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NEWSLETTER No. 34

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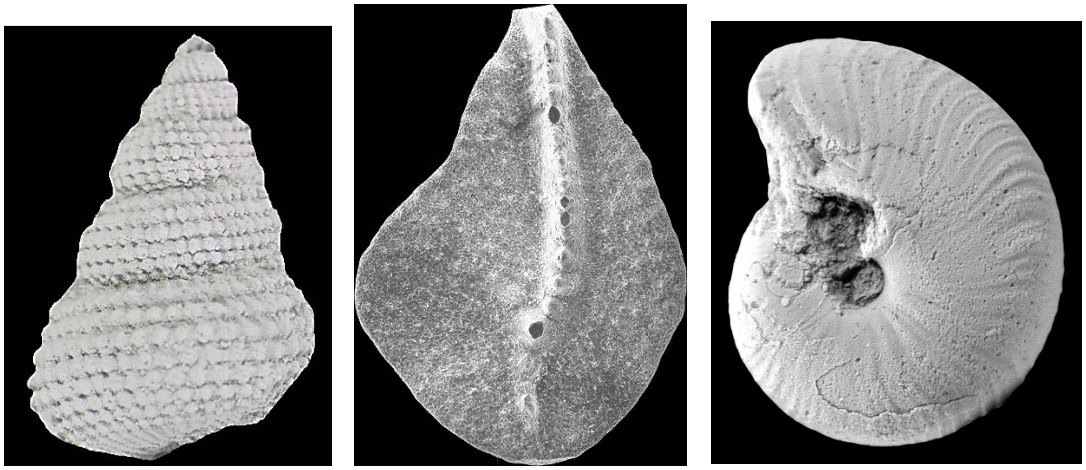

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SDS NEWSLETTER 34

Editorial

The SDS Newsletter is published annually by the International Subcommission on Devonian Stratigraphy of the IUGS Subcommission on Stratigraphy (ICS). It publishes reports and news from its membership, scientific discussions, Minutes of SDS Meetings, SDS reports to ICS, general IUGS information, information on past and future Devonian meetings and research projects, and reviews or summaries of new Devonian publications.

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Please ease the editing by strictly keeping the uniform style of references, as shown in the various sections !

The Newsletter contributions should be quoted as: **"SDS Newsletter, 34: p. x-y."**

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Chairman´s Address

Dear SDS Members,

Welcome to the 2019 SDS Newsletter. This is our yearly compilation of everything Devonian. Please remember that all SDS members, both CM and TM, are expected to contribute news. It is often very important to see what research is going on in advance of publication. In addition, its an excellent place to post notice of research in regional journals that we might otherwise not see.

This year we met officially at STRATI 19 in Milano. We had a successful SDS session with 18 oral and poster presentations. We had hoped to have more presentations on the redefinition of the Emsian GSSP as we don't want to lose momentum in this important task. There is still the opportunity to propose a new GSSP definition and section that is based on the morphological lineage that includes *Polygnathus excavatus* M114. In Milano, we also had a report on additional information from the current GSSP level in the Zinzilban section.

Officially, the SDS should meet early next year at the IGC in India. Each IGC is the end of our four year cycle with renewal of TM's and the SDS officers. However, we agreed that India did not give many opportunities to run a Devonian based fieldtrip. So, we decided to meet in the eastern USA for a fieldtrip run by Jeff OVER and colleagues and based around Geneseo in New York State. This has two exciting fieldtrips to Devonian sections around Cleveland, Ohio, and then in northern NYS. This is an excellent opportunity to both see these famous sections and discover what active research has achieved in the last decade.

In addition, Sasha IVANOV and colleagues in St. Petersburg are organising the 11th Baltic Stratigraphy Conference at the end of August, including a fieldtrip to the classic Devonian sections in Pskov and Novgorod. There is information for this fieldtrip and conference elsewhere in this Newsletter.

2019 is my last year as SDS Chair as I will have completed 2 full terms of 4 years by the time of the IGC in India. We now know that our successors are Ladislav SLAVÍK as Chair and Nacho VALENZUELA-RÍOS as Vice Chair. Please do give them your support. We particularly thank Carlo CORRADINI for also standing as Vice Chair enabling us to have a contested election.

It has been a great privilege to serve as SDS Chair; during this time we have seen much excellent geology, listened to many talks and viewed many posters. But clearly above all it has been the many informal discussions within the Devonian family that has progressed our knowledge and understanding. We have also had excellent support from the other SDS officers including Thomas BECKER who continues to produce the Newsletter and Carlo CORRADINI as webmaster. As regards our ISC targets of redefining the Emsian GSSP and working with the SCS on the D-C boundary definition we may feel that progress is slow. However, this was inevitable given that we had to fully explore the potential within the Zinzilban section. It addition, if we have learnt one thing within the stratigraphy community, it is that GSSP's made in haste frequently have problems when more fully investigated. As regards a community within ICS we are regarded as strong and successful in both meeting very regularly and being able to produce a regular series of publications. However, one sadness is the progressive decline in our numbers and particularly so when we lose young and active members, such as Mena SCHEMM-GREGORY, who were so productive and with so much yet to give for our future.

So, it simply remains to wish you all success into 2020 and beyond.

John MARSHALL

OBITUARIES

Werner BUGGISCH

(2.12.1943-6.4.2019)

by **M. M. JOACHIMSKI**

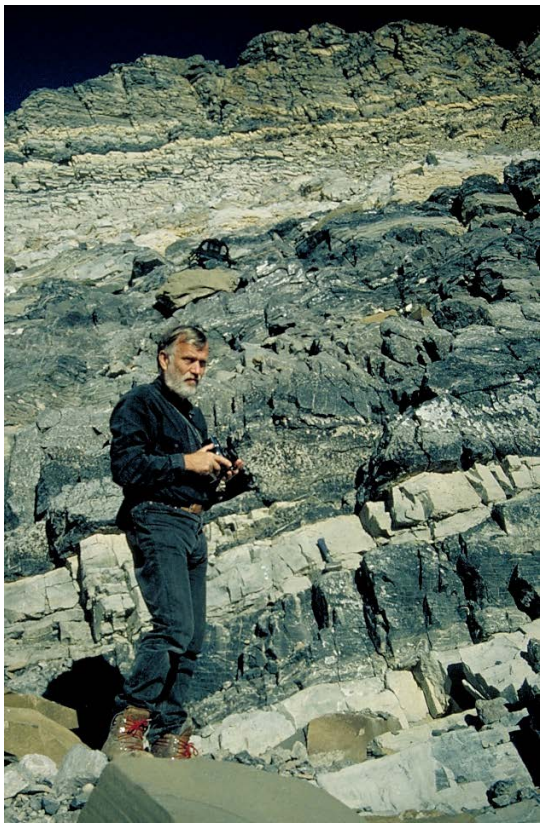
Prof. Werner BUGGISCH passed away after a short illness on April 6th 2019. Werner BUGGISCH belonged to the rare species of geologists with a universal geoscientific knowledge. His scientific work included studies on conodont biostratigraphy, facies, sedimentology, geochemistry, paleoclimatology as well as low-grade metamorphism and tectonics.

Werner BUGGISCH was born on 2.12.1943 in Bensheim-Auerbach/Germany. In 1963 he began his geology studies at the Technical University Darmstadt where he graduated in 1968 with a thesis on the Devonian and Lower Carboniferous at Meggen (Sauerland/Germany). In 1971 he finished his dissertation "On the geology and geochemistry of the Kellwasser limestones and its accompanying sediments (Upper Devonian)" which was supervised by Prof. W. KREBS. He habilitated in 1978 at the University of Darmstadt with a thesis on "Sedimentological and geochemical factors to distinguish marine and continental sediments. The classification of the Grödner Schichten (Permian/Southern Alps)". Werner BUGGISCH was scientific assistant and subsequently lecturer at the University of Darmstadt (1972-1981). After a short-term stay at the University of Bahia Blanca (Argentina) in 1982, he was appointed professor at the Department of Geology (now GeoZentrum Nordbayern) of the Friedrich-Alexander University Erlangen-Nürnberg/Germany. He held this position until his retirement in April 2009. Between 1979 and 1995, he participated in four Antarctic and between 1988 and 2009 in seven Arctic expeditions.

His dissertation on the Kellwasser Horizons was written in German and, although not published in an international journal, it received a lot of attention and was influential to the increasing number of studies on the Frasnian-Famennian extinction event in the 1980 to 2000's. Although Werner soon got interested in variety of other research topics, as for example illite crystallinity, Carboniferous glacial history, the Carboniferous to Permian sedimentological history of Spitzbergen, the stratigraphical record of the Argentine Precordillera or pan-African nappe tectonics in the Antarctic Shackleton Range, he continued working on the Devonian until his retirement.

His great didactic talent was expressed in his attractive lectures and outstanding whiteboard drawings explaining even complex topics in an easy to understand way. In addition to his scientific publications, he wrote a series of geoscientific books for young people together with his son Christian which were translated into several languages among others Chinese.

In 2011, the German Geological Society awarded him the Hans-STILLE Medal for his outstanding contributions to facies analysis, paleoclimatology and polar geology.



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Kenton Stuart Wall CAMPBELL

(9.9.1927 – 17.6.2017)

by **Gavin YOUNG**

The passing of Emeritus Professor Ken CAMPBELL in his 90th year marked the end of an era of high quality palaeontological research at Australian National University (ANU), and an academic career of almost 70 years that placed Ken as one of the most outstanding researchers in Australian palaeontology during the 20th Century. Perhaps his status may be compared only with that of his original mentor and teacher, Professor Dorothy HILL (1907-1997). She was establishing a centre for palaeontology that later achieved international recognition when Ken CAMPBELL began as an undergraduate in geology at the University of Queensland. Ken also played a key role in the establishment of the Association of Australasian Palaeontologists in 1974, when the Queensland Palaeontographical Society of Dorothy HILL merged with the GSA Specialist Group in Palaeontology and Biostratigraphy. Ken was Vice-President of the inaugural AAP committee, and the second AAP President (1976-77).

Ken CAMPBELL was born in Ipswich, Queensland. After attending Brisbane Grammar School (1942-45), he went on to the University of Queensland (UQ), selecting geology as a subject because his school friend Ross STAINES recommended it. This proved a serendipitous choice for Australian geology and palaeontology. Ken excelled in geology, but he felt the foundations of geology were taught as accepted fact, to the exclusion of developing new concepts. This seemed contrary to the purpose of scientific endeavour. In his third year he combined geology with mathematics, but was already developing an interest in fossils as evidence of evolution. His essay on nautiloid evolution attracted the attention of Dr (later Professor) Dorothy HILL, who suggested he might consider an extra year of study to do honours, with her as supervisor.

Dick BARWICK and Charles MARSHALL visit Ken and Daphne CAMPBELL at St. Andrew's Retirement Village, 1st August 2012.

In those stringent times, an extra university year supported by the family, rather than getting a job as a school teacher (Ken's first inclination), needed serious consideration. Dorothy HILL resolved the dilemma by offering Ken a paid research assistant position, to help with her work on forams from Timor exploration wells, for which she had a grant. In retrospect, Ken recognised his decision to take up Dorothy HILL's offer in 1948 as one of the most important of his career, setting the scene for a lifetime's work in scientific research. Ken's Honours project involved geological mapping of an area in the Brisbane valley, requiring a train trip to Esk and pushbike to the field, but he later improved the travel situation by buying an ex-army motorbike. As a part-time research assistant he had two years to complete his mapping project. He graduated Bachelor of Science with First Class Honours in 1949, his Honours work resulting in Ken's first publication. 'The Geology of the Cressbrook-Buaraba area' (1952), is a masterful study on the detailed geology of this part of the Brisbane valley, which also included Ken's first descriptions of Permian fossils.

During 1950-51 Ken had an 'Assistant Geologist' position with the Queensland Geological Survey, helping to compile a

geological map using reconnaissance air photos of North Queensland taken by the US Army during the war. He also had the opportunity to go with the Shell Oil Company to central Queensland, sampling Permian fossils at Cattle Creek and Ingelara, to help with his study of the material from his Honours mapping area. Involvement in both projects was organised by Dorothy Hill. He worked on geological mapping during the day, and pursued his palaeontological interests after hours, eventually submitting this work for his MSc degree at UQ, awarded in 1951.

During this period Ken also became acquainted with a young lady employed as personal assistant to Dorothy HILL, Daphne WATSON, the love of his life, to whom he later proposed. They were married in May 1951, and were together for 64 years (Daphne died in June 2015).

Ken was never prepared to take scientific data for granted – he wanted to analyse it for himself before accepting any evidence as reliable. No doubt this was a quality recognised by Dorothy HILL in her young honours student, indicating an aptitude for scientific research. Ken was unconvinced about his north Queensland geology compilation, an extremely piecemeal activity and no more than a first hypothesis that needed testing with new field data. But the Geological Survey did not agree to his fieldwork request, and he questioned the scientific validity of the work so far with Dorothy. Frustrated by the lack of support, and against her wishes, he decided not to pursue the geological mapping project, but rather look for a job as a school teacher – he was now engaged to be married, and felt a responsibility for obtaining reliable employment.

Ken found a position as a Mathematics Master at Albury Grammar School, which he took up in January 1951, but this lasted no more than a year. Ken recounted geological disagreements at Albury, when the geography teacher asserted that the Snowy Mountains was a folded mountain belt, which the Mathematics Master knew was completely wrong. These difficulties were resolved towards the end of the school year, when Ken received a message from Brisbane that the New England University College in Armidale was looking for a temporary lecturer in palaeontology. Ken contacted the Head of Department, Dr Alan VOISEY, and stopped in Armidale for an interview on the way to Brisbane for Christmas, 1951. Ken was offered the position, which ended his secondary school teaching career. Nevertheless, his teaching commitment to university students remained a hallmark of his later career (and in the 1960s he organised geology short courses for school science teachers under the NSW Education Dept. Wyndham Scheme).

Ken and Daph moved to Armidale for the start of the 1952 academic year. He taught palaeontology, stratigraphy, and some sedimentology, and did much fieldwork both with students and for research, especially in the Carboniferous west of Tamworth. But before year's end Dr VOISEY had taken leave for a Visiting Professorship in the US, and the only other staff member won a scholarship to Cambridge. Thus, Ken CAMPBELL, temporary lecturer, became the de facto 'Head of Department', with a staff of one! The following year Ken was made permanent, remaining at UNE as Lecturer, then Senior Lecturer, until the end of 1960. He expanded his brachiopod studies into the Carboniferous, and pursued his palaeontological research during long vacations at UQ under Dorothy HILL's supervision. This was submitted as a thesis entitled 'Upper Palaeozoic Studies', for which he was awarded his PhD in 1958.

Over the next decade Ken published many significant papers on Permo-Carboniferous fossils, with a special focus on brachiopods. During his period at UNE, following his mentor example at UQ, Ken developed a strong palaeontology school, supervising BSc Honours students Brian ENGEL, John ROBERTS and John PICKETT, all of whom went on to make a major contribution to Australian palaeontology. His first trilobite paper (1960) erected a new Carboniferous genus *Australosutura*, with a 'Gondwanan' distribution, being known from Argentina and Australia. His brachiopod studies culminated in the 146 pp. monograph (1965) on Permian terebratuloids from Australia (BMR Bulletin 68). His trilobite research (mainly Silurian-Devonian) included collaboration with Harry WHITTINGTON in Cambridge (1958: Nuffield Dominion Travelling Fellowship), and at Harvard in 1965 (Australian-American Education Foundation Award; NSF Award). This resulted in significant monographs, on silicified Silurian trilobites from Maine (with WHITTINGTON), and two bulletins of the Oklahoma Geological Survey Bulletin in 1967 and 1977 (68, 222 pp. respectively). Other invertebrate groups he published on included Carboniferous cephalopods

(1964, 1983), receptaculitids (1974), and echinoderms (1971, 1986).

The 1958 sojourn in Cambridge, the first overseas visit for the CAMPBELL family, also broadened Ken's scientific horizons. He met Martin RUDWICK whose experimental methods with the aberrant Permian brachiopod *Prorichthofenia* inspired Ken towards a deeper consideration of functional morphology – a focus he retained throughout his palaeontological research. Ken recognised the value of study leave both for research and teaching – rather than the pedestrian approach of learning names and stratigraphic distributions, fossils could also be interpreted as living animals. Analysis of morphology and environment to interpret how extinct animals may have functioned in feeding, respiration etc. were concepts that produced positive feedback from students when Ken elaborated these ideas in his lectures to undergraduates.

In 1960 Ken applied for an advertised position in micropalaeontology at the new ANU Geology Department. Although he had done no work on Foraminifera since his honours year, he felt he could teach the subject adequately. His other research would also add strength to the teaching program being developed by Foundation Professor of Geology David BROWN (also a palaeontologist). Ken was appointed Senior Lecturer to commence in the 1961 Academic year, and the Campbell family moved to Canberra, which remained Ken's home base for the rest of his career. A major output from ANU Geology in 1968 was Ken's contribution (with David BROWN and sedimentologist Keith CROOK) to the widely acclaimed textbook '*The Geological Evolution of Australia and New Zealand*', the first comprehensive stratigraphic summary for the Australasian region, and a testament to the strong staff collaboration that developed in the ANU Geology Department under Prof. Brown's leadership.

Having moved to Canberra, Ken turned his attention to the Siluro-Devonian palaeontology of the Canberra region, including the spectacularly fossiliferous limestones around Burrinjuck Dam. These were regularly visited for student field trips, with various 3rd year mapping, Honours, MSc and PhD projects undertaken in the Mountain Creek, Taemas, Cavan, and Good Hope areas. This area had also produced numerous Burrinjuck Devonian fish samples collected by the British Natural History Museum (BM) in 1962, the removal of which without David BROWN's knowledge caused great concern (see my article in *The Australian Geologist* June 2015, pp. 29-32). Thus both Ken Campbell and David BROWN were very aware of this internationally significant vertebrate fossil resource in the local area, a relevant fact for Ken's later research direction (see below).

Ken became Head of the ANU Geology Department (a 3 year appointment) when David BROWN relinquished his chair at the end of 1976. Ken also served as Deputy Dean (one year) and Dean of the Faculty of Science (two years) before being appointed Professor and Head of Department in 1983. He stood down as departmental head in 1988, but remained Professor of Geology until his retirement at the end of 1992.

Ken CAMPBELL always stood up for what he believed in, and in these new roles there were many challenges to be met in a rapidly changing university environment. These consumed much of his time and energy, although any diminution of his teaching and research output is hardly evident. In 1991 the department had to vacate the original purpose-built Geology Building to make way for an engineering department. Ken was very concerned that the original building would be lost while he was Professor of Geology, and (with others) fought long and hard to resist the move, to no avail. However, the efforts of resistance ensured that the new accommodation in the former Botany Building was the best that could be obtained under the circumstances. Ken showed a selfless determination that due recognition be given to his esteemed friend and colleague David BROWN for founding the Geology Department, and one of his last official acts, in March 2011, was presiding over the opening of a commemoration stone for D.A. BROWN that he had organised to be mounted in the foyer of the original Geology building.

Ken received many fellowships, honours and awards during his distinguished career. His initial CSIRO Research Studentship at UQ (1948-50) was followed by a Nuffield Dominion Travelling Fellowship to Cambridge (1958), FULBRIGHT and NSF Awards to the US (1965), a NATO Award to Oslo (1973), and the W. B. CLARKE Memorial Lecture (Royal Society of New South Wales, 1975). In 1983 he was elected to the Australian Academy of Science, being cited as 'one of

Australia's most distinguished palaeontologists'. Subsequently he was awarded the MAWSON Medal of the Academy of Science (1986), the W. R. BROWNE Medal of the Geological Society of Australia (2006), and the W. B. CLARKE Medal of the NSW Division of the Geological Society (2010). In 2012, Ken received the Raymond C. MOORE Medal of the US Society for Sedimentary Geology. The citation read: 'The extraordinary breadth and global significance of your research achievements, your diverse international collaborations, and the exceptional scientific progeny your teachings have spawned, all qualify you for this appropriate honour'. This was his last award, near the end of his career when health problems were appearing, and it was greatly appreciated and lifted his spirits.

Ken also had numerous fossil species and genera named in his honour by palaeontological colleagues in Australia, the United States, China and Canada, including brachiopods (*Neospirifer campbelli*, *Fluctuaria campbelli*, *Kitakamithyris campbelli*, *Spinulicosta campbelli*, *Imperiospira campbelli*), a coral (*Lithostrotion campbelli*), bivalve molluscs (*Cornellites campbelli*, *Inaequidens campbelli*), a crinoid (*Campbellicrinus compactus*), trilobites (*Primaspis campbelli*, *Acanthopyge campbelli*), and fossil fishes (*Kenichthys campbelli*, *Campbellodus decipiens*, *Howittacanthus kentoni*, *Amadeodipterus kencampbelli*).

Ken contributed to the academic and scientific communities in many other ways in addition to his research output, serving on various councils and committees at the ANU and in the AAS. He organised various symposia and edited major volumes, for example *Essays in honour of Dorothy HILL* (1969), the 1973 Gondwana Symposium (published 1975), and a *Rates of Evolution Symposium* (with Max DAY; published 1987).

Ken's research output had already earned him an international reputation across various fields of invertebrate palaeontology, but he continued to broaden his horizons, for example his interest in molecular biology and gene regulation through collaborations with George MIKLOS (published in 1994). Otherwise, however, almost all of his research output after his retirement (comprising some 30 publications) was in the field of vertebrate palaeontology.

As the first ANU Geology honours student in vertebrate palaeontology, I was mentored by Ken CAMPBELL in the early years of his research interest in fossil vertebrates. I present here some details on how that came about. In 1964 Prof. F. H. T. RHODES from the UK visited the department, and Ken CAMPBELL and David BROWN (with ANU Vice-Chancellor Prof. L. HUXLEY) arranged a day trip to Taemas to show Frank RHODES the 'Shearby's Wallpaper' fossil site. On this day Ken made a spectacular discovery that would have a major impact on his subsequent research. He found a beautiful lungfish skull, the excitement of which he said caused him to punch the air, and exclaim 'I am the greatest!', in the style of then boxing champion Cassius CLAY!

Following David BROWN's complaints to the British Museum about the removal of significant Burrinjuck fossil fish to London, casts of type specimens, and information on acetic acid preparation, had been obtained from Errol WHITE, Keeper of Palaeontology at the BM. An acid etching facility was therefore set up at the back of the geology building, and Ken started preparing out his new skull, the second known example of the primitive lungfish *Dipnorhynchus sussmilchi* (ETHERIDGE). Ken's first vertebrate palaeontology paper (published 1965) was a preliminary report of this discovery. The type specimen of *Dipnorhynchus*, found near Taemas some 70 years previously, was borrowed from the Australian Museum and also acid etched, to reveal a complete braincase and palate. Ken arranged a collaboration with Keith THOMSON, a vertebrate palaeontologist from Yale University who visited the ANU in 1967, and their co-authored monograph on *Dipnorhynchus* was published in 1971.

I was an undergraduate student for Ken CAMPBELL's palaeontology lectures in 1966-67, but my research collaboration with him began with my 1969 Honours project on acid preparation and study of Devonian fish from the limestones of the Goodradigbee valley near Wee Jasper. This area had been visited only once by the BM, but proved to be a rich source of new fossil fish specimens. Much later, Ken CAMPBELL and Dick BARWICK were to make numerous collecting trips to Wee Jasper, and developed a close friendship and long collaboration with Helen and Ian CATHLES, whose property bordered Lake Burrinjuck. Ken provided geological information, coral samples etc. to augment the display of fossil

fish that the Cathles set up in their restored 'Cooradigbee' Homestead.

During his visit to Europe in 1973, Ken CAMPBELL had taken my photographs and illustrations of some of the very strange new fossil fish skulls from Wee Jasper to show Errol WHITE at the BM. This connection paved the way for my PhD research in London on the Burrinjuck fish material in 1974-76. An incident at the museum is worth recounting, as it demonstrates the international reach of Ken CAMPBELL's reputation, which helped in raising the profile of Australasian palaeontology. One day in 1975, Colin PATTERSON, an outstanding paleontologist in the museum (he wrote the '*Evolution*' handbook for the museum, published by UQ Press in 1978), rushed into my office exclaiming: "Ken CAMPBELL has written a paper called 'A spectre is haunting palaeontology', in some new Australian palaeontology journal! Do you have a copy?"

I was able to inform him *Alcheringa* was an Aboriginal term meaning 'in the beginning', and Ken's paper was entitled 'Cladism and phacopid trilobites', even if there was an allusion to the opening words of the MARX-ENGELS 'Communist Manifesto' in Ken's first sentence! (In fact, Ken was attending the International Geological Congress in Prague in August 1968 when the Russians moved in and the congress was aborted). Ken's provocative paper certainly helped put *Alcheringa* into the minds of many overseas palaeontologists.

A second paper in the first volume of *Alcheringa* (published 1977) was the third vertebrate palaeontology publication by Ken CAMPBELL (co-authored with his 1972 Honours student Maurice BELL). This was significant for two reasons. It describes the first, and still is the only known Devonian tetrapod body fossil from the entire Gondwana supercontinent (*Metaxygnathus*, a lower jaw from Forbes, NSW). *Metaxygnathus* was dismissed as merely the jaw of a fish by Northern Hemisphere researchers, until they found new specimens confirming its tetrapod affinities. Ken CAMPBELL said in 1998: "we always knew we were right – it just took them two decades to agree with us!" Also worth noting is that the *Metaxygnathus* jaw in the 1977 paper was drawn by R. E. (Dick) BARWICK from the ANU Zoology Department. This was actually the first published collaboration between Dick and Ken, which subsequently led to numerous co-authored publications on Devonian-Carboniferous vertebrates.

Ken also collaborated with many distinguished overseas vertebrate paleontologists, including Moya SMITH (Guys Medical School, London), H.-P. SCHULTZE (Univ. Kansas), Dick FOX (Univ. Alberta), Elga MARK-KURIK (Tallinn), Mahala ANDREWS (Edinburgh), and Per AHLBERG (Uppsala). In his most recent publications Ken embraced the latest technology in fossil research, collaborating with Tim SENDEN in the ANU Department of Applied Maths, where high resolution micro-CT scanners were applied to investigate internal structures of the braincase, bone histology, sensory canal systems etc.

Ken's very extensive research output will be a lasting legacy to science, but not to be forgotten are the numerous students mentored and supervised by Ken, who went on to make major contributions to various aspects of the earth sciences both in Australia and overseas. Ken and Dick BARWICK were particularly proud of their former student Charles MARSHALL, who left Canberra for a PhD at the University of Chicago, held a prestigious Harvard Professorship in Paleontology, and is now Director of the University of California Museum of Paleontology (see image above).

Having worked very closely with Ken in teaching and research since I returned to the ANU in 1997, I take this opportunity to put on record the enormous effort he expended over the last 15 years on two issues very close to his heart: the continuation of vertebrate palaeontology teaching and research at ANU, and long term protection for the internationally significant fossil vertebrate collection built up during his five decades of ANU research since he picked up his first *Dipnorhynchus* skull at Taemas.

Vertebrate Palaeontology, when I was an undergraduate, was a third year unit covering all vertebrate groups (agnathans, jawed fishes, amphibians, reptiles, birds and mammals), mainly taught by David BROWN (mammals were taught by M. PLANE, Bureau of Mineral Resources). From 1978 until Ken's retirement, he taught vertebrate palaeontology in alternate years in a course of some 18-21 lectures and 12 practical sessions. I contributed 6-7 lectures on Devonian fishes, and Ken covered all other groups, with mammals being taught by David RIDE from 1988 after he came to ANU. From 1997 the course was reinstated but much reduced, focusing only on

Palaeozoic vertebrates, the main research strength at ANU. There were only 3 lectures and 2 practical sessions, later reduced to one prac, as the vertebrates were squeezed into the general second year palaeontology course (covering all invertebrate groups).

Nevertheless, the vertebrate palaeontology component of undergraduate teaching regularly attracted amongst the highest student numbers for second year earth science units, with a strong contingent from biology. In 2008, after the merger with RSES, Ken CAMPBELL lobbied unsuccessfully for reinstatement of vertebrate palaeontology as a stand-alone unit that would boost student numbers. However, the reality, as then stated by the RSES Director, was that palaeontology was not part of the RSES strategic plan, and vertebrate research was supported mainly by outside funding, and a minor part of ANU earth science activities except as kept going by visiting fellows.

By that time Ken no longer gave lectures, but regularly attended the vertebrate palaeontology practical sessions to demonstrate the exceptional Gogo lungfish material – amazing fossils of skulls and braincases with all the jaws and gill arch cartilages in place. As I had observed for decades, Ken's commitment and teaching engagement, his consummate skill in handling some of the world's most precious and fragile fossils, and his deep knowledge of the subject, still engendered great enthusiasm, interest, and respect with all undergraduate students. Regrettably, the practical session in 2011 was the last Ken attended, as from 2012 I was required to give lectures in the new RSES building, whilst the fragile fossil fish collection remained in the strongroom of the previous Geology Department, and could not be accessed for teaching. For the last year that I was involved in teaching (2014), the vertebrate component actually expanded, with my five lectures on Palaeozoic vertebrates, one on Talbragar fish by Lynne BEAN, a practical session involving casts, 3D printouts from CT scanned specimens, and a tour of the CT lab, plus a one day field trip to Wee Jasper.

From the late 1960s, the exceptionally fragile acid-etched fossil fish skulls and braincases from Burrinjuck and Gogo were locked away in a fire-proof strongroom adjacent to the offices of Ken CAMPBELL and David BROWN, who had the only keys. In the refurbished Botany building, to which the Geology Department relocated in 1991, a new locked fireproof store was provided upstairs to house the acid-etched vertebrates and other types of valuable fossils. The main Geology Museum, including numerous purchased overseas and historically significant fossils, unpublished honours and postgraduate material etc., was relocated to the ground floor of the new building.

Ken CAMPBELL'S increasing concern about the long-term future of the ANU fossil collection resulted from the loss of the Geology Museum curator position in 2001, when Tim MUNSON finished at ANU and was not replaced. Ken approached the ANU Vice-Chancellor on this issue, and started lobbying to retrieve this curatorial function for the Geology Museum. He was referred to the Deputy Vice-Chancellor (Research), and arranged a meeting with him, which I also attended (11 June 2003), but neither of us was much encouraged. This was the first of many meetings Ken organised, as he lobbied the ANU to recognise all of its research collections, which elsewhere were either held in dedicated university museums, or were lodged in appropriate collecting institutions (e.g. the various State Museums). However, with little momentum from other parts of the university, Ken decided to focus only on the fossil collection, and in particular the internationally significant fossil fish material.

In 2005 Ken made contact with the National Museum of Australia (NMA), the then Director (Craddock MORTON) having been one of Ken's former students. Various letters were exchanged, and NMA staff visited the department and surveyed the collection (31th October 2005). The proposal was for a collaboration between ANU and the NMA, the latter taking over responsibility for the collections, which could remain on campus as long as research continued. This proposal did not proceed, and some years later I learnt from a subsequent NMA Director that a follow up at a higher level had led to rejection by the ANU (at the time neither Ken nor myself had any idea our plans had been thwarted by the ANU).

By the mid 2000's the fireproof store was full, and the overflow of type fossils was housed downstairs in less secure accommodation – the former office of the Museum Curator (as far as possible the most fragile specimens were kept upstairs in the locked strongroom). But in 2008 the Geology Department was merged into the Research School of Earth Sciences (RSES), with a much broader range of earth science disciplines.

Ken made a submission regarding inadequate storage for the growing type collection, and proposed an additional fireproof storage area in unused laboratory space. Plans were drafted up, but again nothing eventuated, being overtaken by events. There was a change of leadership, with the external appointment of a new RSES Director in February 2010, an agreed condition entailing the two parts of RSES being brought physically together in a new RSES building. There was little understanding nor consultation about collection storage requirements in planning that new building.

Ken contacted Pro Vice-Chancellor Mandy THOMAS about collection protection, with a new plan to set up an endowment fund to secure a curatorial position at ANU. Ken approached one of his most successful former students, Bob DAY (his second palaeontology PhD at ANU, 1968), who later became Chief Government Geologist and Director-General of Mines and Energy in Queensland. A pilot scheme was started for a part-time shared research and curatorial position in vertebrate palaeontology, but regrettably that did not continue. Neither Ken nor Bob DAY found acceptable an RSES proposal to redirect endowment funds to scientific fields other than palaeontology. Bob DAY withdrew his support, and transferred his funding for a postdoctoral position in vertebrate palaeontology at UQ. However, a positive outcome of Ken's efforts was a survey of all ANU collections across campus, leading to a formal ANU Collections Policy document from the PVC's office in January 2009.

Ken continued to lobby strongly for collection protection with the RSES Director, but there was decreasing sympathy for the importance of palaeontology collections, and teaching of the subject. Ken's Visiting Fellowship at RSES was not renewed in 2011; it was pointed out that an Emeritus Professor already had all the same privileges, but there were also concerns about Ken's health. In October 2011 all occupants of the former Geology building were advised of a plan to relocate to a new building in 2012 – except for palaeontology (including the collections and the Geology Museum), which would remain until a refurbished original John Curtin School building was finished.

The original Geology building was eventually vacated by RSES in early 2015, but from late 2011 Ken CAMPBELL had continued his research mainly from a home office. He still regularly visited the department for his collaboration with Dick BARWICK (regrettably Dick died in November 2012). During this period Ken persisted with his mentoring of students, and any others interested in vertebrate palaeontology and evolution (e.g. Nicola POWER, Honours 1 on Burrinjuck placoderms 2010; James HUNT and Greg BELL, M.Sc projects on *Kenichthys*-like early tetrapodomorph fishes from Wee JASPER and antiarch placoderms from Forbes; Alice CLEMENT, PhD 2011 on Gogo Devonian lungfish; Lynne Bean, current PhD on Talbragar fossil fishes).

Ken experienced health problems in 2011-12. In mid 2012 Ken and Daph moved into temporary Respite Care whilst Ken's condition was monitored. Ken told me a specialist investigating possible memory loss asked if he could remember any animals (cow, dog, horse, perhaps?). Ken refrained from listing numerous species of Permian brachiopods, Devonian fish, and Silurian trilobites, which would have confounded the medical specialist! In late 2012 they moved into John FLYNN House at St Andrew's Retirement Village, Woden, ACT, where they occupied adjacent rooms. This proved a very effective arrangement, with Ken's room mainly functioning as an office for his research (see image above), and Daph's room for entertainment of visitors. Various overseas research colleagues visited Ken at St Andrews, including Per AHLBERG (Uppsala), and Charles MARSHALL (Univ. California). Ken was still preparing manuscripts and working on the text for a book during 2017. He is survived by his three children Rodney, Rosslyn and Ian and their partners, five grandchildren, and nine great-grandchildren.

I thank Ian CAMPBELL for information about Ken's early career, and comments on a draft that greatly improved this document. Bob BURNE provided copies of documents he and Dick BARWICK prepared for the R. C. MOORE Medal nomination. Other information came from John LONG'S article in *The Conversation* (26 June 2017), and Peter JELL'S summary in the 459 page Festschrift 'Palaeontological studies in honour of Ken Campbell', published as *AAP Memoir* ***15*** (1993; P. A. JELL, Editor). A co-authored biographical memoir for *Historical Records of Australian Science* is in preparation (contact John LONG for details).

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William Thomas KIRCHGASSER

(17.2.1939 – 14.1.2019)

by **R. T. BECKER, C. E. BRETT & G. C. BAIRD**

Fig. 1: Bill in the field (Canning Basin) in summer 1990.

William (Bill) Thomas KIRCHGASSER, 79 of Colton, NY (formerly of Potsdam), died suddenly at the ER of the Canton-Potsdam Hospital on January 14, 2019. Born February 17, 1939, and raised in Delaware County, Pennsylvania, Bill graduated from Nether Providence High School in 1957. During childhood trips to the Western states with his parents and brothers and Boy Scout Jamborees he developed his lifelong interest in geology and palaeontology. He received his BA in Geology from Union College in 1961 and his MS and Ph.D. in Geology from Cornell University, with a specialty in paleontology. His M.Sc. dealt with the Parrish Limestone, a goniatite-bearing pelagic middle Frasnian limestone of western New York (KIRCHGASSER 1965), the Ph.D. with the palaeontology and stratigraphy of the middle Frasnian Cashaqua Shale (KIRCHGASSER 1967, 1968, 1969).

After graduation from Cornell, Bill received a FULBRIGHT Scholarship in 1967 to research and write with Michael HOUSE, than professor of the University of Hull in Yorkshire, England. This led to his first conodont paper (KIRCHGASSER 1970). His close collaboration with Michael continued until Michael´s death in 2002 (see obituary in *SDS Newsletter* **19** and BECKER & KIRCHGASSER 2007).

After a year of teaching at the State University of New York (SUNY) at New Paltz, in 1969, Bill began his long and distinguished career as a Professor in the Geology Department at SUNY Potsdam, Chairing the Department from 1985 to 2000, and retiring in 2004 as a Full Professor. Bill continued his work on the Devonian of the Appalachian Foreland Basin, especially of New York State. Over many years, his close co-operation with the well-known other New York specialists became established, especially with Carl BRETT, Gordon BAIRD, Gil KLAPPER, Bill OLIVER, Donald WOODROW, Charles VER STRAETEN, and Jeff OVER. He became an internationally acknowledged specialist for Frasnian goniatites and conodonts but was also well experienced in sedimentology, sequence stratigraphy, graphic correlation, and taphonomy. Because of his humorous, incredibly friendly and open personality, mixed with a deep scientific knowledge, Bill was much liked. He is deeply missed by anybody, who had the pleasure to work with him. Field work with Bill was, particularly, a lot of fun. On one occasion, Carl fondly remembers, during lunch in the field he and Alex BARTHOLOMEW were down on the ground looking at some specimens, not eating. Bill started throwing down potato chips as one might feed a pigeon. They obligingly ate the chips; Bill chuckled, in his inimitable way and threw more.

Apart from his Devonian work, he also put a considerable effort into the recovery, preservation and investigation of a Pleistocene Beluga whale (*Delphinapterus leucas*) in the St. Lawrence lowlands, nicknamed Félix (because it was found at Saint-Félix-de-Valois, Quebec; e.g., STEADMAN, KIRCHGASSER & DUANE 1994).

Fig. 2: Bill and Gil KLAPPER taking conodont samples in the Canning Basin.

The close co-operation with Michael led to an increasing interest in international correlation and cooperation. As a consequence, Bill became one of the long-lasting members of SDS, serving both as TM and CM. He participated in field trips all over the world, including trips to China, Siberia, and Australia. During several field campaigns to the ammonoid-rich, remote outback of the Canning Basin of western Australia, jointly involving Michael, Gil, Phil PLAYFORD and others (1989-1993, Figs. 1-2), Thomas, then Michael's post-graduate research assistant, and Bill became good friends. Bill related some amazing campfire stories that should be written up. The unexpectedly rich Canning Basin Frasnian goniatite record and its correlation stimulated a refined international zonation (HOUSE & KIRCHGASSER 1993; BECKER et al. 1993). Bill´s and Thomas´ cooperation continued after Michael´s death, which they jointly commemorated in a Geological Society Special Publications volume (BECKER & KIRCHGASSER, Eds., 2007). In addition to this, Bill undertook a considerable effort to finish posthumously the long-planned joint goniatite monograph with Michael, what his family (and later he himself) affectionately called the "Magnum Opus". This outstanding monograph, published in the PRI series *Bulletins of Paleontology*, was titled more specifically "Late Devonian Goniatites (Cephalopoda, Ammonoidea) from New York State" (HOUSE & KIRCHGASSER 2008). Of equal highest importance is his joint refinement of New York Frasnian conodont stratigraphy with Gil (KLAPPER & KIRCHGASSER 2016).

