

Laudation: Dr. Andrew C. Sorensen, Twenty-First Recipient of the Tübingen Prize for Early Prehistory and Quaternary Ecology

Laudatio: Dr. Andrew C. Sorensen, einundzwanzigster Träger des Tübinger Förderpreises für Ältere Urgeschichte und Quartärökologie

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Ladies and gentlemen, Dean Rosenstiel, representatives of Romina EiszeitQuell, dear colleagues, students, and friends of the Institute, dear Dr. Sorensen, it is a great honor and pleasure for me to introduce the 21st laureate of the Tübingen Prize for Early Prehistory and Quaternary Ecology. Over the last twenty years, the prize has been awarded to prehistorians who focus on cultural and technological identity, human subsistence, land use, and migrations, to paleoanthropologists, geneticists, and dating specialists.

This year’s laureate opens the floor for one of the major questions archaeologists are confronted with throughout their professional life: When did humans start to make fire? By addressing this question, Dr. Sorensen captured the attention of the jury in the first round of review of 13 doctoral theses evaluated this year. His approaches and results succeeded in expanding the interest during the detailed review, finding high esteem among the referees. Having finished his Ph.D. in the Netherlands, this year’s laureate broadens the range of countries from which the previous eleven female and nine male awardees come: six were from the USA, five from France, four from Germany, two from Spain and the UK, and one from Denmark. He fits well among that long line of promising young academics, many of whom now hold permanent positions, determine the international research agenda, and support young academics themselves. At this point, I also want to thank explicitly all of the applicants for their fresh ideas, inspiring work and fascinating results. It is their research that constitutes the importance of the Tübingen Prize for Early Prehistory and Quaternary Ecology. Every year the jury is privileged to view new approaches and findings. Today it is my honor to present to you, on behalf of the jury and our sponsor Romina EiszeitQuell, this year’s winner of the award, Dr. Andrew C. Sorensen.

Andrew Charles Sorensen was born in 1982 in Mason City in Iowa, USA. He began his studies in Geology and History at Cornell College, Mt. Vernon, Iowa in 2000 and earned his B.A. in 2004. Between 2004 and early 2011 he turned to get his hands dirty at the University of Iowa’s Office of the State Archaeologist in Iowa City, among others. In 2011 he continued his studies at the Faculty of Archaeology at Universiteit Leiden in



Award ceremony of the twenty-first Tübingen Prize for Early Prehistory and Quaternary Ecology on February 07, 2019, at Schloss Hohentübingen / *Verleihung des 21. Tübinger Förderpreises für Alte Urgeschichte und Quartärökologie auf Schloss Hohentübingen am 07. Februar 2019*. From left to right / *Von links nach rechts*: Priv.-Doz. Dr. Miriam N. Haidle (jury), Bettina Claß, (Romina EiszeitQuell, sponsor), Dr. Andrew C. Sorensen (recipient / *Preisträger*), Prof. Nicholas J. Conard Ph.D., Prof. Dr. Michael Bolus, Dr. Yvonne Tafelmaier, Prof. Dr. Harald Floss (all jury). Photo: Friedhelm Albrecht, © Universität Tübingen.

the Netherlands where he finished his Master's degree in 2012 with a thesis on "The Invisible Fire Starters: A usewear-based approach to identifying evidence of fire production by Neandertals". His Ph.D. project continued this research line, and he defended his thesis entitled "Beyond Prometheus: Pursuing the origins of fire production among early humans" at Leiden on 13 December 2018. Dr. Sorensen is currently a postdoctoral fellow within the Human Origins Group at the Faculty of Archaeology at Leiden University where he assists in coordinating the controlled excavation and sampling of a Gravettian fireplace from Auneau (France) under the direction of Prof. Marie Soressi.

Andrew Sorensen's CV shows a wide range of activities that contributed to the formation of a researcher with a broad, international and interdisciplinary view. After his B.A., he worked for seven years as an assistant project archaeologist, assistant geomorphologist, and archaeological field and lab technician. Thus, he became an experienced field archaeologist with surveys, test and recovery excavations in around 160 projects in different states of the United States, but also at Late Neolithic up to post-Medieval sites in the Netherlands and Paleolithic sites in the UK and France. He assisted in developing an OpenCourseWare Project at the Faculty of Archaeology at Leiden and has given

lectures there since 2013. Andrew Sorensen has been active in presenting his work at international conferences and co-organized two conferences at Leiden University. He is first author and co-author of several articles in US-American volumes and international, high-ranking journals such as *Journal of Archaeological Science*, *Quaternary International*, *PLoS ONE* and *Scientific Reports*.

