



# Human Colonization of the Arctic: The Interaction Between Early Migration and the Paleoenvironment

Edited by  
V.M. Kotlyakov, A.A. Velichko and S.A. Vasil'ev



# Human Colonization of the Arctic: The Interaction Between Early Migration and the Paleoenvironment

*Edited by*

*V.M. Kotlyakov, A.A. Velichko  
and S.A. Vasil'ev*



**ACADEMIC PRESS**

An imprint of Elsevier

Academic Press is an imprint of Elsevier  
125 London Wall, London EC2Y 5AS, United Kingdom  
525 B Street, Suite 1800, San Diego, CA 92101-4495, United States  
50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States  
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, United Kingdom

Copyright © 2017 Elsevier Inc. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website: [www.elsevier.com/permissions](http://www.elsevier.com/permissions).

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

### Notices

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our understanding, changes in research methods, professional practices, or medical treatment may become necessary.

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds, or experiments described herein. In using such information or methods they should be mindful of their own safety and the safety of others, including parties for whom they have a professional responsibility.

To the fullest extent of the law, neither the Publisher nor the authors, contributors, or editors, assume any liability for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

### Library of Congress Cataloging-in-Publication Data

A catalog record for this book is available from the Library of Congress

### British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

ISBN: 978-0-12-813532-7

For information on all Academic Press publications visit our website at  
<https://www.elsevier.com/books-and-journals>



Working together  
to grow libraries in  
developing countries

[www.elsevier.com](http://www.elsevier.com) • [www.bookaid.org](http://www.bookaid.org)

*Publisher:* Candice Janco

*Acquisition Editor:* Anneka Hess

*Editorial Project Manager:* Emily Thomson

*Production Project Manager:* Debasish Ghosh

*Designer:* Victoria Pearson Esser

Typeset by TNQ Books and Journals



*This edition has been dedicated to the memory of our friend and colleague, the late Professor Andrey Velichko (1931–2015), the leading Russian specialist in Pleistocene paleogeography and human paleoecology, who had initiated this work within the framework of the International Polar Year. His sudden death was a great loss for all Quaternary scientists in the world.*

# Contents

List of contributors	xiii
Foreword	xvii
<b>Part One Regions of initial colonization</b>	<b>1</b>
<b>Section One European North</b>	<b>3</b>
<i>Fennoscandia</i>	<b>5</b>
<b>1.1 Postglacial human colonization of Fennoscandia</b> <i>Paul M. Dolukhanov</i>	<b>7</b>
<b>1.2 Northern Scandinavia: synthesis</b> <i>Hans Peter Blankholm, Bryan Hood and Jan Ingolf Kleppe</i>	<b>15</b>
<b>1.3 Northern Scandinavia: paleogeography of the Kola Peninsula</b> <i>Tatyana V. Sapelko</i>	<b>23</b>
1.3.1 Introduction	<b>23</b>
1.3.2 Northwestern part of the Kola Peninsula	<b>24</b>
1.3.3 Conclusion	<b>30</b>
<b>1.4 The Early Holocene (Mesolithic) sites on the Kola Peninsula</b> <i>Vladimir Y. Shumkin</i>	<b>33</b>
1.4.1 Western sector	<b>35</b>
1.4.2 Eastern sector	<b>43</b>
<b>1.5 Eastern Fennoscandia and the adjacent regions of the northwestern East European Plain</b> <i>Paul M. Dolukhanov, Elena A. Kosheleva, Sergey N. Lisitsyn and Dmitriy A. Subetto</i>	<b>51</b>
1.5.1 Introduction	<b>51</b>
1.5.2 General characteristics of the changes in environment during the Late Glacial	<b>52</b>
1.5.3 Specific characteristics of environments and the initial colonization of the territory	<b>55</b>
1.5.4 Initial colonization of southeastern Fennoscandia	<b>58</b>
1.5.5 Main archaeological sites of Southern Finland and of the Ladoga region of Karelia	<b>61</b>