Bill was a dedicated university teacher. He taught a general course called "Ancient Life" for non-geology majors to acquaint them with evolutionary changes over geologic time, Together with a psychology professor he collaborated to teach a seminar on evolution to students in their senior year. Named a Professor Emeritus upon his retirement, Bill continued researching, writing, lecturing, doing field work, and going to his office nearly every day. For example, there were plans to publish jointly with Thomas a paper on the evolution of early beloceratids, based on material from New York (see KIRCHGASSER et al. 2010), the Canning Basin, and Morocco. He donated his specimen collection to the Geology Department at SUNY Potsdam and, at the time of his death, he was arranging to donate portions of the collection to the New York State Museum in Albany and the Paleontological Research Institute in Ithaca, NY,

where he was recently named a Member of the Board of Trustees.

A lifelong music lover, Bill played the violin, fiddle, piano and saxophone and regularly attended performances of the Orchestra of Northern New York. He served as Vice Chair of the Canton-Potsdam Hospital Foundation Board, was a Member of the SUNY Potsdam Foundation Board, and held many leadership positions at the Unitarian Universalist Church of Canton. He enjoyed traveling, reading (especially the New York Times), walking, watching sports, and spending time at home with Linda and their dog Tully on Arbuckle Pond. He is survived by his wife Linda SERAMUR of Colton, NY, and his daughter Alison KIRCHGASSER. He was predeceased by his daughter Karen KIRCHGASSER, and by his long-term partner Betsy NORTHROP. He inspired his friends and family to live life to the fullest, to be curious about the world, to travel with open minds and hearts and to be "wheels up" for the next adventure. This is a message that we can embrace with our whole heart.

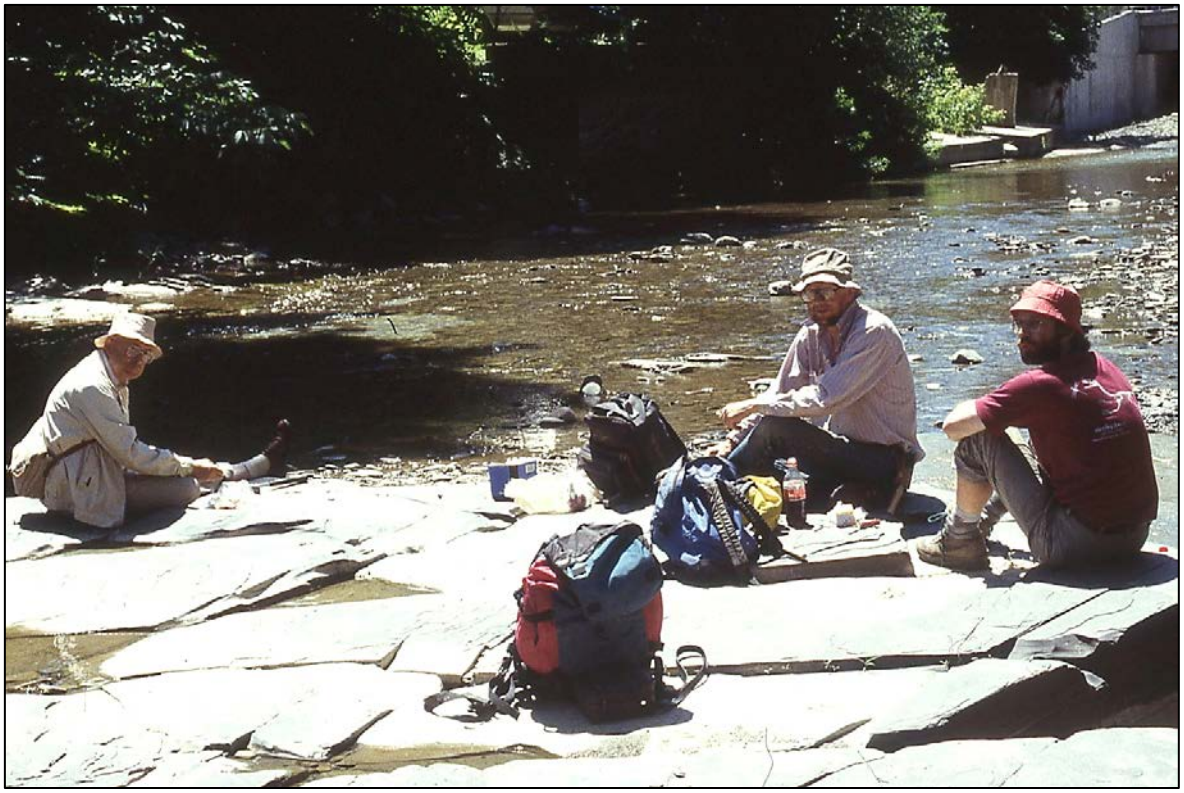

Fig. 3: New York State field party in summer 1997, lower Hannover Shale at Walnut Creek, with Bill, Michael HOUSE (left) and Eberhard SCHINDLER (right).

There are three Devonian fossils named in his honor:

Koenenites lamellosus kirchgasseri HOUSE, 1978, found in the lower Frasnian of West Virginia;

Polygnathus kirchgasseri KLAPPER, 2007, marker conodont for the Lower Kellwasser level in southern France, southern Morocco, and Germany;

Allopharciceras kirchgasseri BOCKWINKEL, BECKER & ABOUSSALAM, 2017, rare goniatite from the upper Givetian of southern Morocco.

Acknowledgement. This obituary made use of information made public at Dignity Memorial (https://www.dignitymemorial.com/obituaries/potsdam-ny/william-kirchgasser-8129783.

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Ruth MAWSON

(20.2.1937–26.6.2019)

by **J. A. TALENT**

Ruth passed away at 8.30 on the 26th June in the Bella Vista Gardens Aged Care facility. She was born and schooled in Cooma, a town renowned for cold winters and occasional snow, trout fishing and eventually becoming the headquarters of the Snowy Mountains Hydroelectric Scheme. Her mother, Bessie, was from a German family from Munich, her father, Frank, a genial builder of houses and even much larger structures. Frank traced his origins back to English migrants drawn to Australia by the gold-rushes, specifically in the vicinity of Kiandra. The small MAWSON clan split up: one portion to Cooma, the other to Adelaide. It is said that Sir Douglas MAWSON'S daughter Patricia was strikingly like Ruth, so much so that people encountering Ruth around the Macquarie University campus and who knew Patricia (from Adelaide), would ask Ruth what she was doing in Sydney…

Ruth was delighted while travelling with me by ferry from Copenhagen to Malmo—en route to visit the inimitable conodontologist, Lennart JEPPSSON in Lund— when an immigration officer noted that she had a Scandinavian name and asked if she was on her way to visit Swedish relatives. She expressed disappointment that she had no known relatives in Scandinavia, perhaps none since the Vikings 'colonized' England, long before her time.

Ruth remained proud of everything to do with the history of Cooma, the Snowy Mountains, the south coast of New South Wales and the adjoining mountainous and coastal regions of eastern Victoria. The entire region is punctuated with her friends. She loved everyone and everything from the flora of Alpine bogs to the intertidal faunas and floras of rock platforms. She enjoyed watching waves and near-shore whales. Recollections of those regions and their personalities were the last to leave her memory.

Ruth's first teaching assignment after graduating with a teaching degree from the University of Sydney was with the New South Wales Department of Education at the West Wyalong high school in the often parched interior of New South Wales. She arrived there with an

unshakeable passion for teaching everything that others tried to sidestep, teaching history (especially Australian history), English language and literature, sports (especially swimming), and even business principles and practice. She was greeted with proverbial open arms by the West Wyalong citizenry, swiftly became known to everyone in that warm-hearted town, and remained a close friend of many of its inhabitants and many from the surrounding countryside for the rest of her life.

Her next teaching position was on the coast in Moruya high school, an utterly different context. Trying to teach children passionate about sand and surfing to the exclusion of all else, may have been a different challenge, but she won their attention by using surfing magazines to improve their reading skills and, with the late Kevin HYLAND (another student of ours) as driver, organized teaching significant slabs of the curricula by bus tours to relevant places in eastern Australia. There was also a spinoff from the students, for instance she learned what 'hanging five' on a surfboard meant.

Concurrent with secondary school teaching, Ruth swiftly completed extraordinarily heavy loads of diverse subjects by distance education at Macquarie University ranging from English language and literature to geology and palaeontology. She then undertook a BSc (Hons) on the stratigraphy and palaeontology (conodonts and silicified faunas, especially brachiopods and gastropods) of the latest Silurian and Early Devonian limestones of the Windellama area, coupled with a third-year course in Invertebrate Zoology (without relevant first and second year courses)—in which, as usual with all university subjects, she topped the class.

It seemed that she received First Class Honours for every subject she broached. She was immediately given a tutorship for palaeontology and first year earth sciences, followed soon afterwards by a lecturing position then, in rapid succession, promotion to senior lecturer and then Associate Professor. Meanwhile, she had commenced and completed a Doctor of Philosophy degree in minimal time.

Ruth was loved and respected university-wide, renowned for her kindness, and for her compassion without prejudice. Her limited financial resources were poured into good causes, such as her favourite charity, *Médicins sans Frontières*. She didn't care about ethnicity, religion or political affiliation. On several occasions, it was these characteristics that brought senior-most university administrators to seeking her counsel on sensitive psychosocial problems of individual students. Though not a psychiatrist, her compassionate counsel, quietly given, probably saved lives.

Ruth's contribution to every aspect of tertiary education was golden. She was a mentor to dozens of students at all levels—undergraduate to doctoral. During the many years we taught together, we shared supervision of at least 30 successful doctoral students, numerous BSc (Hons), MSc and M App Sci candidates. During almost 40 years we team-taught often enormous classes in earth sciences (especially palaeontology) and in coral reef dynamics and museology. Wherever possible, there was a significant field component, mostly in Australia and the southwest Pacific (for contemporary and Cenozoic reefs), but also in nearby Asia (Thailand, China, Nepal, India and Pakistan).

Ruth and I, in collusion with friends from Biological Sciences including the late Frank MERCER, Alison DOWNING and Noel TAIT, had fun generating a biogeographic garden at the university featuring trees and shrubs from groups with a long geological history, and finding elegant and instructive rocks of five tonnes or more weight to be trucked in for "our garden" from assorted places in eastern Australia

Ruth was a crowd favourite for her down-to-earth skill as a raconteur. She never dwelt on mortality, spirituality or faith, but was appalled by Australia's early and violent history. After a few years of teaching, she slid sideways into science from Australian history and English language and literature, coming to rest in geology, palaeontology and biology. She could be droll and whimsical, but the hallmark of whatever she wrote and said was her endearing modesty.

Ruth relished the melancholic emptiness of inland Australia from the Canning Basin of northwestern Australia, the watershed of Queensland's Burdekin River and its tributaries (especially the Broken River), and the high country of eastern Victoria and its extension into southeastern New South Wales. They were all parts of her emotional palette: poetic and hypnotic and with a broad emotional range. Her output was prolific. Ruth was a workaholic who seemed

never to have contemplated mortality. She could work for weeks at a time with no more than a couple of brief catnaps per day of 20 or 30 minutes.

Ruth survived two major operations for cancers and may have been afflicted with a third cancer during 2018 but, in view of her frail physical condition (too frail for her to undergo surgery), it was deemed useless to X-ray her from head to toe to find out.

In retirement Ruth moved to a capacious home in Castle Hill, an outer suburb of Sydney. Two large rooms with tables were immediately covered with cumulates of reprints, photo copies, materials for her never-completed family history, and half-written manuscripts on conodont faunas from Xinjiang (far western China), New Zealand and her beloved Broken River region of Queensland's far north. A large compactus taking up the entire side of one room became jam-packed with scientific literature, quite a lot of it not available in Australia.

In Castle Hill, she developed additions to her vast coterie of friends scattered over 25 or more countries. They provided the affection she deserved after her long and incredibly fruitful career in teaching and research—the latter particularly on her beloved mid-Palaeozoic conodonts and brachiopods. Among her other great loves— music, literature, mosaics, architecture, theatre and film—the last reigned supreme. She had a noteworthy love for films produced by Scandinavian, French, Czech, Russian, Mongolian and Japanese film makers (especially Ingmar BERGMAN, Agnès VARDA, Andrei ZVYAGINTSE and Akira KUROSAWA). We avidly watched the reviews of films, particularly in *The Guardian*, and waited for their appearance in Sydney cinemas, especially the Roseville cinemas, until it became too exhausting for her to mount the stairs. Ruth had little time for the canned blather of commercial television, but during her last year there was some sort of rapprochement to the commercial television that she (and I) had treated with contempt.

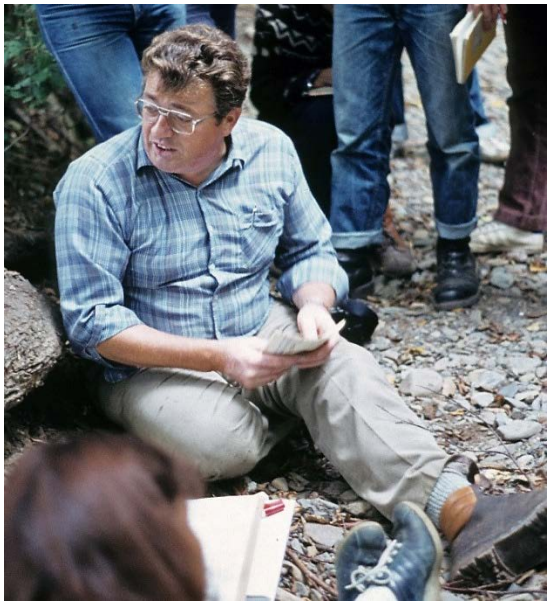
Ruth was glad that she had faded out (c. 2008) from 'full-on' teaching at Macquarie University when the retirement of our much-loved Vice Chancellor (Di YERBURY) was followed by the rumbling chaos of a contrasting era that continues to this day.

It has been a privilege to have shared our teaching careers and for me coming to know the hidden depths of this gorgeous puzzle of a hyperdynamic lady. There were many moments that can only be described as pure magic. I keep such moments close, picking them up every once in a while, the way she would have picked up a particularly elegant silicified fossil, stood in awe of the Mediaeval *La Dame et Le Licorne* tapestries in the bowels of the Musée Cluny in Paris, looking up astonished at the Art Deco ceiling of Au Printemps, also in Paris, or marveling at beautiful crystals sent by our late and inimitable palaeobotanist friend, Fran HUEBER, who passed away just before her.

Klemens OEKENTORP

(20.07.1935-19.02.2019)

by Bern-Peter LÜTTE



For many colleagues, the death of Klemens OEKENTORP came as a complete surprise, and we too, his friends and students, who knew that he was in poor health, were deeply shocked when we received the sad news of his passing.

Klemens OEKENTORP was born on 20.07.1935 in the Westphalian town of Buer, today a district of Gelsenkirchen. His parents, Maria and Ferdinand OEKENTORP, owned a large farm in Buer, which had a significant impact on Klemens' early interest in the natural sciences. After attending elementary school and high school in Gelsenkirchen Buer, he left on 04.03.1955 having passed the "Abitur". He enrolled at the University

of Münster in the winter semester of 1955 to study natural sciences. After taking physics for one semester, he began courses in geology, palaeontology, zoology and botany.

During his studies at the University of Münster, fossils aroused his interest more and more so it was finally without question that he aspired to a degree in palaeontology. He was especially impressed by the "cnidarians" and in his later doctoral supervisor, Prof. Alexander von SCHOUPPÉ, he found a teacher of high professional reputation, who was always ready to listen, advise and support Klemens to the best of his ability. Over the years, this relation developed into an intense friendship that went far beyond the normal "teacher - student relationship" and also extended into the private sphere.

The second teacher of importance for Klemens at the University of Muenster was Prof. F. LOTZE, who gave him a life-long lasting love for the land of Spain, its culture and its diverse geology and palaeontology. As a result, his completed dissertation in 1966 was about the Asturian favositid fauna.

Immediately after completing his studies, Klemens worked as a research assistant for v. SCHOUPPÉ at the "Forschungsstelle für Korallenpaläozoologie" in Münster. Funded by the German Research Foundation, the focus of his studies was the morphogenesis of tabulate corals. Since much of the required literature had appeared only in Russian, Klemens gradually familiarised himself to the language with the help of a dictionary, which later allowed him to access several important works written in Russian by his friend V. LELESHUS. Now translated into German, this literature has become more readily available. Later on, the experience gained in this project led Klemens, with numerous students and guest researchers, to carry out their own "DFG" projects on various coral topics.

After working as a research associate at the "Forschungsstelle", Klemens obtained a position as an academic advisor at the University of Münster in 1971. Initially, tabulate corals continued to be the focus of his scientific research, but later he also devoted himself to the problem of coral microstructures and their relevance to systematics. This theme guided his scientific thinking and he missed no opportunity to try and convince his colleagues, and especially the guests at the "Forschungsstelle" and his students, of his ideas.

However, the corals and their microstructures were not the only subject of his work, as is shown by a variety of publications on topics such as "Lower and Upper Oligocene of the Doberg" (together with M. KAEVER), "Barbara, patron saint of geologists", "Fossils in Ecclesiastical Art - the windows of MEISTERMANN in St. Paul`s Cathedral, Münster", as well as the series "Fossils of Westphalia" (together with M. KAEVER and P. SIEGFRIED), all examples of his manifold interests.

With his employment at the Geological-Palaeontological Institute, from 1971 he was also promoted to the head of the Geological-Palaeontological Museum of the University of Münster in succession to Prof. P. SIEGFRIED. All his efforts were devoted to the expansion of the geological-palaeontological collections and the preservation and maintenance of the "old collections". Above all, he strongly advocated the preservation and location of the "Ahlen Mammoth", the museum's showpiece. From each of its international and national excursions and travels, a wealth of rocks and fossils reached the museum. Since he was also responsible for the training at the preparation school, the collection cabinets and showcases were filled with some outstanding and perfectly prepared objects over the following years.

Klemens OEKENTORP and Alexander v. SCHOUPPÉ.

As part of his museum activities, he participated in a "reconnaissance trip" in preparation for a possible excavation of dinosaurs, partly in the Republic of Niger, in 1977/1978. In 1979, together with Prof. H. HÖLDER, he led the dinosaur excavation in Nehden (Sauerland). He was particularly pleased that the well-known specialist D. NORMAN undertook the scientific processing of the finds from Nehden.

Klemens has always endeavored to bring in as many museum visitors as possible, especially the numerous school classes, as well as geologists and palaeontologists, promoting the significance of the exhibits for society at large. His work at the museum also enabled him to join the international working group on the creation of a "Dictionarium Museologicum". For this he attended several meetings in Berlin, Budapest and in Veszprem on Lake Balaton.

In order to reach a wider audience for the needs and importance of geology and palaeontology, starting in 1973 he organised more than 45 special exhibitions on a wide range of topics in the fields of geology and palaeontology in specially designed rooms at the museum. Klemens always tried to invite well-known guest speakers for the opening ceremony of each exhibition. In the displays, he did not confine himself solely to the presentation of rocks and fossils, but also topics such as "fossils on stamps", "postcards - geological history and fossils" and "the fascination of the unicorn" which were particularly close to his heart. In addition he endeavored to promote the museum lectures, which he was commissioned to carry out on a regular basis. In order to reach the largest possible audience for this he made special use of his good contacts in the local press and the university administration.

Since his preference for a teaching position at the University of Münster could not be achieved, Klemens used the opportunity to officially run the training of diploma and doctoral students through friendly colleagues. It was only when Klemens was offered the opportunity of a habilitation at the University of Cologne in 1981, under the direction of Prof. U. JUX, that his situation changed. From 1980 until his retirement, he gave numerous lectures and exercises on the topics of fossil and living corals, hominids, geology and palaeontology of the "Münsterland" at the University of Cologne. In 1991 he was appointed to an extraordinary professorship.

In the course of his teaching activities in Cologne, and starting from an excursion to the Harz, initiated in 1982 by Prof. U. JUX, which he carried out together with Prof. H. JESSEN, Klemens regularly led excursion to the Harz, the Ardennes, in the Münsterland as well as to the Pragian area and to Moravia (in co-operation with A. GALLE, J. HLADIL and J. KRUTA from Prague and J. DVOŘÁK from Brno).

Immediately after the reunification in 1992, he took the opportunity to include the eastern part of the Harz region in student excursions, in which he was actively supported by colleagues D. WEYER and H. WELLER. Especially through the intensive preparation for the first inclusive excursion to the Harz Mountains, he got to know the beauty and the scenic and historical diversity of this region. As a result, the Harz, in addition to the Ardennes, became the repeated focus of his excursion programmes.

The training and mentoring of students, graduate students and doctoral candidates in Cologne from 1981 onwards, was of particular importance to Klemens, as seen in the focus of the work assigned to corals. However, in addition to his undergraduates and postgraduates, he also supervised numerous other students in their diploma mapping, as well in the Eifel hills or later also in the Sauerland, often as an introduction to a later diploma or thesis. All should be considered "his students".

In the mapping exercise, both the "site introduction" and the "site survey" were usually carried out over two days and often with the participation of several diploma and/or doctoral students. Klemens always showed interest in the progress of the work of all his students, and was praised for his constant willingness to discuss and help when difficulties arose. Even after their graduation, Klemens helped his students as far as possible to gain access to the world of work. Similarly, this also applied to the preparatory work apprentices, whom he saw as equally committed.

With his participation in the first "Fossil Cnidaria" symposium in Novosibirsk in 1971, Klemens began his venture into the "international" scene. Until the 2012 congress in Liège, he took part in all coral symposia, of which he was especially proud.

By attending the "1973 International Symposium on Coral Reefs" in Brisbane and the

"1978 Congress of Sedimentology" in Jerusalem, he specifically sought contacts with colleagues who dealt with recent corals as well as the mineralogy and diagenesis of aragonite and calcite. So Klemens was increasingly able to understand the observed structures in fossil coral material from a different point of view. In 1982 he took part in an international expedition, "Palaeontology of the Devonian", to the People's Republic of China as part of the cooperation program between Academia Sinica and the Max Planck Society.

The intensive, often very personal, contacts with many colleagues of that time was partly due to his active participation in the then still young newsletter "Fossil Cnidaria". Thanks to his activities, he was entrusted with the publication of the newsletter at the congress in Washington in 1983. Klemens undertook the management of this important news organ of the "Association" from 1984 to 1994 and again from 2000 to 2003. During that time, Klemens was constantly striving to improve the layout and the character of the publications, increasing its distribution and encouraging new members to join the Association. At the same time, a large number of special issues were published, which were well received, not only among the members.

Thanks to his good connections in the University of Münster, he decided to bring the sixth coral symposium to Münster. For this he was able to quickly gain the participation of numerous international and national colleagues and friends, so that the participants not only enjoyed a comprehensive and well-founded scientific lecture program, but also numerous national and international pre- and post-excursions could be offered.

After the official takeover of the "Forschungsstelle für Korallenpaläozoologie" from Prof. v. SCHOUPPÉ in 1995, he continued the long-standing tradition of welcoming international researchers to the research center as guests. Their stay might extend over several months and sometimes this resulted in one or more joint publications. It should not go unmentioned that numerous guests on limited budgets were able to live with Klemens in his family home and so directly participated in his life.

After retiring in July 2000, Klemens could have devoted himself entirely to his home, to the garden he loved so much, to interesting journeys and to his great passion for classical music. However, the situation of the museum (closed for complete renovation since many years) and the "Forschungsstelle" as well as the increasingly looming decline in the area of coral palaeozoology left him no peace and repeatedly formed focal points in his conversations.

A final major coral project allowed Klemens to visit the rich locality of Schischkat in Tadzhikistan. At the suggestion of V. LELESHUS, this locality became the focus of palaeontologists in Germany. Already in 1999, the "Senckenbergische Naturforschende Gesellschaft" in Frankfurt carried out a preliminary major expedition during which rich fossil material was recovered. This was followed by a three-month research visit by V. LELESHUS to Münster and Munich. Finally, in 2003, a joint research trip was conducted under the direction of Klemens, sponsored by the "Deutsche Forschungsgemeinschaft". In addition to V. LELESHUS, the local leader of the expedition, D. WEYER, F. TROSTHEIDE and S. SCHRÖDER took part.

In recent years Klemens had devoted himself intensively and with great joy to the portrayal of the life and work of well-known former colleagues, an issue that was always close to his heart and for which he had conducted extensive research over the years. Even after his retirement Klemens was still a constant guest at the Coral Symposia. His participation in the congress in Oman (2015) was already planned, but was no longer possible for health reasons.

Acknowledgements. The author is strongly indebted to Colin SCRUTTON, Newcastle, for his review

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Philip Elliot PLAYFORD

(27.11.1931 – 12.7.2017)

by **R. Thomas BECKER**

Rather weakly acknowledged by the international community of Devonian stratigraphers, and especially by our subcommission, one of the world-leading specialists for Devonian reef complexes died in summer 2017. Philip E. PLAYFORD, widely known as Phil, was the "un-crowned king of the Canning Basin" of Western Australia, where the globally most spectacular and very fossiliferous Devonian reef complexes are widely exposed. His research in the region ranged through five centuries, beginning with a first paper on the famous Windjana George (PLAYFORD 1960) followed by the first monograph by PLAYFORD & LOWRY (1966). Jointly with Tony COCKBAIN, they recognized that Canning Basin stromatoliktes partly grew in deep water, unlike the intertidal present day equivalents of Western Australia (PLAYFORD & COCKBAIN 1969). Most impressive is the comprehensive and wonderfully illustrated Canning Basin volume that was published in 2009 in the Bulletin of the GSWA series (PLAYFORD et al., Eds., 2009). It was last

followed in 2014 by a shorter review (PLAYFORD et al. 2014), but, of course CB research is now continued by numerous other workers.

Early in my carrier, I had the pleasure to be part of an international research team, which included Michael HOUSE, Gil KLAPPER, Bill KIRCHGASSER, Raimund FEIST, Rex CRICK, and many Australian colleagues, such as Annette GEORGE, Roger HOCKING, Scott BROWNLAW, etc. Under Phil´s leadership, we worked towards a refined, integrated understanding of Canning Basin biostratigraphy, facies development, palaeo- and reef ecology, sedimentology, sea-level changes, and palaeontology. From the highly productive time of our main field campaigns (1989-1995) there are still many unpublished results. Phil was a strong-minded leader person that liked to have things his way, which caused one or the other disagreement, but without him, it would have been hardly possible for Michael, Bill, Gil, and myself to conduct our exceedingly successful field investigations. Phil led us to the often very isolated localities, supplied maps and literature, shared his immense knowledge of the reef complexes, made the GSWA logistics available, and made sure that the "greenhorns" did not get lost in the vast outback area. We were forced to learn how to cook damper bread in the open campfire and how to store it during the day in a dirty, not in a clean towel. And he was right that VB was the best beer to have in the evening. Personally, I owe him a lot since the Canning Basin work gave a push to my carrier.

Apart from his work on the Devonian reefs of W.A., Phil had a lot other interests, from Aboriginal arts and culture to historic ship wrecks, not to mention his position as the long-term director of the Western Australian Geological Survey. He discovered the famous stromatolites of Shark Bay (Hamelin Pool) and had a special interest in Rottnest Island, the home of the quokkas, which we visited after one of our field seasons. Phil is survived by his wife Cynthia, and his daughters Julia and Katherine, and by his brother, Geoffrey PLAYFORD, the famous specialist on Devonian palynology. For a more balanced and complete view on his many life-time achievements, I add the obituary published only by COCKBAIN et al. (2017).

Phil´s Devonian work and his support for palaeontological research led several authors to name Canning Basin and other fossils after him:

Sonninia playfordi ARKELL, 1954 – a Middle Jurassic ammonite [later placed in the subgenus *Euhoploceras*];

Eurydesma playfordi DICKENS, 1957 – Lower Permian bivalve, possibly the oldest epibyssate species attached to shoreline rocks;

Eriphyla playfordi COX, 1961 – Lower Cretaceous bivalve;

Playfordia GLENISTER & KLAPPER, 1966 – late lower Frasnian marker conodont genus;

Hexagonaria playfordi HILL & JELL, 1970, lower Frasnian colonial rugose coral;

Concavicaris playfordi BRIGGS & ROLFE, 1983 – a lower Frasnian thylacocephalan crustacean;

Playfordiella RIGBY, 1986 – Upper Devonian sponge genus;

Playfordites BECKER, HOUSE & KIRCHGASSER, 1993, globally widespread index goniatite genus for the base of the upper Frasnian;

Cyrtosymbole (Cyrtosymbole) playfordi FEIST & BECKER, 1997 – at the time the first Famennian proetid of Australia;

Woolagia playfordi ARCHBOLD, 1997 – Lower Permian brachiopod from the Perth Basin;

Playfordicrinus JELL & JELL, 1999 – Famennian crinoid genus;

Palmatolepis playfordi KLAPPER, 2007, upper Frasnian marker conodont.

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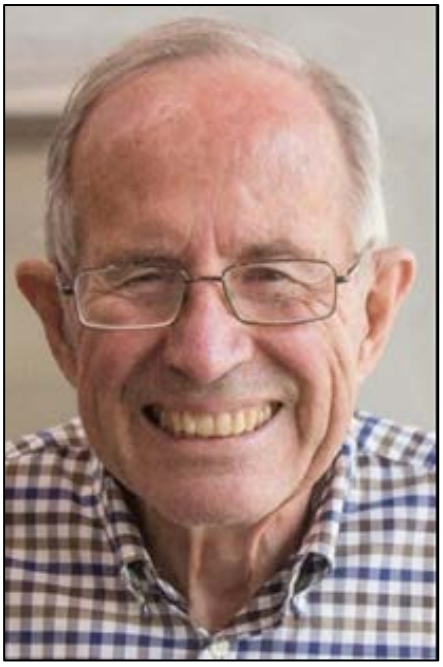
Phillip Elliot PLAYFORD (Phil)

(1931–2017)

by **A. E. COCKBAIN, R. HOCKING & P. REID**

[copied from ***Department of Mines, Western Australia,*** website: http://oa.anu.edu.au/obituary/playford-phillip-elliot-phil-27604/text35001].

Distinguished Western Australian geologist Phillip (Phil) Elliott PLAYFORD passed away aged 85 on the 12th July, leaving a legacy of scientific achievement and significant contributions to the State's history. He was born on 27 December, 1931 in Guildford, the elder son of Elliott Geoffrey and Alice Mary PLAYFORD. He attended the Forrest Street State School (now South Perth Primary School) from 1937–1942 and completed his schooling at Perth Modern School from 1943–1948. He later wrote that he "didn't like the school" and that his "salvation came through tennis, in which I eventually became school champion and captain of the winning team in the inter-school competition".



He won a General Exhibition in the Leaving Certificate exam and went on to study geology at the University of Western Australia from 1948–1953. His honors project was mapping the Jurassic geology of the Geraldton district. Travelling to and from the field area on his motorbike (a Triumph 3T), he collected a large number of ammonites from the Newmarracarra Limestone which he sent to W. J. ARKELL at Oxford University, who was the world-renowned expert on Jurassic rocks. This led to his first major publication (with ARKELL, in the Philosophical Transactions of the Royal Society of London) that established the Bajocian age for this unit.

After graduating, Phil joined the Bureau of Mineral Resources (BMR) in 1953, working in Alan CONDON'S team with two other stalwarts of WA geology, Murray and Daryl JOHNSTONE, mapping the southern Carnarvon Basin.

In 1953, West Australian Petroleum Pty Ltd (WAPET) discovered oil at Rough Range, and lured Phil, among others, away from the BMR. In those days, oil exploration in Western Australia involved a lot of detailed geological mapping, and Phil has always emphasised the importance of such field work in understanding the geology of a region. This work culminated in MCWHAE et al's

(1958) extended paper, which laid the foundations of our modern understanding of the stratigraphy of the major sedimentary basins of the state.

Phil's time with WAPET took him to the Carnarvon and Canning Basins and had important impacts on his subsequent career. The first was discovering stromatolites at Hamelin Pool in July 1954, when he and Daryl JOHNSTONE were working in the Shark Bay area. This led to his lifelong interest in stromatolites and the geology of the Shark Bay area.

The second was meeting stockman Tom PEPPER at Tamala station, also in July 1954, who showed him various items that he said came from a shipwreck at the foot of the coastal cliffs south of Tamala. This began Phil's involvement with what he eventually deduced was the wreck of the Dutch trading ship, the *Zuytdorp*.

Thirdly, in 1956 he was introduced to the Devonian reef complexes, which started a lifelong love affair with these superbly exposed rocks. The Aboriginal cave paintings in these Devonian limestones also fascinated Phil, resulting in his research into the mythological significance of the paintings and the mapping of tribal boundaries.

Arising from this interest, in 1964 Phil joined an expedition to the Gibson and Great Sandy Deserts, which successfully located the last known Aborigines who had never before seen Europeans, living almost untouched by the outside world. Phil at times recounted the tale of how, although they had never met Europeans, they knew of "puddy tats", through contacts with other Aborigines.

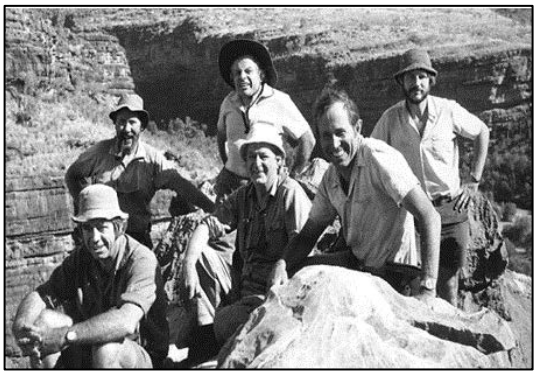
Phil was awarded a Fulbright Scholarship in 1959 which took him to Stanford University where he obtained a PhD for his thesis on the geology of the Egan Range, near Lund, eastern Nevada. He completed the project in two years and decided to return to Australia. Not long after his return to Perth he met Cynthia HOGBIN, with whom he shared a keen interest in the bush – Phil with the rocks, Cynthia with the plants. They married in 1964 and had two daughters, Julia and Katherine.

While WAPET was keen to rehire Phil, he saw that fieldwork was a lower priority than before, and instead joined the Geological Survey of Western Australia (GSWA, a branch of the Mines Department – now newly renamed the Department of Mines, Industry Regulation and Safety) in 1962, as Supervising Geologist of the newly created Sedimentary (Oil) Division, which had responsibility for mapping the Phanerozoic basins of the State and assessing their fossil fuel resources.

He worked for the department in various positions (Assistant Director GSWA - 1978-1980, Deputy Director GSWA - 1980-84, Assistant Director General – 1984-1986, Director GSWA - 1986-92) until his retirement in 1992, except for a short time as Exploration Manager and General Manager of Abrolhos Oil in 1970-71.

After retirement, he wrote up his work on the *Zuytdorp* and continued to work on the geology of the Devonian reef complexes, Shark Bay, and most recently Rottnest Island, from an office in GSWA until late in 2015.

One of Phil's first recommendations in GSWA was to ask the Minister for Mines to encourage WAPET to drill the anticline below Barrow Island in the Carnarvon Basin. The subsequent discovery of oil in commercial quantities in 1964 marked the dawn of petroleum production in Western Australia. Under his supervision and as part of GSWA Director Joe LORD's drive to map all of WA at 1:250 000, mapping was undertaken in the major Phanerozoic basins, resulting in the publication of several bulletins.



Phil PLAYFORD with colleagues at Windjana Gorge, one of his favourite sections, in the early 1970s

Phil continued his work on the Devonian reef complexes of the Canning Basin, soon publishing the first *GSWA bulletin* on their geology (*Bulletin* **118**) in 1966. He then embarked on detailed studies of significant areas of the reef complexes. One of the early results of this work was the realization that stromatolites in the marginal slope deposits extended down-slope to at least 35 metres, and probably more than 100 metres water depth. This was in conflict with the prevailing view in the 1960s that stromatolites were intertidal, and renewed his interest in the Hamelin

Pool stromatolites, where he showed that they also extended into the subtidal region.

The Devonian reef complexes were the subject of several lecture tours by Phil, through the USA and Canada in 1978 as an AAPG Distinguished Lecturer; through Australia in 1980 as a PESA Distinguished Lecturer; in China in 1988 as an Exchange Scientist for the Australian Academy of Science and Academia Sinica; and through Europe in 1989 as a Guest Fellow of the Royal Society of London.

An ongoing condition of Phil's acceptance of administrative roles in the Mines Department and its later incarnations, was that he be allowed to devote time each year to geological research, primarily field work on the Devonian reef complexes. Regular updates on the geology of the complexes continued through the 1980s and 1990s, together with supervision of PhD and post-graduate projects, until their culmination in 2009 with publication of the second GSWA bulletin on the complexes (*GSWA Bulletin* **145**). This also included observations on Permian glacial pavements and subglacial channels, lakes, tunnels, cave systems, tower karst, collapse breccias, and solution dolines.

Visits to Shark Bay and the Zuytdorp Cliffs continued while en route to the Kimberley, and as separate short trips. After the second bulletin on the reef complexes, completion of the Shark Bay research became Phil's top priority. The remarkable stromatolites were largely responsible for Shark Bay being declared a World Heritage Area, but were not the only focus of Phil's work.

The project grew to include aspects of Quaternary coastal geology around most of WA, but particularly neotectonism and the recognition of the imprint of ancient major tsunamis on WA, from the Kimberley through the Pilbara to Shark Bay, to large erratic blocks in coastal areas. Phil concluded that major tsunamis, although infrequent, constitute a significant hazard in coastal areas that has not been adequately included in risk assessments. A comprehensive bulletin, again oriented towards the field geology but also including the history of the Shark Bay region, was published in 2013 (GSWA Bulletin 146).

Compilation of a similar bulletin integrating Phil's work on Rottnest Island, was under way in late 2015 when Phil was diagnosed with cancer, and sadly will not be completed. Part of the Rottnest work was the updating of a field guide, first prepared in 1988. Phil's final paper, reviewing the history of our understanding of the Canning Basin reef complexes is to be published soon in Society for *Sedimentary Geology (SEPM) Special Publication* **107**, which is dedicated to his memory.

Phil's scientific achievements and work throughout his career promoting the petroleum prospectivity of Western Australia have been recognised in several awards. These include: Special Commendation Award of the American Association of Petroleum Geologists, Lewis G. WEEKS Gold Medal of the Australian Petroleum Exploration Association (APEA), Gibb MAITLAND Medal from the Geological Society of Australia, Honorary DSc from the University of WA (UWA), Honorary Membership of the Royal Society of WA (RSWA), Royal Society Medal from RSWA, and Distinguished Honorary Membership of the Petroleum Exploration Society of Australia (PESA).

