

Report on the 19th International Congress on the Carboniferous and Permian, Cologne, July, 29th–August, 2nd, 2019

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Figure 1. Participants of the 19th ICCP 2019, Cologne

Facts

The 19th International Congress on the Carboniferous and Permian (XIX ICCP 2019) was held from July, 29th to August, 2nd, 2019 at the University of Cologne, Germany. Organized by Hans-Georg Herbig, Michael Amler, Sven Hartenfels (all University of Cologne), and Markus Aretz (Université Paul Sabatier Toulouse, France), it came back to central Europe, after the successful meetings in Nanjing (2007), Perth (2011), and Kazan (2015), sixteen years after the 15th ICCP in the Netherlands (Utrecht, 2003), and forty-eight years after the “7ème Congrès International de Stratigraphie et de Géologie du Carbonifère” in Krefeld, 1971, hitherto the only congress of the series in Germany. The congress was financially strongly supported by German Research Foundation (DFG), German Academic Exchange Service (DAAD), and the International Commission on Stratigraphy (ICS). Additional funds could be raised from the International Association of Sedimentologists (IAS), the German Geoscientific Network Aachen-Bonn-Köln-Jülich (ABC-J), and the Geological Survey of the German Federal State Northrhine-Westfalia (Geologischer Dienst Nordrhein-Westfalen).

Exactly 200 participants from 27 countries (Tab. 1) gathered during hot summer days in the central lecture hall of the university, which enabled compact presentation of lectures and posters. This not only facilitated rapid and easy change between the two parallel sessions, but also vivid discussions among all participants and to relax with coffee, drinks and snacks. 14 sessions were grouped into five major themes: (1) the World of Stratigraphy, (2) the World of Palaeontology, (3) the World of Facies, Environments, and Basin Analysis, (4) the World of Oceans and Mountains, (5) the World of Economic Geology. Morning and afternoon sessions were opened by splendid keynotes (Tab. 2), each 40 minutes long. Of course, the key notes introduced into the major topics, but also were a quite successful tool to sweep people back to the lecture hall!

Inauguration speeches in the opening ceremony highlighted the traditional and future economic importance of Carboniferous rocks in western Germany (Dr. Ulrich Pahlke, Director of the Geological Survey of Northrhine-Westfalia, Krefeld), explained the rooting of the university within the city of Cologne (Mrs. Helga Blömer-Frerker, Mayor of the Cologne University district Lindenthal), introduced the wide spectrum of the Cologne geosciences

Germany (73)	USA (8)	Ireland (3)	Ukraine (2)	Portugal (1)
China (24)	Italy (6)	Japan (3)	Canada (1)	Slovenia (1)
Russia (17)	United Kingdom (6)	Spain (3)	Egypt (1)	Turkey (1)
Belgium (11)	Australia (4)	Czech Republic (2)	Hungary (1)	
Poland (10)	India (4)	Mexico (2)	Kazakhstan (1)	
France (9)	Austria (3)	The Netherlands (2)	Morocco (1)	

Tab 1. Distribution of participants

<p>GÖTZ, A.E. (University of Portsmouth) – Late Palaeozoic energy resources of Gondwana - archives of climate change that power the world.</p> <p>LINDEMANN, U. (Senckenberg Natural History Collections Dresden) and coauthors – The Central European Variscides – the heart of Pangea.</p> <p>MCGHEE, G.R. (Rutgers University, Piscataway/New Jersey) – Carboniferous giants and mass extinction: The legacy of the Late Palaeozoic Ice Age.</p> <p>MONTAÑEZ, I.P. (University of California, Davis) – Understanding feedbacks between climate, pCO₂, and ecosystems in the late Palaeozoic Earth system.</p> <p>NIKOLAIEVA, S. (The Natural History Museum London, Borissiak Paleontological Institute Moscow and Kazan University) – Boundaries in sections, not in research: new and old Carboniferous stratotypes of Russia.</p> <p>PERYT, T. (Polish Geological Institute - National Research Institute, Warsaw) – The origin and evolution of the North-European Zechstein Basin: A Polish perspective.</p> <p>SHEN, S.-Z. (Nanjing University) – The Permian timescale: Progress, problems and perspective.</p>

Tab. 2. Keynote lectures



Figure 2. Clockwise from upper left: (1) Ready to start – some of our students at the registration desk. (2) The venue in the central lecture hall of the university. (3) During coffee break. (4) Isabel Montañez presenting her keynote lecture.