1.5.6	Discussion	66
1.5.7	Archaeological cultures and local specific features	69
1.5.8	Conclusions	72
<b><i>North and North-East of the East European Plain</i></b>		<b>73</b>
<b>1.6</b>	<b>North of the East European Plain</b>	<b>75</b>
<i>Alexander V. Volokitin and Yuriy N. Gribchenko</i>		
1.6.1	Evolution of landscapes and climate during the Late Glacial and the Holocene	75
1.6.2	The oldest settlements and environments	80
1.6.3	The Veretye culture sites	80
1.6.4	The burial complex of Peschanitsa	87
1.6.5	Popovo burial ground	91
1.6.6	North	93
1.6.7	Visskiy 1 peatland	93
1.6.8	Parch 1 and Parch 2	97
1.6.9	Lek-Lesa 1	102
1.6.10	Conclusion	103
<b>1.7</b>	<b>Environments of the Northeastern East European Plain at the time of the initial human colonization</b>	<b>105</b>
<i>Yuriy N. Gribchenko</i>		
1.7.1	Introduction	105
1.7.2	Paleolithic sites in the Pechora drainage basin	108
1.7.3	Mamontova Kurya	111
1.7.4	Byzovaya	113
1.7.5	Medvezhya Cave	117
1.7.6	Paleolithic sites in the middle reaches of the Kama River	119
1.7.7	Talitskogo (Ostrov)	120
1.7.8	Garchi I	124
1.7.9	Zaozerye	127
1.7.10	Conclusion	133
<b>1.8</b>	<b>Middle and Upper Paleolithic sites in the Northeast of the East European Plain</b>	<b>137</b>
<i>Pavel Yu. Pavlov</i>		
1.8.1	Middle Paleolithic	137
1.8.2	Early Upper Paleolithic	142
1.8.3	Final Paleolithic	148
<b>1.9</b>	<b>Environments of the Paleolithic sites in the Northeast of the East European Plain</b>	<b>153</b>
<i>Pavel Yu. Pavlov</i>		
1.9.1	The Late Pleistocene Environments in the Northeast of the East European Plain	153
1.9.2	Subsistence of prehistoric people	155

<b>Arctic Islands</b>	<b>159</b>
<b>1.10 Arctic islands of the Barents and Kara seas</b>	<b>161</b>
<i>Vadim F. Starkov</i>	
1.10.1 Early settlements on the Spitsbergen archipelago	<b>161</b>
1.10.2 Novaya Zemlya	<b>172</b>
<b>Section Two Siberian North</b>	<b>177</b>
<b>2.1 West Siberia</b>	<b>179</b>
<i>Vladimir S. Zykin, Valentina S. Zykina, Sergey V. Markin</i> <i>and Liybov A. Orlova</i>	
<b>2.2 North of West Siberia</b>	<b>189</b>
<i>Evgeniy M. Besprozvanny, Pavel A. Kosintsev and Andrey A. Pogodin</i>	
2.2.1 General traits of the landscape system evolution	<b>189</b>
Late Pleistocene	<b>190</b>
Holocene	<b>192</b>
2.2.2 Geological and archaeological context of the sites	<b>195</b>
<b>2.3 Central Siberia (the Yenisey-Lena-Yana Region)</b>	<b>211</b>
<i>Yaroslav Y. Kuzmin</i>	
2.3.1 Introduction	<b>211</b>
2.3.2 Environments of northern Central Siberia in the second half of the Late Pleistocene (30,000–10,000 BP) and in the Early Holocene (10,000–6000 BP)	<b>213</b>
2.3.3 Principal regions of the initial settlement	<b>214</b>
2.3.4 Regions of the later colonization	<b>226</b>
2.3.5 Taymyr Peninsula	<b>228</b>
2.3.6 Initial colonization of the north of Eastern Siberia: a synthesis	<b>229</b>
2.3.7 Conclusion	<b>232</b>
<b>Section Three Beringia (Northeast of Asia, Alaska, Yukon)</b>	<b>239</b>
<b>3.1 Western Beringia (Northeast Asia)</b>	<b>241</b>
<i>Sergey B. Slobodin, Patricia M. Anderson, Olga Y. Glushkova</i> <i>and Anatoly V. Lozhkin</i>	
3.1.1 Indigirka-Kolyma region	<b>246</b>
3.1.2 Kamchatka	<b>267</b>
3.1.3 Chukchi Peninsula	<b>279</b>
3.1.4 Initial human colonization of Western Beringia: a synthesis	<b>293</b>
3.1.5 Conclusion	<b>297</b>
<b>3.2 Eastern Beringia: climates and environments during the initial peopling</b>	<b>299</b>
<i>Patricia M. Anderson and Anatoly V. Lozhkin</i>	