He served geology and other sciences as President of the RSWA, APEA Professional Division (WA), PESA (WA), Australian Geoscience Council, and the National Trust (WA). He was also WA Museum of Natural Science Chairman of the Board, CURTIN University Adjunct Professor of Petroleum Geology, University of Notre Dame Adjunct Professor of Geology, and an Honorary Associate of the Geological Survey of WA and the WA Museum.

Although Phil's geological legacy is considerable, he may also be remembered by the general public for his contributions to WA's history, principally the early Dutch explorers and aspects of Aboriginal art and heritage. Phil's first tasks after his retirement as GSWA Director were a new phase of fieldwork in the Kimberley, and the completion of his work on the Zuytdorp. This was published in 1996 as "Carpet of Silver" by UWA Press, received the Premier's Book Award for Historical and Critical Studies in 1997, and was reprinted in 1998 and 2006. Phil and Tom PEPPER were officially recognized in 1994 by the State as being the co-discoverers of this historic wreck. He followed Carpet of Silver in 1998 with a book on Willem DE VLAMINGH's voyages, "Voyage of Discovery to Terra Australis: by Willem DE VLAMINGH, 1696-97", after he discovered de VLAMINGH's personal journal and this work was also reprinted.

Phil was involved in the 400th anniversary celebrations of the landing of Dirk HARTOG in Western Australia and jointly edited "The life and times of Dirk HARTOG" published by the Royal Western Australian Historical Society in 2016. These interests also led to several public lectures and articles, the chairing of committees promoting aspects of WA's pre-colonization history, and the installation of a replica of Dirk HARTOG's plate on Dirk HARTOG Island.

Parts of the bulletins on the Devonian reef complexes and on Shark Bay were devoted to the history and Aboriginal heritage of the West Kimberley and the Shark Bay areas, respectively. In 1998, he was made a Member of the Order of Australia (AM) for "contributions to geology and the history of early Dutch exploration and shipwrecks in Australia".

His life has truly been that of a renaissance man.

[Compiled by Tony COCKBAIN, Roger HOCKING and Pam REID from "Biographical Notes" written by Phil Playford in May 2000]

Utkir D. RAKHMONOV

(1963-2018)

by **N. IZOKH, A. KIM, M. ERINA, O. OBUT, O. IZOKH & I. KIM**

Dr. Utkir RAKHMONOV, corresponding member of the Subcommission on Devonian Stratigraphy (SDS), passed away on December 12, 2018. His research activities were connected with Devonian geology and biostratigraphy of the Zeravshan Ridge (South Tien Shan). Many of us knew him as the Director of the Kitab State Geological Reserve (KSGR) of the Geology Committee of the Uzbekistan Republic, where Utkir worked for a long time.

Utkir was born in the Kashkadaria area, Uzbekistan, in 1963. In 1985 he graduated from Tashkent State University as geologic engineer and started to work at the Kitab Reserve, first as a junior research assistant, then as the head of the Geological Department, and, from 1993, as the Director.

Utkir studied Paleozoic (Ordovician, Silurian and Devonian) crinoids of the Zeravshan-Gissar mountainous area, Uzbekistan (e.g., Palaeontological Atlas of Phanerozoic faunas and floras of Uzbekistan, 2007). But his main interest was connected with Devonian crinoids, which he described in detail in his PhD thesis entitled "Crinoids from the Khodzha-Kurgan Formation (Emsian-Eifelian) of the SW offshoots of the Zeravshan Ridge (South Tien Shan)". The defense took place in 2001 at the Mirzo Ulugbek State Uzbekistan University in Tashkent. His scientific advisors were Drs. Galina STUKALINA, Aleksey KIM, and Evgeniy YOLKIN.

In recent years, several international research field investigations were carried out in the Kitab State Geological Reserve. Geologists from the State Committee on Geology and Mineral Resources of Uzbekistan worked together with biostratigraphers and paleontologists from Russia, Germany, Czech Republic, Spain, Switzerland, and others. Utkir actively promoted these activities.

KSGR become one the important scientific centers for the regional and international scientific workshops and meetings, including field training for young career geologists from Uzbekistan Republic. In 2008, Utkir together with A. I. KIM, E. A. YOLKIN, M. V. ERINA, I. A. KIM, N. A. MESHCHANKINA, F. A. SALIMOVA, F. S. KARIMOVA, E. S. TSMEYREK, N. K. BAKHAREV, N. G. IZOKH, O. T. OBUT, and others guided the International Conference "Global Alignments of Lower Devonian Carbonate and Clastic

Sequences" and excursion in the Kitab State Geological Reserve.

Studies of the reference Lower Devonian sections of the KSGR were made in great details due to the long-term joint research of the Russian-Uzbekistan team including Aleksey KIM, EVGENY YOLKIN, Nikolay BAKHAREV, Nadezhda IZOKH, Aleksandr YAZIKOV, Maya ERINA, Irina KIM, Elena TSMEYREK, and other colleagues.

Utkir was a very dedicated father and husband. His untimely death means a terrible loss for our Devonian family. He was a good friend of many of us. Cherished memories about Utkir will forever remain in our hearts.

Utkir D. RAKHMONOV in the field in the Kitab Reserve

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Dieter STOPPEL

(18.3.1933 – 7.6.2019)

by **J. BRINCKMANN, F. W. W. LUPPOLD, H.-G. RÖHLING, E. SCHINDLER & K. STEDINGK**

Dieter STOPPEL was born on 18th March 1933 in Bad Laasphe (State of Nordrhein-Westfalia). After he graduated from highschool in the nearby town of Biedenkopf in 1952, he started to study geology/palaeontology at the University of Marburg/Lahn under the supervision of Prof. Walter KOCKEL. He finished his studies, which included two semesters at the universities of Tübingen and Braunschweig, in 1959. Already as an undergraduate student, he started to work on conodonts, a research field, which had been pushed there by Günther BISCHOFF, Willi ZIEGLER and Otto WALLISER. Therefore, he gained a deep knowledge concerning these increasingly important microfossils, in particular their great importance for biostratigraphy of Palaeozoic and Triassic sedimentary rocks.

Dieter STOPPEL explaining stratigraphy at the Kellwasser type locality (Harz Mountains, Germany) during the ECOS V Meeting 1988 (photo: F. W. LUPPOLD)

Dieter STOPPEL could directly apply this knowledge in his PhD thesis on the revised subdivision of the Kellerwald area, i.e., the southeastern „appendix" of the Rhenish Massif. Being a meticulous worker, he was able to find numerous conodonts in the prevailing siliciclastics (especially on shale surfaces), which allowed him to date these rocks. In particular, he was able to give age assignments for the shales and greywackes (Schiefer/Grauwacken-Serie) belonging to the strange Hörre-Acker Zone located between the Lahn and Dill synclines. This led Dieter STOPPEL, more-or-less subsequently, to the Acker-Bruchberg Zone of the Harz Mountains; and, of course, he was able to apply conodont biostratigraphy there as well. His studies in the Middle and Upper Devonian of the Northwestern Harz Mountains (Oberharz), often together with Johann-Gotthelf ZSCHEKED, became famous. Besides many other results, they interpreted parts of Middle and Upper Devonian sequences as synsedimentary slumps.

In November 1959, Dieter STOPPEL was employed by the Federal Geological Survey of Germany (Bundesanstalt für Geowissenschaften und Rohstoffe) in Hannover, where he was a co-leader of the project ‚Palaeogeographic Atlas of the Lower Cretaceous in Northwest Germany', before he changed inhouse to the enviromental department. Here, reports on mining projects of the former German Democratic Republic (DDR) were among his manyfold tasks. He continued personal research, e.g., with stratigraphic and palaeogeographic studies in the Palaeozoic of the Pyrenees (in cooperation with the French BRGM). For many research projects in the German Rhenohercynian, his expertise was the base for age assignment and palaeogeography, especially concerning many drilling projects (e.g., Brilon Reef and Western Harz Mountains). His profound knowledge of conodont biostratigraphy made him known to many colleagues, not only in Germany, and due to his unselfishness when asked for determinations, he was very popular among his colleagues.

Besides conodont research, Dieter STOPPEL was deeply interested in ore deposits in veins, either newly discovered or known ones. He was involved in studies of such deposits in the Western Harz Mountains (monograph on the German lead-zinc ore deposits) as well as the baryte deposits of the Southwestern Harz Mountains, and of the states of Hessen and Saarland. Many publications showed his wide interest in ore and baryte veins and their stratigraphy in the Western Harz Mountains, and in iron and iron-manganese ore deposits in Western Germany. As an experienced Devonian and Carboniferous stratigrapher, he became a co-editor of the monograph on the Mississippian of Germany (AMLER & STOPPEL 2006).

Dieter STOPPEL also contributed his time to science organizations. He was Secretary and later Chairman of the German Subcommission on Carboniferous Stratigraphy (1971 – 2000) and for many years he was a Corresponding Member of the German Subcommission on Devonian Stratigraphy. He was a member of the boards in the German Professional Association of Geoscientists (Berufsverband Deutscher Geowissenschaftler, BDG) and, partly, the German Geological Society (Deutsche Geologische Gesellschaft – Geologische Vereinigung, DGGV, merged since 2015); in the latter, he was the editor of the newsletter for several years.

On 7 June 2019, Dieter STOPPEL passed away, aged 86; an always friendly, unselfish and helpful colleague has gone forever – he will stay in our memories.

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SDS Reports

SDS Annual Report to ICS

1. TITLE OF CONSTITUENT BODY

Subcommission on Devonian Stratigraphy

Reporting J. E. A. MARSHALL (Chair)

2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

In 2018 SDS has continued its work on the revision of problematic GSSPs (base Emsian and the Devonian-Carboniferous boundary). A short session on the revision of the base Emsian GSSP was held during the SDS sponsored sessions at the 5th IPC in Paris (July 2018). These discussions continued during the Annual Business Meeting. Other continued activities include multidisciplinary international correlation, the organisation of Devonian stratigraphic symposia, publication of the SDS Newsletter, and of monographic books/journal volumes.

All listed objectives fit the directions of IUGS and ICS:

- Development of an internationally approved chronostratigraphical timescale for the Devonian with maximum time resolution.
- Promotion of new and modern stratigraphical techniques and their integration into Devonian multidisciplinary schemes.
- Application of GSSP decisions internationally and as a base for a better understanding of patterns and processes in Earth History, including Devonian major global environmental changes.

3. ORGANISATION - interface with other international projects/groups

Actively supporting *IGCP 652, Reading geologic time in Paleozoic sedimentary rocks: the need for an integrated stratigraphy*

3a. Nominated Officers for 2016-2020:

Chair: J. E. A. MARSHALL

Vice-Chair: C. E. BRETT

Secretary: L. SLAVÍK

4. EXTENT OF NATIONAL/REGIONAL /GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

University of Münster (WWU) continues to support the staff costs of the SDS Newsletter production and the mailing. The IUGS support pays for the printing. The Newsletter has an ISSN and status as a publication.

We have a yearly meeting. SDS member support their own attendance at these.

5. CHIEF ACCOMPLISHMENTS IN 2018 (including any publications arising from ICS working groups)

- Following the failure of the joint SDS/Uzbekistan/RAS field expedition to Zinzilban Gorge, Uzbekistan Ucurrent basal Emsian GSSP), to find the nominated conodont taxon *Polygnathus excavatus* Morphotype 114, SDS reluctantly came to the conclusion that the base Emsian cannot be defined at this level in Zinzilban. The SDS 44is disappointed by this outcome as it was our intent that the Emsian GSSP should remain in Uzbekistan. During 2017-18 we have informally considered how to progress with the redefinition of the GSSP. We continued these discussions at the IPC in Paris, with two presentations on new potential GSSP sections from Spain and the Czech Republic. We meet again at STRATI 19 in Milano and will formally request proposals for the base Emsian GSSP. We can then vote on these and move one forwards for formal consideration by the ICS.

6. SUMMARY OF EXPENDITURE IN 2018:

SDS Newsletter	$600
Attendance of SDS Vice-Chair BRETT at IPC in Paris	$500
Attendance of SDS Secretary SLAVÍK at IPC in Paris	$300
Attendance of SDS Chair MARSHALL at IPC in Paris	$100

7. SUMMARY OF INCOME IN 2018:

ICS	$1500

8. BUDGET REQUESTED FROM ICS IN 2019

In 2019 SDS will meet at the STRATI meeting in Milano. We have had our proposal for an SDS sponsored symposium accepted together with an SDS business meeting. Our focus will again be redefinition of the base Emsian GSSP and a meeting with the D-C boundary joint task force for the redefinition of the base of the Carboniferous. We always have an annual meeting and it can be challenging for SDS Officers to continually attend. We request contributions to travel costs for:

SDS Vice-Chair BRETT to travel from Cincinnati, USA	$600
SDS Secretary SLAVÍK to travel from Prague, Czech Republic	$400
SDS Chair MARSHALL to travel from UK	$200
In addition we request part support for production of the SDS Newsletter	$600
Total sum requested from ICS	$1800

9. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR:

- Formal proposals submitted for the revision of the basal Emsian GSSP at STRATI 2019.
- Revision of the D/C boundary with the D/C Boundary Task Group (Chairman: M. ARETZ) in close collaboration with the Carboniferous Subcommission. Progress towards selection of candidate stratotypes at STRATI 2019. SDS contributions to the Palaeo^2 special volume on the D-C boundary.

10. KEY OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2016-2020)

- Redefine the base of the Emsian Stage.
- Redefinition of the Devonian/Carboniferous Boundary with the joint Task Group.
- Annual meeting

APPENDIX (Names and Addresses of Current Officers and Voting Members)

NOMINATED OFFICERS

CHAIR

John E. A. MARSHALL, School of Ocean and Earth Science, University of Southampton, National Oceanography Centre, European Way, Southampton SO14 3 ZH, UK; +44 2380592015 jeam@soton.ac.uk

VICE-CHAIR

Carlton E. BRETT, Department of Geology, University of Cincinnati, Cincinnati, Ohio, OH 45221, USA, 513-566-4556, carlton.brett@uc.edu

SECRETARY

Ladislav SLAVÍK, Laboratory of Paleobiology and Paleoecology, Institute of Geology AS CR, Rozvojova 269, CZ-165 02 Praha 6, Czech Republic, Tel.: +420 233087247, Fax: +420220922670, slavik@gli.cas.cz

SDS NEWSLETTER EDITOR

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WEBMASTER

Carlo CORRADINI, Dipartimento di Scienze della Terra, Università di Cagliari, Via Trentino 51, I-09127 Cagliari, Italy; corradin@unica.it

Voting members, country, special fields, email:

R. BROCKE, Germany, palynology; rainer.brocke@senckenberg.de

C. CORRADINI: Italy, conodonts; corradin@unica.it

C. CRONIER: France, trilobites; catherine.cronier@univ-lille1.fr

A. da SILVA: Belgium, astronochronology; ac.dasilva@ulg.ac.be

Y. GATOVSKY, Russia, gatovsky@geol.msu.ru

J. HLADIL: Czechia, cnidaria, various stratigraphic methods; hladil@gli.cas.cz

N. IZOKH: Siberia, Asian Russia, conodonts; izokhn@uiggm.nsc.ru

MA Xueping: Beijing, brachiopods; maxp@pku.edu.cn

D. J. OVER: U.S. conodonts; over@geneseo.edu

G. RACKI: Poland, brachiopods, event & sequence stratigraphy; racki@uranos.cto.us.edu.pl

C. SPALLETTA, Italy, conodonts; claudia.spalletta@unibo.it

K. TRINAJSTIC: Australia, fish; kate.trinajstic@uwa.edu.au

J. I. VALENZUELA-RIOS: Spain, conodonts; jose.i.valenzuela@uv.es.

U. JANSEN, Germany, brachiopods; ulrich.jansen@senckenberg.de

ZHU Huaicheng, Nanjing, China; palynology; hczhu@nigpas.ac.cn

R. T. BECKER: Germany, ammonoids, conodonts; rbecker@uni-muenster.de

List of Working (Task) Groups and their officers

There is a working group appointed to reinvestigate the D-C boundary. This has 10 members from the SDS and 9 from the SCS.

The Devonian members are:

R. Thomas BECKER, Germany: ammonoids, rbecker@uni-muenster.de

Denise BRICE, France: brachiopods, d.brice@isa-lille.fr

Carlo CORRADINI, Italy: conodonts, corradin@unica.it

Brooks ELWOOD, USA: magnetostratigraphy, ellwood@lsu.edu

JI Qiang, China: conodonts, Jirod@cags.net.cn

Sandra I. KAISER, Germany: conodonts, isotope stratigraphy, kaiser.smns@naturkundemuseum-bw.de

John E. MARSHALL, UK: miospores, jeam@noc.soton.ac.uk

Hanna MATYJA, Poland: conodonts, hanna.matyja@pgi.gov.pl

Claudia SPALLETTA, Italy: conodonts, claudia.spalletta@unibo.it

WANG Cheng-yuan, China, cywang@nigpas.ac.cn>

The Carboniferous members are:

Markus ARETZ, France: corals (Task Group leader)

Jim BARRICK, USA: conodonts, jim.barrick@ttu.edu

Paul BRENCKLE, USA: foraminifers, saltwaterfarm1@cs.com

Geoff CLAYTON, Ireland: palynomorphs, gclayton@tcd.ie

Jiri KALVODA, Czech Republic: foraminifers, dino@sci.muni.cz

Svetlana NIKOLAEVA, Russia: ammonoids, 44svnikol@mtu-net.ru

Edouard POTY, Belgium: corals, e.poty@ulg.ac.be

Barry RICHARDS, Canada, stratigraphy, sedimentology, brichard@NRCan.gc.ca

YUAN Jin-Liang, China: trilobites, yuanjl403@sohu.com

MINUTES OF THE ANNUAL SDS BUSINESS MEETING

July 3, 2019, STRATI 19, Milano, Italy

Attendance: The Chairman (J. E. MARSHALL), Vice-Chairman (C. E. BRETT); Secretary (L. SLAVÍK)

TMs: R. T. BECKER (Newsletter Editor), C. CORRADINI (Webmaster), A.-C. DA SILVA, J. I. VALENZUELA-RÍOS.

CMs: C. DOJEN, I. EVDOKIMOVA, J. FRÝDA, A. HUŠKOVÁ, J.-C. LIAO, E. LUKŠEVIČS, J. J. ZAMBITO.

GUESTS: M. ARETZ, D. GRAZHDANKIN, O. KOSSOVAYA, J. LU, F. LÜDDECKE, N. MCADAMS, M. SINNESAEL, T. SÖTE, D. STRUSZ.

Total of 23 people

The meeting began at 5:30 PM (17:30)

Introductions and apologies for absence

SDS Chair JOHN MARSHALL called the main meeting to order. He started with the introduction of himself as the SDS Chair, Vice-Chair C. E. BRETT, Secretary L. SLAVÍK, Newsletter Editor T. BECKER and SDS Web Master C. CORRADINI.

Apologies for non-attendance were received from:

TMs: R. BROCKE, Y. GATOVSKI, J. HLADIL, N. IZOKH, U. JANSEN

CMs: Z. S. ABOUSSALAM, O. ARTYUSHKOVA, P. BUDIL, A. BLIECK, C. BURROW, J. DAY, D. DE VLEESCHOUWER, J. EBERT, R. GESS, C. GIRARD, S. GOUWY, S. HARTENFELS, S. HELLING, O. IZOKH, T. KUMPAN, H. MATYJA, J. OVER, C. PENN-CLARKE, L. PONCIANO, E. SCHINDLER, S. TURNER, C. VER STRAETEN, S. VODRÁŽKOVÁ.

Formal Approval of Minutes of 2018 SDS Meeting

JM asked if there were comments on the minutes of last year's SDS meeting at IPC 5 in Paris. There were none and the Minutes of 2018 meeting were approved; they had already been edited and appeared in SDS Newsletter 33.

Chair's Business:

Chair JOHN MARSHALL: reported deaths of several former SDS members or of internationally known Devonian workers:

Werner BUGGISCH

Philippe GERRIENNE

former TM William T. KIRCHGASSER

former TM Ruth MAWSON

Dieter STOPPEL

Obituaries will appear in SDS Newsletter **34**.

SDS observed a moment of silence for the passing of these individuals.

JM noted that we had again a successful session on the Devonian and were pleased to receive about 10 talks and 7 posters for the session on Devonian Life, Environments, and Time presented here in Milano; he also noted that the SDS meeting must conclude by 7:00 p.m.

New Officers

JM noted that the terms of the present chair, himself, and vice chair are due to expire by the IGC in 2020. Both J. MARSHALL and C. BRETT are in the final year of two four-year terms and according to the bylaws of the ICS there needs to be an election for a new chair and vice chair, the secretary is to be appointed by the new chair.

TM Thomas BECKER has agreed to seek nominations and assemble a ballot to be voted on by titular members. Once nominations are assembled a ballot will be e-mailed to all TMs in October.

JM thanked TM CARLO CORRADINI for his work on the SDS website, which he will continue despite moving to a new department in Trieste.

ICS Matters

There was not too much of substance to report; there had been a discussion of abstentions in ICS votes and their significance. There is an ongoing debate on the Holocene GSSP with proponents mass emailing members of other sub-commissions. You can safely ignore these emails.

GSSPs

Revision of the Pragian/Emsian boundary

Chair JOHN MARSHALL: Most of the discussion of this meeting is again on the Pragian-Emsian boundary, which remains unsettled owing to the scarcity of polygnathid conodonts in Zinzilban section at the approximate level of the revised boundary definition. JM expressed hope that two proposals for possible new boundary stratotypes in the Prague Synform and in the Pyrenees could be produced within the year. Also any proposals from Uzbekistan (Kitab State Geological Reserve) are welcomed.

Firuza SALIMOVA from Uzbekistan (site of the present GSSP) had written a letter to JM (and to several SDS members) on behalf of a consortium of Uzbek researchers, regarding their strong support for retaining the base of the Emsian at the level of the *Eocostapolygnathus kitabicus* and disappointment at attempts to establish a new and higher boundary level associated with *Pol. excavatus*. There are several points that perhaps need to be addressed including the opinion that the redefinition of the Pragian-Emsian boundary is a matter of convenience for European workers to maintain "traditional" definitions as opposed to international usefulness. The document also contends that the *E. kitabicus* (GSSP) boundary in the Zinzilban Section "is exceptionally well represented in the continuous succession and is better represented than in the Pragian-Zlichovian boundary in the Barrandian; it is a striking boundary showing taxonomic changes in many fossil groups, both benthic and pelagic, allowing interregional correlations." In contrast, they argue that other sections, especially those in the Pyrenees have not been so well studied from the standpoint of other proxies such as geochemistry. The letter also emphasizes that temporary restrictions on visiting sites in Zinzilban have been lifted and access is not a problem.

In addition, Dr. Elena MIKHAILOVA in the Mining Institute St Petersburg and Uzbek government officers also invited several SDS members to attend the International Geotourism Forum on August 1-3 in Uzbekistan; they are trying to promote the Kitab State Geological Reserve. Secretary L. SLAVÍK will attend on behalf of SDS.

JM called upon a representative of the Russian team investigating the Zinzilban Gorge section, Dr. Dmitrij GRAZHDANKIN, husband of CM O. IZOKH, who works extensively on this section. D. GRAZHDANKIN presented a brief slide show of graphs showing geochemical data. Among other things he pointed to a negative carbon isotopic excursions in both carbonates and organic matter, as well as minor spikes in S and other elements associated with the first appearance of *Eoc. kitabicus*. He also pointed out the appearance of microbial mud mounds in primarily bioclastic Emsian limestones and suggested a change in the partial pressure of CO_2 in the atmosphere may have facilitated carbonate precipitation. There is also a sharp increase in proxies of redox conditions,

supporting anoxic conditions at least locally. Thus, the current GSSP has evidence from several proxies, as well as sedimentology, suggesting important changes associated with the boundary. He noted that there are mud mounds in some sections and bioclastic sediments in others.

JM thanked Dr. GRAZHDANKIN, and noted that the SDS regards the Zinzilban section a very good one and the *Eoc. kitabicus* boundary is very suitable to be used for the prospective stratotype of the upper Pragian boundary or "Zinzilbanian" substage once we move to that level of subdivision. He inquired as to whether new sections yield abundant polygnathid conodonts. D. GRAZHDANKIN noted that at present we do not know, as this has not been studied in detail. Russian colleagues were not aware of the letter sent by the Uzbek scientists and he felt that they did not agree with the tone of the letter and were afraid that it had been misunderstood. He also noted that the military restrictions were now removed and the Zinzilban Gorge sections were quite well accessible. JM did note that he had yet to receive the letter although he had heard about it. It had gone to an old email.

TM R. Thomas BECKER (TB) noted that finding of *E. kitabicus* in additional sections was promising and that the new work presented was very useful for the future substage boundary level.

CM Jiří FRÝDA noted that data based on just single measurements may not be too relevant and that some of the proxies may only record geochemistry of the local basin. Single profiles are not enough: there need to be studies at several sections to demonstrate the generality of these patterns. Sr isotopes from brachiopod shells might be useful as there is a pretty major and monotonic shift through this interval; this could be useful in correlation.

D. GRAZHDANKIN responded that other studies are underway. They will do parallel studies to test the generality of patterns. TB noted that it would be important to see error bars on the variables.

TM NACHO VALENZUELA-RÍOS (NV) provided a discussion of the issues surrounding the discussion on the state of affairs with respect to this boundary. When a new GSSP for the base of the Emsian was established in 1994 at Kitab Reserve (Zinzilban) this action was well received by ICS; the section seemed to be well documented and was valued by SDS and appeared to be a good GSSP. This was partly based upon a false concept. But as better correlations were established with the nominal Pragian based on the Praha Formation in Prague Synform, it was found that this redefined Emsian became excessively long, the Pragian was reduced by about 2/3 from its original concept and the boundary did not closely match traditional usage. He repeated the three main decisions from the SDS meeting in Kitab State Reserve from 2008 (see previous SDS newsletters and reports on the sampling field works at Zinzilban section). He reviewed the history of the situation with sampling and subdivision of samples into three batches sent to conodont workers in Novosibirsk, Prague, and Valencia in 2008, and subsequently in 2015, at a higher level, but in each case, came to the conclusion that the preferred level with *Pol. excavatus* Morphotype 114 could not be well defined owing to a paucity of polygnathid remains at appropriate levels.

Then he presented date from Pyrenees, especially in sections Baliera 6, Isábena and others. In Baliera 6, three levels are well represented: *Pol. pireneae*, lower *Pol. excavatus*, middle *Pol. excavatus*. There is a good range chart for conodonts in this section, where not only polygnathids but also icriodontids (e.g., *Icriodus sigmoidalis* in the middle *excavatus* zone) are represented. He mentioned also the approximation of the traditional Emsian base in the Pyrenees – i.e. Basibé Fm.

In the Iberian Chains, the Santa Cruz Fm. may be the equivalent of the Koněprusy Ls. of the Prague Synform; there are 12 brachiopod species that overlap with the faunas of the traditional Emsian of Germany, including the "monster" brachiopod, and also tentaculitoids are distinctive at this level; this is close to the upper *Pol. excavatus* level though Morphotype 114 has not been found in the Prague Basin so far. The base of the Mariposas Formation in the Iberian Chains is the corresponding level for correlation of the FAD of *Pol. excavatus* Morphotype 114.

Dr. GRAZHDANKIN: When the boundary stratotype was established at the *Eoc. kitabicus* level, was SDS aware of how low in the classic Pragian this was?

NV noted that PETER CARLS and he were aware of it.

TB: Only a few other members of SDS were aware of how much this deviated from the classical conception of Pragian and Emsian. Otherwise, they probably would not have approved it.

D. GRAZHDANKIN: Shouldn't you name Morphotype 114?

NV: Morphotype 114 is just temporary; it is a good morphotype; it will be named.

TB: It should probably be a subspecies of *Eolinguipolygnathus excavatus*. Details of its morphology and variability, based on rich collections from Morocco, have been published by ABOUSSALAM et al. (2015). Therefore, it is difficult to understand the criticism/unclarity raised in the letter of our Uzbek colleagues.

JM: The taxon should be approved first.

NV: Yes, we need to agree upon it being the future boundary definer.

JM: Again, any proposed stratotype must be reviewed and approved by chairs of all subcommissions. The proposal must include multiple proxies including biostratigraphy, magnetic susceptibility, carbon isotopes, etc.

TB: When we visited the Pyrenees sections in 2017 we agreed that one of the sections shown could be appropriate for the stratotype, but we need denser sampling and other proxies.

JM: SDS could apply for funding for better documentation of the Pyreneees sections. This might be a plan to proceed with.

TB: This is not such an easy section. He notes that in Morocco the top of the *Deiroceras* Limestone shows the entry of the first ammonoids; *Eol. excavatus* Morphotype 114 first occurs at the base, just above black shales that are close to the Bohemian Graptolite Event (*atopus* Event), where graptoloids became extinct. In Morocco, the level before the probably slightly delayed *excavatus* M114 FOD is associated with pyritized faunas deposited during a major transgression. Thus, a number of distinctive phenomena make the *Eol. excavatus* Morphotype 114 level a useful boundary.

LS: Unfortunately, the Graptolite Shale is represented only in sections of the northwestern limb of the Prague Synform.

TB: The 114 level has merit of being associated with isotope events, a major transgression, and the extinction of graptolites.

CM JIŘÍ FRÝDA: Dacryconarids also show distinct changes at about this level.

TB: In Zinzilban some graptoloids are said to persist much higher; he had brought copies of a paper on this topic.

LS: These random occurrences are mostly facies-driven.

JM: We will bring to a close further discussion of P/E boundary and move to D/C boundary.

Devonian-Carboniferous (D-C) Boundary

JM: Normally, MARCUS ARETZ would have an informal meeting of the D/C boundary after the SDS meeting, because the Carboniferous subcommission "owns" the boundary. But he will defer on this because MARCUS will host a special meeting on this topic in August at Cologne, Germany. There will be about ten talks and there will be a vote on criteria and plan to have a formal proposal within four years. MARCUS urged those interested to attend the workshop in Cologne. Chair John MARSHALL will attend.

Devonian Substages

JM: Again, discussion of substages is tabled as they are yet to be formally approved by the ICS and cannot be officially defined until the stage boundary stratotypes are agreed upon.

SDS Membership

JM: There are proposals for new CMs

LS: TM Eberhard SCHINDLER has proposed Dr. Judith NAGEL-MEYERS as a CM. She completed a Ph.D with Thomas BECKER at Münster in 2006, is one of the few Devonian bivalve workers and has done extensive work on predation in bivalves in the Devonian of New York State. She is presently Associate Professor at St. Lawrence University in Canton, NY

TM CARLO CORRADINI proposed Dr. MARIA CORRIGA of Università di Cagliari, Italy*;* she is very actively researching the upper Silurian-Lower Devonian in Italy.

TM C. BRETT proposed, as a new CM, Dr. Rodrigo Scalise HORODYSKI, Curator of the Geological History Museum of Rio Grande do Sul State, Vale do Rio dos Sinos University, Brazil. He noted that Dr. HORODYSKI has done work on taphonomy and paleoecology of Brazilian Devonian faunas and is collaborating with CM CAMERON PENN-CLARK on comparative studies of the Devonian of Gondwana and the Malvinokaffric Realm. - All proposals were accepted.

SDS Devonian Publications:

SDS Newsletter: TB requests reports from all TMs and CMS for the newsletter by the end of

August. He will try to edit the newsletter beginning in September. He asked that Secretary L. SLAVÍK request reports for the membership in the near future. TB reminded members that the newsletter is a convenient forum for short contributions on new findings that can be published quickly. He also noted the obligation of all members to contribute an annual report, even if only a paragraph or two.

JM: Noted other volumes nearing completion: The ICOS GECkO volume from the 2017 meeting is nearly completed and a majority of papers are published on-line in Palaeo-3.

Nacho's volume of papers related to the Valencia meeting for Palaeo-2 is progressing. The volume will include not only Devonian but also other papers related to conodonts. They will accept papers on conodonts until October, 2019.

Sven HARTENFELS, Christoph HARTKOPF-FRÖDER, Peter KOENIGSHOFF and others are completing a special volume on the Devonian to Carboniferous geology of the Rhenish Massif and Ardennes. Contributions will still be accepted until the end of October.

TB noted that the 2018 Field Guidebook on the Devonian of the eastern Anti-Atlas, published in conjunction with the 10th International Cephalopod Symposium in the *Münstersche Forschungen zur Geologie und Paläontologie* series, has been sold out. An inquiry showed that the printing of additional volumes would be too costly (double the original price). However, all Devonian chapters are available on-line through ResearchGate.

JM: A long awaited volume on "Devonian palaeoecosystems and palaeoenvironments of South China" by W. QIE, K. LIANG and P. KÖNIGSHOF was published early this year. Several copies have been distributed by Jienfeng LU.

LS mentioned a recent Devonian review paper from China: QIE Wenkun, Ma Xueping, XU Honghe, QIAO Li, LIANG Kun, GUO Wen, SONG Junjun, CHEN Bo, LU Jianfeng, Devonian integrative stratigraphy and timescale of China, *Science China, Earth Sciences*, **62**, 112 (2019).

Another volume on Devonian had been proposed by GRZEGORZ RACKI for EPSL.

CB also noted recent receipt of a new review paper by CM CAMERON PENN-CLARK in the *Journal of African Earth Sciences*.

Future Meetings

JM: As noted previously, the State Committee of the Republic of Uzbekistan on Geology and Mineral Resources (Goscomgeology) and the State Committee of the Republic of Uzbekistan for Tourism Development has invited a few members of SDS to an "International Geotourism Forum" Uzbekistan for a three-day excursion in August 1-3 to discuss (among other things) the geological importance of the Zinzilban Gorge and the Kitab State Geological Reserve. Ladislav SLAVÍK has agreed to attend this meeting and give a short report.

As noted, there will be a meeting in Cologne in August on revision of the Devonian-Carboniferous boundary; Marcus ARETZ will give a report on this.

CB reported on the meeting for SDS in July, 2020, in New York State, based upon an outline sent recently by TM Jeff OVER. The tentative plan is that the meeting would be about ten days total, with the main conference and technical sessions in the Integrated Sciences Building at State University of New York at Geneseo, NY on July 26 (Sunday) to July 28 (Tuesday); this would include a banquet and a mid-meeting trip to Tioga, Pennsylvania to examine Frasnian-Famennian boundary strata. At present the intent is also to have a three to four day pre-meeting field trip on the Upper Devonian of Cleveland, Ohio through western New York. A post-meeting trip of about four days will include the disconformable Devonian-Silurian contact in western New York, Middle Devonian reefs, Middle Devonian black shales, platform clastic and carbonates through the Finger Lakes region, and then Lower and Middle Devonian carbonate dominated to terrestrial strata in eastern New York State.

The trip will start in Geneseo, NY and finish in Catskill, NY, about 3 hours north of New York City. At present, cost estimates are being reconsidered. The tentative cost of ~$2000 on top of airfare, and 10-11 days for the full meeting seems a bit much based on discussion with members of SDS. A more definite schedule will be posted soon on the website.

M. ARETZ asked for a show of hands as to how many individuals present would definitely go on the full meeting as scheduled and about six people raised hands.

TB asked if there would be various options for attending such as just the pre-meeting and main meeting or only meeting and post-meeting trip or all three.

CB responded that he was certain there would be such options and that he will be communicating with J. OVER to try to finalize a somewhat more cost-efficient meeting. In addition, J. OVER has requested 4-5 thematic topics that might serve for sessions at the New York meeting; one that has already been suggested is a workshop on cyclostratigraphy and astrochronology run by CM A.-C. DASILVA, University of Liege.

TM C. CORRADINI requested information for the website as soon as possible.

JM: Reminded SDS that the next International Geological Congress meeting will be held in New Delhi, India in the spring of 2020. SDS does not intend to put in a proposal for a session on the Devonian. There is no Devonian within easy reach of the meeting and no field excursions are planned. There is an effort to have subcommission meetings instead at STRATI conferences.

JM also noted that these is a field trip with the next Baltic Stratigraphic Conference in St Petersburg. According to information from CM A. IVANOV, this will include classic Devonian localities around Lake Peipsi together with Lake Il'men and the Volkov River. Some of these are classic 'Murchison' localities, where fish and brachiopods occur on the same bedding planes. It was the timely discovery of these localities that established the Devonian as a System.

Summarizing future meetings:

2020: Field meeting in Geneseo, NYS, USA

2021: Join with ICOS in Wuhan, China

2022: Possibly join with the International Palaeontological Congress (IPC); details will be forthcoming.

TB noted that he would be interested some time to have a meeting in South America again.

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JM: Bolivia would be interesting though the logistics could be tough.

Financial Report:

This year the SDS received $3000, more than most previous years. This money would go for the newsletter and support of travel for officers; now there are more conditions including more reporting of financial spend.

Any Other Business

NV reported that this year there was a symposium in honor of CM MIKE MURPHY at the North American Paleontological Convention.

TB noted that SDS has met with NAPC in the past (2009 in Cincinnati) and he suggested that this might be a possibility again going forward. He also suggested that SDS might wish to give an award to younger researcher for excellence in research as is done in some other subcommissions. JM remarked that this would be a good idea and perhaps a way to recruit new CMs. We should also consider nominating members for the larger ICS awards. This has been done in the past (CB received MCCLAREN Medal in 2008).

TM C. CORRADINI reminded nominators to send information on new corresponding members to put on the SDS website.

LS noted that a number of e-mails have been returned, even Nacho's e-mails have been kicked back. He urged members to send updated contact information.

Adjournment: Chair John MARSHALL thanked members of SDS, and expressed his sincere thanks to the organizers of last year's Paris meeting and those of the present meeting in Milano.

He declared the meeting adjourned at ~7:00 p.m.

The Devonian Investigation Group (DIG) from NIGPAS

(copied from: http://english.nigpas.cas.cn/ns/palaeonews/no8/201902/t20190204_205334.html)

The Devonian Investigation Group (DIG) has a broad focus, and is interested in early plant taxonomy and phylogeny, Devonian integrative stratigraphy, marine palaeoecology and palaeobiogeography reconstruction, and biogeochemical cycling. The group now has fifteen members, including two full professor (XU Honghe, WANG Yi), three associate professors (QIE Wenkun, FU Qiang and QIAO Li), six assistant professors (LIANG Kun, LU Jianfeng, SONG Junjung, GUO Wen, HUANG Pu and ZHANG Xiaole), and four graduate students (WANG Yao, MA Jiaxin, HUANG Jiayuan and WANG Yujue). Encompassing all kinds of fossil groups from both terrestrial and marine strata of Devonian, the field of DIG is currently focused on the evolution of early land ecosystem and its impacts on Earth climate system and marine ecosystem, which could be separated into the following eight key research themes:

1) Silurian-Devonian plant evolution,
2) Subdivision of Chinese regional Devonian stages,
3) Devonian marine anoxia and biotic events,
4) Devonian reef ecosystem,
5) Palaeoecology reconstruction around the F-F and Hangenberg events ,
6 Brachiopod palaeobiogeography reconstruction,
7) C-N-S biogeochemical cycling ,
8) Climate changes in the Mid-Palaeozoic.

The Group has key alliances with the Subcommission on Devonian Stratigraphy, Subcommission on Carboniferous Stratigraphy of ICS, and is keen to work with young international scholars and accepted graduate students.

Recent projects of the group are mainly founded by the Chinese Academy of Sciences, NSFC and the Key Laboratory of Palaeobiology and Stratigraphy, and the Nanjing Institute of Geology and Palaeontology, CAS.

