujet D., Männik P., Martma T. and Wilson M.V.H. 1998. Results of the expedition to Baillie-Hamilton and Cornwallis Island in 1994. p. 104. In: Gutierrez-Marco, J.C., and Rabano, I. (editors). Proceedings of the 6th International Graptolite Conference of the GWG (IPA) and the SW Iberia Field Meeting 1998 of the International Subcommission on Silurian Stratigraphy (ICS-IUGS), Madrid, 1998. *Temas Geologico-Mineros ITGE*, 23: 104.

Märss T., Soehn K.L., & Wilson M.V.H. 1998. Microvertebrate-based correlations of the Llandovery-Wenlock boundary in some sections of the Selwyn and Franklinian sedimentary basins, northern Canada. pp. 37-39. *Ichthyolith Issues Special Publication* 4:1-62.

Matukhin R.G., Menner V.V., Karatajute-Talimaa V., Melnikov S., Modzalevskaya T., Männik P. & Märss T. 1998. On the reconstruction of the Palaeozoic sedimentary basins and palaeotectonic conditions in the modern Arctic shelves. p. 35. *Ichthyolith Issues Special Publication* 4:1-62.

Märss T. 1999. Changes in scale morphology - a basis for high resolution thelodont biostratigraphy. The Fourth Baltic Stratigraphical Conference. Problems and Methods of Modern Regional Stratigraphy. Abstracts. R_ga, p65-66.

Märss T. & Gagnier P.-Y. 1999. A new chondrichthyan from the Wenlock, Lower Silurian, of Baillie-Hamilton Island, Arctic Canada.- In: Ahlberg G. (conven.), Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development (joint Systematics Association / Natural History Museum meeting, 8-9 April 1999, London): 49 [abstract and poster].

Märss T., Soehn K.L. & Wilson M.V.H. 1999. Event levels in the distribution of Silurian and Lower Devonian vertebrates in Northern Canada. *Ichthyolith Issues Special Publication* 5, p29-30.

Miller C.G. & Märss T. 1999. A conodont, thelodont and acanthodian fauna from the

Lower P₁dolí (Silurian) of the Much Wenlock area, Shropshire. *Palaeontology*, 42(4):691-714.

Papers in press/prep.:

Märss T. Silurian vertebrate studies during 1990-1996. *Courier Forschungs-Institut Senckenberg*.

Märss T., and Karatajute-Talimaa V. Ordovician and Lower Silurian thelodonts from Severnaya Zemlya. *Geodiversitas*.

Soehn K.L., Märss T., Hanke G.F. & Wilson M.V.H.: Preliminary vertebrate biostratigraphy of the Avalanche Lake sections (Wenlock, Silurian), southern Mackenzie Mountains, N.W.T., and review of northwestern Canadian vertebrate localities of Silurian age. *Courier Forschungs-Institut Senckenberg*

Märss T., and Karatajute-Talimaa V. Thelodonts. In new "Fundamentals of Paleontology".

* * * * *

Rob MARTIN, Department of Geology and Geography, West Virginia University, P.O. Box 6300, Morgantown, WV 26506-6300, U.S.A.

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Rob writes "Well, I've finally found a Ph.D. here at West Virginia where I shall make a paleoecological study of Devonian fishes. This may include specimens stored at the Buffalo museum! I am going up soon for a preliminary look around."

Bill MAY - enquiry off the net.

E-mail: bmay@telepath.com

Bill is interested in Permian palaeoniscoids. He wrote to the VP listserver:

Can anyone give me references on identifying Lower Permian palaeoniscoid fish scales. Thanks in advance.

* * * * *

Roma MERTINIENE, Lithuanian Institute of Geology, Sevcenkos 13, 2600 Vilnius, LITHUANIA. Fax (370 2) 23 67 10

Papers of note:

Karatajute-Talimaa V., & Mertiniene R.1998.

Morphogenetic types of squamation of Devonian and Early Carboniferous chondrichthyans. pp. 23-25. *Ichthyolith Issues Special Publication 4*:1-62.

Mertiniene R. 1999. Structure of scales of the "Holmesella" morphological type. *Ichthyolith Issues Special Publication 5*, p34.

Dr Marcus OTTO, Paläontologisch-Geologisches Institut und Museum, für Naturkunde der Humboldt-Universität, Invalidenstr. 43, D-10115 Berlin, GERMANY

Papers of note:

Otto M. 1998. A new antiarch from the Devonian of Ellesmere Island, Arctic Canada. *Ichthyolith Issues Special Publication*, 42-43.

Otto M. 1999. Neues material von *Protitanichthys? montanus*(Vertebrata, Placodermi, Arthrodira) aus dem unteren Mitteldevon des Bergischen Landes. [New materials of *Protitanichthys? Montanus* (Vertebrata, Placodermi, Arthrodira) from the Lower Middle Devonian of the Bergisches Land (Northwest, Germany)]. *N. Jb. Geol. Paläont. Mh.*, 397-408.

Otto M. 1999a. The problem of fossil interpretation. *Lethaia Reviews*, *Lethaia*, 32:140-142.

Otto M. 1999b. New finds of vertebrates in the Middle Devonian Brandenburg Group (Sauerland, Northwest Germany). Part 2. Ptyctodontida, Acanthodii, Actinopterygii and Sarcopterygii. *Paläontologische Zeitschrift*, 73(1/2):113-131.

Otto M. & Laurin M. 1999. Osteostracan tesseræ from the Baltic Middle Devonian: morphology and microanatomy. *N. Jb. Geol. Paläont. Mh.* 8:464-476.

Otto M. & Laurin M. 1999. Structure of the dermal skeleton of Middle Devonian osteostracans from the East Baltic. *Ichthyolith Issues Special Publication 5*, p37-38.

Dr Bobby PATON, National Museums of Scotland, Royal Museum of Scotland, Edinburgh EH1, U.K.

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Co-hosted an excellent SVPCA at the Royal Scottish Museum and Museum of Scotland with many interesting fishy (and other) papers and events with a suitably Scottish flavour.

Paper of interest:

Paton R.L., Smithson T.R. & Clack J.A. 1999. An amniote-like skeleton from the Early Carboniferous of Scotland. *Nature* 398:508-513.

Frank RIEMANN, Institute of Geology & Palaeontology, University of Hannover, Callinstr. 30, D-3000 HANNOVER 1, Germany

Frank Riemann supervised by Prof. Detlev Thies and Dr. Immo Schülke has worked on Late Devonian (Early Famennian) microvertebrate remains from France (Montagne Noir). The study of numerous early Famennian fishes is based on conodont samples from Coumiac Quarry, La Serre trench C and the Causses et Veyran section which Schülke investigated for conodont apparatuses. The samples have been analysed from systematic, stratigraphic, and sequence stratigraphic perspectives. The

material comprises acanthodian, elasmobranch and osteichthyan remains.