(Prof. Dr. Karl Schneider, former Dean of the Faculty of Science, University of Cologne), and ended with a welcome address by Hans-Georg Herbig (Chair of the XIX ICCP).

Besides the keynotes (Tab. 2), 104 talks and 62 posters compiled by 425 authors were presented during four days. The possibility to publish extended abstracts (maximum two pages) that included key references and partly coloured figures resulted in an abstract volume of 345 pages (ed. Hartenfels et al., 2019). Winners of the student

and young scientist poster awards were elected by the participants (Tab. 3). The fifth day of the congress (Wednesday) traditionally was devoted to mid-congress field trips, which in a geotouristic manner introduced the geological highlights in the surroundings of Cologne, while other participants decided to have a private or guided stroll through historical downtown Cologne. Destinations of the field trips were (1) 12.900 year old Laacher See volcanism and medieval to industrial cultural history of the East Eifel region, guided by C. Munker, (2) the largest contiguous brown coal mining area in Europe west of Cologne (Miocene Rhenish Brown Coal) and Chateau Paffendorf, guided by S. Hartenfels, (3) Neanderthal Museum at the type locality of Neanderthal man and medieval town of Zons at the banks of the river Rhine, guided by H.-G. Herbig.

The social highlight of the congress surely was the congress dinner. It was served during a cruise on the river Rhine in front of the historical waterfront of Cologne glowing up in the falling night.

Student Poster Award

1. **SCHULZE HOBELING, REBEKKA**, Institute of Geology and Palaeontology, University Münster, Germany.
SCHULZE HOBELING, R., BLOMENKEMPER, P., KERP, H. & BOMFLEUR, B.: Arthropod-plant interactions from the late Permian Umm Irna Formation, Dead Sea region, Jordan.
2. **FORAPONOVA, TATIANA**, Borissiak Paleontological Institute, Moscow, Russia.
FORAPONOVA, T.: First data on in-situ pollen from synangia of *Permotheca* type-species from the Middle Permian of the Russian Platform.
3. **SAILOL, MATTHIEU**, Université de Toulouse (UPS), GET (OMP), Toulouse, France.
SAILOL, M., GOUYGOU, T., ARETZ, M. & CHRISTOPHOUL, F.: The Ségure Basin (Corbières, southern France): evolution of a Stephanian basin in the southern external zones of the Variscan Orogen.

Young Scientist Poster Award

1. **EL DESOUKY, HEBA**, Mansoura University, Department of Geology, Faculty of Science, Mansoura, Egypt.
EL DESOUKY, H., KORA, M. & HERBIG, H.-G.: Reconsideration of a neglected fossil group – the tabulate coral fauna from the Viséan (Mississippian) of the Sinai Peninsula (Egypt)
2. **FORTE, GIUSEPPA**, Naturmuseum Südtirol/Museo di Scienze Naturali dell'Alto Adige. Bozen/Bolzano, Italy.
FORTE, G., BRANZ, R., NOWAK, H., PRETO, N. & KUSTATSCHER, E.: Morphometric range and $\delta^{13}\text{C}$ signature of the Lopingian (late Permian) conifers from the Bletterbach flora (Dolomites, NE Italy)
3. **NOWAK, HENDRIK**, Naturmuseum Südtirol/Museo di Scienze Naturali dell'Alto Adige. Bozen/Bolzano, Italy.
NOWAK, H., KUSTATSCHER, E., FORTE, G. & ROGHI, G.: Permian macro- and microfloras of the Southern Alps.