Projects in progress:

The State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, CAS: Interactions between Late Devonian marine and terrestrial organisms and their palaeoenvironments of South China. PI: XU Honghe

The Strategic Priority Research Program (B) of Chinese Academy of Sciences: The establishment and the development of the earliest terrestrial ecosystem. PI: XU Honghe

The National Natural Science Foundation of China: The anatomy and the growth pattern of the

Upper Devonian tree-like plants from Xinjiang. PI: XU Honghe

The Strategic Priority Research Program (B) of Chinese Academy of Sciences: Devonian marine biotic and anoxic events and climate changes. PI: QIE Wenkun

The National Natural Science Foundation of China (Grant No.: 41772004): Mass extinction and paleoenvironmental backgrounds during the Devonian-Carboniferous transition in South China. PI: QIE Wenkun

The National Natural Science Foundation of China: Early Devonian conodont from Guangxi and southeastern Yunnan: systematic Palaeontology and biostratigraphy. PI: LU Jianfeng

The National Natural Science Foundation of China: The differences and causes in the responding patterns to the F-F event between marine benthic and pelagic ostracods in the Late Devonian of South China. PI: SONG Junjun

The National Natural Science Foundation of China: Studies of the phylogeny and leaf morphological evolution of Late Devonian-Early Carboniferous sphenophytes from South China. PI: HUANG Pu

SDS DOCUMENTS

Letter to the SDS group,

From: Aleksey KIM, Maya ERINA, Irina KIM, Natalia MESHCHANKINA, Firuza SALIMOVA, Firdaus KARIMOVA, Nadir DAVLATOV, Elena TSMEYREK, Nuriddin ABDIEV

In connection with the ongoing SDS discussion on the redefinition of the Pragian-Emsian boundary, we consider it necessary for SDS members to be reminded of the definition of the Pragian-Zlíchovian boundary as published by CHLUPÁČ (1986, 1998), because we will touch upon the correlation of the Zinzilban section with the Pragian-Zlíchovian succession in the Barrandien.

According to CHLUPÁČ (1998, text-fig. 36), the thickness of the Pragian is 35 - 200 m. In the type Praha-Barrande section, the Praha Formation is represented by an 8 m-thick interval, whereas the Zlíchov formation in that section, conformably overlying the Pragian, is 19 m thick. In the Chynice-Mramorka section, the Pragian is represented by a series 9 m thick, whereas the Zlíchovian is represented by two intervals, 12 and 7 m thick. In the type region, the difference between the Pragian and Zlíchovian formations, which is considered classical in Europe, is mainly defined by lithological facies. Palaeontologically, the P-Z boundary is poorly substantiated, since most conodont and dacryoconarid species in that case are transitive.

Eoc. kitabicus appears four meters below the P-Z boundary in the Praha-Barrande section, and three meters below in the Chynice-Mramorka section. This is actually virtually the same section from which *Polygnathus dehiscens* was recorded in other sections of Barrandien, Europe. Naturally there is a question, what is below the stated 9 m of the Pragian Formation, what is its actual thickness? The question is important because Prof. P. CARLS and those supporting him claim that the conodont species *dehiscens* appears in that section exceedingly low, and if accepted, the new definition would significantly reduce the thickness of the Pragian Stage. So, how much shorter in percentage will the Pragian in its new definition be if the difference is 3-4 m with the total thickness of 35-200m? With regard to the Pragian-Emsian boundary in the Zinzilban section, it is exceptionally well represented in the continuous succession and is better represented than in the Pragian-Zlíchovian boundary in the Barrandien; it is a striking boundary showing taxonomic changes in many fossil groups, both benthic and pelagic, allowing interregional correlations. For instance, among dacryoconarids, there is a noticeable change in the generic and species composition. *Nowakia acuaria* is replaced in the Lower Zlíchovian by *N. (Dmitriella) praesulcata* according to ALBERTI (1933) and in the Zinzilban Beds (KIM 2008). Thus, *N. acuaria* and *Guerichina strangulata*, which are transit taxa, can be indicators of the Pragian, if they are overlain by beds with *N. (Dmitriella) praesulcata.* We have discussed this in Newsletter no. **27** in 2012.

It appears that, at least partly, the discussions about the redefinition of the base of the Emsian are supported by the situation that this boundary is not entirely clear in many European sections. Supposedly, in the Barrandien and in the Rhine-Ardennian region, and in Spain (Seltibury) and also in other regions, not everything is so evident with the correlation of the regional and local Devonian strata and the International Scale units, especially where the correlation was based on benthic groups

and principles of historical definitions and traditions. Therefore we are convinced that the present discussion of the redefinition of the Pragian-Emsian boundary comes from convenience of correlation of European sections, rather than from evolutionary successions and international usefulness.

In our opinion, most arguments brought by Peter CARLS, Ladislav SLAVIK, and Nacho VALENZUELA-RIOS are based on the above convenience and not on the actual value of the markers proposed to internationally define the boundary. The "tradition" argument, even though considered important, does not prevail in the development of the international scale, where the needs of international stratigraphy, stability, consensus, and precision should be considered at least as important, if not deserving more attention and consideration. The evolution of the international scale and international stratigraphy is a fact, and e.g., we had to give up traditional Ordovician stages (all of them!) for the needs of a modern stratigraphic scale. This is a good example of a balanced attitude to tradition and evolution in stratigraphic science.

In addition, a temporary restriction of access to the Kitab Geological Reserve (which has currently been lifted) cannot be considered as a valid reason for an immediate need to look for another type section (see SLAVIK's note in the SDS Newsletter no. **33**, 2018). Temporary bureaucratic impediments, even related to state security issues, they do happen everywhere, and have to be dealt with in due course. We are entitled to announce that all restrictions of access are now lifted and there is no problem to visit and re-examine the GSSP section. We consider SCHINDLER's (2018, Newsletter no. **33**) statement that there is no access to the section to be erroneous and alarmist. The Reserve provides all the facilities and necessities for research. It is important that the section is on national land and accessible from major airports and public transport, as many of the SDS members already know.

We would also like to comment on Thomas BECKER'S (2018, Newsletter no. 33) statement that the Zinzilban section faunal content is impoverished. From our knowledge, this is not the case, and there are few sections in the world that could compare with the Zinzilban section for the diversity of fossils in the boundary beds.

The long duration of the Emsian and short duration of the Pragian (BECKER and DA SILVA, 2018, Newsletter no. **33**) do not make a valid argument. The data on astrochronology cannot be considered as a primary argument to change stratigraphic boundaries. The durations of the Frasnian and Famennian are comparable to, if not longer than, the Emsian.

The same applies to isotope data. The new datings are not in themselves a reason to reconsidered boundaries or sections. The type section has carbonate beds open for isotope sampling and examination.

We are in total agreement with John MARSHALL's (2018, Newsletter no. **33**) argument "we are no longer in 1975!" No serious GSSP can be considered without multiple criteria. It is also important to have parastratotypes. These are all regional references and it is important to have several." We agree with that. Who wouldn't? But we are not convinced that the Pyrenean sections are as well examined and satisfy all the necessary GSSP criteria, except possibly using conodonts. Remember that the guidelines say that "an occurrence of the primary marker does not automatically determine the boundary. Other markers should therefore be available near the critical level, in order to support chronostratigraphic correlation in sections other than the GSSP" (REMANE et al., 1996).

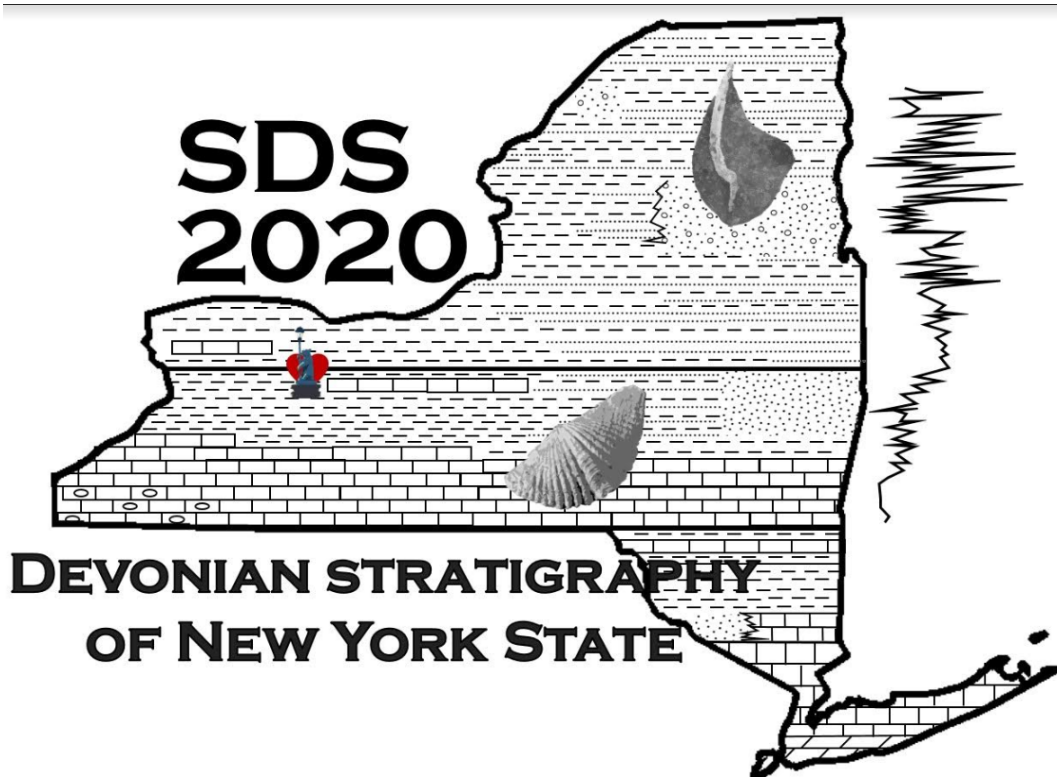
We do not think that fundamental science can be guided by "plans", "schedule", or the conveyer belt delivery of results. It seems that some are in a hurry to pull out a golden spike from a comprehensively studied section, and hammer it into a new, half-baked and insufficiently studied section.

We currently cannot see a better alternative to *Eoc. kitabicus* that could be effectively used world-wide. The suggested species "*Eol. excavatus* Morph (or ssp.) 114" cannot be seriously considered and formally voted as the marker because of its unresolved taxonomy and phylogeny. What does this name even mean? It is not immediately obvious outside a small group of conodont workers. At the moment its name has no biological meaning. The authors suggesting this "taxon" as a marker presumably cannot decide whether it is a morphotype, or species, or a subspecies, let alone considerations of its phylogeny, which is also unresolved. This needs to be resolved in any event, whatever the decision is made by the SDS, because the marker taxon should be a designated taxonomic species or subspecies the gradual transition between the marker and its ancestor can be observed (see

REMANE et al., 1996). However, species cannot be termed as ancestors of "morphotypes", which are supposedly morphological variants of a particular species. However, this might be all possible to resolve in the Kitab area, especially as BECKER (2018, Newsletter no. **33**) mentions there are other good sections in the area, that can be sampled in addition, e.g., the Khodzha Kurgan Gorge, which has a good ammonoid record. We cannot agree with its dismissal as too short and condensed at base. Its Pragian part alone is over 30 m (Kim, YOLKIN, 2011, fig. 1).

We also suggest that our colleagues from Czech Republic and Germany should re-examine their "traditional section" in search of a suitable marker, which can be used internationally, or in its absence to try to reconcile their regional stratigraphy with the best accepted world levels.

SDS MEETINGS



Dear SDS:

Here is a revision of the 30 June 2019 preliminary schedule and estimate of costs for the SDS 2020 meeting – Devonian Stratigraphy of New York State – to be held in Geneseo, NY. The closest international airport is in Toronto, Canada – 3.5 hours away – and there is a regional airport in Rochester, NY – 40 minutes away. New York City is 6 hours from Geneseo. Public transport to Geneseo is minimal, there is a morning bus from Rochester that runs once a day.

Pre-meeting field trip:

23 July (Thur) to 25 July (Saturday)

Features will be the Devonian-Carboniferous boundary clastic strata in northeastern Ohio and northwestern Pennsylvania; Upper Devonian offshore clastic dominated strata in western New York that contain the Middlesex Event, Kellwasser bed equivalents, and the Frasnian-Famennian boundary.

The trip will start in Cleveland, Ohio, transportation from Rochester or Geneseo will be an option on 22 July (Wednesday).

Estimated cost is $500 US, which includes transportation from Cleveland to Geneseo, meals, lodging, and guidebook.

Conference and technical sessions:

26 July (Sunday) to 29 July (Wednesday)

The conference will be held in the Integrated Science Building on the campus of the State University of New York (SUNY) College at Geneseo and at the Paleontological Research Institute – Museum of the Earth in Ithaca, New York within the beautiful Finger Lakes region of New York State. The campus rests on upper Givetian strata and Ithaca is in the Frasnian.

Evening 25 July – welcoming reception

26 July – technical sessions and business meeting

27 July – Field trip to Frasnian-Famennian boundary strata in northern Pennsylvania – *cost $40 US*, which includes transportation and lunch or an excursion to Niagara Falls and Silurian strata – *estimated cost $40 US*.

28 July – technical sessions

29 July – field trip to visit Lower and Middle Devonian clastics and carbonates that feature the disconformable Devonian-Silurian contact and fossiliferous Middle Devonian strata in route to Ithaca and the Paleontological Research Institute for viewing collections, museum tour, and the meeting banquet to be held "under the whale."

Lodging and meals in Geneseo will be the responsibility of participants, there are several motels, inns, guest houses, and the dormitory on campus are available, as well as dining options on campus or in the village adjacent to the meeting facility.

Estimated cost is $170 US which includes lodging on 29 July.

Post-meeting trip

30 July (Thursday) to 3 August (Monday)

Features will be Middle Devonian black shales, platform clastic and carbonates through the Finger Lakes region, and then Lower and Middle Devonian carbonate dominated to terrestrial strata in eastern New York State.

The trip will start in Cortland, NY and finish in Catskill, NY, about 3 hours north of New York City. Transportation will be provided back to Geneseo or Rochester. Participants may also opt to be dropped off in Catskill or Albany where the bus or train services New York City.

Estimated cost is $700 US, which includes transportation from Geneseo to Catskill and return to Albany or Geneseo/Rochester on 4 August, meals, lodging, and guidebook.

If you have any questions please do not hesitate to contact me or other members of the field trip and conference organizers.

Yours,

Jeff OVER

Devonian Stratigraphy of New York State
SDS 2020 Annual Meeting, IGCP 652
Geneseo, New York, 23 July – 02 August 2020

Please complete and return to:
SDS New York 2020 c/o D. Jeffrey OVER
Department of Geological Sciences
1 College Circle – SUNY Geneseo
Geneseo, New York 14454

over@geneseo.edu
conference web page -
https://www.geneseo.edu/SDS_2020

Name: _____ E-Mail: _____
Institution: _____
Address: _____
City: _____ State/Province: _____
Country: _____ Postal Code: _____
Telephone: _____ Fax: _____

Please indicate participation in conference, estimated cost $170US:
possibly probably almost certainly

I will present:
oral paper poster attend but not present

Pre-conference field trip, estimated cost $500US:
possibly probably almost certainly
Need transport from Rochester/Geneseo to Cleveland on 22 July, 2020 yes no

Intra-conference field trip, estimated cost $40US:
1) Upper Devonian strata **or** **2) Niagara Falls and Silurian strata**
possibly probably almost certainly possibly probably almost certainly

Post-conference field trip, estimated cost $700US:
possibly probably almost certainly
Need transport from Catskill, NY to Rochester/Geneseo on 03 August, 2020. yes no

Official invitation needed: yes no

Tentative schedule:
22 July – Arrive Cleveland, Ohio for pre-meeting field trip
23 July – field trip departs, Upper Devonian strata - spend night in Erie, PA
24 July – field trip, Upper Devonian strata - spend night in Fredonia, NY
25 July – field trip, Upper Devonian strata - spend night in Geneseo, NY
non-field trip conference participants arrive in Geneseo, NY – welcoming party
26 July – conference begins, stay in Geneseo
27 July – intra-conference field trip – Upper Devonian strata **or** Niagara Falls, stay in Geneseo
28 July – conference, stay in Geneseo
29 July – field trip to Lower and Middle Devonian strata and PRI-MOTE in Ithaca, banquet, spend night in Cortland, NY
post-meeting field trip starts in Ithaca/Cortland
30 July – field trip, Middle Devonian strata - spend night in Cortland, NY
31 July – field trip, Middle Devonian strata - spend night in Cortland, NY
01 August - field trip, Lower and Middle Devonian strata - spend night in Oneonta, NY
02 August – field trip, Lower and Middle Devonian strata – spend night in Catskill, NY – end of field trip
03 August – return to Geneseo/Rochester

Abstracts Due: 1 May 2020 **Meeting Registration Due: 1 May 2020**

First Announcement

THE 11TH BALTIC STRATIGRAPHICAL CONFERENCE (BSC)

August 24 – 27, 2020
Saint Petersburg, Russia

The Baltic Stratigraphic Association (BSA) united the stratigraphic commissions of Estonia, Latvia, Lithuania, NW Russia, and Poland organizes international conferences every three years since 1991. The BSA conferences focused on various aspects of regional geology and stratigraphy. Ten conferences already have been held by BSA in Tallinn (1991, 1996, 2008), Vilnius (1993, 2002, 2014), Riga/Jurmala (1999, 2011), St. Petersburg (2005) and Chęciny, Poland (2017).

It is our pleasure to announce that the 11th Baltic Stratigraphic Conference will take place in Saint Petersburg, Russia. The organizing institution is A.P. Karpinski Research Geological Institute (Sredny prospect, 74, Saint Petersburg).

All topics related to geology and stratigraphy of the Baltic region and adjacent areas are welcome. Depending on the number of participants and presentations different sessions could be organized. Preliminary topics are:

- Regional stratigraphical schemes
- Lithostratigraphy
- Biostratigraphy
- Event stratigraphy
- Sequence stratigraphy
- Chemostratigraphy and isotope stratigraphy
- Palaeontology and biodiversification
- Palaeoecology, palaeogeography and palaeoclimate reconstructions
- Quaternary geology
- Geoheritage
- History of Geological Science

If you wish to propose a special session, organize a workshop, or a committee meeting during the conference, please let us know by 10th of November, 2019.

Pre- and post-conference field trips are planned:

- A. Lower Palaeozoic of the Leningrad Region;
- B. Devonian of the Pskov and Novgorod regions;
- C. Carboniferous of the Novgorod Region;
- D. Quaternary of the Leningrad Region.

Registration:

If you are interested in participation, please return the preliminary registration form via e-mail before 10th of November, 2019 to Irina Evdokimova (Irina_Evdokimova@vsegei.ru).

Registration fee:

Early registration fee (to be paid until 15th July 2020, inclusive)	150 EUR
Late registration fee (after 15th July 2020 or later)	170 EUR
Student fee	70 EUR
Conference Dinner	30 EUR

Abstracts for oral and poster presentations:

Abstracts volume will be published before the beginning of the conference. The length of abstracts is limited to two A4 page, 1.5 spaced, 12 pt Arial, with 2.5 cm margins with references and figures. Further details will be given in the first circular.

Important deadlines:

Preliminary registration	November 10, 2019
First circular	February 15, 2020
Deadline for early registration fee	July 15th, 2020
Deadline for abstracts	May 20, 2020
Second circular with detailed programme	August 1, 2020

Organizing Committee:
Alexander IVANOV
Andrey DRONOV
Tatiana TOLMACHEVA
Irina EVDOKIMOVA
Olga KOSSOVAYA

Contact persons:
Irina EVDOKIMOVA (Irina_Evdokimova@vsegei.ru)
Alexander IVANOV (IvanovA-Paleo@yandex.ru)
Tatiana TOLMACHEVA (Tatiana_Tolmacheva@vsegei.ru)

More information will be given in the first circular in February 2020 and on Website: https://vsegei.ru/ru/conf/events/

Preliminary registration form

11TH BALTIC STRATIGRAPHICAL CONFERENCE
August 24 – 27, 2020
Saint Petersburg, Russia

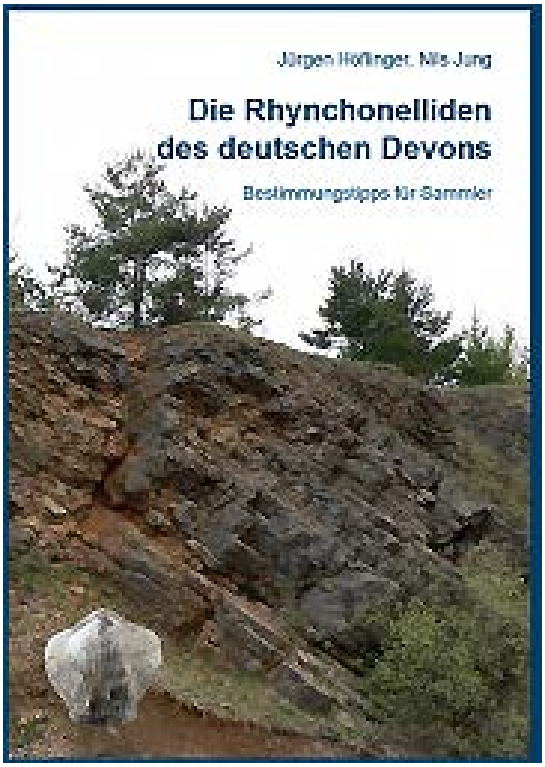
Registration Form

Mrs. or Mr.		
Title		
First name		
Family name		
Institution		
Street & No		
Postal (zip) code		
City		
Country		
Phone		
Fax		
E-mail		
I would like to present		
Oral presentation (preliminary title) YES/NO	**Poster (preliminary title)** YES/NO	
Preliminary title:		
Pre- or post-conference field trip		YES/NO
Name of field trip		

If you are interested in participation, please return the preliminary registration form via e-mail before the 10th November 2019 to Irina EVDOKIMOVA (Irina_Evdokimova@vsegei.ru)

Devonian Publications

Devonian rhynchonellids of Germany

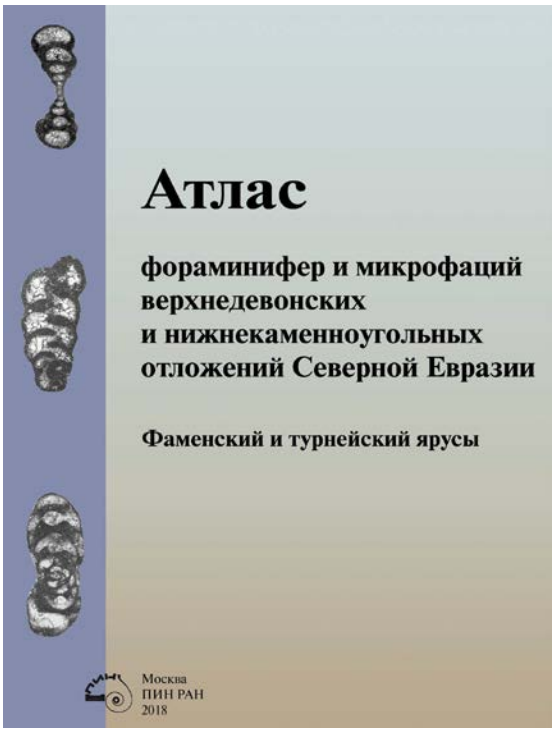


HÖFLINGER, J. & JUNG, N. (2019). Die Rhynchonelliden des deutschen Devons. – 224 pp., Röthenberg.

This new monograph written in German by two amateur collectors summarizes the external morphology, distribution in time and space of more than 170 rhynchonellid species in the Devonian of Germany. The book can be ordered (at the price of 22 € without postage outside Germany) from the senior author at: juergen.hoeflinger@o2online.de.

Atlas of Upper Devonian and Lower Carboniferous foraminifers

KULAGINA, E. I., STEPANOVA, T. I., ZAYTSEVA, E. L., GOROZHANINA, E. N., GIBSHMAN, N. B., IVANOVA, R. M., VEVEL, Y. A., PONOMAREVA, G. Y. & FILIMONOVA, T. V. (2018). Atlas of Upper Devonian and Lower Carboniferous foraminifers and microfacies of Northern Eurasia. Famennian and Tournaisian. – 220 pp., 96 figs.; PIN RAS, Moscow; ISBN 978-5-903825-49-3 [in Russian].



GSA Annual Meeting 2018, Indianapolis, important Devonian contributions

Geological Society of America, Abstracts with Programs, **50** (6). [in alphabetical order of first author – for full abstracts see: https://gsa.confex.com/gsa/2018AM/webprogram/start.html]

ALGEO, T. J., LIU, J. JAMINSKI, J. KUHN, T. & JOACHIMSKI, M. M. Insights on depositional processes of Devonian-Mississippian black shales (central Appalachian Basin, U.S.A.) from C-S-Fe analysis within an optimized cyclostratigraphic framework. - Paper No. 234-8.

BAIRD, G. C., HANNIBAL, J. T., & BOYER, DIANA L. Large-magnitude erosion events and anomalous, sparsely fossiliferous, late Famennian sedimentary record in OHIO: regional proxies for global biocrises and associated paleoclimatic perturbations on the end-Devonian earth. - Paper No. 234-3.

BARRY, R. M., MULLIGAN, M. A. & KENDRICK, D. C. Microfossils preserved in chert from the lower Middle Devonian Onondaga Limestone, Finger Lakes region of New York, USA. - Paper No. 39-1.

BRISSON, S., PIER, J. Q., FERNANDES, A. M. & BUSH, A. M. Changes in paleoecological gradients resulting from the Frasnian-Famennian extinction event (Late Devonian) in the Appalachian Foreland Basin. - Paper No. 73-5.

BROUSSARD, D., TREASTER, C., TROP, J. M., RYGEL, M. C., BENOWITZ, J. A. & DAESCHLER, T. Temporal changes in latest Devonian vertebrate fossil assemblages in north-central Pennsylvania: a consequence of mountain building, glaciation, and environmental change? - Paper No. 234-6.

BULINSKI, K. V., BURMAN, A. A., HALL, M. S., LAUGHLIN, Z., SADLER, K., SUMMERLIN, T. & WILCOX, A. Re-evaluation of biostrome paleoecology at the falls of the Ohio (Middle Devonian), Clarksville, Indiana. - Paper No. 273-5.

BURMAN, A. A. & BULINSKI, K. V. A comparative study of diversity and organismal interactions at the falls of the Ohio (Middle Devonian, Clarksville, Indiana) to similar environments within the Kaskaskia sea. - Paper No. 257-13EDWARDS, C., GOVERT, D. J. & LAMB, WILLIAM A. Where is the Late Devonian anoxic Kellwasser event across the Frasnian-Famennian boundary?: new insights from the Great Basin region, USA. - Paper No. 234-2.

CECIL, C. B., DIMICHELE, W. A., RAHL, J. M., EBLE, C. & STAMM, R. G. The Devonian-Mississippian climate transition in southeastern Laurentia (eastern USA): late Famennian glaciation, Kinderhookian coal, Osagean loess. - Paper No. 234-7.

CUI, Y., SUN, Y., CHANG, J., LI, F., PENG, Y. & SHEN, B. Seafloor oxygenation in the Late Devonian Frasnian-Famennian Boundary Event. - Paper No. 234-4.

DE BAETS, K., JAROCHOWSKA, E., KIESSLING, W., KORN, D. & RITA, P. Preservation of macroecological and macroevolutionary signals within cephalopod body-size distributions across time. - Paper No. 163-1.

ELRICK, M., WHITE, D. A., ALGEO, T. J. & ROMANIELLO, S. J. Do uranium isotopes of marine limestones provide evidence for seawater anoxia as a common driver for Phanerozoic mass extinctions? - Paper No. 234-14.

ESTRADA, L., PIPPENGER, K., BOYER, D. L., JONES, D. S. & COHEN, P. Mercury and microfossil trends during end-DEVONIAN extinction events. - Paper No. 185-6.

GARCIA, W. J., Biogeographic patterns of *AGELEODUS* across the end-Devonian mass extinction. - Paper No. 257-2.

GARRETT-ANES, N. M., MCRIVETTE, M. W. & BARTELS, W. S. Mapping a small Devonian world: a GIS analysis of the distribution of epizoans on brachiopod shells. - Paper No. 96-56.

GILLEAUDEAU, G. J., ELRICK, M., ROMANIELLO, S. J., MORFORD, J., CHENG, K. & ALGEO, T. J. Onset of major ocean oxygenation during the early Middle Devonian period recorded by uranium isotopes in marine limestones from the western U.S.A. - Paper No. 234-1.

GROSSMAN, E. L. & JOACHIMSKI, M. M. Paleozoic ocean temperatures: brachiopod and conodont $\delta^{18}O$ records compared. - Paper No. 86-1.

HESS, A. V. & TROP, J. M. Sedimentology and chemostratigraphy of Upper Silurian–Lower Devonian marine strata at Winfield Quarry, Central Pennsylvania. - Paper No. 221-4.

ICE, B. & WILLIAMS, J. C. Reconstructing the Middle Devonian paleoclimate using Marcellus Shale geochemical signatures. - Paper No. 256-4.

JACQUET, S. M., BROCK, G. A., SELLY, T. & SCHIFFBAUER, J. D. X-ray microscopy of armored worms: the plate assembly and protective system of Early Devonian articulated machaeridians from Australia. - Paper No. 260-2.

KELLY, P. R. & ELRICK, M. Recognizing a global negative carbon isotope excursion in the Early Devonian. - Paper No. 96-46.

KERR, J. Commensalism in the midst of extinction: encrusters and borers of the Appalacian Foreland Basin across the Frasnian-Famennian boundary. - Paper No. 73-7.

KOSTER, O., LAMASKIN, T. A., LANE, C. S., & HAWKES, A. D. Stable carbon isotope signature of the Late Devonian (Frasnian) Alamo Impact at Devils Gate, Nevada: geologically instantaneous transfer of ^{13}c-enriched carbon from the lithosphere to the dissolved inorganic carbon pool. - Paper No. 185-9.

LAMASKIN, T. A., SCHANTZ, K. A., KOSTER, O. A., PERRY, A. A., LANE, C. S., OVER, D. J., NOLAN, J. T. & ELLWOOD, B. B. The Late Devonian (Frasnian) *Punctata* Event in the Great Basin, U.S.A.: a new high-resolution $\delta^{13}c_{carb}$ and magnetic susceptibility record. - Paper No. 234-5.

LAMSDELL, J. C. An environmental driver for heterochronically mediated morphological change in aquatic chelicerate arthropods. - Paper No. 214-6.

LAUGHLIN, Z. & BULINSKI, K. V. Exploring the influence of water energy on the taphonomic condition of rugose corals at the Falls Of Ohio, Clarksville, Indiana. - Paper No. 38-23.

LIU, B., SCHIEBER, J., MASTALERZ, M., LAZAR, R. & TENG, J. Organic matter content and type variation in the sequence stratigraphic context of the Upper Devonian New Albany Shale, Illinois Basin. - Paper No. 53-8.

MARACEK, C. & BARTHOLOMEW, A. Trace fossils of the Middle Devonian Stony Hollow Fauna, Hurley & Cherry Valley Members, Kingston, NY. - Paper No. 55-4.

MCCOY, V. E., TREMBLAY, S. L., OOY, C. V., BOOM, A. & LABANDEIRA, C. C. Chemical analysis of preserved oil-body cells in Devonian liverworts. - Paper No. 213-11.

MENDONCA, S. E., PRUDEN, M. J., DIEVERT, R V. & LEIGHTON, L. R. A reassessment of durophagous predation on brachiopods through the Paleozoic. - Paper No. 273-2.

MORSE, A. & DAY, J. Upper Devonian (late Frasnian-early Famennian) conodont biostratigraphy and $\partial^{18}o_{apatite}$ isotopic and subtropical North American sst records spanning the Kellwasser extinction events. - Paper No. 187-13.

OVER, D. J. & MASON, C. E. *Aculeatus* Zone age of Three Lick Bed type locality, Ohio Shale, Upper Devonian, Eastern Kentucky. - Paper No. 187-17.

PERRY, A. A. LAMASKIN, T. A., SCHANTZ, K. A., KOSTER, O. A., NOLAN, J. T., ELLWOOD, B., LANE, C. S. & OVER, D. J. A stratigraphic multi-proxy covariation test for the cause of the Late Devonian *Punctata* Event carbon isotope excursion, Guilmette Formation, eastern Nevada, U.S.A. - Paper No. 185-4.

PIPPENGER, K., ESTRADA, L., BOYER, D. L. & COHEN, P. Exploring the microfossil record of the Late Devonian Hangenberg Event in the Cleveland Shale, Ohio. - Paper No. 111-2.

SALLAN, L., FRIEDMAN, M., SANSOM, R., BIRD, C. & SANSOM, I. J. The nearshore cradle of early Vertebrate diversification. - Paper No. 13-1.

SEDLACEK, A. R. C., CLARK, R. J., MCMORRAN, R., BISHOP, N., WIEMAN, S. T., SEBREE, J. & WITZKE, B. J. Application of carbon isotopic stratigraphy of the Middle to Upper Devonian (Givetian-Frasnian) Cedar Valley Group in the Iowa Basin – NEW data from a core in north-central Iowa. - Paper No. 185-1.

SMART, M., FILIPPELLI, G. M., GILHOOLY III, W. & WHITESIDE, J. H. The Devonian plant revolution: roots, weathering and the impact on global biogeochemical cycling. - Paper No. 235-1.

SONG, Y., GILLEAUDEAU, G. J., ALGEO, T. J., OVER, D. J., ANBAR, A. D. & XIE, S. Biomarker evidence of Late Devonian marine algal-microbial community changes driven by riverine nutrient inputs (Chattanooga Shale, Tennessee, U.S.A.). - Paper No. 256-5.

STEUER, C., BOWEN, D. W. & CALAVAN, C. Sequence stratigraphic framework and depositional systems of the Late Devonian (Frasnian) Duperow Formation in western and central Montana. - Paper No. 121-2.

STUBER, C., GENTRY, J., ALLEN, A. KNOX, L. W. & WOLAK, J. M. Petrophysical analysis of impact breccia in the Flynn Creek Crater, Jackson County, Tennessee. - Paper No. 96-20.

TREASTER, C., BROUSSARD, D., RYGEL, M. C., TROP, J. M. & DAESCHLER, T. Blossburg revisited: paleoenvironmental variation of an especially fossiliferous Late Devonian alluvial plain deposit in the Catskill Formation of north-central Pennsylvania. - Paper No. 259-5.

VAYDA, P. J., BABCOCK, L. E. & OTI, E. A. Application of x-ray computed tomography reveals a (fool's) gold mine of exceptionally preserved fossils in the Silica Shale (Devonian) of Ohio. - Paper No. 3-8.

WILCOX, A. &. BULINSKI, K. V. Identifying environmental conditions of the Middle Devonian biostrome at the falls of the Ohio (Clarksville, Indiana) through examination of corallum curvature in rugose corals. - Paper No. 38-14.

WILLIAMS, S. Understanding the C-S-Fe systematics of the Marcellus Formation. - Paper No. 23-1.

WITTE, Matthew K. On the phylogenetics of the trilobite family Phacopidae with systematic implications for *Eldredgeops* (GREEN, 1832). - Paper No. 13-6.

ZHANG, F., ALGEO, T. J., DAHL, T. W., CUI, Y. LUO, G. LIU, J. ROMANIELLO, S. & ANBAR, A. D. Rapid oscillations of global marine redox conditions at the Devonian-Carboniferous transition. - Paper No. 234-9.

GSA Annual Meeting 2019, Phoenix, Arizona, Devonian contributions

Geological Society of America, Abstracts with Programs, **51** (5). [in alphabetical order of first author – for full abstracts go to: https://gsa.confex.com/gsa/2019AM/webprogram/start.html]

ACCOTTO, C., MARTINEZ POYATOS, D. J., AZOR, A. &. JABALOY-SÁNCHEZ, A. Structural and geochronological constraints on the early Variscan evolution of the eastern Moroccan Meseta. - Paper No. 291-10.

BATTHER, H. K., SHAPIRO, R. S. & NUESTER, J. Biogeochemistry of sedimentary barite deposits in the Devonian Slaven Chert of central-north Nevada. - Paper No. 261-10 [new data on seep barite and adjacent *Dzieduszyckia* beds].

BENNETT, Y., OVER, D. J. HACKETT, S. Conodonts, magnetic susceptibility, and the Frasnian-Famennian Boundary in the Kettle Point Formation, Upper Devonian, subsurface of Western Ontario, Canada. - Paper No. 88-5.

BENNICK, M. I., VENN, C. & VAN RYTHOVEN, A. Determining the origin of intracameral deposits in the orthocerid genus *Arionoceras*. - Paper No. 118-8.

BOND, D. P. G. & STEPHENSON, C. A. Radiations and extinctions during the Devonian plant revolution and their role in anoxia-driven marine extinction crises. - Paper No. 247-4.

BROWNE, T. N., MALKOWSKI, M. A., HOFMANN, M. H. & SPERLING, E. A. Redox geochemical study of the Devonian-Carboniferous Sappington Formation, Southwest Montana: paleoenvironmental conditions in the Sappington Formation and comparison to the Bakken Formation. - Paper No. 261-9.

GAZDEWICH, S. C., HUSSON, J. M. & HAUCK, T. E., A. Stable isotope stratigraphy of Late Devonian carbonates in the Rocky Mountain front ranges: a field test of the authigenic lever. - Paper No. 282-7.

GIBSON, M. A rarely encountered scyphozoan conulariid from the Lower Devonian Ross Formation, Western Tennessee. - Paper No. 194-15.

GININDZA, G., FORDE, B. K., AGUSTIN, S. R., KHANDAKER, N. I., SHAMI, M. & SCHLEIFER, S. Paleoenvironment of the Devonian fossiliferous Glenerie Limestone, Rosendale, upstate New York. - Paper No. 26-8.

HEATH, M. N., STOLFUS, B. M., CRAMER, B. D., DAY, J., ROWE, H. D., CLARK, R. J. & TASSIER-SURINE, S. A. High-resolution integrated conodont and carbonate carbon isotope chemostratigraphy of the Hangenberg excursion from the H-28 and H-32 cores, Burlington, Iowa. - Paper No. 282-9

HERVÉ, F., CALDERON, M. N., FANNING, M., PANKHURST, R. J. & RAPELA, C. W. A review of Chaitenia: a Devonian oceanic island arc accreted to Patagonia south of Chilenia, South America. - Paper No. 165-4.

HOGANCAMP, N. JAY, & RODRIGUEZ, A. P. The conodont biostratigraphy and lithostratigraphic framework of the Devonian-Mississippian Englewood Formation, Black Hills, South Dakota, USA. - Paper No. 88-9.

HUGHES, E. S. & LAMSDELL, J. C. Determining the prey sizes of sweep-feeding eurypterids via analysis of appendage armature. - Paper No. 145-3.

JUNIUM, C. K., COHEN, P., KING PHILLIPS, E. J. & UVEGES, B. T. I. Carbon isotopic composition of single organic microfossils during the Devonian Frasnian-Famennian biotic crisis. - Paper No. 8-4.