Riemann F. 1998. Mikrofauna (Ichthyolithen, Phyllocariden und Scolecodonten) aus dem basalen Famennium (*tringularis*- bis *crepida*-Zone) der Montagne Noir (Frankreich). Diplomarbeit U. Hannover, Oct.

Martha RICHTER, Laboratório de Paleontologia, Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS, BRAZIL
mrichter@pucrs.br

From July 1998 was based in Germany for a years Post-Doc with Prof. W-E. Reif. My post-doc project deals with thousands of shark teeth and scales, as well as other fragmentary actinopt remains from the Upper Permian of Brazil. I am working on a collection of microremains coming from similar levels studied by Wurdig-Macieli (1975). Apart from the actinopterygian scales and teeth, there are numerous well-preserved xenacanthid teeth and hybodontiform-like teeth and (fragmentary) spines. The material is pretty well-preserved and very good for histology as well, so I hope to be able to provide some new insights on that South American ichthyofauna. I plan to examine the Palaeozoic shark collections at different museums around Germany and elsewhere in Europe during my stay.

Papers of note:

Richter M. & Langer M.C. 1998. Fish remains from the Upper Permian Rio do Rasto Formation (Paraná Basin) of southern Brazil. In Almond, J., Anderson, J., Booth, P., Chinsamy-Turane, A. Cole, D., De Wit, M., Rubridge, B., Smith, R. & Van Bever Don, J. (Editors) Special Abstracts Issue Gondwana 10: Event Stratigraphy of Gondwana. *Journal of African Earth Sciences* 27: 158-159.

Richter M. 1998. Dental histology and its bearing on the systematics of the Xenacanthiformes (Pisces: Chondrichthyes). pp. 43-44. *Ichthyolith Issues* Special Publication 4:1-62.

Alex RITCHIE, Australian Museum, 6 College Street, Sydney. PO Box A285, Sydney South, NSW 2000. AUSTRALIA
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Alex visited the old country for the Edinburgh VP meeting and gave a talk on the state of play at the Age of Fishes Museum, Canowindra.

Ivan SANSOM and **M. Paul SMITH**, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, U.K.

E-mail: <SANSOM@ers.bham.ac.uk>

Abstract of note:

Sansom I.J., Smith M.M. & Smith P.M. 1999. The Ordovician radiation of vertebrates. In Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 26.

Hans-Peter SCHULTZE, Paläontologisch-Geologisches Institut und Museum, für Naturkunde der Humboldt-Universität, Invalidenstr. 43, D-10115 BERLIN, GERMANY
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Hans-Peter Schultze has submitted a manuscript on "*Dialipina* and the characters of basal actinopterygians" to the special volume of the London conference held in April 1999. *Dialipina* is the most primitive member of the actinopterygians. It possesses two dorsal fins like other osteichthyans in contrast to other actinopterygians.

Steve Cumbaa and Rick Day, Canadian Museum of Nature, Ottawa, Canada, H.-P. Schultze, Museum für Naturkunde, Berlin, Germany, and John Storer, Yukon Tourism, Whitehorse, Canada, relocated the Devonian locality of *Stomiahykus* in the northern Mackenzie Mountains, Yukon Territories. A float plane dropped us on a lake 2 1/2 hours hiking distance from the locality on July 29. The crinoidal limestone layer is extensive, but useful vertebrate remains could only be found in one locality on the tributary of the Snake River. No additional lungfish skull was found, arthrodiran plates and one large *Machaeracanthus* spine instead. The age of *Stomiahykus* is not Middle, but Early Devonian. After transfer to Popcornfish lake by helicopter, another float plane took us out to Mayo, Yukon Territories, on August 11.

Gloria Arratia and H.-P. Schultze are finishing a manuscript on the vertebral structure of sarcopterygians starting with the ontogeny of extant lungfish together with Casciotta. There is more variation in the structure of the vertebrae of *Eusthenopteron* than shown by Jarvik and Andrews.

Schultze H-P. 1999. *Dialipina* and the primitive characters of basal actinopterygians. In Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 27.

Schultze H-P. 1999. *Melanognathus*, a primitive dipnoan from the Lower Devonian of the Canadian Arctic. *Ichthyolith Issues Special Publication* 5,p38-39.

Jonas SHETCHKUS, Lithuanian Institute of Geology, Sevcenkos 13, 2600 Vilnius, LITHUANIA.
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Jonas is a new student of Valya Talimaa's and Juozas Valiukevicius. He is doing his master's thesis on microremains of Upper Devonian actinopters from the Baltic States, Belarus, etc. (scales, teeth and otoliths). Please send relevant reprints.

Rodrigo SOLER-GIJON, Paläontologisch-Geologisches Institut und Museum, für Naturkunde der Humboldt-Universität, Invalidenstr. 43, D-10115 Berlin, GERMANY

I was very busy with the corrections of two manuscripts related with xenacanth. One on the structure and growth of the occipital spine of *Orthacanthus* (J. Morphology) and other on trace fossils (fish trails (ichnogenus *Undichna*) produced by xenacanth together with tetrapod trackways (probably from microsaur) from the Stephanian of Puertollano (submitted to Lethaia). On the other hand I continue with the baby and juvenile sharks (small Cretaceous hybodont from Las Hoyas?). Also, I am studying (with Jiri Zidek) small complete xenacanth from Bohemia.

Papers of note:

Soler-Gijón R. 1998. Heterochrony and the evolution of xenacanth sharks. *Ichthyolith Issues Special Publication 4*, 46

Soler-Gijón R. & Hampe, O. 1998. Evidence of *Triodus* JORDAN 1849 (Elasmobranchii: Xenacanthida) in the Lower Permian of the Autun Basin (Muse, France). *N. Jb. Geol. Paläont. Mh.*, 1998: 335-348, 4 figs., 2 tabs; Stuttgart.

Paper in press:

Schneider J.W., Hampe O. & Soler-Gijón R.: The Late Carboniferous and Permian: aquatic vertebrate zonation in southern Spain and German basins. *Courier Forschungs-Institut Senckenberg*

Dr Barbara J STAHL, 100 Magnolia Rd, Manchester, New Hampshire 03104, USA
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Barabara has finished her magnum opus, the latest *Handbook of Paleoichthology* on Holocephali.

Where to order

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Andrea TINTORI, Dipartimento di Scienze della Terra, Via Mangiagalli 34, 20133 MILANO, ITALY
Email: tintori@e35.gp.terra.unimi.it

Paper of note:

Tintori A. 1998. New chondrichthyan fauna from the Guadakyoub (middle Permian) of the sultanate of Oman. *Ichthyolith Issues Special Publication 4*: 48-49.

Kate TRINAJSTIC, Western Australian Museum, Francis St. Perth, WA 6000, AUSTRALIA
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Kate finished her thesis and is planning post-doc work. She has submitted several papers on the thelodont and shark fauna of the early Frasnian in Western Australia.

Papers of note:

Trinajstic K. 1998. Frasnian sharks from the Gneudna Formation, Western Australia. *Ichthyolith Issues Special Publication 4*, 50.

