Animal Teeth and Human Tools

A Taphonomic Odyssey in Ice Age Siberia

The culmination of more than a decade of fieldwork and related study, this unique book uses analyses of perimortem taphonomy in Ice Age Siberia to propose a new hypothesis for the peopling of the New World.

The authors present evidence based on examinations of more than 9000 pieces of human- and carnivore-damaged bone from 28 late Pleistocene and two special Holocene archaeological and paleontological sites, including cave and open locations, which span more than 2000 miles, from the Ob River in the West to the Sea of Japan in the East. The observed bone damage signatures suggest that the conventional prehistory of Siberia needs revision and, in particular, that cave hyenas had a significant influence on the lives of Ice Age Siberians.

The findings are supported by more than 250 photographs, which illustrate the bone damage described and provide a valuable insight into the context and landscape of the fieldwork for those unfamiliar with Siberia.

Christy G. Turner II is Regents’ Professor Emeritus of the School of Human Evolution and Social Change, Arizona State University. He is internationally recognized for his work on human dentition and, more recently, for his taphonomic studies of cannibalism in the American Southwest.

Nicolai D. Ovodov is Chief Research Collaborator at the Institute of Archaeology and Ethnography, Novosibirsk, Russia. He is well known in Russia for his important contributions to Siberian paleontology and paleoanthropology.

Olga V. Pavlova was a translator with the Russian Academy of Sciences for more than 30 years in both the Institute of Geology and Geophysics and the Institute of Archaeology and Ethnography.
Animal Teeth and Human Tools

A Taphonomic Odyssey in Ice Age Siberia

CHRISTY G. TURNER II
Arizona State University

NICOLAI D. OVODOV
Institute of Archaeology and Ethnography, Novosibirsk

OLGA V. PAVLOVA
## Contents

*Acknowledgments*  
*xviii*  
*Note on photograph identifications*  
*xix*

1 **What is perimortem taphonomy, and why study it in Siberia?**  
1 Introduction  
1 An imaginary tale of winter death  

2 **Bone damage and its meaning**  
26 Taphonomy: the man  
26 A few historical accounts of perimortem taphonomy  
28 Definitions of 26 perimortem taphonomic variables  
33 Piece selection  
49 Grand total  
49 Summary  

3 **The 30 Siberian archaeological and paleontological sites, distributed from the Ob River to the Sea of Japan**  
52  
1 Afontova Gora  
54  
2 Boisman II  
60  
3 Bolshoi Yakor I  
69  
4 Borabashevskskaya  
77  
5 Denisova Cave  
79  
6 Dvuglaska Cave  
90  
7 Gosudarev Log I  
101  
8 Kamenka  
104  
9 Kaminnaya Cave  
120  
10 Kara-Bom  
133  
11 Kirkalinskaya Cave  
140  
12 Krasny Yar  
143  
13 Kurla I  
160  
14 Malaya Seeya  
164  
15 Mal’ta  
173
Contents

4 Discussion: analyses, comparisons, inferences, and hypotheses

Summary of our descriptive perimortem taphonomic findings
Analytical findings
What is an archaeological site?
Some other comparisons
Damage signatures
Site disturbance
Review of studies of modern carnivores with emphasis on hyenas
Modern hyenas
Siberian humans and hyenas
Modern attitudes about hyenas
Human predation by carnivores
Other attacks on humans
Did late Pleistocene Siberian hyenas hunt humans?
Did humans eat hyenas?
Hyenas and archaeological stratigraphy
Who were the late Pleistocene humans of Siberia?
Siberian Mousterians replaced?
Why are there so few late Pleistocene human skeletal remains in Siberia?
Extinction of megafauna
Northern limit of cave hyena distribution
A hyena barrier to Beringia?