KENDALL, B. & YANG, S. Ocean redox conditions at the Devonian–Mississippian Boundary (Hangenberg Event) inferred from redox-sensitive elemental abundances and molybdenum isotope compositions of the Exshaw Formation, Alberta, Canada. - Paper No. 36-4.

KERR, J. P., PIER, J. Q., & BUSH, A. M. Variation in skeletobiont-host relationships across the Frasnian-Famennian extinction event along an environmental gradient. - Paper No. 194-18.

KONDAS, M., FILIPIAK, P., WAWRZYNIAK, Z. & STRULLU-DERRIEN, C. The Early Devonian biocoenosis of the clastic sediments from the Holy Cross Mts., Poland. - Paper No. 285-1.

MASON, C. & YACOBUCCI, M. M. Paleontology of the Upper Devonian Antrim Shale in northwest Ohio: how isolated was the Michigan Basin? - Paper No. 271-30

NAVAS-PAREJO, P., LARA PEÑA, R. A., RAMOS MARTÍNEZ, O., PALAFOX REYES, J. JUAN JOSÉ, & VALENCIA-MORENO, M. E. Shallow-water conodonts of the Middle *expansa* Zone (latest Devonian) in Sonora, Mexico. - Paper No. 88-6.

OVER, D. J., FARRUGGIA, V., RUGGIERO, J. & D'ANDREA, R. Conodonts in the Marcellus Shale Subgroup (Middle Devonian) in western New York State and magnetic susceptibility correlation of conodont-poor strata in the Oatka Creek Formation. - Paper No. 88-4.

SMART, M., ILIPPELLI, G. M., GILHOOLY III, W. & WHITESIDE, J. H. Decoding Devonian mass extinctions: new evidence linking land plant expansion to marine anoxia**.** - Paper No. 247-5.

STOLFUS, B. M., HOGANCAMP, N. J., CRAMER, B. D., DAY, J., CLARK, R. J. & TASSIER-SURINE, S. A. A revised conodont biozonation for the Kinderhookian (Lower Mississippian). - Paper No. 88-10.

STOLFUS, B. M., HOGANCAMP, N. J., CRAMER, B. D., DAY, J., CLARK, R. J. & TASSIER-SURINE, S. A. A revised conodont biozonation for the Kinderhookian (Lower Mississippian). - Paper No. 88-10.

SUNDGREN, J. R. Provinciality in early Lochkovian (Early Devonian) *Caudicriodus* species and implications for correlation of the Silurian–Devonian Boundary. - Paper No. 117-1 [announces two new North American basal Devonian *Caudicriodus* species].

TIAN, H., FAN, M., WAITE, L., STERN, R. J. & VALENCIA, V. A tale of two Late Paleozoic arcs: Evidence from volcanic ash geochemistry in the Midland Basin, West Texas. - Paper No. 294-5.

WARREN, A. M., JIANG, G., HUANG, S. & MORALES, D. Paleoenvironmental changes across the Late Devonian-Early Mississippian transition. - Paper No. 200-7.

STRATI 2019 – Third International Congress on Stratigraphy, Milano

Devonian contributions

ARETZ, M. & CORRADINI, C. The redefinition of the Devonian/Carboniferous Boundary: state of the art.

BECKER, R. T. Principles of Devonian ammonoid zonations.

BRETT, C. E., VER STRAETEN, C. A., BAIRD, G. C., BEARD, A., BOYER, D. L., IVANY, L. C., JUNIUM, C., OVER, D. J. & UVEGES, B. Drowning the Shallow Water Model for Middle and Upper Devonian Black Shales of New York State.

DA SILVA, A. C., ZEEDEN, C., HILGEN, F. J., BRETT, C. E., BARTHOLOMEW, A., VER STRAETEN, C. & DEKKERS, M. J. Precession and obliquity length extracted from a Devonian record from New York State, U.S.

DA SILVA, A. C., HLADIL, J., CHADIMOVA, L., SLAVIK, L., HILGEN, F. J. & DEKKERS, M. J. The quest for a trustworthy paleoclimatic proxy in a Lower Devonian hemipelagic succession from the Czech Republic.

DOJEN, C., LUKOSZ, R., CÍGLER, V. & KUMPAN, T. Environmental implications by Famennian and Tournaisian Ostracodes from the Moravian Karst (Czech Republic).

EVDOKIMOVA, I. O. & SOBOLEV, N. N. The Pragian/Emsian key section in the Novaya Zemlya Archipelago (Arctic Russia) - new ostracod data.

GIRARD, C., CORNÉE, J.-J., CAMPS, P., CORRADINI, C., MOSSONI, A. & FEIST, R. Magnetic susceptibility records challenge Late Devonian paleogeographic relations between Avalonian and Gondwanan margins.

HASSANZADEH, A., BAHRAMMANESH, M., MADJIDIFARD, M. & KHAKSAR, K. Some genera of Brachiopods, D/C boundary in Hoz-e-Dorah Section, Tabas area (SE Tabas), Iran.

HUŠKOVÁ, A. & SLAVÍK, L. Discussion on phylogeny of biostratigraphic markers among spathognathodontidae (Conodonta) around the Silurian/Devonian boundary.

KOSSOVAYA, O. L., PETROV, E. O., EVDOKIMOVA, I. O., SHMANYAK, A. V., ZHURAVLEV, A. V., LEONTIEV, D. I., BERBENEV, M. O. & YUDIN, S. V. New analytic study of Devonian-Permian deposits in the Polar Urals (Kozhim River) and Pay-Khoi (Yugorsky Peninsula).

LIAO, J.-C., VALENZUELA-RÍOS, J. I., GARCÍA-LÓPEZ, S. & CARLS, P. Late Eifelian (Middle Devonian) Geoevent: timing and characterizing of the Kačák Episode in the Iberian Peninsula (Spain).

LIAO, J.-C., GIRARD, C. VALENZUELA-RÍOS, J. I. & FEIST, R. New conodont data from the Middle-Upper Devonian boundary stratotype section at Col du Puech de la Suque (Montagne Noire, France).

LU, J.F., VALENZUELA-RÍOS, J. I. & LIAO, J.-C. Conodont Biostratigraphy of the Yukiang Formation in the Liujing area of Guangxi, South China.

LÜDDECKE F. & HARTENFELS S. Famennian conodont biostratigraphy and biofacies of the Minervois Nappe (Ravin de la Fontaine de Santé, Montagne Noire, Southern France) – a reinvestigation.

MARSHALL, J. E. A. There was a mass extinction in plants at the Devonian-Carboniferous Boundary.

PAGE, K. N. & GIBSON, T. Brachiopod faunas of the Type Devonian, SW England: Contrasting patterns of extinction in the Late Devonian across a terrane boundary.

SLAVÍK, L. & HLADIL, J. Early Devonian conodonts and bioevents in the Prague Synform.

SÖTE, T. & BECKER, R. T. Lower Famennian ammonoid stratigraphy in the Canning Basin (Western Australia).

STINKULIS, G. & LUKŠEVIČS, E. Vertebrate assemblages in the tidally influenced siliciclastic deposits of the epeiric Baltic Devonian basin.

VALENZUELA-RÍOS, J. I. Some thoughts regarding the position of the base of the middle Lochkovian (Lower Devonian).

VALENZUELA-RÍOS, J. I. & LIAO, J.-C. Conodonts as a tool for challenging Geodynamic interpretations: two examples from the Devonian of the Spanish Pyrenees.

ZAMBITO, J., DAY, J. & MCLAUGHLIN, P. Integrated Stratigraphy of the Middle Devonian Lake Church and Thiensville Formations, Western Michigan Basin, U.S.A.

ZHANG, N., JIANG, H. & WANG, G. Radiolarians and associated conodonts through the D-C boundary from bedded cherts of Bancheng section, Qinzhou city, southeastern Guangxi, South China.

MEMBERSHIP NEWS

CM Gordon C. BAIRD

Much of 2019 was devoted to writing parts of three summative chapters on Devonian chronostratigraphy as part of a multi-authored geochronological volume on the Devonian of New York and adjacent region. One chapter, co-authored with Carlton BRETT (University of Cincinnati) and Alexander BARTHOLOMEW (S.U.N.Y. New Paltz), reviews numerous unit divisions of the Givetian Hamilton Group. A second chapter, co-authored with Jay ZAMBITO (Beloit College) and Carlton BRETT, is devoted to the middle-to-late Givetian Taghanic Stage succession and succeeding Geneseo Formation. A third Chapter, with several co-authors, synthesizes the regional stratigraphy of the late Famennian stratigraphy and events through the states of New York, Pennsylvania, and Ohio. This volume, both honoring and updating the work of L.V. RICKARD, is being assembled by Charles VER STRAETEN, the New York State Stratigrapher at the New York State Geological Survey, to be published through the Paleontological Research Institution with anticipated publication in 2020.

Efforts continue, in conjunction with Carlton BRETT and museum staff at the Paleontological Research Institute in Ithaca, NY, to build and organize a large, digitally curated, stratigraphic collection of Devonian-age rock samples and associated fossils that we have assembled over a 45 – year period. Over 2200 samples, mainly from New York divisional units, spanning Pragian through earliest Famennian stages, had been labeled, boxed, and transported to P.R.I. as of September 2019.

I also conducted stratigraphic fieldwork on late/latest Famennian rock units (Cleveland Shale Member, Bedford Formation, and Berea Formation) in northern and central Ohio to better characterize the signatures of end-Devonian Hangenberg biocrisis events in that area.

Publications

VER STRAETEN, C., BRETT, C. E., BAIRD, G. C., BOYER, D., LINDEMANN, R., IVANY, L., OVER, D. J. & WITZKE, B. (2019). Drowning the shallow water model for Middle and Upper Devonian black shales, New York State: A Comment. - Geology, **47** (reply to article by SMITH et al. 2019 in Geology, 47 (3): 279-283.

BRETT, C. E., ZAMBITO, J. J. IV, BAIRD, G. C., ABOUSSALAM, Z. S., BECKER, R. T. & BARTHOLOMEW, A. J. (2018). Litho-, Bio-, and sequence stratigraphy of the Boyle-Portwood succession (Middle Devonian, central Kentucky, U.S.A.). - Palaeobiodiversity and Palaeoenvironments, **98**: 331-368, https//doi.org/10.1007/s12549-018-0323-6.

TM R. Thomas BECKER, CM Z. Sarah ABOUSSALAM, CM S. HELLING and the Münster Group

As in the past years, work on the Devonian of Morocco played a major role since the last report. Field work in spring 2019, jointly with Till SÖTE and Philip HERBERS, concentrated on neglected sections in the Tafilalt and Maider, on the filling of knowledge gaps, and on the exploration of so far unstudied regions, such as the region S of Tazzarine, where the Lower Devonian rests on a large mountain (Jebel Saredrar) formed entirely by Silurian black orthoceratid limestone. For anybody interested in the area, we can recommend the "Camp Saredrar", a small, privately owned paradise at the foot of the Palaeozoic. In the Tafilalt/Maider, there was some focus on the Frasnian-Famennian boundary, as a base for the Ph.D. studies of Till and Felix LÜDDECKE. One of the finest, so far poorly studied F-F succession is situated at Rich Gaouz in the western Tafilalt. We also re-collected the Rich Bou Kourazia in the SW Maider, one of the best sections for the correlation of post-Kellwasser goniatite-conodont radiations. At the eastern Aguelmous, a lateral section to Lambidia exposes the so far most ammonoid-rich succession through the global Dasberg Event and overlying strata in basinal shale facies. An attempt to re-collect Upper Devonian sections in the eastern Tafilalt failed because the military zone around the Moroccan-Algerian border has been largely expanded. For example, this made our Ouidane Chebbi-West sections inaccessible. Now one can just drive until Tisserdimine, not beyond. But the unexpectedly forced diversion resulted in the discovery of a new fossiliferous lower/middle Famennian section at the eastern end of the Tisserdimine ridge. On the way to the eastern Anti-Atlas we continued our detailed survey of the previously unknown Middle Devonian at the foot of the High Atlas N of Ouarzazate (Talioune section). We collected several new upper Givetian ammonoids but their source in a mostly covered steep slope formed by

Eovariscan conglomerates is still unclear. Afterwards, we met up with Amine TALIH from Rabat (Université Mohamed V), who is currently working on a Ph.D. on the sedimentology and structural geology of the autochthonous Devonian of the Tinejdad region. This led to further sampling at Oued Ferkla and SE of the Bou Tisdafine (Fig. 1).

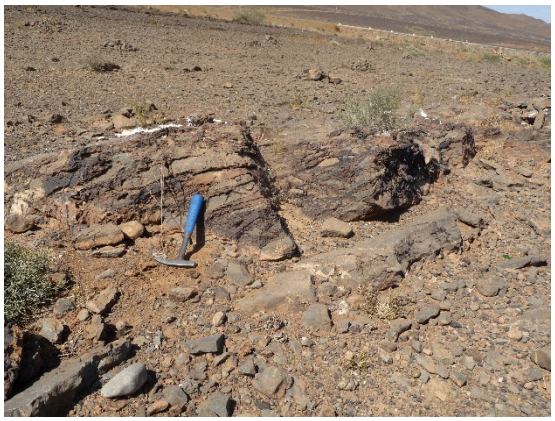


Fig. 1: Eovariscan (Givetian), hematite impregnated breccia bed at Bou Tisdafine SE, area of Southern Variscan Front.

Jointly with Christian KLUG, Dirk FUCHS, Ahmed EL HASSANI, Kathleen RITTERBUSH, and Daniel MARTY, the editing of the proceedings volume of the 10th International Cephalopod Symposium, which the Münster Group organized jointly with Ahmed and others in spring 2018 in Fes, Morocco, was completed (KLUG et al. 2019). The issue was dedicated to the late Jürgen KULLMANN (see his obituary in SDS Newsletter 33). It includes our discovery of the oldest Devonian goniatites of Morocco (*Praechebbites* n. gen., Fig. 2), which are correlated with the global record of oldest ammonoids (BECKER et al. 2019). The advanced morphology of the new genus led to the conclusion that there must be even older faunas that are still to be discovered. Other goniatite work progresses more slowly, e.g. descriptions of further upper Givetian, lower/middle Frasnian and upper Famennian (Dasberg Event Interval) faunas.

In the Rhenish Massif, the fruitful co-operation with Agnes PISARZOWSKA, Greg RACKI and others resulted in a detailed manuscript (PISARZOWSKA et al. 2019) on the Middlesex/"*punctata*" Event at the long-known Padberg Section in the eastern Sauerland (turbiditic volcanic seamount facies). A review of global conodont and carbon isotope data led to a refined correlation. It showed that the main isotope spike does not start in the *punctata* (= MN 5) Zone, but everywhere in the level of the first *Ancyrodella nodosa* (= *gigas* Morphotype 1), at the top of MN Zone 4 (*transitans* Zone). SDS should re-consider the definition of the base of the proposed Middle Frasnian substage. It seems that an *Ad. nodosa* Zone is much easier to recognize in most regions than the base of the *punctata* Zone. Also, it would correlate strictly with the anoxic, transgressive Middlesex Event and the initiation of one of the most significant positive carbon isotope excursion in the Palaeozoic. The new data also require a re-evaluation of the question whether there was a causal connection between the isotope spike and the contemporaneous, famous Alamo Impact in Nevada.

Fig. 2: A paratype of the oldest Tafilalt goniatite, *Praechebbites debaetsi*, from the top *Deiroceras* Limestone (top *Eol. excavatus* M114 Zone, basal Emsian).

We continue to study Rhenish Devonian reefs. These may develop a new economic importance, as reservoirs for deep geothermal energy projects. In the Wülfrath Reef Complex, colleagues from the Geological Survey at Krefeld discovered a new goniatite bed that indicates a phase reef drowning. It may represent the Upper Kellwasser level but its conodonts are exceedingly distorted and very difficult to identify. There are also some new biostratigraphic ages for black shale intercalations and the final drowning of the Hofermühle, Neanderthal, and Hagen-Balve reefs (e.g. STICHLING et al., in prep.).

Jointly with Sven HARTENFELS and Sandra KAISER, investigations at the D/C boundary continued. We still have to secure the important conodont collections from Franconia of Harald TRAGELEHN. In the Rhenish Massif, our regional GSSP favorite at Borkewehr (Wocklum) was

demonstrated to excursions members in conjunction with the International Congress on the Carboniferous and Permian (HARTENFELS & BECKER 2019, HERBIG et al. 2019). Some re-sampling at the famous Drewer section showed a major problem of that section: a common very poor conodont yield. The most critical question to solve is the precise taxonomy, with strict definitions of new subspecies and morphotypes, in the *Protognathodus collinsoni-kockeli* lineage. A requested (by the D/C Boundary Task Group) review of Rhenish D/C boundary sections (BECKER, HARTENFELS & KAISER, in prep.) is close to completion. In parallel, work on Moroccan D/C boundary section continued. Important goniatite results for the Mkarig and Lalla Mimouna sections were presented at Cologne (BECKER 2019). At the Task Group Meeting, a general overview of Moroccon sections was given (without abstract). Unfortunately, the joint international and interdisciplinary efforts concerning the Kule section of Uzbekistan have not progressed much.

Another major task was the completion of the Devonian chapter, jointly with Anna-Christine DA SILVA, John MARSHALL, Gabi and Jim OGG, for the GTS 2020 volume, which will come out in summer 2020. Felix GRADSTEIN is the main project editor and without his pushes, things would have lasted much longer. There will be a new absolute time-scale (beyond our responsibility), but it is clear that we need many more biostratigraphically well-tuned zircon age tie points before stability of the time scale will become in sight.

Despite excellent ratings by all external reviewers, our research proposal concerning the role of the Afro-Appalachian Seaway for global palaeobiogeography, palaeoceanography and palaeobiodiversity was not successful. We will try to study relevant sections, for example in the Tan-Tan region, in the frame of other projects. Jointly with Ahmed EL HASSANI we started to write chapters for a volume to be published by the Geological Survey of Morocco on the Devonian stratigraphy, facies development, palaeogeography and synsedimentary tectonics of the Moroccan Meseta. It gives us the opportunity to publish at least some of the wealth of new data, including many ammonoids, conodonts, and thin sections that we assembled in the last ten years. We hope to finish ten chapters until early next year. Of course, we intend to produce a volume that becomes a MUST for all Devonian stratigraphers.

CM Z. Sarah ABOUSSALAM

The year 2019 started with a most pleasant event. Sarah´s scientic research was rewarded by a nomination to become a Corresponding Member of the Royal Academy of Sciences and Technics of Morocco. The inauguration took place in February in Rabat, during the annual meeting of the academy. She is part of an only small group of geoscientists and the only external member from Germany.

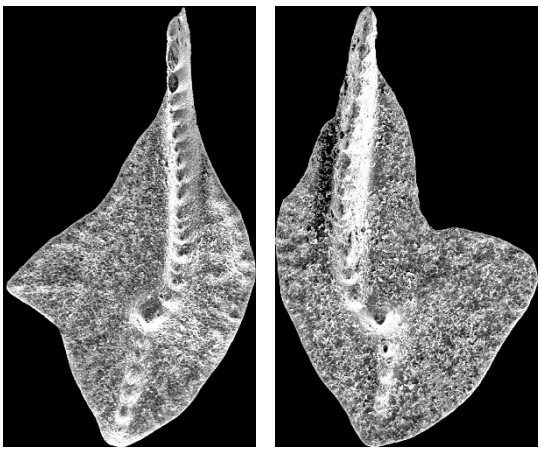


Fig. 3: Two unusual palmatolepids from intra-Kellwasser beds (MN Zone 13a) of Anajdam, S of Mrirt, Moroccan Meseta.

Her conodont work focused on additional samples from the Moroccan Meseta, for example from the Skoura region (Taliouine, Tizi-n-Ourthi, Asserhmo), and from the Tafilalt. The new samples from Seheb-el-Rhassal confirmed the results of her Ph.D. Thesis. The section is currently the best in the Anti-Atlas for the middle/upper Givetian boundary, especially since the Ouidane Chebbi region is now very difficult to access. A major task is the final identification of all Meseta conodont samples (Fig. 3), corresponding microfacies analysis, and section log drawings for the planned Meseta volume (see above).

In the Rhenish Massif, the conodont stratigraphy for the joint paper on the Padberg section and the Middlesex Event was the prime work. In addition, there were some new samples from reef complexes (Oberrödinghausen, Neanderthal). The second Wulankeshun paper (Famennian of Xinjiang) with WANG Zhihong and Sven is still waiting for Thomas…

CM Stephan Helling

Stephan has spent much of the last year with various excavations campaigns, ranging from archaeology to Devonian palaeontology. A focus of his trilobite work were upper Famennian faunas from pelagic shales of Wuppertal-Üllendahl. These

include ontogenetic stages of proetids (*Drevermannia*) and phacopids (*Dianops* and *Phacops* ex gr. *granulatus*), which will be published in at least two papers. This let to a further delay of manuscripts on Pragian trilobites from the Moroccan Meseta (Ain-al-Aliliga) and the Southern Variscan Front (Taourirt Khellil, SE of Tinerhir). A new interest are rare new odontopleurid specimens from the upper Givetian/lower Frasnian of the Rhenish Massif (Hofermühle, Beul).

Research assistants/Ph.D. students

FELIX LÜDDECKE finished his M.Sc. on the Famennian conodont biostratigraphy and biofacies of the Minervois Nappe of the Montagne Noire, southern France, late in 2018. Final results were presented at the 3rd ISC - STRATI in Milano (LÜDDECKE & HARTENFELS 2019). Prior to the 19th ICCP in Cologne, he accompanied Wenkun QIE and Sven HARTENFELS during field work in the Rhenish Massif, which focused on the Famennian of the Effenberg and Frasnian/Famennian transition at Beringhauser Tunnel. Felix is now continuing his research as a research assistant. His Ph.D. studies focus on the ontogeny, taxonomy, palaeodiversity and extinction patterns of conodonts across the F-F boundary, with special respect to climatic and facies gradients, conodont biofacies, and palaeobiogeography. Relevant conodont samples from Morocco, southern France, the Saxothuringian Zone and the Rhenish Massif assembled in the last decade. As a first topic, he is currently reinvestigating the famous Martenberg section in search for the *jamieae* Zone around the middle/upper Frasnian boundary.

Till SÖTE became a research assistant in late 2018. He is currently working on a PhD thesis dealing with the morphometry, taxonomy, palaeobiogeography and phylogeny of tornoceratids (Goniatitida) around the global Kellwasser Crisis. The first project deals with a completely new Intra-Kellwasser (UD I-K) fauna from the Sand Formation of Bergisch-Gladbach, which was mostly provided by the amateur collector Carlo HERD. Jürgen BOCKWINKEL is also co-operating closely and supplied nice photographs (Fig. 4). The Sand Formation yielded a highly diverse tornoceratid fauna with 21 species, 6 genera, and 10 new taxa. First results were presented at the annual meeting of the Paläontologische Gesellschaft in Munich (SÖTE et al. 2019). A joint manuscript is close to completion. Subsequently he will work on a contemporaneous, new and rich goniatite fauna from Büdesheim in the Eifel Mountains, which is somewhat younger than the diverse fauna from the classical Büdesheim Goniatite Shale.

Fig. 4: *Serramanticoceras serratum* from the Sand Formation (*"Archoceras" varicosum* Zone, UD I-K) of Bergisch Gladbach, western Rhenish Massif (photo J. BOCKWINKEL)

Stephan EICHHOLT is mostly occupied by his full time job in an environmental geology company. On the side, he is slowly working on a second paper on the Devonian reef complexes of the Moroccan Meseta. This second contribution will deal with the Oulmes to Azrou region.

M.Sc. Students

Lucas AFHÜPPE started to investigate the partly common Middle Devonian (mostly upper Givetian) oncoceratids and discosorids of the Tafilalt Platform. He is faced with an unexpected morphological variability; almost all specimens must have been adults, but partly at very different size.

Lara HOLDERIED studies middle Frasnian goniatites from two sections in the Canning Basin of Western Australia. Her task is to use ontogenetic morphometry to clearly define all present species (of *Manticoceras, Prochorites, Probeloceras, Gogoceras,* and *Acanthoclymenia*) and to compare them with contemporaneous, closely related forms of Europe and Eastern North America. This will give a base for an improved palaeobiogeographic understanding.

Lars OTTO started a M.Sc. project on so far undescribed Devonian bactritids from the Canning Basin and Southern Morocco. As a novelty in the group, he will apply simple morphometry and statistics to clarify species variability and ontogeny. There is also unpublished material from the Rhenish Massif for comparisons.

Konrad SEYFFERT also applies detailed morphometry in his project, but on Emsian phacopids of southern Morocco (Fig. 5). So far, there are a very few population, ontogenetic and statistical approaches in that group. However, this is regarded as essential in order to reach a refined taxonomy. The description and revision of faunas will form a base for evaluations of biodiversity and regional phylogeny.

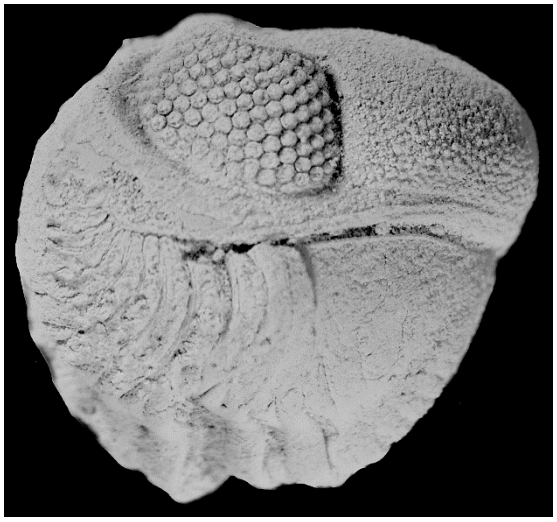


Fig. 5: Enrolled new specimen of the large-eyed phacopid *Austerops kermiti* (MCKELLAR & CHATTERTON, 2009) from the upper Emsian of Rich Tamelougou, western Dra Valley.

Philip HERBERS identified the conodonts from Famennian foraminifer samples from Col de Tribes, Montagne Noire, left over from the M.Sc. study of Anna SAUPE (see 2018 report). These faunas will form a base for modern statistical analyses of conodont biofacies, using cluster analysis and other features of the R software package. The aim is to better recognize and define conodont subfacies types based on a species group approach, rather than on the simplified, outdated count of "mega-genera", such as *Polygnathus* and *Palmatolepis.*

Maro-Pascal ELLERKAMP finished his M.Sc. thesis on Givetian gastropods from the western Dra Valley, which remained unstudied although they were collected almost 20 years ago by Thomas and Sarah from pelagic black shale facies. As expected, there are several new taxa, but there are also various forms that are long known from oxic peri-reefal facies of the Rhenish Massif. This led to comparisons, which also investigated the influence of the global Taghanic Crisis on gastropods from the deeper water realm.

Publications

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CM Alain BLIECK

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I retired from the CNRS on August 2014 and was then an emeritus senior scientist. After personal health problems (end of 2017 - beginning of 2018) and professional problems with the CNRS in 2018), I had to leave my office at the University of Lille, and am now at home. I am still working on early vertebrates, and in particular on pteraspidomorphs (Ordovician to Devonian), in collaboration with David K. ELLIOTT (Northern Arizona University, Flagstaff). We are working for the Handbook of Palaeoichthyology, vol. I (in progress with other authors, and in particular with Philippe JANVIER, MNHN, Paris, France).

Publications

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CM Iliana BONCHEVA

My recent work has been carried out in the frame of the National Science Program on "Environmental Protection and Reduction of Risks of Adverse Events and Natural Disasters", approved by the “Resolution of the Council of Ministers” and supported by the Ministry of Education and Science (MES) of Bulgaria. I continue working on Iranian geological sections and conodont paleontology, biostratigraphy and paleoinvironment together with colleague from Iran - University of Isfahan. A few papers have been published in collaboration.

Publications

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(proposed CM) **Robert B. BLODGETT**

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TM Carlton E. BRETT

During 2019, I continued working steadily on the revision of the New York State Devonian Stratigraphy and Correlation Chart, edited by Charles VER STRAETEN (New York State Geological Survey), Gordon BAIRD (SUNY College Fredonia), Alex BARTHOLOMEW (SUNY New Paltz), and Jay ZAMBITO (Beloit College). I have prepared three extensive manuscripts on stratigraphic terminology, and the re-description of units and facies analysis of the Middle Devonian of New York and adjacent regions. At present two manuscripts are in review, one on the Eifelian to lowest Givetian Onondaga and Marcellus formations (VER STRAETEN et al., submitted), and a second on the mid-upper Givetian Taghanic (Tully-Geneseo) interval (BAIRD et al., submitted). During 2019 I synthesized some 35 years of work on correlation and sampling of the Middle Devonian in a 200 page report, which, for the first time, documents and updates every member, submember, and bed of this succession. This document will be submitted in the next month to be published as a part of a major volume in the *Bulletins of American Paleontology* through PRI. The full volume will be published electronically (print on demand). Our intent is to have the text and charts published in time for the SDS Devonian meeting in New York State in the summer of 2020.

Gordon BAIRD and I are continuing to work with the Paleontological Research Institution (PRI) to assemble and fully document our combined collections made over the past four decades, from the Devonian of New York State and elsewhere. As part of this initiative, a wing of a building at PRI is being renovated, in part, to accommodate the several ton stratigraphic collection. This effort is combined with plans for a digital atlas of Middle Devonian fossils and an extensive database of geographic and stratigraphic data based on these collections.

During this past year, considerable time was devoted to two Devonian projects that were unanticipated at the time of the previous report. First, Gordon BAIRD and I worked on the completion of a co-authored manuscript by the late William T. KIRCHGASSER (formerly SUNY Potsdam). The paper, on Middle and Upper Devonian goniatites from central Pennsylvania, is now in press as part of a *Geological Society of America Special Paper* on Devonian studies in honor of the late John DENNISON. This project also involved curation of a suite of goniatite and conodont specimens collected by Bill, assigning them museum numbers, and repositing them in the US National Museum, as desired by Bill.

A second project stemmed from a paper published in March 2019 (SMITH, L. B., SCHIEBER, J. & WILSON, R. D. (2019). "Shallow-water onlap model for the deposition of Devonian black shales in New York, USA. *Geology*, **47**: 279-283."). This study presented evidence, which suggested that most Devonian back shales in New York accumulated in shallow water (a few 10s of meters at most). This surprising conclusion encouraged a series of New York researchers, including Charles VER STRAETEN, Gordon BAIRD, and myself, to reconsider our long-held assumptions about the moderately deep-water origin of these black shales. In collaboration, we marshalled more than a dozen lines of stratigraphic, sedimentologic, and palaeontologic data that oppose a very shallow water setting and yield a strong consilience of evidence for water depths of no less than 50 meter and up to 150 m for deposition of most New York black shale units. A preliminary summary of evidence was presented at the SDS symposium at the 3rd Strati conference in Milano; a brief comment

on the SMITH et al. (2019) paper has just been accepted by *Geology* (VER STRAETEN et al. 2019) and a longer detailed summary paper is in preparation.

I also continued to work collaboratively with researchers on Gondwana Devonian paleontology and taphonomy: Dr. Wendy TAYLOR and Mhairi REID in Capetown University, South Africa (see paper by REID et al. 2019), Dr. Rodrigo HORODYSKI (new CM of SDS) and colleagues, curator at the Geological History Museum of Rio Grande do Sul State Vale do Rio dos Sinos University, Brazil (see paper by HORODYSKI et al. 2019), and with CM Luiza PONCIANO Universidade Federal do Estado do Rio de Janeiro, Brazil.

Finally, research continued with Anne Christine DA SILVA on the Devonian cyclostratigraphy of New York State. This research will provide a well-tuned geochronology for the upper Emsian and Eifelian stages. It indicates that facies and biotas were responding to short, intermediate, and long term cyclicity mediated by climatic change and/or eustatic sea level oscillations. This research will be featured in a symposium on astrochronology for the SDS meeting at Geneseo, July, 2020.

In addition, I am working with Thomas BECKER to develop the concept of two substages of the Eifelian Stage, although this proposal is in preliminary status. A boundary between lower and upper Eifelian substages at the base of the *Tortodus kockelianus* Zone would appear to be a useful and natural, if slightly unequal division. In this way each substage would commence with significant eustatic, carbon isotopic and biotic events. The lower substage would be based as at present at the base of the *Polygnathus partitus* Zone and would include, near the lower boundary, the global Chotec Event, the onset of a modest positive isotopic excursion, and evidence for global transgression.

The upper substage would include near its base the newly recognized but significant Bakoven and Stony Hollow events (see DESANTIS & BRETT, 2011) and the onset of a stronger positive isotopic excursion, as well as evidence for strong eustatic sea level rise. It's top would be defined as the base of the Givetian Stage (base of *Po. hemiansatus* Zone) and would likewise coincide approximately with the global Kacak Event. The lower Eifelian substage would use the well known section at Wetteldorf, Germany, coinciding with the base Eifelian golden spike section. At present the quest is on for a suitable stratotype section for the base of the upper Eifelian substage. Candidate sections should be in conodont-rich pelagic facies (e.g. in Morocco, Spain, Bohemia, South China, or Australia). Further work will be needed to establish precise correlations with the ammonoid and dacryoconarid record, as well as correlations into the shallow-water realm with brachiopods and into near-shore settings with miospores. Other authors are welcomed to contribute to these questions.

Publications

BRETT, C. E., ZAMBITO, J.J. IV, MCLAUGHLIN, P. I. & EMSBO, P. (2019 online). Revised perspectives on Devonian biozonation and environmental volatility in the wake of recent time-scale revisions. - Palaeogeography, Palaeogeography, Palaeoecology, 509.

HORODYSKI, R. S., BRETT, C. E., SEDORKO, D., BOSETTI, E. P., SCHEFFLER, S. M., GHILARDI, R. P. & IANNUZZI, R. (2019). Storm-related taphofacies and paleoenvironments of Malvinokaffric assemblages from the Lower/Middle Devonian in southwestern Gondwana. - Palaeogeography, Palaeoclimatology, Palaeoecology, **514**: 706-722.

REID, M., TAYLOR, W. L., BRETT, C. E., HUNTER, A. W. & BORDY, E. M. (2019). Taphonomy and paleoecology of an ophiuroid-stylophoran obrution deposit from the Lower Devonian Bokkeveld Group, South Africa. - Palaios, **34**: 212–228.

VER STRAETEN, C., BRETT, C. E., BAIRD, G. C., BOYER, D., LINDEMANN, R., IVANY, L., OVER, D. J. & WITZKE, B. (2019). Drowning the shallow water model for Middle and Upper Devonian black shales, New York State: A Comment. - Geology, **47**.

TM Rainer BROCKE

The year 2018 was mainly affected by the move of the extensive palaeontological and geological collections and labs from our former location in the Kuhwaldstrasse to the new (old) buildings close to the Senckenberg museum in the Senckenberganlage. Thus, time for science and field work was quite limited.

Our activities in the Eifel area and the Hunsrück are going on. Together with Carl BRETT and German colleagues we had a presentation on a section in the Hillesheim Syncline. A second poster contribution showed exceptionally preserved spores

from the Hunsrück shale; both were presented at the IPC 5 Meeting in Paris.

Publications 2018

BROCKE, R., RIEGEL, W., BRETT, C. E., HARTKOPF-FRÖDER, C., LENZ, O., KÖNIGSHOF, P., SCHINDLER, E. & WILDE, V. (2018). Palynology and microfacies of Middle Devonian leperditian-rich beds from the classical Eifel area (Germany). – 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract Book: 817.

BROCKE, R., RIEGEL, W., LÜNSDORF, N. K. & WILDE, V. (2018) Exceptional preservation of spores from the Lower Devonian Hunsrück Shale, Rheinisches Schiefergebirge, Germany. 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract Book: 786.

CM Carole BURROW

is still working on the Middle Devonian acanthodians of Scotland and Spitsbergen with Mike NEWMAN and Jan DEN BLAAUWEN, including correlating occurrences in the Baltic and elsewhere. The three publications for the AGP volume based on presentations at the Early Vertebrates/Lower Vertebrates conference in Poland in 2017, on which Carole is the lead author, were published in a special volume of AGP in 2018. She is also collaborating with John MAISEY and colleagues on investigations into the structure of the hard tissues of early sharks. A manuscript is in preparation with Sue TURNER on microvertebrate assemblages from the ?Early Devonian of the Northern Territory. However, this work is dependent on Sue's re-evaluation of all the Australian late Early-early Middle Devonian thelodont taxa. Other work focusses on the dental structures in Early Devonian placoderms with Yuzhi HU, Gavin YOUNG and colleagues, and with Kate TRINAJSTIC and colleagues on Late Devonian placoderms. Carole is also undertaking further work on the Cravens Peak Beds fauna from the small limestone outcrop – the only such deposit anywhere in the Devonian of central Australia.

TM Carlo CORRADINI

Since the middle of September 2019, I moved to Trieste University. New address:
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My research is mainly devoted to conodont biostratigraphy in several regions (mainly the Carnic Alps, Sardinia and Montagne Noire), from Silurian to Lower Carboniferous, specially focusing on the Silurian/Devonian and Devonian/Carboniferous boundaries. The latter is mainly related with the International Task Group on the redefinition of the Devonian/Carboniferous Boundary (led by M. ARETZ, Toulouse). Several manuscripts on the D/C boundary in various areas of the world have been submitted for a thematic volume to be published in *Palaeobiodiversity and Palaeoenvironments*.

The main research on the Devonian of the Carnic Alps deal with the geology and stratigraphy of selected key areas (with several co-authors). A paper on conodont distribution across the Silurian/Devonian boundary in the Carnic Alps, and one on a multidisclinary study of the Lochkovian Rio Malinfier West section, were published. Manuscripts on the Lake Wolayer area and the central sector of the Carnic Alps are in progress. Also, a new geological map of the central sector of the Carnic Alps, updated according to the recent lithostratigraphical scheme, is almost completed and will be published in a short time (PONDRELLI et al.).

A short field trip to the Devonian reefs and related environments of the Carnic Alps was organized in connection with the "13th International Symposium on Fossil Cnidaria and Porifera" (August 30-September 2, 2019).

In the Montagne Noire, research deals with conodonts, stratigraphy and facies in the Famennian and lowermost Tournaisian (with C. GIRARD, R. FEIST, and others). In Sardinia, the revision of the classical Mason Porcus section is in progress (with Maria G. CORRIGA).

The reconstruction of the conodont apparatus of *Ozarkodina eladioi* was published (CORRIGA & CORRADINI 2019). Other taxonomic studies on Early (with Maria G. CORRIGA) and Late Devonian (with C. GIRARD and others) conodonts are in progress.

Extra-European Devonian researche deals with the conodont stratigraphy of the Silurian and lowermost Devonian of the Precordillera, Argentina (with M.-J. GOMEZ, A. MESTRE, and S. HEREDIA).

Devonian publications 2018-2019

FERRETTI, A, SCHÖNLAUB, H.-P., TODESCO, R. & CORRADINI, C. (2018). Conodont fauna and biostratigraphy of the Valentin Törl Section, Carnic Alps, Austria. - IPC 4 Paris, Abstract: 530.

CORRADINI, C. & SPALLETTA, C. (2018). Continuity of fossil record and biozonation schemes: an example across the Devonian/Carboniferous boundary. - IPC 4 Paris, Abstract: 789.