Tab 3. Poster awards

Pre-congress field trips

- DENAYER, J. C. PRESTIANNI, C., MOTTEQUIN, B. & POTY, E.** – The Uppermost Devonian and Lower Carboniferous in the type area of Southern Belgium.
- WREDE, V., DROZDZEWSKI, G., JUCH, D., LEIPNER, A. & SOWIAK, M.** – The Pennsylvanian of the Ruhr Basin and Osnabrück region, western Germany – facies, stratigraphy, and tectonics of a paralic foreland basin of the Variscides.
- SCHNEIDER, J., WOTTE, T., GAITZSCH, B., WERNEBURG, R., ZEIBIG S. & SCHOLZE, F.** – The classical Central European Permian: Continental “Rotliegend”, marine “Zechstein”, and the Permian-Triassic Transition in Germany.

Post-congress field trips

- H.-G. HERBIG, H.-G., KORN, D., AMLER, M.R.W., HARTENFELS, S. & JÄGER, H.** – The Mississippian Kulm Basin of the Rhenish Mountains, western Germany – fauna, facies, and stratigraphy of a mixed carbonate-siliciclastic foreland basin.
- VOIGT, S., SCHINDLER, T., THUM, H. & FISCHER, J.** – Pennsylvanian–Permian of the Saar-Nahe Basin, SW Germany.
- NOVAK, M., FORKE, H.C. & SCHÖNLAUB, H.P.** – The Pennsylvanian–Permian of the Southern Alps (Carnic Alps/Karavanke Mts.), Austria/ Italy/Slovenia – fauna, facies and stratigraphy of a mixed carbonate-siliciclastic shallow marine platform along the northwestern Palaeotethys margin.

Tab. 4. Field trips

Besides the scientific sessions, the congress also was the place for the regular business meetings of the International Subcommittee on Carboniferous, respectively on Permian Stratigraphy, of the SCCS working group on redefinition of the Devonian-Carboniferous boundary, and of the German Subcommittee on Carboniferous Stratigraphy.

During the closing ceremony Markus Aretz presented the next venue of the congress that will take part in 2023 in Toulouse, southwestern France.

The congress was flanked by three pre-congress and three post-congress field trips, except for the two day trip to the Ruhr area all with an duration of three days (Tab. 4). The field trips attracted 77 participants that from dedicated leaders got of the newest insights into the varied Carboniferous and Permian geology of central Europe, including the southern Alps. A fully coloured, 302 pages thick field guide (ed. Herbig et al. 2019) was distributed to all participants.



Figure 3. Clockwise from upper left: (1) Winners of the poster awards; from left: Matthieu Saillol (Toulouse), Tatiana Forapouva ((Moscow), Rebekka Schulze Hobeling (Münster), Hendrik Nowak (Bozen), Heba El Desouky (Mansoura); presenting: Hans-Georg Herbig. (2) Mid-congress field trip to the Rhenish Brown Coal mining area. (3) Field trip to the Southern Alps guided by Holger C. Forke (standing in front), Hans Peter Schönlaub (in yellow shirt) and Matevž Novak (in front of H.P. Schönlaub). (4) Field trip to the Rhenish Mountains; Dieter Korn in front of lowermost Carboniferous Hangenberg Limestone, eastern provincial quarry Drewer.

Changes, chances and challenges

The scientific spectrum of the congress series widened through time, not at last expressed by the inclusion of the Permian at the Congress in Buenos Aires, Argentina, in 1993. The early “Heerlen congresses” were strongly devoted to stratigraphy and inherited palaeontology. They laid the basis for biostratigraphy and correlation within the Carboniferous System, in a need to get to a common language. Still, these are major topics of the congress, as seen in the struggle for redefinition of the Devonian-Carboniferous boundary, and the quest for the GSSPs at the base of the Serpukhovian, Moscovian, Kasimovian, and Gzhelian stages. Of course, the early efforts from the Heerlen congresses were strongly related to coal mining. It was amazing to see that topics concerning coals, already declining in the last congresses, were not any more addressed at the congress except in the keynote of Annette Götz. She stated the continuing economic importance of coal for certain countries in the southern hemisphere for coming decades. Also geological aspects of the huge salt deposits from the upper Permian Zechstein Basin in north-central Europe, well-illustrated in the keynote of Tadeusz Peryt, or from salt deposits elsewhere were almost missing. Same holds true for the geological and economic aspects of black shales, respectively of shale gas from Carboniferous strata. However, the strong session “Mississippian carbonate rocks in North-West Europe –

reservoir for deep geothermal energy” chaired by Martin Salamon and Anna Thiel (both from Krefeld) has to be highlighted.