Trinajstic K. 1999a. Scale morphology of the Late Devonian palaeoniscoid *Moythomasia durgaringa* Gardiner and Bartram 1977. *Alcheringa* 23, 9-19.

Trinajstic K.M. 1999b. Scales of palaeoniscoid fishes (Osteichthyes: Actinopterygii) from the Late Devonian of Western Australia. *Records of the Western Australian Museum Supplement No. 57*: 93-106.

Trinajstic K.M. & McNamara K.J. 1999. Heterochrony in the Late Devonian arthrodiran fishes *Compagopiscis* and *Incisoscutum*. *Records of the Western Australian Museum Supplement No. 57*: 77-91.

Paper in press:

Long J.A. & Trinajstic K.M.: An overview of the Devonian microvertebrate faunas of Western Australia. *Courier Forschungs-Institut Senckenberg*.

Dr Sue TURNER, Queensland Museum, P.O. Box 3300, S. Brisbane, Q 4101, AUSTRALIA

....is just too busy!!!! But thoroughly enjoyed her 6 months as a D.A.A.D. Visiting Professor teaching in Hannover during Winter 98-99. She gave a series of 15 lectures on the Geology of Australia and with Detlev Thies gave a combined lecture/prac. course on fish microfossils; they were joined for one session by Jo Vergoossen (Univ. Groningen). While in Europe she had chances to visit and sometimes lecture at the Senckenberg, the Humboldt, Universities of Bonn, Cologne, Copenhagen, Marburg Tübingen, Villeneuve d'Ascq and Warsaw; as well as quick visits to the Natural History Museum and to see Wim van den Bruggen in Glasgow, with a brief look at East Kirkton Quarry in the snow and a running 10 minute tour of the newly-opened Museum of Scotland provided by former Keeper, Ian Rolfe, giving her a quick glimpse of the *Turinia pagei* model which she helped create. She also had a chance to visit Dr Vlad Babuska at UNESCO in Paris before his

retirement as Secretary-General of IGCP last April.

She made a fleeting visit to Edinburgh, Reading, Newcastle and Jurmala in September 99. In Edinburgh she spoke about the Lower Carboniferous tetrapod-bearing assemblage in Queensland. Allen & Unwin have just brought out a paperback called "Wizards of Oz - Recent breakthroughs by Australian scientists" by Peter Spinks and Anne Warren and Sue are in it for the discovery of the Carboniferous tetrapods! Most exciting so long as the powers that be read it and give us more money!!

In Jurmala Sue showed some of the arctic remains from Somerset Island and Timan. In between she delved in museum drawers at BGS and RSM Edinburgh and the Hancock Museum.

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Turner S. 1999. Early Silurian to Early Devonian thelodont assemblages and their possible ecological significance. In Boucot, A.J. and Lawson, J. (eds.).

Palaeocommunities: case studies in International Geological Correlation Programme 53, Project Ecostratigraphy, Final Report. Cambridge University Press, Cambridge. 42-78.

Turner S. (1999): Non-gnathostome vertebrates: In R. Singer (ed.), Encyclopedia of Paleontology. Fitzroy Dearborn Publishers. 2 volumes; 1700 p. Chicago.

Turner, S., Kuglitsch, J.J. and Clark, D.L. 1999. Llandoveryan thelodont scales from the Burnt Bluff Group of Wisconsin and Michigan. *J. Paleont.*, 73(4):667-676. (SEE THE COVER!!)

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Below a small digression upon which I have pondered long and hard:-

THE IMPORTANCE OF COPROLITE EVENTS S. Turner : *Ichthyolith Issues* 20.

HAS anyone else wondered seriously about how much we owe to the vertebrate digestive system to preserve really important information about the evolution of our ancestors? With my propensity for finding coprolites (and sometimes not much else) I have often given the matter deep thought. Well, I think we should elevate the humble coprolite to the position it deserves. I suggest here that we should seek out the characteristics of Palaeozoic and other fish coprolite-bearing horizons, which I propose here to designate Coprolite Events (as a belated contribution to IGCP 216 perhaps - with apologies to Otto Walliser).

These phosphatic deposits are event horizons crowded, nay overwhelmed by fossil ordure or coprolites (Reviews see e.g. Häntzschel et al. 1968, Duffin 1979, Thulborn 1991). Palaeozoic horizons where coprolites begin to be noticeable (i.e. fish have got to a reasonable size and perhaps begin schooling)

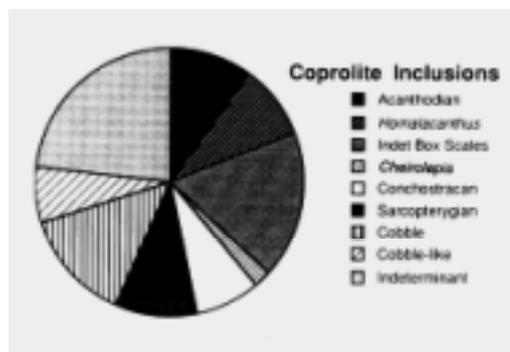
do not occur until the Early Carboniferous according to Daphne Sumner's (1994) review. She illuminated us on the large numbers of coprolites throughout the West Lothian Oil-Shale Formation, Lower Carboniferous (commonly in the transition zone between the East Kirkton Limestone and the overlying Little Cliff Shale) which is a case in point. She also noted other horizons, in particular, the Pumpherston Shale at South Queensferry near Edinburgh (even I managed to collect some from here - S.T. coll. in Hancock Museum - courtesy of a fine day out with Stan Wood) - all Viséan. She noted other similar Carboniferous horizons (Price 1927, Johnson 1934, Zidek 1980). Johnson's (1934) horizon may be a significant stratigraphic event horizon being found by him in Colorado and by Price (1927) in West Virginia at approximately the same age in black shales of the so-called Weber Formation; the copious coprolites occurring in a zone about 23 m thick. Johnson and Price ascribed their coprolites to "ganoids" but given their spiral nature, chondrichthyans would be a more likely source. Does anyone else have evidence of this Late Carboniferous phosphatic hey day. Were Zangerl & Richardson's (1963) examples from the same time?

BUT significant coprolitic horizons do also occur in much older deposits: the Telychian fish beds of Lesmahagow in Scotland and New Brunswick, Canada, for example. Here presumed coprolitic masses and strings have yielded some of the best-preserved thelodont scales. The source of these coprolites is thought to be invertebrate, arthropod and possibly eurypterid or phyllocarid. Gilmore (1992) had a deal to say about other spiral coprolites in the Late Llandovery of Scotland; Ritchie (1963) also noted these. Gilmore saw his specimens as originating from thelodonts with a spiral valve, as in chondrichthyans.

