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Note: Images available at

<https://nyutandon.photoshelter.com/galleries/C0000DKT3j1AvpA/G0000jnHb3mJpExk/Glue-Gums-Up-Neanderthal-Theory>

**EMBARGO: Monday, August 19, 2019, 3:00 p.m. EDT**

## One argument for Neanderthal genius debunked

**Researchers from the University of Tübingen and New York University discover it was easy to make a strong adhesive in the Stone Age**

NEW YORK, Monday, August 19, 2019 – Neanderthals and other early humans produced a tarry glue from birch bark; this was long considered proof of a high level of cognitive and cultural development. Researchers had long believed that birch tar – used by the Neanderthals to make tools – could only be created through a complex process in which the bark had to be heated in the absence of air.

However, an international team led by researchers at the University of Tübingen and including faculty from New York University’s Department of Anthropology and the NYU Tandon School of Engineering found that there is a very simple way to make this useful glue.

The study was published August 19 in *Proceedings of the National Academy of Sciences (PNAS)*.

“Our paper challenges common beliefs that the presence of birch tar in Neanderthal archaeological assemblages means they had sophisticated cognitive abilities,” said co-author [Radu Iovita](#), a paleoanthropologist and Paleolithic archaeologist in the Department of Anthropology at NYU and a member of the faculty of the Department of Early Prehistory and Quaternary Ecology at the University of Tübingen.

Prior researchers had experimented with pits, clay structures, ash mounds, and metal and ceramic vessels as means to heat the bark in the absence of oxygen. Instead, this research team experimented with ordinary materials available in the Stone Age. They collected cut fresh birch bark or dead bark in the forest and burned it near flat river stones. After three hours, the process yielded a usable amount of a black sticky material. The tar could easily be scraped off the surface of the stones. Its molecular characteristics were similar to archaeological samples from Neanderthal sites and, more important, it formed a stronger glue than tar produced in more complex oxygen-free processes.

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The team used their adhesive to make a wood-scraping tool and turned to a robot that used force-control technology developed by [Ludovic Righetti](#) and [Johannes Pfleging](#).

Righetti is an associate professor in the Electrical and Computer Engineering and the Mechanical and Aerospace Engineering Departments at NYU Tandon and a senior researcher at the Max-Planck Institute for Intelligent Systems in Tübingen. Pfleging is a visiting scholar of anthropology at NYU and a doctoral student in robotics at the Federal Institute of Technology (ETH) in Zürich, Switzerland.

Their robot arm dragged the tool with a precision that humans cannot emulate over 170 strokes. The approach also allowed the researchers to measure the effects with precision: The tool showed no weakening of the adhesive bond.

In another test, the researchers used the adhesive to stick a stone scraper to a wooden handle, as the Neanderthals had done. Iovita was able to scrape the tough outer membrane from the thigh bone of a calf.

The researchers say this method of making birch tar is so simple that early humans could have easily discovered it by accident in the course of their everyday activities. The production and use of birch tar can therefore no longer serve as an indicator of modern or complex behavior.

Patrick Schmidt and Claudio Tennie from the Institute of Early Prehistory and Quaternary Ecology at the University of Tübingen led the study. In addition to the NYU researchers, the team comprised Matthias Blessing and Maxime Rageot, both of the Institute of Early Prehistory and Quaternary Ecology; and Klaus G. Nickel, Applied Mineralogy, Department of Geosciences, Eberhard Karls University of Tübingen.

“Birch tar extraction does not prove Neanderthal behavioral complexity,” appears in *PNAS – Proceedings of the National Academy of Sciences*, week of August 19, 2019, at <https://dx.doi.org/10.1073/pnas.1911137116>.

### ***About the New York University Tandon School of Engineering***

*The NYU Tandon School of Engineering dates to 1854, the founding date for both the New York University School of Civil Engineering and Architecture and the Brooklyn Collegiate and Polytechnic Institute (widely known as Brooklyn Poly). A January 2014 merger created a comprehensive school of education and research in engineering and applied sciences, rooted in a tradition of invention and entrepreneurship and dedicated to furthering technology in service to society. In addition to its main location in Brooklyn, NYU Tandon collaborates with other schools within NYU, one of the country’s foremost private research universities, and is closely connected to engineering programs at NYU Abu Dhabi and NYU Shanghai. It operates Future Labs focused on start-up businesses in downtown Manhattan and Brooklyn and an award-winning online graduate program. For more information, visit <http://engineering.nyu.edu>.*

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**Media Contacts:**

Kathleen Hamilton, NYU Tandon  
646.997.3792 / mobile 347.843.9782  
[kathleen.hamilton@nyu.edu](mailto:kathleen.hamilton@nyu.edu)

Rachel Harrison, NYU Anthropology  
212-998-6797  
[rachel.harrison@nyu.edu](mailto:rachel.harrison@nyu.edu)

Janna Eberhardt, University of Tübingen  
+49 7071 29-76788 / +49 7071 29-77853  
[janna.eberhardt@uni-tuebingen.de](mailto:janna.eberhardt@uni-tuebingen.de)