SPALLETTA, C. & CORRADINI, C. (2018). History of conodont researches in the Carnic Alps (Austria and Italy): an overview. Gortania Geologia, Paleontologia, Planetologia, **39**: 5-26.

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CORRADINI, C., CORRIGA, M.G., PONDRELLI, M., SERVENTI, P., SIMONETTO, L. & FERRETTI, A. (2019). Lochkovian (Lower Devonian) marine-deposits from the Rio Malinfier West section (Carnic Alps, Italy). - Italian Journal of Geosciences, **138** (2): 153-170, doi: 10.3301/IJG.2018.33

GIRARD, C., CORNÉE, J.-J., CAMPS, P., CORRADINI, C., MOSSONI, A. & FEIST, R. (2019). Magnetic susceptibility in Late Devonian records: a challenge for paleogeographic scenarios around the Rheic Ocean. - STRATI 2019 Abstract Book: 184.

ARETZ, M. & CORRADINI, C. (2019). The redefinition of the Devonian/Carboniferous Boundary: state of the art. - STRATI 2019 Abstract Book, 199.

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CORRADINI, C., MOSSONI, A., CORRIGA, M.G. & SPALLETTA, C. (2019). The Devonian/Carboniferous Boundary in Sardinia (Italy). - In: HARTENFELS, S., HERBIG, H.-G., AMLER, M.A. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29-August 2, 2019, Abstracts. Kölner Forum für Geologie und Paläontologie, **23**: 66-67.

FEIST, R., CORNEÉ, J. J., CORRADINI, C., HARTENFELS, S., ARETZ, M. & GIRARD, C. (2019). Transect from near- to offshore in Devonian-Carboniferous Boundary sections of the stratotype area (Montagne Noire, Southern France). - In: HARTENFELS, S., HERBIG, H.-G., AMLER, M.A. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29-August 2, 2019, Abstracts. Kölner Forum für Geologie und Paläontologie, **23**: 97-98.

SPALLETTA, C., CORRADINI, C., FEIST, R., KORN, D., KUMPAN, T., PERRI, M. C., PONDRELLI, M. & VENTURINI, C. (2019). Review of the Devonian/Carboniferous Boundary in the Carnic Alps (Austria and Italy). - In: HARTENFELS, S., HERBIG, H.-G., AMLER, M.A. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29-August 2, 2019, Abstracts. Kölner Forum für Geologie und Paläontologie, **23**: 294-295.

CORRIGA, M. G. & CORRADINI, C. (2019). The conodont apparatus of *Zieglerodina eladioi* (VALENZUELA RIOS, 1994). - Bollettino della Società Paleontologica Italiana, **58**: 181-185. doi:10.4435/BSPI.2019.14.

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CORRADINI, C., SUTTNER, T. J., PONDRELLI, M., SIMONETTO, L., SPALLETTA, C., KIDO E., CORRIGA, M. G., FERRETTI, A. & SCHÖNLAUB H.-P. (2019). Lithostratigraphy of the Pre-Variscan sequence of the Carnic Alps: a work still in progress. - In: Geological Research in the Carnic Alps: from past to future, Udine, 23-24.09.2019: 7-10.

PONDRELLI, M., CORRADINI, C., SPALLETTA, C., SUTTNER, T. J., SIMONETTO, L., PERRI, M. C., CORRIGA, M. G., VENTURINI, C. & SCHÖNLAUB H.-P. (2019). The geological map of the central sector of the Carnic Alps (Austria-Italy). - In: Geological Research in the Carnic Alps: from past to future, Udine, 23-24.09.2019: 37-40.

CM Maria G. CORRIGA

My research is mainly devoted to Silurian and Devonian conodonts and biostratigraphy in several regions (mainly the Carnic Alps and Sardinia).

In the Carnic Alps, I am studying several classic and new sections of late Silurian and Early Devonian age, mainly in the central sector of the chain. A paper analyzing the conodont distribution across the Silurian/Devonian boundary in ten sections in various depositional settings, both shallow water and open sea, was recently published, as well as a multidisclinary study of the Lochkovian Rio Malinfier West section. I am also to new geological maps of the region in accord with the revised lithostratigraphical scheme.

In Sardinia, I am revising the conodont fauna of the classical Mason Porcus section.

My research also deals with Silurian and Devonian conodont taxonomy. The new genus *Walliserognathus* was proposed and the reconstruction of the conodont apparatus of *Ozarkodina eladioi* hasjust been published (CORRIGA & CORRADINI 2019). A paper on the ontogeny and generic assignment of *Ancyrodelloides carlsi* is in press.

Publications

SCHÖNLAUB, H.-P., CORRADINI, C., CORRIGA, M. G. & FERRETTI, A. (2017). Chrono -, litho- and conodont bio-stratigraphy of the Rauchkofel Boden Section (Upper Ordovician-Lower Devonian), Carnic Alps, Austria. - Newsletters on Stratigraphy, **50** (4): 445-469, doi: 10.1127/nos/2017/0391

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SUTTNER, T .J., KIDO, E., CORRADINI, C., CORRIGA, M. G., PONDRELLI, M. & SIMONETTO, L (2017). Late Eifelian to early Givetian conodonts of the Zuc di Malaseit Basso (ZMB) section. - Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, **23**: 242-245.

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CORRADINI, C., KIDO, E., SUTTNER, T., SIMONETTO, L., PONDRELLI, M., CORRIGA, M. G. & SPALLETTA, C. (2019). Devonian reefs of the Carnic Alps and related environments. - 13th International Symposium on Fossil Cnidaria and Porifera, Modena, 3-6 September 2019. Pre-Conference field Trip: 24 pp.

TM Anne-Christine DA SILVA

My research focused in 2018-2019 mostly on the Devonian of Czech Republic, Belgium, Germany and New York State in the U.S. This year we have been working on different successions, the Route 199 near Kingston (New York State, U.S.A.), encompassing part of the Emsian, in collaboration with C. BRETT (U. Cincinnatti), C. VER STRAETEN (New York State Museum), and A. BARTHOLOMEW (University of SUNY New Paltz). Some work is also in progress (high resolution ICPMS) on the Seneca Stone quarry, going through part of the Eifelian (work of D. Pas from Liege University and Utrecht University, in collaboration with C. BRETT and J. OVER from University of Geneseo). We also have current work in Czech Republic (collaboration with J. HLADIL, L. CHADIMOVA, L. SLAVÍK from the Czech Academy of Sciences) with the Pod Barrandovem section, going through the Zlíchov Formation (Emsian), with geochemistsry, magnetic susceptibility, magnetic hysteresis measurements. On the Pod Barrandovem section, some work allowed to highlight small scale millennial cycles (DA SILVA et al., 2019). With D. DE VLEESCHOUWER (University of Bremen), we are also working on the cyclostratigraphy of the Steinbruch Schmidt section (Germany). A master student did a project on the Sourd d'Ave section from Belgium, encompassing the Givetian-Frasnian boundar.

Publications

DA SILVA, A.-C.; DEKKERS, M. J.; DE VLEESCHOUWER, D.; HLADIL, J.; CHADIMOVA, L.; SLAVÍK, L. & HILGEN, F. J. (2019). Millennial-scale climate changes manifest Milankovitch combination tones and Hallstatt solar cycles in the Devonian greenhouse world. – Geology, **47** (1): 19-22 [open access].

PERCIVAL, L. M. E., DAVIES, J. H. F. L., SCHALTEGGER, U., DE VLEESCHOUWER, D., DA SILVA, A.-C., FÖLLMI, K.B. (2018). Precisely dating the Frasnian–Famennian boundary: implications for the cause of the Late Devonian mass extinction. Scientific Report, **8**: 9598.

CM James R. EBERT

Lithostratigraphic, biostratigraphic (chitinozoans), and sequence stratigraphic research in the Helderberg Group (Přídolí to Lochkovian) of New York State is ongoing. My current focus is on the sedimentary petrology of the Deansboro Formation (raised from member status) and the new Buckley Mill Formation, formerly considered a part of the Kalkberg Formation.

Undergraduate students in my Sedimentary Geology class measured paleocurrents from oriented orthocones and gastropods on a large, bedding plane exposure in the Green Vedder Member of the Manlius Formation in the Hudson Valley. The results from this project were presented at a regional meeting of the Geological Society of America (see abstract references below).

A new project has begun, using a newly acquired Gamma Surveyor Vario, a 2048 channel gamma-ray spectrometer with VB21 Probe (BGO detector 347cm^3). Last fall a test survey of the Onondaga Formation at Cherry Valley, New York measured K (%), U (ppm) and Th (ppm), which then were converted to API units and used to create a synthetic gamma ray log. The synthetic log was strikingly similar to a gamma ray log from a nearby exploration well. The preliminary results of this project were presented also at a regional meeting of GSA (abstract reference below). This project will continue with the eventual goal of building a synthetic gamma ray log for the entire Přídolí through Eifelian sequence from the famous Cherry Valley outcrops.

A detailed description of the Lochkovian Lac au Renard Tephra Cluster from the Indian Point Formation on the Gaspé Peninsula, Québec, Canada, is in review for publication in Atlantic Geology.

Devonian Publications

EBERT, J. R. &MATTESON, D. K. (in review). The Lac au Renard Tephra Cluster: A Record of Lochkovian (Lower Devonian) Volcanism in the Indian Point Formation, Gaspe Peninsula, Quebec, Canada. - Atlantic Geology.

EBERT, J. R. & MATTESON, D. K. (in review). Litho-, Bio-, and Sequence Stratigraphy of the Helderberg Group in the Appalachian Standard Succession (New York). - Submitted for eventual publication in revised Devonian stratigraphic chart of New York State to be published by the Paleontological Research Institution.

EBERT, J. R. (2019). A Synthetic Gamma Ray Log of the Onondaga Formation at Cherry Valley, New York. - Geological Society of America,

Abstracts with Programs, **51** (1), ISSN 0016-7592, doi: 10.1130/abs/2019NE-326924.

EVERY, M., RASCOE, S., SILBERT, Z., HARRISON, S., VITEVITCH, C., HARRINGTON, P., WESTMAN, D., ADAMS, D. & EBERT, J. R. (2019). Orientation of Cephalopods as Paleocurrent Indicators in the Green Vedder Member, Manlius Formation, New York State. - Geological Society of America, Abstracts with Programs, **51** (1), ISSN 0016-7592, doi: 10.1130/abs/2019NE-328273.

RETTEW, E., MARRONE, T., MAKARIUS, G., SZAWIEL, A., HARSHA, G., ELDRED, J., MORLANG, D. & EBERT, J.R. (2019). Orientation of Gastropods as Paleocurrent Indicators in the Green Vedder Member, Manlius Formation, New York State. - Geological Society of America, Abstracts with Programs, **51** (1), ISSN 0016-7592, doi: 10.1130/abs/2019NE-328288.

TM Yury A. GATOVSKY

Last year, the study of Devonian sections in different regions of Russia continued. A lot of time was spent on details of typical sections of the Devonian-Carboniferous boundary.

On the western slope of the Middle Urals, additional samples were taken for conodonts from carbonate interlayers from the Kosaya Rechka and Yadro sections. The interval corresponding to the Hangenberg Event (Crisis) is regionally represented by black clay limestones and breccias. Carbonate breccias probably correspond to the maximum of the Hangenberg regression. The first occurrence of *Siphonodella sulcata* is noted just above this stratigraphic level.

On the western slope of the Southern Urals, the D/C boundary in the sections of Sikaza and Zigan continue to be refined. Conodonts from these sections are being explored and will be published soon.

The Kolesovo section has been explored on the East European Platform. Large samples (5-10 kg) were taken for conodonts. Geochemical studies have also been done in this section. An important point is to find the first appearance of species of the genus *Patrognathus*. The boundary interval of the Kupavna Formation is characterized by a complex of conodonts of the species of the genera *Polygnathus* and *Bispathodus*.

Last July, a field trip to the sections of the Devonian eastern slope of the Middle Urals took place. The Devonian sections are represented by terrigenous and carbonate rocks. Conodont samples from the sections of the Upper Devonian of Kodinka, Pershino, Soharevo, and the Khvoshchevsky quarry were taken. The results of field studies were reported at the stratigraphic PALEOSTRAT-2019 meeting in Moscow.

The Upper Devonian conodonts of Belkovsky Island (Novosibirsk Islands, Russian Arctic) were studied and described. The conodonts of the Frasnian and Famennian stages are determined. The Nerpalakh Formation contains a complex of Lower Frasnian conodonts: *Palmatolepis transitans, Icriodus symmetricus, Polygnathus dubius, Po. decorosus, Po. aequalis, Po. xylus, Ancyrodella rotundiloba, Ad. rugosa, Mesotaxis falsiovalis, M. asymmetricus, Zieglerina ovalis*. The Chekur Formation includes a complex of conodonts of the Upper Frasnian: *Palmatolepis* sp., *Po. krestovnikovi, Ad.* cf. nodosa, and the Lower Famennian: *Pa. crepida, Pa. subperlobata, Pa. quadrantinodosalobata, Pa. sandbergi, Pa. regularis, Pa. perlobata perlobata, Pa. minuta minuta, Pa. minuta loba, Pa. weddigei, Ancyrolepis cruciformis, Icriodus cornutus, Pelekysgnathus planus*.

Together with mapping geologists, conodonts of Yakutia (Northeast Russia) were studied. In the limestones of the Datninskaya Formation on the left bank of the river Khatynakh-Sala, identified conodonts, such as *Drepanodus* sp. and *Ozarkodina remscheidensis remscheidensis* indicate the Lochkovian of the Early Devonian. Limestones of the Sagyr Formation on the river Esterictyah include the conodonts *Pandorinellina exigua philipi* and *Panderodus unisostatus*, giving an age for these deposits as Pragian. The main results were reported at a meeting of LOMONOSOV-2018 in Moscow.

A new location of Famennian conodonts in the Bilovo section (north-western regions of the East European Platform) was discovered. Conodonts are represented by species of the genus *Polygnathus*. This section is known in Russia for a large concentration of Upper Devonian fish.

The first Famennian conodonts were discovered on Bakalskaya Square in the Southern Urals. The age of the rocks is defined as Lower Famennian (*Palmatolepis triangularis* Zone). The conodont complex consists of *Palmatolepis triangularis, Pa. subperlobata, Pa. quadrantinodosalobata,*

Mitrellataxis ornata, *Polygnathus* sp., and "Spathognathodus sp." A publication is being prepared based on this material.

Also, Devonian deposits in wells of the Volga-Urals (southeast of the East European platform) were studied. It was possible to determine Upper Devonian conodonts. The Frasnian-Famennian boundary is established by the first appearance of *Palmatolepis triangularis*.

New conodont species of the genus *Polygnathus* from the Upper Famennian of the Urals and Cis-Urals are described together with A. PLOTITSYN. *Polygnathus tsygankoi* sp. nov. ranges from the *expansa* to *praesulcata* conodont zones. This species occupies an intermediate position in the phylogenetic lineage *Polygnathus atasuensis–Po. tsygankoi* sp. nov.*–Po. lobatus* sensu KONONOVA. *Polygnathus serriformis* sp. nov. is known from the *praesulcata* Zone. Its evolutionary relationships are unknown.

Studying Devonian deposits in wells in Algeria, I found a sample with the imprint of an unknown animal. The age of the deposits is supposedly Early Devonian. The taxonomic affiliation of the animal has not yet been established. Fig. 1 shows this imprint of an animal. Help me please to identify this animal. You can write to my e-mail address: gatovsky@geol.msu.ru

Fig. 4. Imprint of an unknown Early Devonian animal from Algeria.

Publications

PLOTITSYN, A.N. & GATOVSKY, Y. A. (2019 in press). New Conodont Species from the Famennian (Upper Devonian) of the Urals. - Paleontologicheskii Zhurnal, **6**: 1-6.

GATOVSKY, Y. A., KALMYKOV, G. A., SUSLOVA, A. A., KRASNOVA, E. A., KHOTYLEV, O. V., KALMYKOV, A. G., KNIPPER, A. A, TOPCHII, M. S. & FOMINA, M. M. (2019). Sections of the Upper Devonian and Lower Carboniferous on the eastern slope of the Middle Urals. – In: ALEKSEEV, A. S. & NAZAROVA, V. M. (Eds.), PALEOSTRAT-2019, Moscow, January 28-30, 2019, Program and Abstracts, M. BORISYAK Paleontological Institute of RAS: 19-20 [In Russian].

GATOVSKY, Y .A. (2018). New finds of Devonian conodonts in the region of the Perevalochnaya Base of Dalstroy (Republic of Sakha, Yakutia). – In: LOMONOSOV-2018, Scientific Conference, Section of Geology, April 16 - 25, 2018, Lomonosov Moscow State University, Russia: P. 20-22 [In Russian].

CM Sven HARTENFELS

One of the major goals in 2019 was the XIX ICCP 2019 – 19th International Congress on the Carboniferous and Permian, which took place in Cologne, Germany, July 29th to August 2nd. Besides four days full of scientific presentations, the program included three geotouristic mid-congress fieldtrips to cultural and geological heritages of the region, as well as five scientific field trips to explore some of the most classical regions of the Carboniferous and Permian in Germany and Central Europe. However, mostly not Devonian, the congress hosted in a special session and meeting, chaired by Markus ARETZ (Toulouse) and Carlo CORRADINI (Trieste), the redefinition of the Devonian/Carboniferous Boundary and, therefore, the base of the Carboniferous Period. As part of the congress committee, I was deeply involved with the organization, management, and running of the congress, and as part of the editorial board, occupied with editing the congress abstract volume (*Kölner Forum für Geologie und Paläontologie*, **23**: 345 pp.) as well as the field guidebook (*Kölner Forum für Geologie und Paläontologie*, **24**: 302 pp.). Together with Hans-Georg HERBIG, Michael R. W. AMLER (both Cologne), Dieter KORN (Berlin), and Hartmut JÄGER (Leimen), a three-day excursion to the Mississippian Kulm Basin of the Rhenish Massif was successfully guided. Amongst others, the latter included the DCB sections of Riescheid, Borkewehr, and Drewer. Jointly with R. Thomas BECKER (Münster), new insights into the phylogeny of early representatives of the genus

Protognathodus were presented (HARTENFELS & BECKER 2019), as well as pre-event conodont faunas from Franconia, Germany, together with Sandra I. KAISER and Michael W. RASSER (both Stuttgart).

Prior to the congress, I accompanied QIE Wenkun, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, several days in the field, in order to advance our work on Devonian successions of the Rhenish Massif. This year we focused on the Famennian at Effenberg and on the Frasnian/Famennian transitions of Beringhauser Tunnel section. The co-operation will be continued. It is planned to spend several days in the field, connected with an upcoming DCB workshop next year in China.

The co-operation with Raimund FEIST, Catherine GIRARD, Jean-Jacques CORNÉE (all Montpellier), Markus ARETZ (Toulouse), and Carlo CORRADINI (Trieste) continued. New data on the DCB sections of the stratotype area (Montagne Noire, southern France) were presented at the ICCP 2019 (FEIST et al. 2019). Furthermore, a manuscript was accepted for publication in a special DCB issue in *Palaeobiodiversity and Palaeoenvironments*. In the frame of his completed master thesis, I worked together with Felix LÜDDECKE (Münster) on conodont faunas (taxonomy, stratigraphy, biofacies) of the Ravin de la Fontaine de Santé section (Minervois Nappe, Montagne Noire; LÜDDECKE & HARTENFELS 2019).

Research in the Rhenish Massif and Morocco concentrated in the last year on Famennian and lower Mississippian successions. I continued to collaborate with Hans-Georg HERBIG, Sarah ESTEBAN LOPEZ (both Cologne), Peter KÖNIGSHOF (Frankfurt am Main), Christoph HARTKOPF-FRÖDER (Krefeld), Hans Martin WEBER (Bergisch Gladbach), David DE VLEESCHOUWER (Bremen), Tomáš Kumpan (Brno), Dieter WEYER (Berlin), and, of course, R. Thomas BECKER and the Münster Group. Additional conodont samples were taken around the Hangenberg Black Shale at Borkewehr. In parallel, I continued studies on other Rhenish (e.g., Effenberg, Kreishaus Bergisch Gladbach) or Moroccan (e.g., Bou Tchrafine) sections. Famennian conodonts from Meseta sections (e.g., Bou Tisdafine SE, Ziyyar, Bab-el-Ari, Bou Ighial, Gara de Mrirt) will partly be published in the forthcoming Meseta volume, jointly with Thomas, Sarah and Ahmed EL HASSANI. There are also preparations for the publication of the Famennian foraminifer data of Anna SAUPE (now at Cologne), and for Famennian conodonts from Hönne Valley bore holes (STICHLING et al. in prep.).

Jointly with Hans-Georg HERBIG, I supervised B.Sc. student Daniele BEVILACQUA (Cologne), who worked on carbonate microfacies analyses across the DCB. His unpublished data set will be useful for the redefinition of the DCB.

Together with Christoph HARTKOPF-FRÖDER, Peter KÖNIGSHOF, and Hans Martin WEBER, our work on a Special Issue on the Devonian and Mississippian of the Ardenno-Rhenish Massif continued; it will be published in 2021 in *Palaeobiodiversity and Palaeoenvironments*.

Publications

HERBIG, H.-G., KORN, D., AMLER, M. R. W., HARTENFELS, S. & JÄGER, H. (2019). The Mississippian Kulm Basin of the Rhenish Mountains, western Germany – fauna, facies, and stratigraphy of a mixed carbonate-siliciclastic foreland basin. – In: HERBIG, H.-G., ARETZ, M., AMLER, M. R. W. & HARTENFELS, S. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Field Guides. – Kölner Forum für Geologie und Paläontologie, **24**: 143-216.

HERBIG, H.-G., ARETZ, M., AMLER, M. R. W. & HARTENFELS, S. (Eds., 2019). 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Field Guides. – Kölner Forum für Geologie und Paläontologie, **24**: 1-302.

KAISER, S. I., RASSER, M. W. & HARTENFELS, S. (2019). Pre-event conodont faunas – record of the early phase oft he Hangenberg Crisis ast the Devonian-Carboniferous Boundary at Geuser (Franconia, Germany)? – a preliminary report. – In: HARTENFELS, S., HERBIG, H.-G., AMLER, M. R. W. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Abstracts. – Kölner Forum für Geologie und Paläontologie, **23**: 167-168.

HARTENFELS, S. & BECKER, R. T. (2019). The Devonian/Carboniferous transition in the Rhenish Massif – Borkewehr, a potential GSSP section. – In: HARTENFELS, S., HERBIG, H.-G., AMLER, M. R. W. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Abstracts. – Kölner Forum für Geologie und Paläontologie, **23**: 140-141.

FEIST, R., CORNÉE, J.-J., CORRADINI, C., HARTENFELS, S., ARETZ, M. & GIRARD, C. (2019). Transsect from near- to offshore in Devonian-Carboniferous Boundary sections of the stratotype area (Montagne Noire, Southern France). – In: HARTENFELS, S., HERBIG, H.-G., AMLER, M. R. W. & ARETZ, M. (Eds.), 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Abstracts. – Kölner Forum für Geologie und Paläontologie, **23**: 97-98.

HARTENFELS, S., HERBIG, H.-G., AMLER, M. R. W. & ARETZ, M. (Eds., 2019). 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Abstracts. – Kölner Forum für Geologie und Paläontologie, **23**: 1-345.

LÜDDECKE, F. & HARTENFELS, S. (2019). Famennian conodont biostratigraphy and biofacies of the Minervois Nappe (Ravin de la Fontaine de Sante, Montagne Noire, Southern France) – a reinvestigation. – In: Strati 2019, 3rd International Congress on Stratigraphy, 2-5 July 2019, Milano, Italy, Abstract Book: 187.

BECKER, R. T., KLUG, C., SÖTE, T., HARTENFELS, S., ABOUSSALAM, Z. S. & EL HASSANI, A. (2019). The oldest ammonoids of Morocco (Tafilalt, loweer Emsian). – Swiss Journal of Palaeontology, **138**: 9-25.

KOLTONIK, K., PISARZOWSKA, A., PAZKOWSKI, M., SLÁMA, J., BECKER, R. T. ZZCZERBA, M., KRAWCZYNSKI, W., HARTENFELS, S., MAZUR, S. & FRANKE, W. (2019). Reply to Comment by M.F. PEREIRA, J.B. SILVA and C. GAMA on "Baltic provenance of top-Famennian siliciclastic material of the northern Rhenish Massif, Rhenohercynian zone of the Variscan orogeny, by KOLTONIK et al., International Journal of Earth Sciences (2018) 107:2645-2669". – International Journal of Earth Sciences, **108**: 1075-1078; doi.org/10.1007/s00531-019-01692-z.

CM Rodrigo Scalise HORODYSKI

Studies of sequence stratigraphy, taphonomy, ichnology, taxonomy, paleoecology, paleoenvironments and bioevents from Brazilian Devonian basins were developed in 2018 and 2019. I highlight four papers of Daniel SEDORKO (Uberlândia Federal University, Brazil) as part of his doctoral thesis at the Geology Graduate Program of the Unisinos University, with collaborations of Renata G. NETTO (his doctoral advisor - Unisinos University, Brazil), Charles SAVRDA (Auburn University, USA), Rodrigo Scalise HORODYSKI (Unisinos University), and Mario Luis ASSINE (São Paulo State University – UNESP). The first two (SEDORKO et al. 2018a, 2018b) reorganized all Silurian and Devonian strata from the Paraná Basin (by sequence stratigraphy), recognized expressions of the *Skolithos*, *Glossifungites* and *Cruziana* ichnofacies, and correlated these with the global sea-level curve. The results will be very useful for understanding the regional benthic biota and their correlation with global events, especially by trace fossil. The third paper (SEDORKO et al., 2018c; again, about trace fossils), provided evidence that dense *Zoophycos* ichnofabrics in storm beds of highstand systems tracts are taphonomic artifacts rather than representing an ecologic strategy. Besides, *Zoophycos* trace fossil appear in Paraná Basin strata related to the first occurrence of land plants. The fourth paper (SEDORKO et al. 2019) recognonized local and global Silurian to Middle Devonian bioevents in the Paraná Basin in an integrated study of ichnology and taphonomy. Additionally, a paleobathymetric curve was provided and, for the first time, the effects of these events on the marine biota was interpreted in the basin.

A taphofacies analysis of the Malvinokaffric body fossil from the Lower-Middle Devonian (Paraná Basin, Brazil) was conduzed by me, Carlton BRETT (University of Cincinnati, USA), Elvio P. BOSETTI (Ponta Grossa State University-BR), Daniel SEDORKO, Sandro M. SCHEFFLER (Museu Nacional- Rio de Janeiro-BR), Renato P. GHILARDI (São Paulo State University), and Roberto IANNUZZI (Rio Grande do Sul Federal University). The taphofacies analysis suggested storm-influences on Devonian Malvinokaffric assemblages, and the data showed that similar preservational process are observed in analogous environments from other Devonian strata (Cape Basin - South Africa, Anti-Atlas - Morocco, and Appalachian Basin - NY).

Two paper registered and interpreted two taxa for the Paraná Basin: the mitrate *Placocystella langei* (with addional taphonomy and paleoecology) by SCHEFFLER et al. (2018) and *Sphenothallus*, a medusozoan cnidarian by VAN ITEN et al. (2019).

Finally, I and Renato GHILARDI are planning the First Symposium on Brazilian Devonian, may be within the next two or three years.

Devonian Publications (2018-2019)

CARBONARO, F. A., LANGER, M. C., NIHEI, S. S., DE SOUZA FERREIRA, G. & GHILARDI, R. P. (2018). Inferring ancestral range reconstruction based on trilobite records: a study-case on *Metacryphaeus* (Phacopida, Calmoniidae). - Scientific reports, **8** (1), 15179.

HORODYSKI, R. S., BRETT, C. E., SEDORKO, D., BOSETTI, E. P., SCHEFFLER, S. M., GHILARDI, R. P. & IANNUZZI, R. (2019). Storm-related taphofacies and paleoenvironments of Malvinokaffric assemblages from the Lower/Middle Devonian in southwestern Gondwana. - Palaeogeography, Palaeoclimatology, Palaeoecology, **514**: 706-722.

OLIVEIRA MARTINS, G. P., DA COSTA RODRIGUES-FRANCISCO, V. M., DA CONCEIÇÃO RODRIGUES, M. A., & DE ARAÚJO-JÚNIOR, H. I. (2018). Are early plants significant as paleogeographic indicators of past coastlines? Insights from the taphonomy and sedimentology of a Devonian taphoflora of Paraná Basin, Brazil. - Palaeogeography, Palaeoclimatology, Palaeoecology, **505**: 234-242.

SCHEFFLER, S. M., HORODYSKI, R. S., & BOSETTI, E. P. (2019). Morphology, palaeoecology and taphonomy of the Devonian mitrate *Placocystella langei* from Paraná Basin, Brazil. - Alcheringa, **43** (2): 228-240.

SEDORKO, D., NETTO, R. G., & SAVRDA, C. E. (2018a). Ichnology applied to sequence stratigraphic analysis of Siluro-Devonian mud-dominated shelf deposits, Paraná Basin, Brazil. - Journal of South American Earth Sciences, **83**: 81-95.

SEDORKO, D., NETTO, R. G., SAVRDA, C. E., ASSINE, M. L., & TOGNOLI, F. M. (2018b). Chronostratigraphy and environment of Furnas Formation by trace fossil analysis: Calibrating the lower Paleozoic Gondwana realm in the Paraná Basin (Brazil). - Palaeogeography, Palaeoclimatology, Palaeoecology, **487**: 307-320.

SEDORKO, D., NETTO, R. G., & HORODYSKI, R. S. (2018c). A *Zoophycos* carnival in Devonian beds: Paleoecological, paleobiological, sedimentological, and paleobiogeographic insights. - Palaeogeography, Palaeoclimatology, Palaeoecology, **507**: 188-200.

SEDORKO, D., BOSETTI, E. P., & NETTO, R. G. (2018d). An integrative ichnological and taphonomic approach in a transgressive–regressive cycle: a case study from Devonian of Paraná Basin, Brazil. - Lethaia, **51** (1): 15-34.

SEDORKO, D., BOSETTI, E. P., GHILARDI, R. P., JÚNIOR, M., JOSÉ, L., SILVA, R. C., & SCHEFFLER, S. M. (2018e). Paleoenvironments of a regressive Devonian section from Paraná Basin (Mato Grosso do Sul state) by integration of ichnologic, taphonomic and sedimentologic analyses. - Brazilian Journal of Geology, **48** (4): 805-820.

SEDORKO, D., NETTO, R. G., & HORODYSKI, R. S. (2019). Tracking Silurian-Devonian events and paleobathymetric curves by ichnologic and taphonomic analyzes in the southwestern Gondwana. - Global and Planetary Change, **179**: 43-56.

VAN ITEN, H., LEME, J. D. M., SIMÕES, M. G., & COURNOYER, M. (2019). Clonal colony in the Early Devonian cnidarian *Sphenothallus* from Brazil. - Acta Palaeontologica Polonica, **64** (2): 409-416.

TM Nadezhda G. IZOKH and the Novosibirsk Group

Our team continued the investigation of Devonian and Lower Carboniferous stratigraphy in the Russian Arctic region (lower riches of the Lena River), Altai-Sayan Folded Area, and Central Asia (Kitab State Geological Reserve, Uzbekistan).

The research group includes:

TM Dr. Nadezhda G. IZOKH (Trofimuk Institute of Petroleum Geology and Geophysics SB RAS). – conodonts,
CM Dr. Olga T. OBUT (Trofimuk Institute) – radiolarians,
CM Dr. Olga P. IZOKH (SOBOLEV Institute of Geology and Mineralogy SB RAS) – geochemistry
Boris M. POPOV – ostracods,
Tatiana A. SHCHERBANENKO (Trofimuk Institute) – brachiopods.

TM Nadezhda G. IZOKH

continued the study of Devonian and Lower Carboniferous conodonts from Siberia and Central Asia. New early and middle Frasnian conodont

assemblages were found in the type section of the Orto Khaya Fm along the right bank of the Bykov Channel and on Orto-Khaya Island (Lena River delta). The first assemblage includes *Ancyrodella alata* GLENISTER & KLAPPER, *Icriodus symmetricus* BRANSON & MEHL, *Mesotaxis asymmetrica* (BISCHOFF & ZIEGLER), *M. costaliformis* JI, *M. guanwushanensis* (TIAN), and *Palmatolepis transitans* MÜLLER. The second yielded *Ancyrodella nodosa* ULRICH & BASSLER and *Ancyrodella* sp. (IZOKH 2019).

CM Olga P. OBUT,

together with Nadezhda G. IZOKH, CM Maya ERINA and Nuridin ABDIEV, completed a study of Late Devonian radiolarians and conodonts from the siliceous and carbonate rocks of the Akbasay Formation on the left side of the Kule Gorge, Zeravshan-Gissar mountainous area (Uzbekistan) (OBUT & IZOKH 2019). Eight conodont zones were defined for the Frasnian-Famennian interval (from the *guanwushanensis* Zone up to the *expansa* Zone) (Figs. 1-3). Four radiolarian assemblages were described. They characterize middle Frasnian, upper Frasnian, lower Famennian, and middle Famennian intervals.

They include eight genera of spherical and spiny *Trilonche* HINDE, 1899, *Stigmosphaerostylus* RUST, 1892, *Haplentactinia* FOREMAN, 1963, *Palaeoscenidium* DEFLANDRE, 1953, *Radiobisphaera* WON, 1997, *Palaeothalomnus* DEFLANDRE, 1973, *Moskovistella* AFANASIEVA, 2000, *Nazarovites* AFANASIEVA, 2000, and *Ceratoikiscum* DEFLANDRE, 1953. The four latter genera are very rare; predominant is *Trilonche*. The co-occurrence of radiolarians and conodonts enable to refine the age of radiolarian associations.

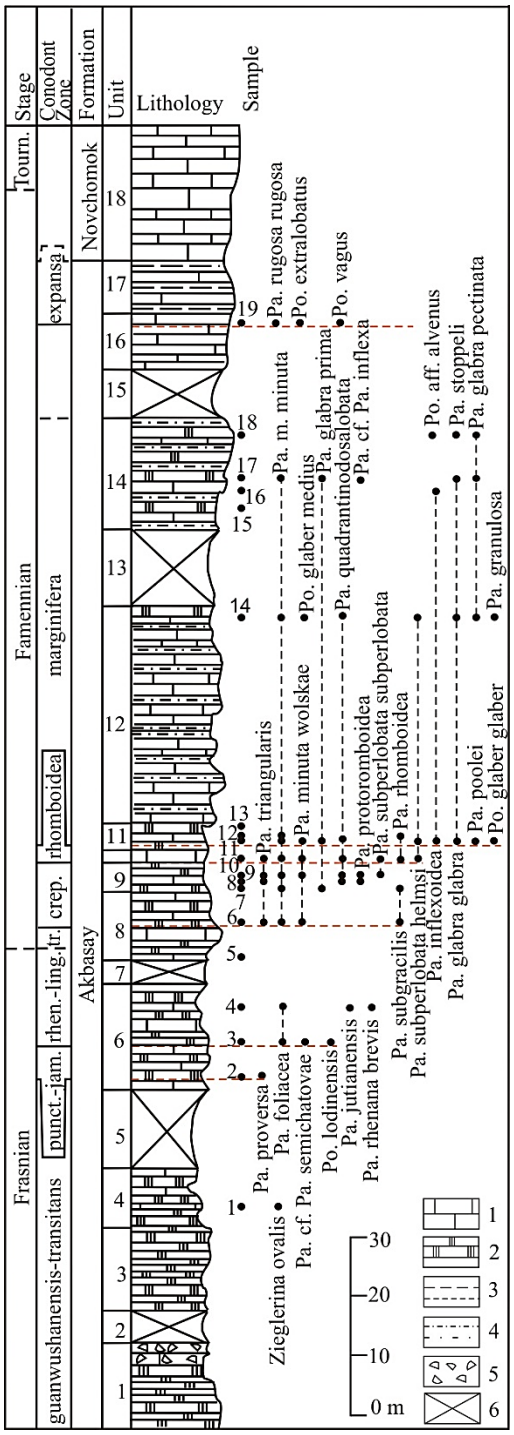

Fig. 1: Ranges of conodont taxa in the Akbasay Formation, left bank of the Kule Gorge, Kitab State Geological Reserve (IZOKH et al. in press; OBUT & IZOKH 2019).