At the first IGCP 328 meeting at Parc de Miguasha in 1991, Jim McAllister enthralled us with an account of the coprolites from the Late Devonian (early Frasnian), Escuminac Formation (McAllister 1996). Then there are amazing examples possible in the late Famennian Cleveland Shale (e.g. Williams 1972, Briggs & Crowther 1990, McAllister 1985). Waldman (1970) prized open a Cretaceous coprolite to the same good effect finding *Lepisosteus* scales and other remains in a presumed crocodylian coprolite. He emphasised something I have been trying to maintain since the beginnings of IGCP 328 - that most palaeoecology etc. has been based on macrovertebrate evidence and that microvertebrates have been neglected or ignored, giving what Waldman calls an unbalanced or a "top-heavy" approach.

So vertebrates got into the weighty business much earlier than Sumner's contention implies and equally significantly by Early Silurian times. BUT I know of no really good Ordovician event - can anyone enlighten me?

If others would like to have a good look at such Palaeozoic phosphatic delights, send stories to the next issues.



Coprolite inclusions "pie" from McAllister, J. 1996

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* * * * *

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Nacho enjoyed himself immensely at the ECOS VII conference and field trip. He, Sven Stouge and Andrew Simpson formed the "ECOS swim team" and ploughed up and down the pool in the Hotel Sporting Trexante in Senorbi village, Sardinia. The pool was complete with an inflatable shark, rumoured to be there to make the Australians feel more at home.

Papers of note.

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Papers of note:

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Jo is in the final stages of writing his thesis.

Papers of note:

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Paper in press:

Vergoossen J.M.J.: Acanthodian and chondrichthyan microremains in the Siluro-Devonian of the Welsh Borderland, Great Britain, and their biostratigraphical potential. *Courier Forschungs-Institut Senckenberg*

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Papers of note:

Wang N.Z., Zhang S.B., Wang J.Q., and Zhu M. 1998. Early Silurian chondrichthyan microfossils from Bachu County, Xinjiang, China. *Vertebrata PalAsiatica* 36:257-267.

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Papers in press

Zhu Min & Wang Jun-qing: Silurian vertebrate assemblages of China. *Courier Forschungs-Institut Senckenberg*

Zhu Min, Wang Nian-zhong & Wang Jun-qing: Devonian macro- and microvertebrate assemblages of China. *Courier Forschungs-Institut Senckenberg*

Hans-Martin WEBER, Universität Köln, Geologisches Institut, Zùlpicher Strasse 49a, Köln, D- GERMANY
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Hans-Martin is interested in the Late Devonian fishes of the Bergisch-Gladbach and in addition is working on Lower Carboniferous carbonates from Belgium. He has found a rich microfauna which includes teeth of *Bransonella*.

Lisa WHITENACK, USA - from the net

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Lisa sent this to the VP listserver:

While I'm sorry to say that I don't know of any *Cladodus* specimens that have more than the teeth preserved, I would like to say thanks again to those who helped me with my *Cladodus*/form taxon problem earlier this year. My senior thesis is FINALLY done! The title of it is "The Fauna and Paleoecology of the Burlington Formation (Mississippian) of Missouri, with a focus on Chondrichthyan Ichthyoliths" If anyone is interested in a copy, let me know...I did devote a small chapter to the status of *Cladodus*.

Mark V.H. WILSON, Department of Biological Sciences, University of Alberta, Edmonton, CANADA T6G 2E9

E-mail: Mark_Wilson@biology.ualberta.ca

We continue to find amazing things in our samples from the MOTH site, but most of the new undescribed species are coming in the acanthodian and problematic heterostracan areas rather than in the thelodonts. Nevertheless I'm still very interested in the fork-tails. The more I work with them the more I think they share something special with pteraspidiforms.

I've got a couple of undergraduate students doing projects on cephalaspids these days. One of them is zeroing in on the sandy filling of the inner ear that we see in cephalaspids, acanthodians, and putative chondrichthyans at the MOTH site. It also occurs in acanthodians at Miguasha.

Books /Papers of Note:

Ginter M., & Wilson M.V.H. (Editors). 1998. IGCP 406 Circum-Arctic Palaeozoic Faunas and Facies. Faculty of Geology, Warsaw University, Warsaw, Poland, September 3-8, 1998 *Ichthyolith Issues Special Publication 4*:1-62.

Luksevics E., Stinkulis G. & Wilson, M.V.H. (eds.) Lower -Middle Palaeozoic Events Across the Circum-Arctic. A joint Baltic Stratigraphical Association/IGCP 406 Project meeting. Jurmala, Latvia, September-October 1999. *Ichthyolith Issues Special Publication 5*, 1-67.

Wilson M.V.H., Hanke G.F., & Sahney S. 1999. Observations on the head of some Lower Devonian gnathostomes. *Ichthyolith Issues Special Publication 5*, p54-55.

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Paper in press:

Soehn K. L., Märss T., Hanke G.F. & Wilson M. V. H.: Preliminary vertebrate

biostratigraphy of the Avalanche Lake sections (Wenlock, Silurian), southern Mackenzie Mountains, N.W.T., and review of northwestern Canadian vertebrate localities of Silurian age. *Courier Forschungs-Institut Senckenberg*

Dr Gavin C. YOUNG, Department of Earth Sciences, Australian National University, Canberra, ACT 0200, AUSTRALIA
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In early 1999 Gavin spent 3 months at the MNHN in Paris working on placoderms with Daniel Goujet. Gavin is remembered in 1998 for his stoic performance in continuing his talk at Isfahan while doubled over as technicians attended to an audio malfunction. What a professional!

He is currently at the Humboldt Museum in Berlin.

Papers of note:

Young G.C. 1999. Preliminary report on the biostratigraphy of new placoderm discoveries in the Hervey Group (Upper Devonian) of central New South Wales. *Records of the Western Australian Museum Supplement No. 57*: 139-150.

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Papers in press

Basden A., Burrow C., Hocking M., Parkes R. & Young G.: Siluro-Devonian microvertebrates from southeastern Australia. *Courier Forschungs-Institut Senckenberg*

Young G.C. & Turner S.: Devonian microvertebrates and marine-nonmarine correlation in East Gondwana: overview. *Courier Forschungs-Institut Senckenberg*

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<http://www.gli.cas.cz/home/zajic/default.htm>

This year I will 1) prepare finally my ichthyolith work for press 2) write new extended faunal list of the limnic Permo-Carboniferous fauna of the Czech Republic and 3) start with study of the Permian acanthodians of the Czech Republic.

Paper in press:

Zajic J.: Vertebrate zonation of the non-marine Upper Carboniferous-Lower Permian

basins of the Czech Republic. *Courier Forschungs-Institut Senckenberg*

ZHU Min, I.V.P.P., P.O. Box 643, Academia Sinica, Beijing 100044, CHINA

Papers of note:

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Papers in press:

Zhu Min & Wang Jun-qing: Silurian vertebrate assemblages of China. *Courier Forschungs-Institut Senckenberg*

Zhu Min & Wang Nian-zhong & Wang Jun-qing: Devonian macro- and microvertebrate assemblages of China. *Courier Forschungs-Institut Senckenberg*

Zhu Min: Catalogue of Devonian vertebrates in China, with notes on bio-events. *Courier Forschungs-Institut Senckenberg*

MESOZOIC MATTERS

III INTERNATIONAL MEETING ON MESOZOIC FISHES

Systematics, Paleoenvironments and Biodiversity
Serpiano (TI-CH) ---August 2001

At one of the most famous sites for these fossils, the Monte San Giorgio-Besano area.