5 Conclusions for seven questions

Another tale of winter death

vi
<table>
<thead>
<tr>
<th>Appendices</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tables</td>
<td>409</td>
</tr>
<tr>
<td>2 Scientific names for Siberian Pleistocene species identified in one or more of the 30 faunal assemblages</td>
<td>453</td>
</tr>
<tr>
<td>3 Listvenka</td>
<td>455</td>
</tr>
</tbody>
</table>

References 460
Index 486
This project eventually came about after meeting Sergey Arutyunov in 1979 at the Pacific Science Conference held in Khabarovsk. It was he who explained to the senior author how one goes about getting permission to carry out research in Russia. Financial aid came from the National Geographic Society (grant #6454-99); the Wenner Gren Foundation for Anthropological Research (grant #6588); the senior author’s Arizona State University Regents’ Professorship research account; the Institute of Archaeology and Ethnography, Academgorodok; the Archaeology Laboratory of Krasnoyarsk Pedagogical University, and ASU Emeritus College grant. Personal help came from the following individuals:

Irkutsk

German I. Medvedev (Director, Laboratory of Archaeology, Irkutsk State University): collections access and visits to Mal’ta, other nearby sites and to Lake Baikal and the Shamanka site. Ekaterina A. Lipnina: discussions about Mal’ta. Y. M. Ineshin: access to Bolshoi Yakor collection. P. E. Shmygun: information about Kurla I. Yuri A. Mochanov (Department of Archaeology and Human Paleoecology, Academy of Sciences of the Sakha Republic, Yakutsk): discussions and examination of the Diring-Yuryakh collections in Irkutsk.

Kiev (Ukraine)


Krasnoyarsk

Nicolai I. Drozdov (President, Krasnoyarsk Pedagogical University; Director, Laboratory of Archaeology): trips to the Yenisei River Afonova Gora site, and sites at Kurtak field camp, collections access, lodging, explanations about the Pleistocene Kurtak complex. Eugene V. Artemiev: collections access. Nicolai I. Martynovich
(Krasnoyarsk Regional Museum): assistance in excavation at Dvuglaska Cave and visit to Razboinich’ya Cave paleontological site; helped sort collections from Bolshoi Yakor, excavated by Yevgeny M. Ineshin. Lena Popkova: compilation of part of Appendix A.

**Moscow**

Alexander K. Agadjanyan (Institute of Paleontology): collections access, logistics. Natalia B. Leonova (Moscow State University): collections access.

**Novosibirsk**


**St. Petersburg**

Alexander G. Kozintsev (Senior Researcher, Museum of Anthropology and Ethnography): references and discussions about human evolution in Siberia.

**Tomsk**

Sergei V. Lechshinskiy (Tomsk State University): collections access and site visit to Tomsk mammoth locality.

**Ulan-Ude**

Ludmila V. Lbova (Institute of Mongolian, Buddhist and Tibetan Studies): visit to Kamenka, Varvarina Gora, other sites, collections access and lodging arrangements.
Acknowledgments

United Kingdom

We would like to express our sincere appreciation to the several individuals at Cambridge University Press who helped to see this volume through to completion: Martin Griffiths, Edward Bailey, Lynette Talbot, Gary Smith, Chris Miller, and Beata Mako.

United States


Vladivostok


There are dozens of other Russians, whose names are unknown or not remembered, but without their help we could never have carried out this study. They range from the charming female conductors of the Trans-Siberian Railroad, shop keepers, maids, students, waitresses, dacha vegetable vendors, minibus and taxi drivers, and on and on. Spasibo!
Note on photograph identifications

All images are cataloged using a coded system; for example: CGT neg. IHPP 2-15-84:21. The first letters in capitals are the initials of the photographer. The second term – neg. or color – indicates a black-on-white negative or an original Kodachrome slide. The next letters, either in capitals or a geographic name, indicate where the photograph was taken. The next three numbers indicate date as month–day–year. The last number is the frame exposed. Thus, the above example means: Christy G. Turner, black-on-white, Institute of History, Philosophy and Philology, February 15, 1984: frame 21.

Initials of institutions, mostly units of the Russian Academy of Sciences, refer to:

- FESU, Far East State University, Vladivostok
- IAE, Institute of Archaeology and Ethnography (formerly IHPP)
- IEL, Institute of Ethnography, Leningrad
- IHPP, Institute of History, Philosophy and Philology, Academgorodok, Novosibirsk
- KSPU, Krasnoyarsk State Pedagogical University, Krasnoyarsk
- LPR, Laboratory of Plastic Reconstruction, Moscow
- MBSC, Mongolian and Buriat Scientific Center, Ulan-Ude
- PIPM, Paleontology Institute, Paleontology Museum, Moscow
- TU, Tomsk University, Tomsk

“Odyssey” refers to illustrations that help establish context, locality, people, travel, and related considerations.