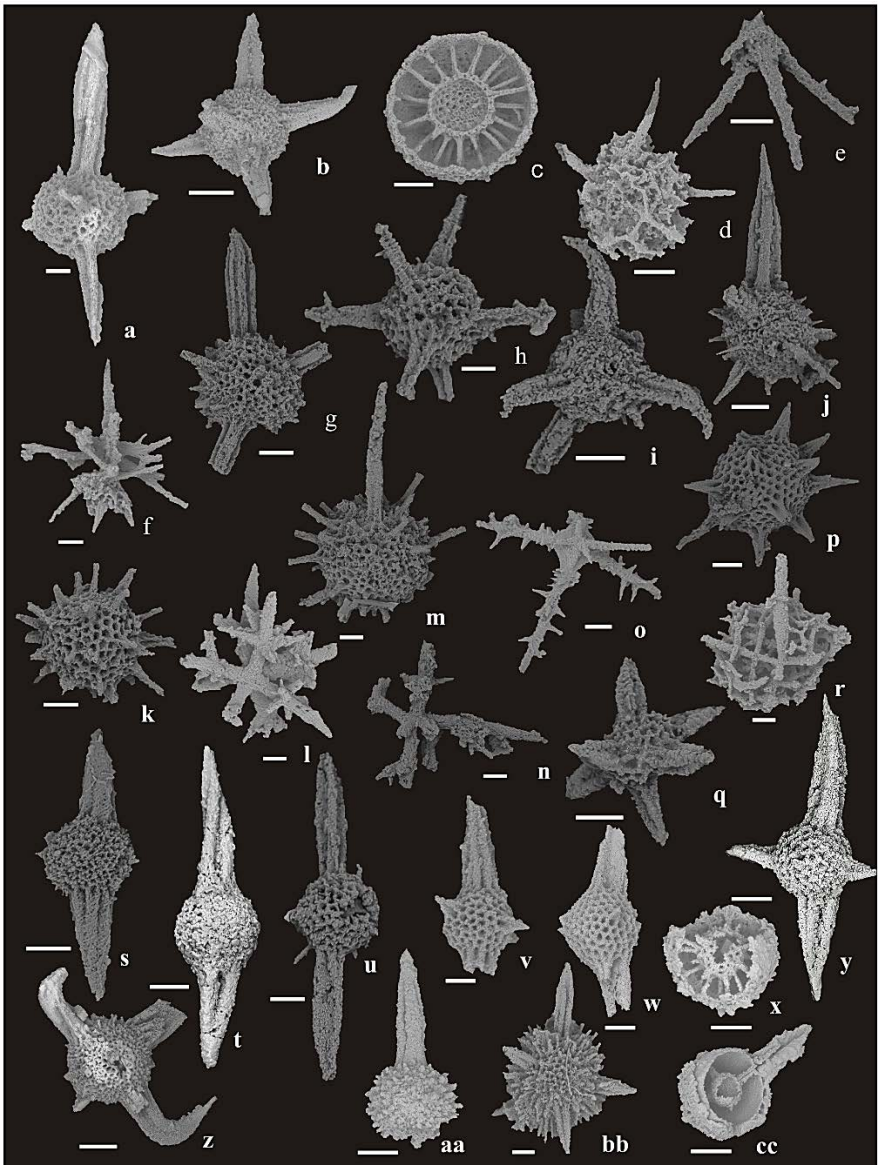

Fig. **2.** Radiolarians from the Akbasay Formation, Kule Gorge section, Zeravshan-Gissar mountainous area, Uzbekistan; middle Frasnian, *punctata–jamieae* conodont zones, Sample 08083101/1 (a–e); upper Frasnian, *rhenana–linguiformis* conodont zones, Sample 08083102/2 (f–s); lower Famennian, *crepida* Zone, Sample 08083104/1 (t, y), – Sample 08083103/1 (v–x, ac); middle Famennian, *marginifera* conodont Zone, Sample 08083105 (u, z, aa, bb). Scale bar = 50 µm. **a, y** – *Trilonche hindea* (HINDE, 1899), a – specimen Kule 1–2/1, y – specimen Kule 1-2/20; **b, q** – *Trilonche d*avidi (HINDE, 1899), b – specimen Kule 1–2/2, q – specimen Kule 1–2/10; **c, x** – *Radiobisphaera* sp., c – specimen Kule 1–2/50, x – specimen Kule 1–2/55; **d** – *Haplentactinia* cf. *rhinophyusa* FOREMAN, 1963, specimen Kule 1–2/40; **e** – *Palaeoscenidium* sp., specimen Kule 1–2/60; **f** – *Nazarovites* cf. *bioculus* AFANASIEVA, 2000, specimen Kule 1–2/70; **g** – *Trilonche elegans* HINDE, 1899, specimen Kule 1–2/11; **h** – *Moskovistella allbororum* AFANASIEVA, 2000, specimen Kule 1–2/75; **i, z** –*Trilonche guangxiensis* (LI & WANG, 1991), i – specimen Kule 1–2/12, z – specimen Kule 1-2/30; **j, aa** – *Trilonche echinata* (HINDE, 1899), j – specimen Kule 1–2/13, aa – specimen Kule 1–2/31; **k** – *Stigmosphaerostylus stellata* (NAZAROV, 1975), specimen Kule 1–2/80; **l** – *Palaeothalomnus timokhini* AFANASIEVA, 2000, specimen Kule 1–2/66; **m** – *Stigmosphaerostylus paronae* (HINDE, 1899), specimen Kule 1–2/81; **n** – *Palaeothalomnus* cf. *quadriramosum* (FOREMAN, 1963), specimen Kule 1–2/67; **o** – *Palaeoscenidium cladophorum* DEFLANDRE, 1953, specimen Kule 1-2/63; **p** – *Stigmosphaerostylus* sp., specimen Kule 1–2/82; **r** – *Haplentactinia rhinophyusa* FOREMAN, 1963, specimen Kule 1–2/45; **s – u** –*Trilonche minax* (HINDE, 1899), s – specimen Kule 1–2/14, t – specimen Kule 1–2/20, u – specimen Kule 1-2/21; **v, w** – *Trilonche vetusta* HINDE, 1899, v – specimen Kule 1–2/22, w – specimen Kule 1–2/23; **bb** – *Trilonche* cf. *variacanthina* (FOREMAN, 1963), specimen Kule 1–2/24; **cc** – *Trilonche* sp., specimen Kule 1–2/25.

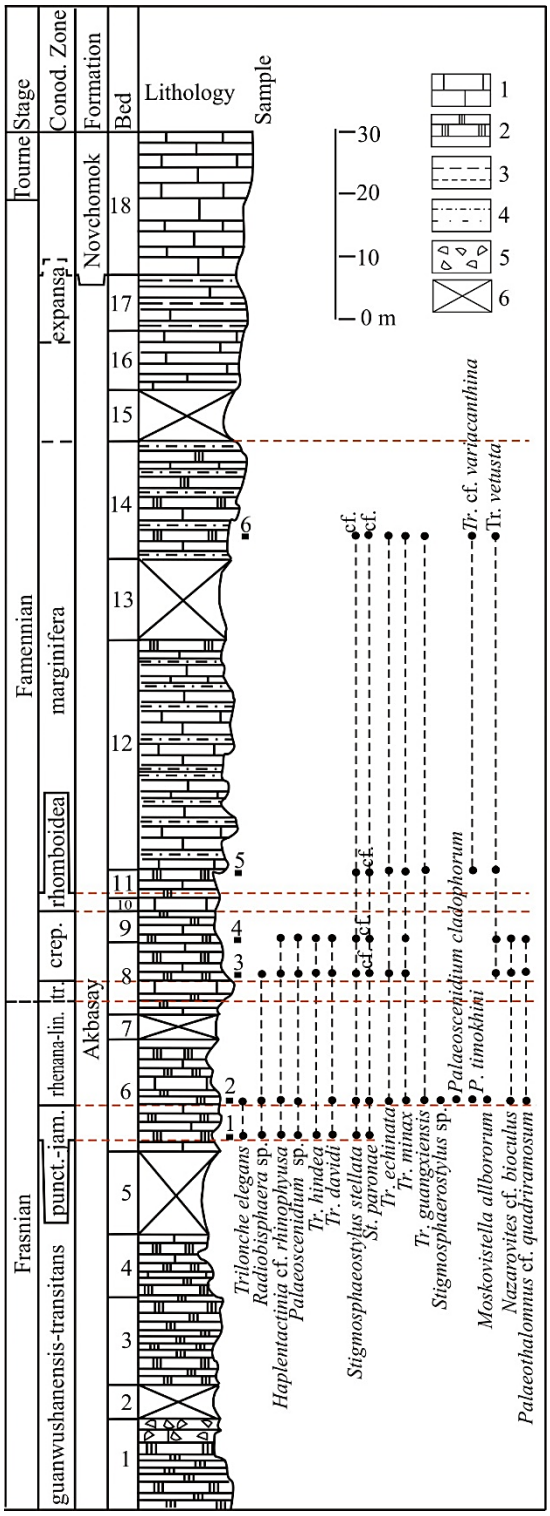

Fig. 3: Ranges of radiolarioan taxa in the Akbasay Formation, left bank of the Kule Gorge, Kitab State Geological Reserve (IZOKH et al. in press; OBUT & IZOKH 2019).

CM Olga P. IZOKH

conducted isotope-geochemical studies in the Devonian of the Salair (SW Siberia) and Kitab State Geological Reservat. Together with colleagues, she studied isotope-geochemical characteristics of the S/D boundary interval in the Obi-Safit Gorge, Zeravshan-Gissar Foldbelt, Uzbekistan (O. IZOKH et al. 2019). Carbonate rocks are represented by the Přídolían Kupruk Formation and the Lochkovian Madmon Formation. Geochemical studies were conducted to assess the terrigenous input, nutrient supply, and redox conditions in the sedimentary basin (Al, Na, K, Si, Ti, Zr, Fe, Co, U/Al, Mo/Al, Mn/Sr and Fe/Sr contents; $\delta^{13}C$ and $\delta^{18}O$ values). It was proven that the Kupruk Formation represents a depositional environment with limited water circulation leading to episodic anoxia in the sediment and/or bottom waters, as suggested by increased U/Al and Mo/Al values in the carbonates. The upper part of the Kupruk Formation records a change in the depositional regime, specifically the rise of sea level and the inflow of marine waters of normal salinity. Observed decreases in U/Al and Mo/Al values suggest the establishment of normal redox conditions accompanied by an increase in $\delta^{13}C$ values approaching the isotopic composition of mean ocean water (0±2‰). Deposition of the lower Madmon Formation was characterised by normal marine conditions and a deepening of the sedimentary basin accompanied by isotopic geochemical perturbations because an observed increase in U/Al and Mo/Al values is coeval with rises in Ni/Al and Cu/Al values, and with significantly elevated Ba and P values. The apparent increase in Ni, Cu, Ba, and P concentrations is thought to be indicative of an increased nutrient input into the sedimentary basin. This, in turn, could stimulate bioproductivity and lead to anoxic conditions in the sediment and/or of bottom waters, as evident by the increased U/Al and Mo/Al values. Accelerated productivity and burial of the organic matter removes isotopically light carbon from the water and results in precipitation of carbonates with increased $\delta^{13}C$ values. The isotope geochemical data are in agreement with facies variations and suggest the inflow of nutrient-rich oceanic water towards the epicontinental basin during a highstand. The observed isotopic geochemical perturbations is part of the global phenomenon seen in numerous coeval sections of the Silurian–Devonian boundary strata.

Boris M. POPOV studies ostracods from reference sections of the Middle and Upper Devonian of the Kuznetsk Basin. Ostracods were obtained from stratotype sections for a number of regional horizons (Vassino, Solomino, Peshchorka) and formations (Izyly, Vassino, Shubkino, Yaya-Petropavlovka).

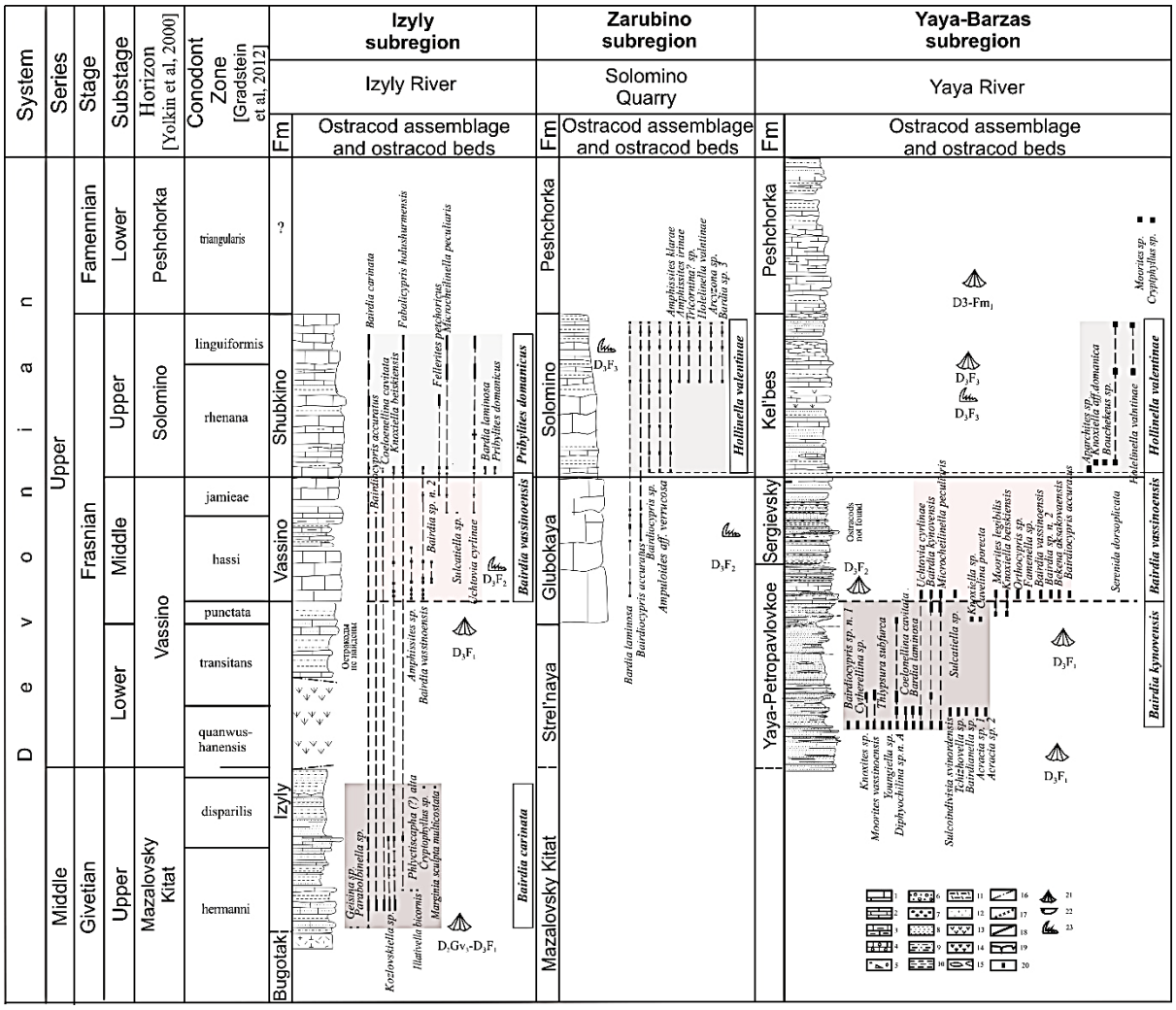

Fig. 4. Correlation chart of Middle and Upper Devonian sections of structural-facies subregions of the margin of the Kuznetsk Basin, with ostracod beds and the distribution of ostracods in studied sections (Middle-Upper Devonian lithopstratigraphy of 2011, with additions). 1 - massive limestone; 2 - bedded limestone; 3 - clayey limestone; 4 - crinoid limestone; 5 - carbonate concretions; 6 - conglomerates; 7 - gravelstones; 8 - sandstone; 9 - siltstone; 10 - mudstones; 11 - siliceous pellets; 12 - liparite porphyries; 13 – diabas; 14 - covered interval; 15 - lenses; 16 - faults; 17 - correlation of beds by lithology; 18 - boundaries between regional stratigraphic subdivision; 19 - erosion surface; 20 - location; 21 - brachiopods; 22 - ostracods; 23 – conodonts.

A stratigraphic analysis of the ostracod distribution has allowed to identify five biostrata in the rank of beds with fauna (Figs. 4-6). Due to characteristics of the taxonomic composition, the established ostracod beds have different correlation potential.

Tatiana A. SHCHERBANENKO continues her studies of brachiopods from Ordovician and Devonian deposits of the Altai-Sayan Folded Area.

Publications

Journal papers

OBUT, O. T. & IZOKH, N. G. (2019). Upper Devonian radiolarians from Zeravshan-Gissar Mountainous area, Uzbekistan. - Paleontological Journal, **53** (9): 87-92.

POPOV, B. M. (2019). Biostratigraphic data on ostracods from reference sections of the Middle and Upper Devonian of the Kuznetsk Basin margins (SE of West Siberia). - Geology and mineral resources of Siberia, Novosibirsk, SNIIGGIMS, **2**: 3-15 [in Russian].

Abstracts

IZOKH, N. G. (2019). Late Devonian conodonts from the North Kharaulakh. - In: Late Paleozoic Sedimentary Earth Systems: Stratigraphy, Geochronology, Petroleum Resources, Abstract Volume of Kazan Golovkinsky Stratigraphic Meeting 2019, September 24-28, 2019, Kazan, Russia: 100-101; Kazan University Press [in Russian].

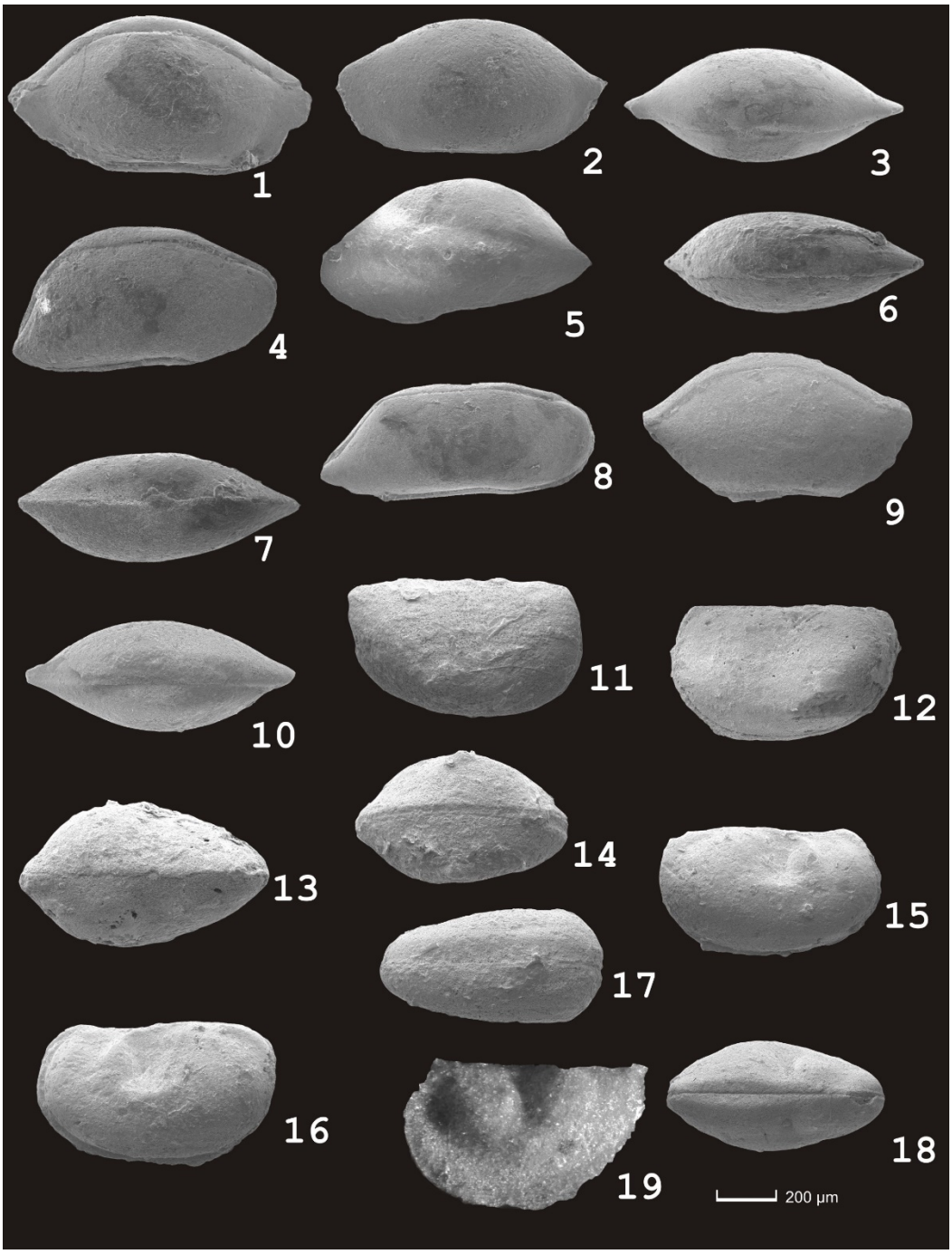

Fig. 5: Middle and Upper Devonian ostracods from of the Kuznetsk Basin margin. **1–3.** *Bairdia laminose* ROZHDESTVENSKAYA, 1972, 1 – no. 429 (Sample BY-9013-3/1), right valve; 2 – no. 430 (Sample BY-9013-3/1), left valve; 3 – no. 432 (Sample BY-9013-3/1), dorsal view, left bank of Yaya River, Yaya-Petropavlovskoe Formation, Frasnian;. **4–7**. *Bairdia vassinoensis* POLENOVA, 1960. 4 – no. 501 (Sample BY-9013-11), right valve; 5 – no. 504 (Sample BY-9013-11), left valve; 6 – no. 502 (Sample BY-9013-11), dorsal view. 7 – no. 503 (Sample BY-9013-11), ventral view, Left bank of Yaya River, Yaya-Petropavlovskoe Formation, Frasnian;. **8**. *Bairdia kynovensis* ROZHDESTVENSKAYA, 1959, no. 433 (Sample BY-9013-3/1), right valve, left bank of Yaya River, Yaya-Petropavlovskoe Formation, Frasnian; **9-10.** *Bairdia carinata* POLENOVA, 1960. 9 – no. 768 (Sample B-066-3/5), right valve; 10 - no. 766 (Sample B-066-3/5), dorsal view, western margin of Kuznetsk Basin, Vassino district, right bank of Izyly River, Shubkino Formation, Frasnian; **11–14**. *Pribylites domanicus* AVERJANOV, 1968. 11 – no. 610 (Sample B-066-3/4), left valve; 12 – no. 686 (Sample B-066-3/1), view of left valve; 13 – no. 612 (Sample B-066-3/4), dorsal view; 14 – no. 611 (Sample B-066-3/4), side view of the abdominal region, western margin of Kuznetsk Basin, Vassino district, right bank of Izyly River, Shubkino Formation, Frasnian; **15–18.** *Knoxiella beiskiensis* POLENOVA, 1960. 15 – no. 614 (Sample B-066-3/4), left valve; 16 – no. 615 (Sample B-066-3/4), right valve; 17 – no. 616 (Sample B-066-3/4), ventral view;18 - no. 617 (Sample B-066-3/4), dorsal view, western margin of Kuznetsk Basin, Vassino district, right bank of Izyly River, Shubkino Formation, Frasnian; **19.** *Hollinella valentinae* EGOROV, 1953, no. 0717h (Sample I-0717-2a), right valve; NW margin of Kuznetsk Basin, Solomino Quarry, limestone and clays, Solomino Formation, Frasnian.

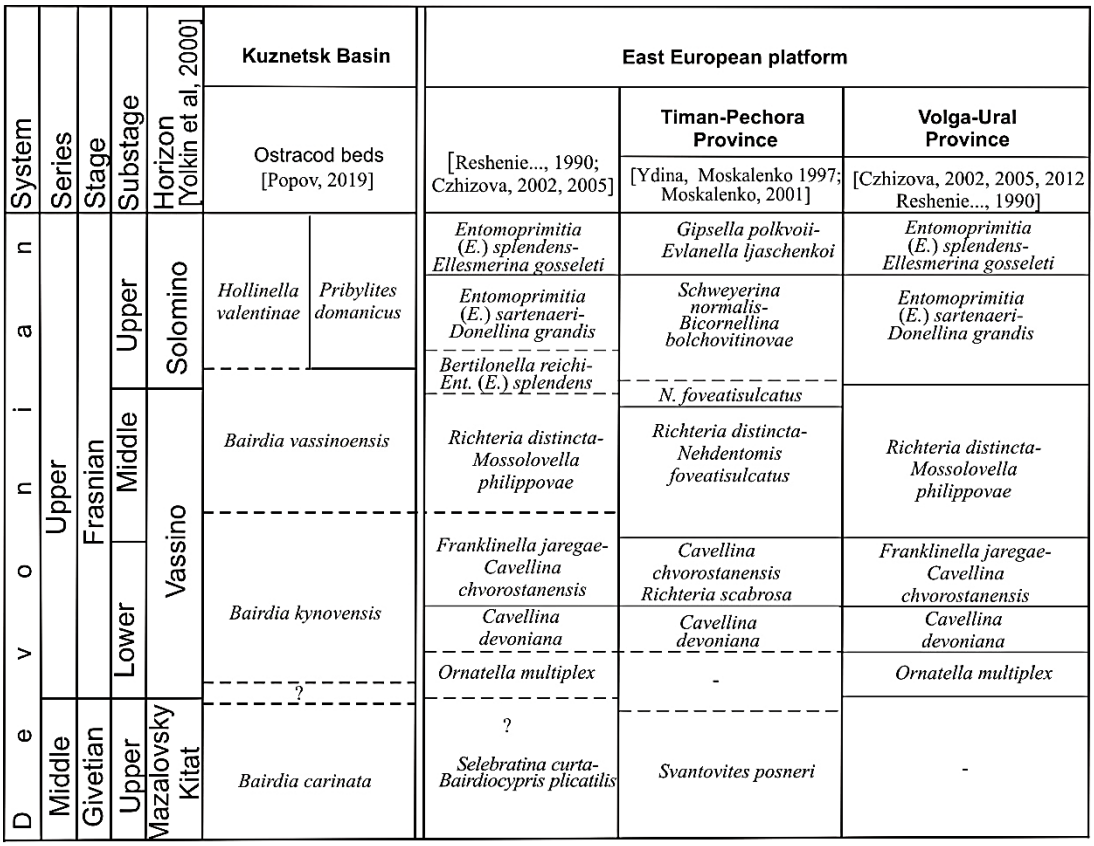

Fig. 6: Correlation chart of the Middle-Upper Devonian regional biostratigraphic scales of the margins of the Kuznetsk Basin and East European platform by ostracods.

IZOKH, O. P., TARASENKO, A. B., JAROCHOWSKA, E. & GRAZHDANKIN, D. V. (2019). Isotopic geochemical proxies and facies across Silurian–Devonian boundary in the Obi-Safit Gorge (Kitab State Geological Reserve, Uzbekistan). – In: OBUT, O. T., SENNIKOV, N. V & KIPRIYANOVA, T. P (Eds.), 13th International Symposium on the Ordovician System, Contributions of International Symposium, Novosibirsk, Russia, July 19-22, 2019, Trofimuk Institute of Petroleum Geology and Geophysics SB RAS, Novosibirsk National Research State University, Novosibirsk: 85-87; Publishing House of SB RAS, 2019.

TM Ulrich JANSEN

In 2018, the move of my section at Senckenberg from the Kuhwaldstrasse to the 'Jügel-Haus' next to the Senckenberg main building was successfully accomplished. This included the collections under my care, which are now stored in renovated rooms, in cabinets of a rolling compact system, and in an emended order.

My research in 2018-2019 concentrated on Devonian brachiopods, mainly from the Rhenish Massif and Morocco. The long-term project on uppermost Silurian to lower Eifelian brachiopods from the Rhenish Massif (Germany) was continued. Recent taxonomic and palaeoecological results were presented at the 5th International Palaeontological Congress in Paris (2018) and at the 8th International Brachiopod Congress in Milano (2018). In 2019, numerous type specimens were studied during visits at the museum in Wiesbaden, the Palaeontological Institute in Bonn, the Geological Survey of Rheinland-Pfalz in Mainz, and during a one-week visit at the Museum für Naturkunde, Berlin. A paper including newest results was published in the proceedings volume of the 8th International Brachiopod Congress (JANSEN 2019).

In February 2019, I started a cooperation with my colleagues Adam HALAMSKI and Andrzej BALIŃSKI from the Polish Academy of Sciences in Warszawa, I order to study some Middle Devonian rhynchonellides from Morocco and Western Europe. A joint paper is almost finished.

Master candidate Simon ZOPPE (Goethe University Frankfurt am Main) has successfully finished a palaeoecological study on latest Emsian faunas in the Sauerland (northern Germany).

Publications

Journal papers

MENNING, M., GLODNY, J., BECKER, R. T., BROCKE, R., JANSEN, U., SCHINDLER, E. & WEYER, D. (2018). The Devonian time scale in the Stratigraphic Table of Germany 2016. - Zeitschrift der Deutschen Gesellschaft für Geowissenschaften, **168** (4): 465-482.

SCHINDLER, E., BROCKE, R., BECKER, R. T., BUCHHOLZ, P., JANSEN, U., LUPPOLD, F. W., NESBOR, H.-D., SALAMON, M., WELLER, H. & WEYER, D. (2018). Das Devon in der Stratigraphischen Tabelle von Deutschland 2016. The Devonian in the Stratigraphic Table of Germany 2016. - Zeitschrift der Deutschen Gesellschaft für Geowissenschaften, **168** (4): 447-463.

MENDE, K., LINNEMANN, U., NESBOR, H. D., MILITZER, A., JANSEN, U., KÖNIGSHOF, P., BAHLBURG, H., HOFMANN, M., GERDES, A., BERNDT, J. & NAWRAT, J. (2019). Provenance of exotic Ordovician and Devonian sedimentary rock units from the Rhenish Massif (Central European Variscides, Germany). - Tectonophysics, **755**: 127-159.

JANSEN, U. (2019). Pragian-Emsian brachiopods from the Rhenish Massif (Germany): new data on evolution and biostratigraphy. - Rivista Italiana di Paleontologia e Stratigrafia, **125** (3): 725-749.

Abstracts

JANSEN, U. (2017). Biotic change in the Early Devonian, exemplified by the succession of brachiopod faunas in the Rhenish Massif (Germany). – In: Geobiodiversity – An integrative approach expanding HUMBOLDT'S vision, International Senckenberg Conference, Abstract Book: 33; Frankfurt am Main.

JANSEN, U. (2018). New Data on evolution and palaeobiogeography of Lower Devonian brachiopods from the Rhenish Massif (Germany). - In: 5th International Palaeontological Congress, July 9th to 13th 2018, The Fossil Week, Abstract Book: 796; Paris.

JANSEN, U. (2018). Evolution, stratigraphy and palaeobiogeography of late Pridolian-early Eifelian brachiopods from the Rhenish Massif (Germany). - Permophiles, Newsletter of the Subcommission on Permian Stratigraphy - The Brachiopod World, **66** (1): 59-60.

SIMONET-RODA, M., MILNER GARCIA, S., MÜLLER, T., GRIESSHABER, E., JURIKOVA, H., ROLLION-BARD, C., ANGIOLINI, L., YE, F., BITNER, M. A., HENKEL, D., TOMAŠOVÝCH, A., EISENHAUER, A., HARPER, D. A. T., JANSEN, U. & SCHMAHL, W. (2018). The evolution of thecideide brachiopod shell microstructure from Triassic to modern times. — Permophiles, Newsletter of the Subcommission on Permian Stratigraphy, **66** (1): 101-102.

Devonian Thesis

ZOPPE, S.F. (2019). Zur Biofazies des höchsten Unterdevons (Ober-Emsium, Kondel-Unterstufe, Harbecke-Schichten) im östlichen Rheinischen Schiefergebirge (südöstliches Sauerland, Lennetal) mit einigen neuen Beiträgen zur Fossilführung. - Master thesis, Goethe University of Frankfurt am Main, 60 pp.

CM Semen A. KRUCHEK, CM Dmitry P. PLAX and the Belarusian Devonian Group

In 2019 the Belarusian Devonian Group from «The Institute of Geology», Branch of the State Enterprise «Research and Production Centre for Geology», including S. A. KRUCHEK, T. G. OBUKHOVSKAYA, V. Y. OBUKHOVSKAYA, T. F. SACHENKO, P. O. SAKHARUK et al., and also D. P. PLAX from the Belarusian National Technical University, and Y. V. ZAIKA from the United Enterprise «Geoservice», have been exploring different aspects (stratigraphy, paleontology, lithology, geophysics, tectonics, and isotope geochemistry) of the Devonian of Belarus. Publications of the second half of 2018 and of the first half of 2019 are presented below. Publications of the second half of 2019, which are in print, will be listed in the next Newsletter (in 2020). Due to the fact that most of the papers are published in Russian, brief English summaries are given.

Publications

Journal papers

PUSHKIN, V. I. (2018). New and little known brachiopods of the family Cyrtospiriferidae

from the Lower Famennian of the Pripyat trough (Belarus) – Lithosphere, **48** (1): 60–77 [in Russian, with English summary].

Some new and little known brachiopods of the family Cyrtospiriferidae (order Spiriferida) from lower Famennian of the Pripyat' Trough (south-east of Belarus) are described in detail. The genus *Dmitria* SIDYACHENKO, 1961 is redescribed, and three its species are defined: *Dmitria mekensis* (ZHEJBA, 1980), *D. vetchinensis* sp. nov., *D. brinevensis* sp. nov. Also some representatives of other cyrtospiriferids are described: *Longilaminaspirifer* gen. nov., with the type species *L. lyashenkoi* sp. nov., *L. acer* sp. nov.; *Belarusispirifer* gen nov., with its type species *B. liplyanensis* sp. nov. The full taxonomic composition of species related to the genera *Dmitria* and *Longilaminaspirifer* described in the world literature is given.

PLAX, D. P. (2018). Ichthyofauna from deposits of the Rechitsa Regional Stage (Frasnian, Upper Devonian) of the Gomel structural dam (from results of the Uvarovichi 94 borehole log study) – Natural Resources, **2**: 54–68.

The paper presents the results of the palaeoichthyological study of the Rechitsa Regional Stage exposed in the Uvarovichi 94 borehole within the Uritsk Block of the Gomel Structural Dam. A vertebrate assemblage established in this borehole is correlated with the synchronous ichthyologic assemblages in the adjacent territories of the East European Platform. The vertebrates assemblage is composed of heterostracans, placoderms, acanthodians, and bony fishes. The ichthyofauna data obtained from the Rechitsa Regional Stage slightly supplement the available information on its geographical distribution and systematic composition within the country.

PLAX, D. P. & ZAIKA, Y. V. (2018). On the Sargaevo deposits (Frasnian, Upper Devonian) of the Latvian Saddle outcropping within Saryanka River basin (Belarus) – Lithosphere, **49** (2): 54–82.

The paper presents a detailed lithological and stratigraphic description of the type outcrops of the Saria Beds of the Sargaevo Regional Stage exposed within the Saryanka River Basin (Verkhnedvinsk district, Belarus). A composite stratotype section consisting of several representative exposures that provide a full description of this stratigraphic unit is suggested. The Saria Beds in this type area are represented by dolomite strata with a few thin clay interbeds. These deposits are supposed to have accumulated in a rather shallow marginal sea basin during transgressive. The Saria Beds are characterized by a quite diverse fossil assemblage consisting of various groups of ichthyofauna, invertebrate remains (brachiopod and gastropod molds and imprints), and charophyte oogonia. Cephalopods, as well as miospores, acritarchs and bivalve relicts are reported from the Saria Beds for the first time. The palaeontological and lithological data, as well as the position of the rocks in the sedimentary sequence, were used to refine the age of the Saria Beds and their stratigraphic correlation. The taphonomy of the fossil assemblages from the Saria Beds was also discussed.

TOLSTOSHEEF, V. I., KRUCHEK, S. A., KUDRYAVETS, I. D., SAKHARUK P. O. & LEVY, M. G. (2018). Thickness map of the Frasnian deposits of the Gomel structural bridge and the adjacent territories – Lithosphere, **49** (2): 83–94 [in Russian, with English summary].

In the process of analysis and generalization of the geology and geophysics on the Gomel structural bridge and adjacent territories, a stratigraphic study of sections of all shallow and deep wells was carried out in order to distinguish the thicknesses of Frasnian formations and to trace them on seismological cross-sections, and also to correlate them with tectonic data. A consolidated thicknes map of Frasnian deposits in the region has been constructed for the first time. This map shows blocks and dividing faults, which were inherited from the crystalline basement. They disrupt completely or partially the Frasnian deposits. The isopachs show thicknesses of Frasnian formations on each block and display positive and negative local structures. The map shows the location of all wells that have completely intersected the Frasnian deposits, and also of some wells which have only encountered Frasnian formations. This aims at the geodetic connection, both on the Gomel structural bridge and in adjacent territories, particularly in the northeastern part of the Pripyat trough.

MARK-KURIK, E., WEWMAN, M. I., TOOM, U. & BLAAAUWEN, I. L. (2018). A new species of the antiarch *Microbrachius* from the Middle Devonian (Givetian) of Belarus – Estonian Journal of Earth Sciences, **67** (1): 3–13.

The article describes *Microbrachius kedoae* sp. nov. (antiarch placoderm) from the Middle Devonian (Givetian) of the Gavrilchitsy 45 borehole,

located in the Starobin centrocline of the Pripyat Trough.

MAKHNACH, A. A., POKROVSKY, B. G., MUSRASHKO, O. V. & PETROV, O. L. (2019). Isotopic chemostratigraphy of the Lower and Middle Devonian sequence within the zone of conjugation of the Orsha Depression and Zhlobin Saddle (the Bykhov parametric borehole) – Lithosphere, **50** (1) 136–148 [in Russian, with English summary].

The paper contains results of the isotopic study of the Lower and Middle Devonian sequence drilled by the Bykhov parametric borehole in the east of Belarus, within the conjugation zone of the Orsha Depression and Zhlobin Saddle. Carbon and oxygen isotopes in carbonate-bearing and carbonate rocks, as well as sulfur isotopes in gypsum, were investigated. Isotopic signals of regional palaeogeographic events were revealed. These events include evaporation episodes, the continental flow energization, deepening and shallowing of the basin, and breaks in sedimentation. The regional isotopic chemostratigraphy enables the separation stratigraphic and lithologic units.

Abstracts

OBUKHOVSKAYA, V. Y. (2018). The palynological characteristic of Rechitsa deposits of South East of Belarus (North Pripyat shoulder and Zhlobin saddle) – In: MAKHNACH, A. A. et al. (Eds.), Problems of Geology of Belarus and Adjacent Territories, Materials of the International Scientific Conference Dedicated to the 100th Anniversary of A. S. MAKHNACH, Academician of the NAS of Belarus (Minsk, November 21–22, 2018), Institute for Nature Management of the National Academy of Sciences of Belarus: 149–152; Minsk, StroyMedia Project Publ. [in Russian].

In deposits of the lower part of the upper Frasnian substage of South East of Belarus, the local miospore zone (lone) *Convolutispora crassitunicata* is distinguished. It corresponds to the Rechitsa horizon. The palyno-complexes of the lone are characterized by a wide distribution of miospores of the genus *Archaeoperisaccus* and by the appearance of *Auroraspora speciosa*, *Membrabaculispores radiates*, and others, which provides an important correlative significance.

KRUCHEK, S. A., OBUKHOVKAYA, V. Y. & SACHANKA, T. F. (2018). Biostratigraphic characteristic of the Frasnian deposits of Gomel structural bridge and Klintsy graben – In: MAKHNACH, A. A. et al. (Eds.), Problems of Geology of Belarus and Adjacent Territories, Materials of the International Scientific Conference Dedicated to the 100th Anniversary of A. S. MAKHNACH, Academician of the NAS of Belarus (Minsk, November 21–22, 2018), Institute for Nature Management of the National Academy of Sciences of Belarus: 76–80; Minsk, StroyMedia Project Publ. [in Russian].

The characteristics of Frasnian deposits of the Gomel structural bridge and Klintsy Graben represented by the Zhelon, Sargayevo, Semiluki, and Rechitsa horizons, is given. They are characterized by complexes of miospores and brachiopods. It enables a correlation with formations of the same age of adjacent territories and can be used during geological mapping.

TOLSOSHEEV, V. I., KRUCHEK, S. A., SAKHARUK, P. O. & LEVY, M. G. (2018). Structural map of the surface of Frasnian deposits (Upper Devonian) of the Gomel structural bridge and the adjacent territories – In: MAKHNACH, A. A. et al. (Eds.), Problems of Geology of Belarus and Adjacent Territories: Materials of the International Scientific Conference Dedicated to the 100th Anniversary of A. S. MAKHNACH, Academician of the NAS of Belarus (Minsk, November 21–22, 2018), Institute for Nature Management of the National Academy of Sciences of Belarus: 177–182; Minsk, StroyMedia Project Publ.: [in Russian].

A structural map of the surface of Frasnian deposits on the Gomel structural bridge and adjacent territories is constructed. It shows the blocks inherited from the crystalline basement, faults, dividing those blocks, and the structure of the surface of Frasnian deposits, shown by isolines for each block.

ZAIKA, Y. U. (2018). New data on detached depositional units of Devonian age in the Asipovichy District (Belarus) – In: MAKHNACH, A. A. et al. (Eds.), Problems of Geology of Belarus and Adjacent Territories: Materials of the International Scientific Conference Dedicated to the 100th Anniversary of A. S. MAKHNACH, Academician of the NAS of Belarus (Minsk, November 21–22, 2018), Institute for Nature Management of the National Academy of Sciences of Belarus: 45–48; Minsk, StroyMedia Project Publ. [in Belarusian].

New data on Devonian detached depositional units occurring in the Asipovichy District (Belarus) are reported. Several hypotheses about their origin are discussed.