The organization of the meeting is supported by the Dipartimento di Scienze della Terra of the Milano University (Andrea Tintori), the Museo Cantonale di Storia Naturale in Lugano (Markus Felber), the Palaeontologisches Institut und Museum der Universitaet Zuerich (Heinz Furrer).

REGISTER NOW

Contact: Dr Andrea Tintori
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In an abstract from the 'Progressive Palaeontology' meeting held at Bristol, a student has "enigmatic" Carboniferous shark's teeth reworked into Late Triassic fissure fauna - see extract below. I suppose "enigmatic" means he's having trouble identifying them? - we all know that problem - ed.

¶Byron **BLESSED**, Department of Earth Sciences, University of Bristol, Wills Memorial Building, Queen's Road, Bristol. BS8 1RJ, UK. E-mail: ByronBlessed@palaeokarst.freemove.co.uk

Distinct vertebrate assemblages from an Upper Triassic cave deposit

In south-west Britain, Mesozoic karstic deposits can be found within Carboniferous Limestones lying immediately beneath an unconformity with overlying Triassic continental deposits. These deposits contain a range of surface-derived material, often revealing concentrated and isolated vertebrate remains, that would otherwise be lost in an 'open' environment.

Cromhall Quarry, the most famous and extensively studied of these deposits, has a growing number of identified taxa (over 24). Blessed suggests that the Cromhall palaeokarst deposit represents a cave system with 3 separate faunal assemblages; a) terrestrial-derived assemblage - rare tetrapod remains and evidence of the first mammals; b) a 'classic' Rhaetian fish fauna (with taxa such as *Lissodus minimus*, '*Hybodus*' *minor*, '*Gryolepis*' and '*Birgeria*'), c) enigmatic reworked Carboniferous shark teeth [BUT check Duffin 1996].

Modified from Abstracts, Progressive Palaeontology, Bristol '99 Conference sponsored by Palaeontological Association (UK) 28th April, 1999, Bristol

¶ **Dr Dominique DELSATE**, CRS du MNHN Luxembourg, Paléontologie, 25 Rue Münster, L-2160 LUXEMBOURG

Here is the fauna I identified from the Luxembourg Ladinian of Moersdorf (common work with Chris Duffin) *Hybodus plicatilis*, *Hybodus multiplicatus/multiconus*, *Acrodus gaillardoti*, *Polyacrodus* sp, *Palaeobates angustissimus*, *Lissodus* sp and *Lissodus* nov.sp, and Actinopterygian teeth I am busy attempting to determine cf *Birgeria*, cf *Gryolepis*, *Colobodus*... I am also still busy sorting sediments from the same outcrop, trying to gather more material.

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I am still collecting fossil shark remains, but also fossil fishes. Since collecting here in Rheinland-Pfalz is very restricted, we spend our holidays at Great Britain (Kent) every year for fossil hunting. This summer we were again at Great Britain to collect sharks teeth. Most of the time we were searching the London Clay at the Isle of Sheppey. We found some really nice material and met some new collectors at the beach.

Because my profession is very time consuming, it is not possible for me to attend meetings like the one at Buckow, even so it would be very interesting for me. But who knows, one day I will join you and the other members of the Working Group. So I am waiting for *Ichthyolith Issues* to read what is going on. (The wait is over, Walter-ed.)

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In 1997 I finished my Master-thesis on Late Jurassic elasmobranchs under the guidance of Detlev Thies. By his intercession with different institutions I got the chance to sample articulated specimens from the collections for the scales. I have produced a comprehensive catalogue of sharks and rays displaying their scale morphology. Isolated scales can now be attributed to a certain species or genus, avoiding the difficulties of parataxonomy for the microremains with the splitting of morphotypes belonging to the same species. Specimens lacking visible remains of the oral teeth or even the complete head can now be assigned at least to a particular genus. From this new taxonomic important tool it follows that the systematics of Late Jurassic elasmobranchs can be corrected, more or less dubious synonyms can be confirmed or disproved, and this has consequent effects on higher taxa.

First results of my work were presented in a talk at the Mesozoic Fish Meeting at Buckow in July 1997 and with a poster on the identification of headless holotypes at the European Workshop of Vertebrate Palaeontology at Maastricht (May 1998). Currently my fish work has stopped due to the common difficulties in fund raising, but still I hope to stay in the business for a doctor's thesis. The taxonomy of some Late Jurassic elasmobranchs needs more comprehensive work and I hope to resolve these riddles, so that the isolated scales may become a reliable source for palaeoecological and even stratigraphic information. A publication as a comprehensive catalogue is planned, co-authored with Detlev Thies, comprising information about specimens, oral teeth and placoid scale morphology.

¶**Alexander MUDROCH**, Inst. f. Geologie u. Paläontologie, Universität HANNOVER, Germany

Papers of interest:

Mudroch A. & Thies D. 1996. Strontium-Isotopie fossiler Fischzähne als Salinitätsindikator. *Terra Nostra Schriften der Alfred-Wegener-Stiftung* 96/6 66. Jahrestagung der Paläontologischen Gesellschaft Vortrags- und Posterkurzfassungen 22-28 September 1996, Leipzig, Germany: p64.

Mudroch A., Thies D., and Baumann A. 1997. Sr isotopic evolution of Late Jurassic epeiric seas shown on ⁸⁷Sr/⁸⁶Sr analysis of fossil fish teeth. *Journal of the Czech Geological Society* 42(3): p89.

Jan REES, Dept Geology Lund University Solvegata 13, SE-223, 62 LUND, Sweden
Jan.Rees@geol.lu.se

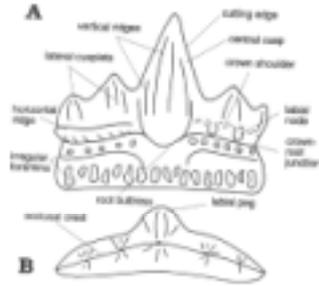


Fig. 3. A generalized batoid shark tooth in lateral (A) and occlusal (B) views, showing descriptive terms used in the text.

useful terminology from:

Rees, J. 1998. Early Jurassic selachians from the Hasle Formation on Bornholm, Denmark. *Acta Palaeontologica Polonica* 43, 3, 439-452.

• * * * * *

Rodrigo SOLER-GIJON, Paläontologisch-Geologisches Institut und Museum, für Naturkunde der Humboldt-Universität, Invalidenstr. 43, D-10115 Berlin, GERMANY

Paper of note:

Soler-Gijon, R. & Lopez-Martinez, N. 1998. Sharks and rays (chondrichthyes) from the Upper Cretaceous red beds of the south-central Pyrenees (Lleida, Spain): indices of an India-Eurasia connection. *Palaeogeog., Palaeoclimatol., Palaeoecol.* 141, 1-12.