Also the numerous contributions within the session “Carboniferous and Permian plants: taxonomy, palaeoecology, palaeogeography”, chaired by Anne-Laure Decombeix and Hans Kerp, were impressive, and the high quality is reflected by the corresponding poster awards (Tab. 3).

Topics concerning palaeoclimate, palaeoecology and facies, and topics related to extinction and recovery of organisms were important in Cologne. On the other hand, in spite of the challenging keynote of Ulf Linnemann and coauthors on the central European Variscides, the number of contributions in the session “Carboniferous and Permian palaeoceanography, plate tectonics and the evolution of relief”, including presentations on (isotope) geochemistry remained low, and it seems important to bring these topics to future congresses, enabling more and more a holistic view of the Carboniferous and Permian time slices.

This cannot be underestimated, as the Carboniferous and Permian is so similar to our world: young mountain ranges, glaciated poles, extinction and recovery. Thus, the time slices are a deep-time equivalent of our world. We can study and try to explain processes in a geological time frame, which today, in our tiny life span, we experience. Therefore, the study of the Carboniferous and Permian is of prime interest and it is our noble task to continue this research, and especially, to inspire and encourage students to follow.

This brings me to the second major issue – the dwindling number of Carboniferous and Permian researchers. It was very problematic to find a person or group to organize the next Carboniferous-Permian Congress and I am indebted to Markus Aretz to shoulder this task in Toulouse – in the meanwhile many working groups are too small for that, or will shrink, as colleagues are about to retire during the next years. Thus, the community must take care to keep its possibilities for sufficient impact in geoscience. Actually, organization of a succeeding congress in North America is overdue (lastly and only Champaign-Urbana, Illinois/USA 1979, and Calgary, Canada, 1999). Even more, a congress in western or central Gondwana, viz. in South America or Africa would be desirable. Actually, the only congress hosted there was in Buenos Aires, 1993. The understanding of the Carboniferous and Permian world, and the sought globally applicable chronostratigraphic subdivision cannot be achieved without understanding the development from Gondwana, respectively from the Southern Continents. In this context, it has to be noted that not a single researcher from South America or sub-Saharan Africa was present at the 19th ICCP, probably mostly due to exaggerated expenses, and we have to avoid decoupling of colleagues from these vast, important regions.

Finally, however, I would like to report that we had a fine number of young, promising scientists in Cologne, and, as already mentioned above, we have to encourage them to continue with Carboniferous and Permian topics: 27,5 % of our participants were master and Ph.D. students, among those almost half female (47,3 %), and this is a good prospect for future!

Final additions and next steps

Due to certain delay we postponed the deadline for contributions to the congress proceedings to March, 31, 2020, even if we appreciate earlier submissions. Also participants that did not yet indicate their interest are invited to contribute. All contributions should be send to iccp-2019@uni-koeln.de. Further informations can be found on the website of the congress <http://iccp2019-Cologne.uni-koeln.de/>. There, you also will find a photo gallery from the congress and from some field trips, and the possibility to download the abstract and field guide volume. Printed volumes can be acquired for 25.00 Euro each via geobibliothek@uni-koeln.de.

Finally, this is the place to say thank you: first, to all the participants for excellent presentations, vivid discussions and the inspiring atmosphere which lasted throughout the congress and on the field trips. And, second, to all people behind the stage for organization of and care-taking during the congress, especially our students who made an excellent job!

Congress publications

Hartenfels, S., Herbig, H.-G., Amler, M.R.W. and Aretz, M., 2019 (eds.). 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Abstracts. Kölner Forum für Geologie und Paläontologie, v. 23, 345 pp.

Herbig, H.-G., Aretz, M.; Amler, M.R.W. and Hartenfels, S., 2019 (eds.): 19th International Congress on the Carboniferous and Permian, Cologne, July 29–August 2, 2019, Field Guides. Kölner Forum für Geologie und Paläontologie, v. 24, 302 pp.