

Conference Report: Expansions 2015, Frankfurt am Main, Germany, 13–17 July 2015

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Understanding the different fields of expansions in human evolution, the developmental processes and mechanisms behind these expansions and the interdependencies between them are the central issues of ROCEEH (Fig. 1), or ‘The Role of Culture in Early

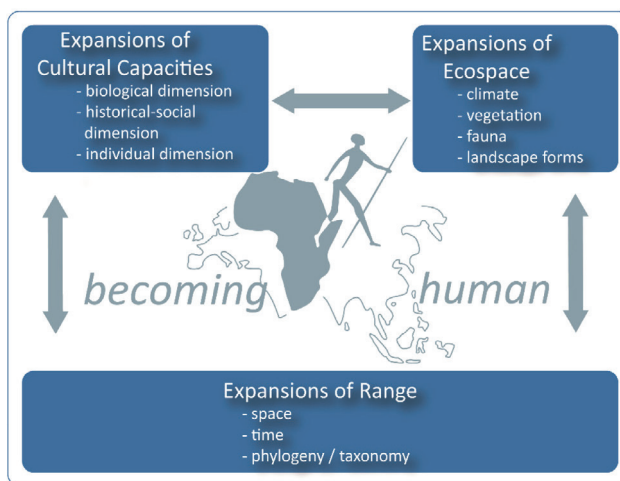


Fig. 1: The ROCEEH model of expansions in human evolution.

Expansions of Humans' (see Haidle et al. 2010; Haidle and Mosbrugger 2014), a research project funded by the Heidelberg Academy of Sciences and Humanities and projected to run for twenty years (2008-2027). ROCEEH explores human expansions and the interrelations of changing environmental conditions and cultural expressions in Africa and Eurasia between three million and 20,000 years before present.

After two symposia focusing on environmental perspectives ('Human Expansions and Global Change in the Pleistocene – Problems and Methods' in Frankfurt am Main 2009) and cultural aspects of human expansion ('The Nature of Culture' in Tübingen 2011, see Haidle and Conard 2011), ROCEEH organized an international conference in 2015 (13-17 July) at the Senckenberg Biodiversity and Climate Research Center in Frankfurt am Main, Germany, to take a closer interdisciplinary look at expansions from the perspectives of ecospace, cultural performances/capacities, and range according to different methodological and geographical approaches. The goal of the meeting was to enable exchange and discussion of new research results among more than 70 participants from the fields of anthropology, archaeology, geography, computer science, mathematics, ornithology, palaeoecology, palaeontology, zooarchaeology, and the geosciences (Fig. 2). The research results were presented in 45 lectures in five sessions and 13 posters.



Fig. 2: Participants of the International ROCEEH Conference on Human Expansions in Frankfurt am Main, Germany.

The first day began with a general introduction of the ROCEEH concept of interdependent expansions of range, cultural capacities, and ecospace on the way to becoming human (Haidle). The first session was dedicated to **Expansions of Ecospace** and primarily dealt with the environmental constraints faced by different hominin groups concerning climate, vegetation, landscape morphology (King et al., Bailey et al., Sauer),

and fauna (Saarinen et al.). The presentations comprised quantitative reconstructions of climate and vegetation for different hominin groups based on various approaches and proxies (Blain et al., Horne et al., Maul et al., Orain et al.). Such ecological descriptions need to be linked with early human cultural performances to understand the role of the environment in spatial expansions. The ecospace of a hominin group provides resources but also depends on hominin capacities and performances in acquiring them. Food resources, such as plant food resources of *Homo heidelbergensis* from Schöningen (Bigga) as well as meat resources of *Homo sapiens* from the Eastern (Starkovich) and Western (Jones) Mediterranean, were discussed in their archaeological context.

The second session, tackling **Expansions of Cultural Capacities**, opened with an introduction to the model of evolution and expansion of cultural performances and capacities (EECC) in different developmental dimensions (Haidle). Five talks provided different geographical perspectives on cultural development in the last 400-600 ka (Wurz, Southern Africa; Adler et al., Caucasus region; Shimelmitz, Levant; Jöris, Europe; Qu and Wang, China). These talks were followed by presentations on the exploration of different cognitive aspects in cultural performances. The expansion of symbolic and ritual capacities in the *Homo* lineage was explored from an interdisciplinary perspective (Dapschuskas). Kandel et al. introduced a concept of behavioral hyperplasticity, while Garofoli challenged hyper-intellectualism in cognitive archaeology with his Gannet Approach. Finally, the use of Material Engagement Theory and metaplasticity in exploring Late Pleistocene material change and cognitive capacities was discussed (Roberts).

The first half of the third day led the participants of the conference to the recently reopened Hesse State Museum in Darmstadt with exhibitions on art, culture and natural sciences. In the afternoon, the third session on the **Multidisciplinary Approaches to Expansions** had members of the ROCEEH Graduate Network presenting topics ranging from the expansions in performance in the post-Howiesons Poort (Bader et al.), to the means to assess innovations in the MSA of southern Africa (Stolarczyk), to the use of cognigrams in exploring the complexity of fire (Scheiffele), to the interplay between hominins and their environment as it influences evolution and dispersal (Lüdecke et al.), to the reconstruction of palaeo-landscapes with the help of remote-sensing (Bachofer et al.). Quénéhervé et al. introduced soil and landscape analysis for predicting the distribution of possible find locations, and Will and Stock discussed correlations of body size of early *Homo* and the first dispersals out of Africa.

The fourth session addressed **Quantification and Modelling** as a means to predict the distribution of Middle Pleistocene hominid sites (Rodríguez et al.), to detect links between dispersals of animals and humans (Palombo), and to deal with the effects of competition among carnivores (Volmer). The contributions of Hölzchen et al., Duppe et al., Timm et al., and, in a more general sense, of Gutmann explored simulation and modelling of the dispersal of early humans through agent-based modelling. In a series of talks, Schröder-Esselbach et al., Heise and Taraz, and Capolongo et al. discussed the advantages and constraints of other modelling approaches. Müller and Sollmann explored the environmental impact on migration of animals and humans. Finally, Carleton et al. developed a cautionary approach towards the use of inadequate analytical methods in modelling.

The fifth session, focusing on **Expansions of Ranges**, comprised a series of talks revolving around the effects of ecosystems on the dispersion of hominins. Lordkipanidze presented the case of Dmanisi, while Meijer et al. and Haupt et al. examined hominin palaeoenvironments in Southeast Asia. Bretzke and Kellberg Nielsen et al. discussed the possibility of hominin range expansions into arid and northern regions. This concluding session opened the field of treating expansions of range as a target variable in reconstructing the dispersals of various hominin groups.

The closing discussion focused on the future options for reconstructing the past by means of modelling. A broad number of challenges were addressed here as well. Variability needs to be made computable and questions raised need to be kept simple at the beginning. Additionally, models should not be seen as a reliable reconstruction of a past reality but as a tool in understanding mechanisms and processes. With regard to future research, the importance of interdisciplinary work was highlighted as an approach to understanding the complexity of interdependent developments in expansions of culture, environment, and range. But also an explicit international perspective is needed, contrasting and yet bringing together complementary views based on different data, geographical situations, and historically developed approaches. The examination of phases of (putative) stasis complements the study of expansions, furthering our understanding of the way toward becoming human. The abstracts of the papers presented at the conference as well as more information about the ROCEEH research project are available at www.roceeh.net.

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