Charles UNDERWOOD, Department of Earth Sciences, University of Liverpool, Brownlow St, Liverpool L69 3BX, UK
E-mail: cju@liv.ac.uk

Underwood, C.J. and Mitchell, S.F. 1999. Albian and Cenomanian (Cretaceous) selachian assemblages from north-east England. *Special Papers in Palaeontology*, 60:9-56, 9pls.
Underwood, C.J., Mitchell, S.F. and Veltkamp, C.J. 1999. Microborings in mid-Cretaceous fish teeth. *Proceedings of the Yorkshire Geological Society*, 52(3):269-274.
Underwood, C.J., Mitchell, S.F. and Veltkamp, K.J. 1999. Shark and ray teeth from the Hauterivian (Lower Cretaceous) of north-east England. *Palaeontology*, 42(2):287-302, 2pls.

Another paper of interest:

Borsuk-Bialynicka, M., Cook, E., Evans, S.E., & Marya_ska, T. 1999. A microvertebrate assemblage from the Early Triassic of Poland. *Acta Palaeontologica Polonica* 44(2):167-188.

TERTIARY TITBITS

Jim BOURDON, Nordica Drive, Croton-on-Hudson, NY 10520, USA.

Phone: 01 914-271-6842, e-mail: raja2@idt.net
The Life and Times of Long Dead Sharks: <http://www.elasmo.com>

Jim sent a message to the VP server:

I could use some help distinguishing fossil dasyatid teeth from urolophid teeth." Only Jacques *Herman et al.* have published much on extant batoid teeth, and the dasyatoids weren't yet covered. Since those early attempts I've concentrated my efforts on getting dentitions from extant species. This quest has only been slightly more successful. I'm always interested in conversing with anyone who is directing time to the study of fossil batoids. If you've seen my website, I've tried to share much of what I've learned. If you come across any collectors interested in batoids, I love to hear from them.

[NB. DO VISIT JIM'S VERY FINE WEB SITE - ed.]

RECENT RUMBLINGS

Living fossil gets cousin

In 1938, the first living coelacanth (*Latimeria chalumnae*) was caught off the east coast of South Africa. This major discovery revealed the existence of a "living fossil" thought to have become extinct 70ma and whose morphology had evolved very little since it appeared in the Devonian, over 400ma. About 200 other coelacanths recorded since the late 1930s have mostly been fished off the Comoros.

To date, all scientific investigation on the rare specimens found since have confirmed the assumption that the population of *L. chalumnae* was restricted to the Mozambique Strait or even to just one or two of the Comoros islands (Grand Comoros and Anjouan). This long-held hypothesis was shaken with the discovery in July 1998 of a coelacanth more than 9000 km away, near Menadotua Island in the Celebes archipelago of Indonesia (see *Geoscientist* v8, 12, p18). Like the original specimen of *L. chalumnae*, the new specimen was found accidentally in a fish-market.

To find out if the Indonesian and Comoros coelacanths belong to distinct populations, a joint research team from IRD, Institut de recherche pour le développement, LIPI (Division of Zoology Research and Development Centre for Biology, Indonesia) and CRIFI-RIFF (Central Research Institute for Fisheries, Indonesia) have performed genetic sequence analysis and established a morphological description of the new specimen. The Indonesian specimens show significant genetic and morphological differences from *L. chalumnae*, which normally shows very little morphological variation. The genetic differentiation is at a

level appropriate to two distinct, though closely related, species. The researchers conclude that the Indonesian specimen is a new species, and have named it *Latimeria menadoensis* after the island where it was discovered.

Using a 'molecular clock' (determining the rate of a gene's evolution by plotting percentage differences in base sequence against time) they believe the two species diverged about 1.5 million years ago. This is a relatively recent event, considering coelacanths' long history.

The Indonesian coelacanth was taken from the submarine slopes of a geologically young volcanic island, a similar environment to the habitat of the Comorean species. Crevices in the lava make ideal refuges for the nocturnal fish. Recent studies have shown that although coelacanths can move several dozens of kilometres between caves, as semi-sedentary fish, they are unlikely to have migrated nearly 10,000km, negotiating the abyssal troughs on that way from the Comoros to the Indonesian coast. Speciation probably occurred as a result of long geographical isolation.

Latimeria menadoensis may not be limited to the area to the north of Celebes. Coelacanth sightings have been reported from elsewhere in the Indonesian archipelago.

- Erdmann M.V., Caldwell R.L. & Kasim Moosa M. 1998. Indonesian "king of the sea" discovered. *Nature* 395, p. 335.
- Forey P. 1998. A home from home for coelacanths. *Nature* 395, p. 319-320.
- Pouyaud, L., S. Wirjoatmodjo, I. Rachmatika, A. Tjakrawidjaja, R. Hadiaty, W. Hadiaty, W. Hadie; A new species of coelacanth. C. Combes; Coelacanths : metapopulation or clade? Both in *Comptes Rendus de l'Académie des Sciences*, 4 April 1999. *The Times* 25.3.99, p13
- Weinburg, Samantha 1999. A fish Caught in Time. *The Search for the Coelacanth*. Fourth estate, Lond 239pp [St 13.99

[see also Final reflections below]

CONODONT CORNER

CON-NEXUS

In August 1998 the Pander Society sponsored the launch of an international e-mail discussion group dedicated to conodonts and all conodont-related matters. As well as providing a forum for discussion between conodont workers, con-nexus is used to circulate Pander Society information rapidly to conodont specialists.

Anyone wishing to subscribe to con-nexus should simply send the message: subscribe con-nexus xxxx@xxxx.xx.xx (where xxxx@xxxx.xx.xx is your e-mail address) to listserv@le.ac.uk.

THE PANDER SOCIETY (for people interested in conodonts) IS ON THE WEB AND CONTACT VIA

'pandersoc@le.ac.uk'

Anne Kemp, Centre for Microscopy and Microanalysis, University of Queensland, St. Lucia, Queensland 4072, AUSTRALIA.

Ichthyolith Issues 20: A Refined Method for the Staining of Organic Remnants in Conodont Elements

Attempts to demonstrate that conodonts are or are not vertebrates have applied many different techniques, including the use of histochemical dyes that are specific for certain components of mammalian tissues (Kemp & Nicoll 1996, Savage et al. 1990). Detailed biochemical analyses have confirmed that amino acids found in collagen are present in the hyaline tissue of conodont elements, but attempts to isolate peptide fragments from well preserved conodonts have not been successful. This has prompted a modification of the techniques used to demonstrate the presence in conodont elements of remnants of molecules such as collagen, as well as a reanalysis of the results. In addition, a method for making permanent preparations of stained conodonts has been designed, to improve histological analysis of elements.