MURASHKO, O. V. & PLAX, D. P. (2018). A finding of the Middle Devonian conodonts in the Bykhovskaya parametric borehole section in the eastern part of Belarus – In: MAKHNACH A. A. et al. (Eds.), Problems of Geology of Belarus and Adjacent Territories: Materials of the International Scientific Conference Dedicated to the 100th Anniversary of A. S. MAKHNACH, Academician of the NAS of Belarus (Minsk, November 21–22, 2018), Institute for Nature Management of the National Academy of Sciences of Belarus: 138–139; Minsk: StroyMedia Project Publ. [in Russian].

New data on the fauna of conodonts from the Kostyukovichi Regional Stage of the Eifelian Stage in eastern Belarus are presented.

PLAX, D. P. (2018). Antiarch Fishes from the Devonian deposits of Belarus – In: KHARITONCHIK, S. V., MALYAREVICH, A. M. & KALINICHENKO, A. S. (Eds.), Proceedings of the 16th International scientific and technical conference «Science for Education, Production and Economy Purposes», Minsk, Belarusian National Technical University, **1**: 409 [in Russian].

PLAX, D. P. (2019). On the findings of actinopterygian fish remains in the Devonian deposits of Belarus – In: BOGDANOVA, T. N. et al. (Eds.), Proceedings of the LXV Session of the Palaeontological Society of the Russian Academy of Sciences, April 2–6, St. Petersburg: 257–259 [in Russian].

CM Tomáš KUMPAN

A new 3-years research project funded by the Czech Science Fundation titled „Palaeoclimatologic significance of Palaeozoic red pelagic carbonates: time specific facies or products of microbial activity?“ started in January 2019. Principal investigator is Ondřej BÁBEK (Palacký University), and coinvestigators are Jiří KALVODA (Masaryk University) and Jiří FRÝDA (Czech Geological Survey). Lower and Middle Devonian sections with alternating red and grey limestones were sampled in Barrandian area, and Middle Ordovician sections in Sweden. Through the analyses of stratigraphic contexts, carbonate petrology, mineralogy of Fe oxyhydroxides, element geochemistry, microgeochemistry and stable isotopes we will interpret the redox conditions, organic productivity and the presence or absence of microbial activity as possible controls of the red carbonate deposition. The principal aim is to make an insight into the origin and palaeoclimatological context of Palaeozoic red carbonate facies.

Our team also continued research related to the Devonian-Carboniferous Boundary and Hangenberg Crisis. We focused on element geochemistry. Two studies on the reconstruction of redox condition changes and the detection of volcanic and hydrothermal influence of sedimentary record were published (KALVODA et al. 2019, KUMPAN et al. 2019). Trace elements and REE composition are also studied at the Devonian/Carboniferous section Borkewehr and at the Frasnian/Famennian section Beringhauser Tunnel, in cooperation with Thomas BECKER (University of Münster) and Sven HARTENFELS (University of Cologne). Moreover, conodonts across the Devonian-Carboniferous Boundary were studied and new and reinterpreted high-resolution data from two famous Austrian sections, Grüne Schneid and Trolp, were provided in KAISER et al. (2019). Famennian and Tournaisian ostracod fauna from the Moravian Karst, Czech Republic, is the subject of join research with Claudia DOJEN (State Museum of Carinthia; DOJEN et al. 2019).

Publications

DOJEN, C., LUKOSZ, R., CÍGLER V. & KUMPAN, T. (2019). Environmental implications by Famennian and Tournaisian Ostracodes from the Moravian Karst (Czech Republic). – In: Strati 2019, 3rd International Congress on Stratigraphy, 2-5 July 2019, Milano, Italy, Abstract book: 182.

KAISER, S., KUMPAN, T. & RASSER, M. (2019 online). High-resolution conodont biostratigraphy in two key sections from the Carnic Alps (Grüne Schneid) and Graz Paleozoic (Trolp) – implications for the biozonation concept at the Devonian-Carboniferous boundary. – Newsletters on Stratigraphy, 26 pp., doi: 10.1127/nos/2019/0520.

KALVODA, J., KUMPAN, T., QIE, W., FRÝDA, J., BÁBEK, O. (2019 online). Mercury spikes at the Devonian-Carboniferous boundary in the eastern part of the Rhenohercynian Zone

(central Europe) and in the South China Block. – Palaeogeography, Palaeoclimatology, Palaeoecology, **531**, Part A, 109221.

KUMPAN, T., KALVODA, J., BÁBEK, O., HOLÁ, M., KANICKÝ, V. (2019). Tracing paleoredox conditions across the Devonian–Carboniferous boundary event: A case study from carbonate-dominated settings of Belgium, the Czech Republic, and northern France.

TM John MARSHALL and the Southampton Group

2018-19 has been a less eventful year for fieldwork with no longer trips to the Arctic. The time has been usefully spent catching up with existing projects, particularly on the Devonian-Carboniferous boundary. More publications are coming out and much of this comes from the TW:eed Project, where we investigated the vertebrates, environments and age of ROMER'S Gap from sections in the Scottish Borders. The important paper from us this year (and any year) is the one that reinterprets the age of the Upper Old Red Sandstone in Scotland. This proves (with palynology, what else) that the Upper ORS in Scotland is firmly Devonian in age, with the D-C boundary approximating the ORS-Ballagan Formation Boundary contact. This changes the view (accepted since the 1930's) that the Upper ORS was Early Carboniferous in age and that consequently, placoderm fish had ranges that extended into the Carboniferous. Importantly this places the ranges of the earliest Carboniferous tetrapods close to *Ichthyostega* and *Acanthostega* and closed 2/3 of ROMER'S Gap not just by finding more tetrapods but by re-dating the sections. In October we made a brief foray to the TW:eed sections in Scotland and were successful in finding a new plant bed including seeds.

In May, I went with Chris BERRY (Cardiff) to Russia on a Science Café sponsored by the British Consul General in Ekaterinburg. We visited Syktyvkar in the Komi Republic, where Olga TEL'NOVA had organised two days of presentations by UK and Russian colleagues on the Devonian and particularly the terrestrial environment. On the return journey we stopped in St Petersburg hosted by Sergei SNIVREVSKY and studied excellent collections in VSEGEI, the University and Botanic Garden. This included some magnificently large *Callixylon* trunks.

The summer was all about conferences and I attended the overlapping AASP (palynology) meetings in Ghent (talk on malformed spores at the F/F mass extinction) and STRATI-2019 in Milano (talk on Devonian-Carboniferous boundary again), where we had a useful and well attended Devonian session followed by the SDS Business Meeting. In August I went to the Carboniferous Congress in Köln for a day and the special session on the D-C boundary redefinition (talk on defining the terrestrial D-C boundary).

At the end of August I attended the EGU Extinctions Meeting in Utrecht (talk on both the F-F and D-C boundary mass extinctions in 15 minutes). This was an interesting meeting not for its Palaeozoic content but for learning about the very detailed studies on the T/J and other mass extinctions.

Publications

RICHARDS, K., SHERWIN, J., SMITHSON, T., BENNION, R., DAVIES, S., MARSHALL, J. E. A. & CLACK, J. (2018). Diverse and durophagous: Early Carboniferous chondrichthyans from the Scottish Borders. - Earth and Environmental Science Transactions of the Royal Society of Edinburgh, **108** (1): 67-87, doi:10.1017/S1755691018000166

MARSHALL, J. E. A. & SIVETER, D. J. (2018). The Lake Il'men Clint, Russia: a Potential Devonian Geopark. - Journal of Mining Institute, **234**: 581-590, doi: 10.31897/PMI.2018.6.581.

MONAGHAN, A. A., UNDERHILL, J. R., HEWETT, A. J. & MARSHALL, J. E. A. (Eds., 2019). Paleozoic Plays of NW Europe. - Geological Society, London, Special Publications, **471**: 395pp.

MONAGHAN, A. A., UNDERHILL, J. R., MARSHALL, J. E. A. & HEWETT, A. J. (2019). Paleozoic Plays of NW Europe: an introduction. The Old Red Group (Devonian) – Rotliegend (Permian) Unconformity in the Inner Moray Firth. - In: MONAGHAN, A. A., UNDERHILL, J. R., HEWETT, A. J. & MARSHALL, J. E. A. (Eds.), Paleozoic Plays of NW Europe. Geological Society, London, Special Publications, **471**: 1-15.

MARSHALL, J. E. A., GLENNIE, K. W., ASTIN, T. R. & HEWETT, A .J. (2019). The Old Red Group (Devonian) – Rotliegend (Permian) Unconformity in the Inner Moray Firth. - In: MONAGHAN, A. A., UNDERHILL, J. R., HEWETT, A. J. & MARSHALL, J. E. A. (Eds), Paleozoic Plays

of NW Europe. Geological Society, London, Special Publications, **471**: 237-252.

BROWN, J. F., ASTIN, T. R. & MARSHALL, J. E. A. (2019). The Old Red Group (Devonian) – Rotliegend (Permian) Unconformity in the Inner Moray Firth. - In: MONAGHAN, A. A., UNDERHILL, J.R., HEWETT, A.J. & MARSHALL, J. E. A. (Eds.), Paleozoic Plays of NW Europe. Geological Society, London, Special Publications, **471**: 253-280.

CLACK, J. A., RUTA, M., MILNER, A. R., MARSHALL, J. E. A., SMITHSON, T. R. & SMITHSON, K. Z. (2019). *Acherontiscus caledoniae*: the earliest heterodont and durophagous tetrapod. - Royal Society Open Science, **6** (5): 182087

MILLWARD, D., DAVIES, S. J., BRAND, P. J. BROWNE, M. A. E., BENNETT, C. E., KEARSEY, T. I., SHERWIN, J. E. & MARSHALL, J. E. A. (2019). Palaeogeography of tropical seasonal coastal wetlands in northern Britain during the early Mississippian Romer's Gap. - Earth & Environmental Transactions Royal Society Edinburgh, **109**: 279-300.

MARSHALL, J. E. A., REEVES, E., BENNETT, C., DAVIES, S., KEARSEY, T., MILLWARD, D., BROWNE, M. (2019). Reinterpreting the age of the uppermost 'Old Red Sandstone' and Early Carboniferous in Scotland. - Earth and Environmental Science Transactions of the Royal Society of Edinburgh, **109**: 265-278.

CHALLANDS, T. J., SMITHSON, T. R., CLACK, J. A., BENNETT, C. E., MARSHALL, J. E. A., WALLACE-JOHNSON, S. M. & HILL, H. (2019). A lungfish survivor of the end-Devonian extinction and an Early Carboniferous dipnoan radiation. - Journal of Systematic Palaeontology, doi: 10.1080/ 14772019.2019.1572234

CM Atike NAZIK

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Çukurova University, Faculty of Engineering, Department of Geological Engineering, 01330, Balcalı, Adana,Turkey
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I continued research on Devonian ostracods from different sections of NW Anatolia and the Taurides in Turkey. Recently, I started to study Upper Devonian ostracods of shallow-water sections from Mongolia, together with Peter KÖNINGSHOF (Senckenberg Institute, Frankfurt a. M.).

My Ph.D student **Emine ŞEKER** is continuing her Ph.D.Thesis on "Ostracod Analysis of the Devonian sequence from the Eastern Taurides (Feke/Adana and Sarız/Kayseri): Biodiversity, Paleoecology, Paleogeography". The MSc. student **Gürkan GÜRBÜZ** started to study the palaeoecological and palaobiogeographic distribution of Devonian ostracods in the Karaisalı - Hacıkırı (Adana) region.

Publications

NAZIK, A., GROOS-UFFENORDE, H., OLEMPSKA, E., YALCIN, M. N., WILDE, V., SCHINDLER, E., KÖNINGSOF, P., ŞEKER ZOR, E. & WEHRMANN, A. (2018). Late Silurian and Devonian ostracods of the Istanbul Zone (Western Pontides) and the Taurides: palaeogeographical implications. - Palaeobiodiversity and Palaeoenvironments, **98**: 593-612.

ÖZKAN, R., NAZIK, A., MUNNECKE, A., SAYDAM-DEMIRAY, D. G., SCHINDLER, E., AYDIN ÖZBEK, T. et al. (2019). Givetian/Frasnian (Middle/Upper Devonian) transition in the eastern Taurides, Turkey. - Turkish Journal of Earth Sciences, **28**: 207-231.

FEIST, M., NAZIK, A., SCHINDLER, E., WEHRMANN, A. & YALCIN, M. N. (2019). Distribution and palaeoecology of charophyte floras in Devonian coastal environments of the Central Taurides (Turkey). - Palaeobiodiversity and Palaeoenvironments, **99**: 353-366.

TM D. Jeffrey OVER

is continuing the study of conodonts, magnetic susceptibility, and astrochronology of Middle through Upper Devonian strata and of the Devonian-Carboniferous boundary, with a focus on the Marcellus Shale in the Appalachian Basin and the shallow water Dyer Formation in Colorado. The Devonian stratigraphy of New York, in cooperation with VER STRAETEN, WOODROW, BAIRD, BRETT, BARTHOLOMEW, ZAMBITO, EBERT, and others, is in the review stage. Publication is planned for June 2019. The 2020 SDS meeting will be held in Geneseo, New York, which will include a pre-meeting field trip focusing on Upper Devonian clastic dominated strata and a post-meeting trip to visit carbonate dominated Lower and Middle

Devonian locations. The schedule and announcement is elsewhere in this newsletter. The web site is: https://www.geneseo.edu/SDS_2020.

CM Eberhard SCHINDLER

The move of the palaeontological/geological department at Senckenberg covered almost the entire year 2018 – and I was the last of all Frankfurt Senckenberg scientists to be transferred to our new building. Of course, this influenced scientific work throughout the year.

There are still results of Turkish–German cooperation projects published (NAZIK et al. 2018) – further papers are in preparation (see e.g., SCHINDLER et al. 2018).

Work on the Eifel area continued together with Carl BRETT and German colleagues – a talk on a section in the Hillesheim Syncline was given at the IPC 5 Meeting in Paris (BROCKE et al. 2018).

Publications 2018 (in chronological order)

BROCKE, R., RIEGEL, W., BRETT, C. E., HARTKOPF-FRÖDER, C., LENZ, O., KÖNIGSHOF, P., SCHINDLER, E. & WILDE, V. (2018). Palynology and microfacies of Middle Devonian leperditian-rich beds from the classical Eifel area (Germany). – 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract Book: 786.

SCHINDLER, E., FEIST, M., NAZIK, A., WEHRMANN, A. & YALÇIN, M. N. (2018). First record of charophytes in the Devonian of Turkey (Central Taurides). – 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract Book: 809.

NAZIK, A., GROOS-UFFENORDE, H., OLEMPSKA, E., YALÇIN, M. N., WILDE, V., SCHINDLER, E., KÖNIGSHOF, P., ŞEKER ZOR, E. & WEHRMANN, A. (2018). Late Silurian and Devonian ostracods of the Istanbul Zone (Western Pontides) and the Taurides: palaeogeographical implications. – Palaeobiodiversity and Palaeoenvironments, **98** (4): 593-612, doi: org/10.1007/s12549-018-0340-5.

TM Ladislav SLAVÍK

In spring 2018, together with co-authors, Jindra HLADIL and Aneta HUŠKOVÁ, we finished two Devonian papers on conodont stratigraphy and bioevents to be included in GEcKO Special Issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*. The volume is going to be published in 2019. Together with MA Xueping and other Chinese colleagues we have published a paper on Lower Devonian conodonts of the Alengchu section in Western Yunnan. The conodont succession described includes *Gondwania irregularis* (= *E. sulcatus*), which overlaps with *Eocostapolygnathus kitabicus*! Such an overlap can be another proof of very low stratigraphical level of both taxa.

In April I was kindly invited by Turkish colleagues (namely CM Atike NAZIK) to take part in the 71st Geological Congress of Turkey. Besides other things, I had possibilities to share some experience in Silurian-Devonian stratigraphy and manifold problems in global correlation. The entire event and the warm welcome was a very nice experience.

In summer 2018 we enjoyed the "Fossil week", wonderfully organized 5th International Paleontological Congress in Paris, and, especially our Devonian session and the SDS meeting. My PhD student Aneta HUŠKOVÁ and I also took part in the post-congress fieldtrip to Paleozoic, Mesozoic and Coenozoic marine sedimentary successions in the Anjou.

Other Devonian activities included collaboration on several papers (e.g., DA SILVA et al., "Cyclicity paper" in press, and BÁBEK et al., 2018, "Red carbonates paper") and various conodont samplings of several sections in the Prague Synform.

Apart from Devonian activities, I was involved in the late Silurian project "Přídolí Series in the Prague Synform - proposal for chronostratigraphic subdivision". where I act as a team leader of the research team with members from the Institute of Geology of the Czech Academy of Sciences (P. ŠTORCH, A. HUŠKOVÁ) and the Czech Geological Survey (Š. MANDA, Z. TASÁRYOVÁ, P. Čáp). And, the first results on stratigraphy that tickles also the Silurian-Devonian boundary, have been published (VACEK et al. 2018).

Publications

Journal papers

BÁBEK, O., FAMĚRA, M., HLADIL, J., KAPUSTA, J., WEINEROVÁ, H., ŠIMÍČEK, D., SLAVÍK, L. & ĎURIŠOVÁ, J. (2018). Origin of red pelagic carbonates as an interplay of global climate and local basin factors: Insight from the Lower

Devonian of the Prague Basin, Czech Republic. - Sedimentary Geology, **364**: 71-88.

WANG, H.-H., MA, X.-P., SLAVÍK, L., WEI, F., ZHANG, M.-Q. & LÜ, D. (2018). Lower Devonian Conodont biostratigraphy of the Alengchu section in Western Yunnan province, South China. - Journal of Stratigraphy, **42** (3): 288-300. Nanjing.

VACEK, F., SLAVÍK, L., SOBIEN, K. & ČÁP, P. 2018): Refining the late Silurian sea-level history of the Prague Syncline – a case study based on the Přídolí GSSP (Czech Republic). – Facies, **64** (30), 16 pp.

Abstracts

SPROSON, A.D., POGGE VON STRANDMANN, P., SELBY, D., LENTON, T.M., JAROCHOWSKA, E., FRÝDA, J., HLADIL, J., LOYDELL, D., SLAVÍK, L. (2018). Orbitally paced Silurian glaciations invoke negative weathering feedbacks that reverse global cooling. – In: Japan Geoscience Union Meeting 2018, Makuhari Messe Chiba, 20-24 May 2018: SCG55-02.

EBERT, J.R., SLAVÍK, L., MATTESON, D.K., BARR, M. (2018). Post-Jamesville Member (Manlius Formation, Helderberg Group) Stratigraphy and the age of the Mosquito Point Reef, Munnsville, New York. – In: The Geological Society of America, Annual Meeting, 18-20 March, 2018, Burlington, Vermont, USA, Abstract ID#:310161 (Northeastern Section 53rd Annual Meeting 2018).

SLAVÍK, L. (2018). Orta Paleozoyik Tabakalarinin Korelasyonu: GSSPs, Biyo-olaylar, Çoklu Yaklasimilar Ve Hatalar / Correlation of Mid-Palaeozoic Strata: The GSSPs, Bioevents, Multiproxies and Errors. - In: AVCIOGLU, M., KURTTAS, T., TOKSOY KÖKSAL, F., EYÜBOGLU, Y., BABA, A., YIGITBAS, E. (Eds), Abstract Book, 71. Türkiye Jeoloji Kurultayi, 23-27 Nisan (71st Geological Congress of Turkey, 23-27 April 2018), METU Cultural and Convention Center, Ankara, Turkey: 767-768.

DA SILVA, A. C., DEKKERS, M., DE VLEESCHOUWER, D., HLADIL, J., CHADIMOVA, L., SLAVIK, L., HILGEN, F. (2018). Millennial scale climate variability during Devonian greenhouse times. In: European Geosciences Union General Assembly 2018, Geophysical Research Abstracts, **20**: EGU2018-18979.

HUŠKOVÁ, A. & SLAVÍK, L. (2018). Diversity of the Lower Devonian icriodontids from the Prague Synform. - In: 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract book: 795.

SLAVÍK, L., MARSHALL, J. E. A., BRETT, C. E. (2018). The Annual meeting of the Subcommission on Devonian Stratigraphy SDS/IUGS – The Pragian/Emsian issue. In: 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract book: 810.

SLAVÍK, L. (2018). The Pragian/Emsian boundary in the Prague Synform: possibilities and constraints for the boundary stratotype. In: 5th International Paleontological Congress – Paris, 9th-13th July 2018, Abstract book: 811.

SLAVÍK, L. (2018). The Pragian/Emsian boundary: Complications, Errors and a story of completely vanished Devonian Stage. - In: PŠENIČKA, J., FROJDOVÁ, J., SVOBODOVÁ, A. & DAŠKOVÁ, J. (Eds.), Abstract book, 19th Czech-Slovak-Polish Palaeontological Conference & MIKRO 2018 workshop, Prague, October 18-19, 2018. Folia Musei Rerum Naturalium Bohemiae Occidentalis Geologica et Paleobiologica, Special Volume, **2018**: p. 79; West Bohemian Museum in Pilsen.

HUŠKOVÁ, A. & SLAVÍK, L. (2018). Conodont diversity from Silurian/Devonian boundary interval from the Praha-Radotin section. In: 1st Virtual Palaeontological Congress, 1. - 15.12.2018, Valencia.

TM Claudia SPALLETTA

I am continuing research on Devonian conodont biostratigraphy and taxonomy, mainly in the Carnic Alps, where the conodont studies are supported by extensive lithologic and sedimentologic analysis. The original relationship between the Devonian carbonate lithostratigraphic units, disrupted by tectonics, are under study with the valuable, priceless collaboration, among others, of Monica PONDRELLI (Pescara). She is producing extremely detailed geologic maps of the Palaeozoic of the Carnic Alps, the first of which will be published soon. We hope that the detailed mapping, the palinspastic reconstruction, and the accurate conodont dating will help in reconstructing the original facies changes, and the physiography of the Devonian Carnic Basin. The multi-year research on the Frasnian/Famennian boundary in collaboration with Maria Cristina PERRI, the late Enzo FARABEGOLI, Monica PONDRELLI, Michael

JOACHIMSKI (Erlangen), and Anita ANDREW materialized in a huge manuscript that still awaits publication. Summaries of the research on the Devonian/Carboniferous boundary in the Carnic Alps and Sardinia have been presented at the Business Meeting on the DCB in Cologne, and will be among the papers to be published in the special volume on the DCB edited by Markus ARETZ and Carlo CORRADINI. The research on the DCB are carried with the main collaboration of Carlo CORRADINI (Cagliari), Maria Cristina PERRI, and Monica PONDRELLI.

Publications

SPALLETTA, C. & CORRADINI, C. (2018). History of conodont researches in the Carnic Alps (Austria and Italy): an overview. - Gortania (Geologia, Paleontologia, Paletnologia), **39** (for 2017): 5-26; Udine, ISSN: 2038-0410

CM Thomas J. SUTTNER

In 2018, we made only little progress. Several applications for research positions and third-party funding were rejected. However, we have resubmitted a revised proposal on icriodontid conodonts to the Austrian Science Fund. Only one paper about the icriodontid apparatus motion was published in the Journal of Systematic Palaeontology. The manuscript on conodont stratigraphy of late Devonian deposits from western Mongolia for the GECkO special Issue in *Palaeo 3* is published online first. In November 2018, I have received the *Award for Palaeobiology* for biostratigraphic and palaeobiological studies on conodonts by the Austrian Academy of Sciences.

Publications

CORRADINI, C., CORRIGA, M. G., KIDO, E., LAPINI, L., MUSCIO, G., PONDRELLI, M., SIMONETTO, L. & SUTTNER, T. J. (2018). Passo Volaia – Leggere il passato nelle rocco. – Le guide del geoparco della Carnia – 1. - Museo Geologico della Carnia, Comunità Montana della Carnia: 1-48, Udine.

SUTTNER, T. J., KIDO, E. & BRIGUGLIO, A. (2018). A new icriodontid conodont cluster with specific mesowear supports an alternative apparatus motion model for Icriodontidae. - Journal of Systematic Palaeontology, **16** (11): 909–926, doi.org/10.1080/14772019.2017.1354090.

CM Susan TURNER

I am still working on mid-Palaeozoic vertebrates and their biostratigraphy, concentrating on thelodonts, gyracanths and ‘sharks’. Various projects continue on the ORS fishes of Britain (Midland Valley of Scotland, Welsh Borders, S Wales and Ireland), and across Gondwana (Australia, Turkey, Pakistan). I am a co-author on publications about thelodonts (with Michal GINTER) and other stem chondrichthyans (with Carole BURROW) for the AGP volume based on presentations at the Early Vertebrates/Lower Vertebrates conference in Poland in 2017, a symposium that was held in honour of my 50 years of work. Several papers recently published (TURNER & BURROW 2018) and in progress (LONG et al.) deal with correlating Australian and other vertebrate microremain occurrences from assemblages previously unstudied or only superficially studied, with better known sequences in other regions.

Publications

BURROW, C., TURNER, S., MAISEY, J., DESBIENS, S. & MILLER, R. (2017). Spines of the stem chondrichthyan *Doliodus latispinosus* (WHITEAVES) comb. nov. from the Lower Devonian of eastern Canada. - *Canadian* Journal of Earth Sciences, **54**: 1248-1262.

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TM José Ignacio VALENZUELA-RÍOS and CM Jau-Chyn LIAO (2017-2019)

Our activities focused on Lower, Middle and Upper Devonian conodont biostratigraphy, Middle Devonian conodont biofacies, and Lower and Middle Devonian microfacies analysis of selected Pyrenean sections. Most of these efforts were oriented towards the organization of the joint SDS-ICOS-ISSS preconference fieldtrip in the Spanish Pyrenees (June 2017) and continue today. Besides the Pyrenees, studies in the Iberian Cordillera have been re-launched and intensified. Cooperation with Raimund FEIST (Montpellier) started in fall 2015 and increased during 2018 with Catherine GIRARD as well, as Teresa spent a short stay (3 months) working together at the University of Montpellier. Around 100 conodont samples were taken in selected outcrops in the Montagne Noire. First results were presented at IPC 5 in Paris (2018) and subsequent conclusions were presented at Strati 2019. Noteworthy is the downward range extension of several key taxa, including the defining taxon for the base of the Frasnian at Coll du Puech de la Suque. We plan to elaborate joint results in the near future and to increase collaboration.

Both in the Spanish Central Pyrenees and in the Iberian Chains, multidisciplinary studies on Devonian sections and outcrops have started. In this context the following actions are noteworthy: Together with CM Sofie GOUWY a graphic correlation project for Pyrenean sections rendered the first results (GOUWY et al. 2016). We have started with Middle and early Upper Devonian sections, and our intention is to continue with Lower Devonian ones.

A cooperation with TM Ladislav SLAVÍK, CM Leona CHADÍMOVÁ and Aneta HUŠKOVÁ from the Czech Geological Survey aims at the comparison of Lower Devonian conodont biostratigraphy, geophysical (mainly GRS and MS) and geochemical data from two European key regions, the Spanish Central Pyrenees and the Prague Synform. This has already produced important results for the middle and upper Lochkovian (VALENZUELA-Ríos et al., 2015) and for the strata around the Lochkovian/Pragian boundary (SLAVÍK et al., 2016). We expect to continue this collaboration.

The long-term project on the detail analysis of Bohemian conodont faunas around the S/D interval is in progress together with CMs Mike MURPHY and Peter CARLS. Also results on a particular group (*Pedavis*) were presented at the 5th IPC and the corresponding paper is already finished.

Cooperation with paleobotanics started in the Lower Devonian strata of the Iberian Chains. It produced first results that demonstrate the presence of high diversity palynoflora (34 spore taxa from 20 genera) of early Pragian age (CASCALES-MIÑANA et al., 2015). The cooperation continues and we want to augment the palaeontological characterization of Lower Devonian strata in the Iberian Chains by adding to the already rich invertebrate and vertebrate data base, the paleopalynological record. This on-going project extends to the Middle and Upper Devonian strata of the Iberian Chains. Some of these results will be presented during the next fieldtrip in connection with the PALASS meeting, to be hold in Valencia (December 2019).

We have also started to pay close attention to the identification of “Events” in the Spanish Pyrenees. Preliminary results have already been presented at professional conferences and we have the intention to submit a long-term project to the next Spanish Grant competition.

In cooperation with CM Olga IZOKH, three selected Devonian sections (and intervals) have been sampled for geochemical studies. The preliminary sampling, which started three years ago, was completed last summer on the occasion of the Pyrenees fieldtrip together with TM Nadya IZOKH and Tatiana KHLEBNIKOVA.

CM LIAO has started a Middle and Upper Devonian joint project with Susana GARCÍA-LÓPEZ

(University of Oviedo) on selected localities of the Cantabrian Mountains. She is focussing now on the Kačác Event in several Spanish sections.

TM Nacho VALENZUELA together with TMs Ladislav SLAVÍK and Nadya IZOKH evaluate the conodont record from the Zinzilban section aiming at the redefinition of the base of the Emsian. This action is a consequence of SDS decisions in 2008 and the new sampling carried out in 2015. So far, the local *Polygnathus* record is scarce and limited to a few beds. This makes an evaluation of the proposed redefined criterium very difficult in the Zinzilban Gorge section.

Last June, our lovely long term friend and colleague CM Mike MURPHY was honoured at the North American Paleontology Conference held at the University of California, Riverside, with an special symposium dedicated to him. Nacho attended this meeting and presented two talks; one showing the impact of one of Mike's ideas on the global subdivision of Lochkovian strata and the other, a joint contribution with CM Peter CARLS, regarding the Pragian and Emsian records of the Spanish outcrops.

The Devonian of the Iberian Chains was also visited during the last International Brachiopod Conference (September 2018), where one day was devoted to visit several localities exhibiting Ordovician to early Devonian brachiopods in the Eastern Iberian Chains. TM José IGNACIO VALENZUELA RÍOS and CMs Jenaro GARCÍA-ALCALDE and Peter CARLS were involved in the Devonian part.

The cooperation we started with the late and lovely friend CHEN Xiuquin (Suzi) and with her/our student Jianfeng LU rendered first results in joint papers quoted below. They represent the first steeps in the envisaged long-term Chinese-Spanish cooperation.

Another multilateral cooperation started in Mongolia several years ago. It rendered the first paper co-authored by 13 colleagues, led by Thomas SUTTNER.

Recently TM Nacho and CM Teresa attended the STRATI 2019 in Milano, with active participation in two symposia, the SDS and the Pander ones, showing the relevance of conodonts for solving geological problems and for challenging geodynamic (and other) interpretations, which are not supported by paleontological data.

Other important actions in relevant Spanish outcrops include 1) the stratigraphical and palaeontological study of Lower Devonian outcrops in Ossa-Morena and Central-Iberian areas in south-western Spain, together with other Spanish colleagues (Miguel PARDO and Esperanza FERNÁNDEZ). This project entails large field-campaigns and mapping in rough areas. 2) Long-term collaboration with CM Peter CARLS on the Devonian of the Iberian Chains, a classical and key area for "Rhenish" (neritic) facies. 3) CM Jenaro L. GARCÍA-ALCALDE continues publishing large monographies on brachiopods from the Cantabrian Mountains. 4) A first joint work with Michal MERGL on lingulate brachiopods from a Pyrenean section has been finished.

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Abstracts

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VALENZUELA-RÍOS, J. I. & LIAO, J.-C. (2019). Conodont as a tool for challenging Geodynamic interpretations: two examples from the Devonian of the Spanish Pyrenees. In: 3rd International Congress on Stratigraphy, STRATI 2019, Abstract Book: 64.

CM Chuck VER STRAETEN

New York is a significant Devonian region in multiple ways. I recently asked our surficial/GIS geologist to calculate the geographic area of Devonian strata in the state. He reported back that Devonian strata are exposed or underlie 50,535 km^2/19512 mi^2 of the state; that equals ca. 40.1% of the total surface area of New York.

For several years, the New York Devonian crew have worked on a volume revising L.V. RICKARD'S (1975) New York Devonian correlation chart. Unlike the brief text in RICKARD'S (1975) chart, this volume will include 10 chapters, which will detail post-1975 stratigraphic revisions, with discussions and summaries of related geological and paleobiological research done since that time. The volume and correlation chart will be published digitally through the Paleontologic Research Institution (Ithaca, New York), and should be out for the Summer 2020 SDS meeting in New York. Co-editors for the volume are myself, Jeff OVER, and Don WOODROW. I'm sole or lead author on chapters about New York's Pragian-Emsian, Eifeian-lower Givetian, and Devonian terrestrial successions.

Several of us in the New York Devonian geo and paleo crew are assisting Jeff OVER preparing for the 2020 SDS meeting here in New York. Jeff and I also plan to make the 1981 and 1997 New York SDS fieldtrip guidebooks digitally available for the meeting also.

There is ongoing research on the Devonian terrestrial strata of New York State. Although these strata are found across nearly 10% of the state (ca. 11,882 km^2/4588 mi^2), New York's Devonian terrestrial strata continue to be my main research focus, in the Catskill Mountains of eastern New York.

For over 20 years I've kept a quote from long-time SDS member Michael HOUSE pasted around my office. *"As an area in which the relations between terrestrial and marine facies can be elucidated, the New York sequence must surely be the only complete succession in the world which can be regarded as forming an international standard."* Michael HOUSE (1974), on New York's Devonian strata.

Over the continuing years, I hope to add to the work done by my predecessor L.V. (Larry) RICKARD and others, and draw some additional solid lines of correlation through the terrestrial into the marine succession to the west. By the way,

Larry RICKARD, who was an active SDS Member, is still alive and still lives in the Albany region.

Publications

Paper in press

VER STRAETEN, C. A., OVER, D. J. & BAIRD, G. C. (in press). Arc-to-Craton: Devonian Airfall Tephras in the Eastern United States. – In: AVARY, K. L., DIECCHIO, R. & HASSON, K. (Eds.), volume dedicated to John DENNISON, a leading 20th Century Appalachian Basin Devonian researcher. Invited submission for Geological Society of America, Special Paper.

Paper in review

Five sole- and co-authored papers in review:
1) Pragian-Emsian strata of New York;
2) Eifelian-lower Givetian strata of New York;
3) Devonian terrestrial strata of New York;
4) Paleoredox of Eifelian-lower Givetian strata, Appalachian Basin, eastern U.S.;
5) Shallow versus deep water deposition of Middle to Upper Devonian shales in New York. - Comment for journal *Geology*.

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CM Gavin YOUNG

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Emeritus Prof. **Ken CAMPBELL** died in his 90th year in June 2017. This marked the end of an era of high quality palaeontological research at the ANU in the Department of Geology (later merged with the Research School of Earth Sciences). This began with appointment of ANU Foundation Professor of Geology D.A. BROWN in 1959, himself a palaeontologist specializing in Bryozoa.

Ken CAMPBELL'S last papers on Devonian lungfish featured images using the latest XCT scanning techniques contributed by co-author Prof. Tim SENDEN of the Department of Applied Mathematics (now Director of the Research School of Physics). Applied Mathematics developed and built the high-resolution scanners now used to study fossils. Research on Palaeozoic vertebrates at ANU continues within that department; the latest scanners use helical rather than circular data acquisition to increase both the resolution and size of fossils that can be scanned.

Gavin YOUNG has continued his research in the Dept. of Applied Maths with current projects on placoderm skulls and braincases from the Burrinjuck Early Devonian limestones (with Yuzhi HU and Jing LU), early tetrapodomorph fishes from Hatchery Creek (with Jing LU and James HUNT), various forms from the Early Devonian Cravens Peak limestone in the Georgina Basin (with Carole BURROW), and antiarchs (*Remigolepis*) and large sarcopterygians from the Upper Devonian of the south coast (with Bob Dunstone).

Bob DUNSTONE with colleague **Peter OLLERENSHAW** continued field activities along the south coast in the Upper Devonian outcrops. Further excavation at the type locality for the giant lobe-finned fish *Edenopteron keithcrooki* YOUNG et al. 2013 has yielded new *Edenopteron* skull material, and some previously missing elements of the extrascapular series and shoulder girdle. Spectacular new examples of the placoderm fish

Remigolepis are of considerable size; they include skulls and intact tails, with bone and scale tissue preserved. Excavation has commenced at another site further south in the coastal cliffs of Ben Boyd National Park, yielding articulated remains of complete lobe-finned fish possibly related to taxa described from the Aztec Siltstone of Victoria Land, Antarctica. This fieldwork is covered by a Scientific Licence from NSW National Parks. A paper on the new *Edenopteron* material is in press in Australian Journal of Earth Sciences.

Ms **Yuzhi HU** continues her PhD research using CT scanning and 3D printing to investigate braincase preservation in the Early Devonian fossil vertebrates from Burrinjuck. Current focus concerns denticle structure of the gnathal bones inside the jaw, in relation to recent ideas about the evolution of teeth. The only other student working on Devonian is **Alex WATT** (RSES), who is conducting acid extraction of Burrinjuck arthrodire bones for an undergraduate student project.

Dr Jing LU (Institute of Vertebrate Paleontology & Paleoanthropology, Beijing) worked in the Dept. Applied Maths in 2016-17 under an ANU Postdoctoral Fellowship. She has returned each year since then to progress work analyzing new XCT data on a range of fossil skulls and braincases from Burrinjuck, and other projects including the South Coast sarcopterygians. Other co-workers visiting ANU have been You-An ZHOU (IVPP, Beijing) and Carole BURROW (Queensland Museum). A French Documentary team working on '*The secret story of our body*' project visited the ANU CT lab in 2017 to film scanning and 3D printouts of 400 Ma vertebrate eye structures. This is now produced as *'The secret history of our evolution'* (Mona Lisa Productions) for French TV in 2019.

In 2018 (with Jing LU) we presented on Devonian fish and plants at the *5th Conference on Earth System Science* (2-4 July, Shanghai), and on Devonian fish from Australia and China at the IPC in Paris, when I also attended the SDS meeting.

In 2019 we participated in the extremely successful *15th International Symposium on Early and Lower Vertebrates* [ISELV15], held in Qujing, Yunnan Province, China, which attracted some 96 delegates. Included were exceptional pre and post conference field trips visiting internationally significant Siluro-Devonian fossil sites in Hunan and Yunnan Provinces.

Publications (2017-2019)

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CM Stanislava VODRÁŽKOVÁ

In 2018 I was mainly working on the manuscript with Thomas SUTTNER on Eifelian conodonts from the Kačák event level from the Barrandian area, which we are about to submit for publication in the following days. I had to interrupt my work on the manuscript several times due to my participation in other project related to unique, shallow-water, lower Silurian facies in the Barrandian area. I also started an active cooperation on Eifelian conodonts with K. NARKIEWICZ and her working group. In 2019 a new project of Ondřej BÁBEK focusing on Paleozoic red limestones started, with Tomáš KUMPAN, Jiří FRÝDA, Jiří KALVODA and myself in the working group.

Publication

VODRÁŽKOVÁ, S., VODRÁŽKA, R., FRANCŮ, J., AL-BASSAM, K., HALODOVÁ, P. & TONAROVÁ, P. (2019). Microbially-induced wrinkle structures in Middle Devonian siliciclastics from the Prague Basin, Czech Republic – Lethaia, **52** (2): 149-164, doi.org/10.1111/let.12280.