At the center of the award of the Tübingen Prize for Early Prehistory and Quaternary Ecology is Dr. Sorensen's doctoral dissertation entitled "Beyond Prometheus: Pursuing the origins of fire production among early humans" supervised by Prof. Dr. Wil Roebroeks and Prof. Dr. Annelou van Gijn, both from the University of Leiden. Until today, fire is a threatening and at the same time fascinating elemental force. The maintenance and purposeful production of fire represent important developments in human cultural evolution. Today, the majority of our living environment is based on the control of energy sources. Yet, the origins of this human behavior remain widely in the dark. We learned that chimpanzees do not panic when confronted with wildfires, but calmly monitor them and change their behavior in anticipation of the fire's movement. Probably our savanna-dwelling ancestors reacted in the same way. For the last 1.5 million years, there is recurrent evidence of human fire management. However, a basic question remained: When were humans able to produce fire at will? In his 1909 novel, *La guerre du feu* ("The quest for fire"), J.-H. Rosny aîné depicted a group of *Oulhamr* (i.e. Neanderthals) with limited intelligence and inventive talent, who were unable to light their dead campfire. To get the urgently needed fire again they sought help from the *Wah*, a group of *Homo sapiens* who possessed the means to produce fire. Although Neanderthals are meanwhile known to have used fire for technical purposes such as the production of birch tar for hafting, it is still an ongoing controversy as to whether they were able to produce fire or relied on natural fires caused, for example, by lightning strikes. In his doctoral thesis, Andrew Sorensen addresses this question.

Sorensen approached the subject from different directions. First, he critically examined the assumption that a decrease of wildfires due to the reduction of lightning activity during colder phases in the last glacial period (MIS 5-3) led to reduced evidence of fire use by Neanderthals. He discussed a number of other factors such as site occupation dynamics and the nature and availability of fuel sources resulting in differences in fire size, duration and frequency. Next, he looked for variability in the signals for fire use by Neanderthals between cold and warm climatic periods. Together with Fulco Scherjon (Leiden) he developed the computer-based model "fiReproxies" which allowed him to explore how differences in site conditions affect the above-mentioned factors and their relative impact on fire signals. The model helps evaluate the signals from heated lithics as fire proxies to interpret evidence of fire use within or between archaeological sites.

A third part of his work was dedicated to the search for direct evidence of Neanderthal production of fire. So far, one of the earliest indications is a pyrite nodule with wear traces found in 40,000-year-old Aurignacian layers at Vogelherd, one of the caves of the Swabian Jura recognized as UNESCO World Cultural Heritage in 2017. In general, these parts of Paleolithic strike-a-lights are badly preserved. Therefore, Andrew Sorensen dealt with flint tools as complementary parts. In the 'expedient strike-a-light model', he proposed that early flint strike-a-lights were not formalized or specialized tools, but that flakes, retouched implements or other fragments made from siliceous raw materials were used

together with pieces of marcasite or pyrite to ignite fire. Based on experimental data, he and colleagues established criteria to identify expedient fire-lighting tools. He then tested five Middle Paleolithic assemblages – with negative results. However, he did not give up and turned his attention to bifaces, curated multi-purpose tools, as parts of tool-kits for percussive fire-making. He examined tools from seven Middle Paleolithic sites in France and finally found wear traces that can be linked to the percussion of hard minerals. Although evidence of residues is still lacking probably due to the corrosive nature of pyrite, Sorensen is now looking for optically invisible micro-residues using various chemical analytical methods.

It is the great merit of Andrew Sorensen's work that it brings new force into a static and intractable controversy by creating and applying new ideas. His approach offers the potential for finding evidence of fire production not only in Neanderthal cultural remains of the last glacial period, but possibly also even earlier traces. Such a combination of experimental and empirical studies as well as theoretical consideration, the critical questioning of previous discussion, approaches from different directions including computer-based modeling and endurance despite backlash are qualities to be honored.

Ladies and gentlemen, I hope that this brief introduction has aroused your interest in Andrew Sorensen's research and its significance for human evolution. It is my pleasure to introduce our guest of honor, Dr. Andrew Sorensen, who will give us a much more in depth presentation of his work. On behalf of the jury and our sponsor, the Romina EiszeitQuell, I would like to express our affectionate congratulation and present to you the 21st winner of the Tübingen Prize for Early Prehistory and Quaternary Ecology, Dr. Andrew Sorensen!