Clean, unaltered conodonts are placed on a glass slide and decalcified with 0.1M HCl in 10% formalin for 10-20 minutes, depending on the specimen. The decalcification process is monitored under a microscope. When the conodont element begins to show evidence of decalcification around the edges, the formalin acid mixture is carefully drawn off and the element is covered with stain, without first washing the element. Stain is applied to the decalcified element at a concentration of 0.1% in a suitable buffer for up to 20 minutes to detect residues of organic matter. Contamination with extraneous material during handling is prevented by using clean containers and slides and by filtering solutions before use.

Staining must be monitored under a microscope because of the acidic nature of many of the chemicals used. Thorough washing in distilled water follows staining, until all free stain is removed. Stained elements are dehydrated in a graded series of alcohols, cleared in xylene and mounted in DePeX. These preparations are permanent, and the stain is stable. The most effective stain is Sirius red, dissolved in saturated picric acid. This is considered specific for collagen in mammalian material. Alcian blue, a stain for chondroitin sulphate found in cartilage,

and Gram's stain, which can detect keratin, are also useful.

Positive controls may include hard tissues from vertebrate and invertebrate fossils from the same localities, as well as skeletal material from fish and amphioxus. Additional controls could involve conodonts that are subjected to light etching instead of decalcification, and the staining of undecalcified elements. The method does not work well on elements that are still embedded in matrix.

This technique makes it possible to localise organic residues to defined tissues in the conodont that are still in a natural position. The stain is not a surface deposit, but soaks into the hyaline tissue and leaves the albid tissue that is exposed on the surface unstained.

Although molecules such as collagen are widespread in the Animal Kingdom, it is unlikely that any of the stains are in fact specific for particular protein residues in the fossil material. They are simply deposited in regions of high organic content. Nevertheless, the presence of hydroxyproline in many species of unaltered conodont element is an effective demonstration that hyaline tissue is high in collagen in the original unfossilised state, and therefore unlikely to be a form of vertebrate enamel. No organic residues appear to be present in the albid tissue, and this is therefore unlikely to be a form of vertebrate bone.

Kemp, A. & Nicoll, R.S. 1996. A histochemical analysis of biological residues in conodont elements. *Modern Geology* 20. 287-302 [reprinted in *MG* 21, 197-213 with 2 colour plates].

Savage, N.M., Lindorfer, A. & MacMillen, G.E. 1990. Amino acids from Ordovician conodonts. *Courier Forschungsinstitut Senckenberg* 118, 267-275.

Richard J. ALDRIDGE, Professor of Palaeontology, Head of Department, Department of Geology, The University, Leicester LE1 7RH, U.K.

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E-mail: ra12@leicester.ac.uk

Palaeobiology in the UK does pretty well at the moment. Ivan Sansom and Phil Donoghue have both just been given Lectureships at Birmingham, and we have appointed Sarah Gabbott to a Lectureship in Leicester. Derek Briggs was elected FRS. As far as my current students go, Kim Freedman is in the very final stages of writing up (look out for her taphonomic study of *Jamoytius* in Palaeontology) and Steph Barrett is getting some interesting new results out of sectioning conodonts. I have a new student starting in September, but he will be working on acritarchs.

Phil DONOGHUE, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK
p.jc.donoghue@bham.ac.uk

Papers of interest:

Donoghue P.C.J. & Chauffe, K.M. 1998. *Conchodontus*, *Mitrellataxis* and *Fungulodus*: Conodonts, fish or both? *Lethaia* 31: 283-292.

Donoghue P.C.J., Purnell, M.A. & Aldridge, R.J. 1998. Conodont anatomy, chordate phylogeny and vertebrate classification. *Lethaia*. 31:211-219.

Donoghue P.C.J., Forey, P.L. & Aldridge, R.J. 2000. Conodont affinity and chordate phylogeny. *Biol. Rev.* 75, 191-251.

Fascinating stuff! - ed.

Mark PURNELL, Department of Geology, The University, Leicester LE1 7RH, U.K.

Is now on the permanent staff at Leicester.

Purnell M.A. 1999. Scenarios, selection, and the ecology of early vertebrates. In *Major Events in Early Vertebrate Evolution: Palaeontology, Phylogeny and Development*. A joint Systematics Association / Natural History Museum meeting 8-9 April 1999, p. 25.

MORE NEWS

* * * *

BOOKS

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ISBN 1-884964-96-6

includes papers on fossil fish by several of our group - e.g., Burrow, Gagnier, Janvier, Kemp, Long, Sansom, Turner, Young

David L. Dineley and Sarah J. Metcalf 1999.

Fossil Fishes of Great Britain

Geological Conservation Review Series no. 16. Joint Nature Conservation Committee. 675pp. Great Britain.

I.U.G.S.

Mike Murphy & Amos Salvador eds
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and finally out:

Boucot.A.J, Lawson.J.D, (eds) 1999.
Paleocommunities: A case study from the
Silurian and Lower Devonian.
Cambridge University Press, 895pp.

AND PAPERS OF NOTE

John E.A. Marshall, T.R Astin & Jenny A. Clack 1999. East Greenland tetrapods are Devonian in age. *Geology* 27, 7, 637-640.

Spore data confirms Famennian date for *Acanthostega*, *Ichthyostega* etc. contra Hartz et al. 1997.

METHODS

Important for phosphatic microfossils
Jeppsson L. & Anehus R. 1999. A new technique to separate conodont elements from heavier minerals. *Alcheringa* 23, 57-62.

Papers of interest:

Gale J.W., Gall L.E., Hlavin W.J. 1998. Preparation techniques of a complete specimen of the Famennian Arthrodire *Dunkleosteus Terrelli* from the Cleveland Shale. *Journal of Vertebrate Paleontology*, Abstract Papers, 58th Annual Meeting Society of Vertebrate Paleontology. p44A.

Lamm E.T. 1998. New methods for the preparation and systematic organization of histological sections. *Journal of Vertebrate Paleontology*, Abstract Papers, 58th Annual

Meeting Society of Vertebrate
Paleontology. p58A.

Recent theses

Bertrand B. 1998. Microfossiles phosphatés du Paléozoïque de la Zone Sud-Portugaise: microrestes de Vertébrés du Dévonien supérieur et Conodontes du Carbonifère inférieur.- Mém. Maîtrise Sci. Terre, U.S.T.L., 22 Juin 1998: 27 p., 9 fig., 1 pl. [ronéotypé].

Duncan, Mags 1999. Irish Lower Carboniferous microvertebrates. Unpublished Ph.D., Dept of Geology, Trinity College, Dublin.
Contact:magsduncan@eircom.net

Trinajstic, Kate 1999. Microvertebrate biostratigraphy of the Gneudna Formation, Upper Devonian, southern Carnarvon Basin, Western Australia. Unpublished Ph.D. University of Western Australia Nedlands.

Blom, Henning 2000. Siluro-Devonian vertebrates from the Northern Hemisphere. Uppsala University Dept of Earth Sciences Historical Geology & Palaeontology, Doctoral dissertation.

• *****

INTERNET NEWS

ICHTHYOLITH ISSUES ON THE WORLD WIDE WEB

Paleozoic Microvertebrates and Mesozoic Fish Home Pages

Who We Are, UNESCO IGCP projects, Links, Meetings, Field Work, Publications, Membership, and Find Out More.

[NB. -Send interesting photos to Mark for inclusion on the Web - ed.]

<http://gause.biology.ualberta.ca/wilson.hp/mesofish.html>

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MEETINGS

60th Ann. SVP, Mexico City, Oct. 25-28th 2000

with trips to Mesozoic localities including the Mexican Solenhofen and associated symposia including Palaeontology of Lower Vertebrates in the 20th Century: National and International run by Shelton

P. Applegate and Victor Hugo Reynoso Rosales.

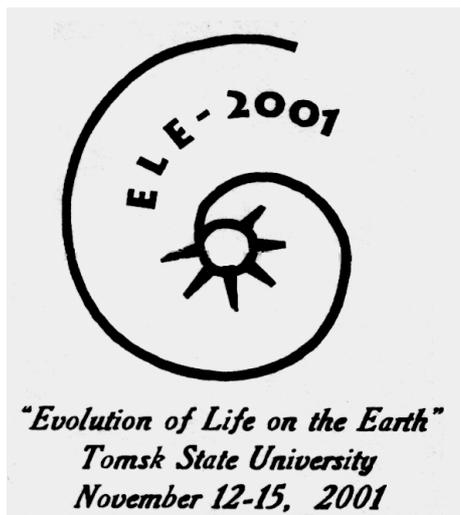
Contact

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alnus.uel.ac.uk/svp

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ELE 2001
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1st Circular



Papers on the following problems are invited [NB titles to be sent ASAP]:

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2. Environmental changes and biota evolution.
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6. Organic life of the marine Mesozoic.
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8. Phanerozoic flora and continental paleolandscapes.
9. Cenozoic vertebrates. Quaternary paleoecosystems and Early man.
10. Biosphere development in the exhibits of paleontological museums.

The Proceedings of the Symposium will be published. Authors who wish to contribute a paper must submit a preliminary application with a title of a report to the Organizing Committee by June 30, 2000 (or ASAP). Paper in final form (three page manuscripts, DIN A4, line spacing 1.0) should be submitted by December 31, 2000. An electronic variant of the text processed in MSWord 6.0-8.0 should also be presented (Times New Roman Font 14, single line spacing, indented lines, all margins 2 cm, justify. The title must be in

bold capitals, throughout double line spacing — the author's surname and initials, lower — the name of an institution, town, country). The official languages of the Symposium are Russian and English. The registration fee for participants is US \$100.

Contact: MM. Podobina or S.A. Rodygin, Geology-Geographical Faculty, Tomsk State University, Lenin Ave. 36, Tomsk 634050 Russia. Telephone: (7-3822) 426-191. Fax: (7-3822) 426-195. E-mail: <palcenter@i-gf.tsu.ru> Internet site: www.ggf.tsu.ru

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There are several translations already on the Web site. Please let me know what you have and in which language. The translations are mostly **TO** English from German, Russian, Japanese, Chinese or French. Other combinations (e.g. Lithuanian to French etc) will be gratefully received. Send copies of any Palaeozoic fossil fish translations to Dr S. Turner, Queensland Museum, and if you want translations try the web site. See past *Ichthyolith Issues* for more information.

PLEASE SEND COPIES OF YOUR TRANSLATIONS TO MAKE THIS WORK, FOR NEW STUDENTS ESPECIALLY.

FINAL REFLECTIONS

And finally:-

Please keep sending news, letters, and

emails - Sue Turner

Suet@gm.qld.gov.au

Or s.turner@mailbox.uq.edu.au

Or paleodeadfish@yahoo.com

* * * * *

OUR HISTORY



The editor measuring a fishy friend at the Hancock Museum, Newcastle upon Tyne in c. 1974 - male coelacanth fished out from the Comoros courtesy of The Royal Society

Series	Stage	Baltic area		Scotland		
Upper Devonian	Famenian	Ketleri	<i>B. ciecere</i>			
		Zagare				
		Svete				
		Mūri	<i>Phyllolepis</i>	<i>B. ornata</i>	Rosebrae + Dura Den	<i>B. hydrophila</i> <i>Phyllolepis</i>
		Akmene				
		Kursa				
Joniškis						
		Eleja	<i>B. leptocheira curonica</i>	Bracken Bay	<i>B. leptocheira leptocheira</i>	
Middle Devonian	Frasnian	Amula + Stipinai				
		Pamušis	<i>Psammosteus falcatus</i>	Scat Craig	<i>Ps. cf. falcatus</i>	
		Snezha	<i>Bothriolepis maxima</i>		<i>B. gigantea</i>	
		Daugava	<i>Psammosteus megalopteryx</i>	Alves Beds	<i>Psammosteus megalopteryx</i>	
	?	?	Dubniki			
			Pļaviņas	<i>Plourdosteus mironovi</i>	Whitemire	<i>P. mironovi?</i>
			Amata	<i>Psammosteus undulata</i> <i>Asterolepis radiata</i> <i>Laccognathus</i>	Naim	<i>PsL. undulata</i> <i>A. maxima</i> <i>Laccognathus</i>
			Gauja	<i>Psammosteus paradoxa</i>		?
	Givetian		Abava	<i>Watsonosteus</i> <i>Microbrachius</i>	Eday + John o'Groats	<i>Watsonosteus</i> <i>Microbrachius</i>
			Burtnieki + Arukūla	<i>Dickosteus?</i> <i>Millerosteus?</i> <i>Homostius</i>	U. Caithness Flagstone Group	<i>Dickosteus?</i> <i>Millerosteus?</i> <i>Homostius</i>
			Kemave	<i>Coccosteus cuspidatus</i> <i>R. cf. threiplandi</i>	Achanarras & equivalents	<i>C. cuspidatus</i> <i>R. threiplandi</i>
			Narva Leivu Vадja	<i>Homostius</i>	L. Caithness Flagstone Group	<i>Homostius</i>
Eifelian		Pārna		?		

Abbreviations: A., *Asterolepis*; B., *Bothriolepis*; C., *Coccosteus*; P., *Plourdosteus*; Ps., *Psammosteus*; PsL., *Psammosteus*; R., *Rhamphodopsis*; L., Lower; U., Upper.

Middle and Upper Devonian correlation of the Baltic area and Scotland using psammosteid agnathans, placoderms, and sarcopterygians by Per Ahlberg, Sasha Ivanov, Ervins Luksevics and Mark-Kurik, E. 1999. from: The 4th Baltic Stratigraphical Conference. Abstracts. Riga, p. 7.

IMPORTANT FOR DEVONIAN CORRELATION - JOINT WORK OF BALTIC STATES LATVIA AND ESTONIA, RUSSIA AND UK.