<b>3.3 The Paleolithic of eastern Beringia from western Alaska to Canadian Yukon</b>	<b>311</b>
<i>Kelly E. Graf and Ted Goebel</i>	
3.3.1 Introduction	312
3.3.2 Characteristics of ancient-most archaeological sites of eastern Beringia	314
3.3.3 Summary of Paleolithic human dispersals into eastern Beringia at the end of the Pleistocene	335
3.3.4 Conclusions	338
 <b>Section Four Canadian North</b>	 <b>339</b>
<b>4.1 Peopling of the Eastern Canadian Arctic</b>	<b>341</b>
<i>Julia M. Ross</i>	
4.1.1 Introduction	341
4.1.2 Glacial history	341
4.1.3 Climatic history	343
4.1.4 Site descriptions	345
4.1.5 Synthesis	352
4.1.6 Conclusion	362
Acknowledgments	363
 <b>Section Five Greenland</b>	 <b>365</b>
<b>5.1 First people in Greenland</b>	<b>367</b>
<i>Jens F. Jensen, Ulla Odgaard, Svend Funder and Patrick Plumet</i>	
5.1.1 Introduction	367
5.1.2 Saqqaq culture: first people in West Greenland	373
5.1.3 Northeast Greenland: Independence I	394
5.1.4 Conclusion	404
 <b>Section Six Iceland</b>	 <b>407</b>
<b>6.1 Iceland at the time of initial colonization</b>	<b>409</b>
<i>Olga A. Markelova</i>	
 <b>Part Two Specific features of the initial colonization</b>	 <b>417</b>
 <b>7 Expansion of ecumene northward and the diet of the Paleolithic population of Eurasia: Neanderthals and <i>Homo sapiens</i></b>	 <b>419</b>
<i>Mariya V. Dobrovolskaya</i>	
7.1 Ecology of human diet at the Mousterian and Upper Paleolithic	420
7.2 Adaptive process and food specialization in the Neanderthal communities	421
7.3 Isotopic evidence for the diet of Neanderthals	422
7.4 Human diet of the Upper Paleolithic based on isotope analysis	426
7.5 Conclusion	427



---

<b>8</b>	<b>The Mesolithic population in the north of Eastern Europe (reconstruction of social activity according to archaeological and anthropological data)</b>	<b>429</b>
	<i>Alexandra P. Buzhilova</i>	
8.1	Anthropological materials	430
8.2	Demographic features	438
8.3	Specific features of the funeral rites	439
8.4	Reconstruction of social activity	443
<b>9</b>	<b>Way to North: Anthropological Evidence of Adaptivity of the First Inhabitants in the High Latitudes</b>	<b>453</b>
	<i>Margarita M. Gerasimova</i>	
9.1	Biological adaptation and the Arctic adaptive type: a synthesis	454
9.2	Sami, Nenets, Eskimo (Inuits): indigenous population of the North, representatives of the Arctic adaptive type	457
9.3	Resolution capabilities of the paleoanthropology as applied to reconstruction of adaptation processes in the past	470
9.4	Specific paleoanthropological materials on the humans' dispersal over the high latitudes	471
9.5	Conclusion	491
<b>10</b>	<b>Genetic data on peopling high latitude areas</b>	<b>493</b>
	<i>Oleg P. Balanovsky</i>	
10.1	Introduction	493
10.2	Cartographic analysis of gene pool structure in Eurasia	494
10.3	The origin of the Sami gene pool	499
10.4	Ancient DNA	502
<b>11</b>	<b>Stages of the initial human colonization of Arctic and Subarctic</b>	<b>507</b>
	<i>Andrey A. Velichko, Sergey A. Vasil'ev, Yuriy N. Gribchenko and Elena I. Kurenkova</i>	
11.1	Introduction	507
11.2	Middle Paleolithic	510
11.3	The Early Upper Paleolithic	512
11.4	Middle Upper Paleolithic	517
11.5	Late Upper Paleolithic	520
11.6	Mesolithic and Neolithic. Holocene	527
	<b>Conclusion</b>	<b>531</b>
	<b>References</b>	<b>535</b>
	<b>Index</b>	<b>609</b>

# Human Colonization of the Arctic:

## The Interaction Between Early Migration and the Paleoenvironment

Edited by

V.M. Kotlyakov, A.A. Velichko and S.A. Vasil'ev

*Discussions from top experts on the interaction of humans and the environment when they first migrated into the Arctic*

**Human Colonization of the Arctic**, explores the relationship between humans and the environment during this early colonization, utilizing analytical methods from both the social and natural sciences to develop a unique, interdisciplinary approach, giving the reader a much broader understanding of the interrelationship between humanity and the environment.

Written by pioneering experts, *Human Colonization of the Arctic* covers the earliest examples of humans developing an understanding of ecosystem services for economic development in extreme climates and covers both terrestrial and aquatic ecosystems.

### About the Editors

Honoured President of the Russian Geographical Society, **V. M. Kotlyakov** is a world-leading glaciologist, investigator of both arctic and antarctic regions. He is one of the early researchers to substantiate the relationship between human activity and climate change. V.M. Kotlyakov is a laureate of Nobel Peace Prize given in 2007 to the Intergovernmental Group of Experts for Climate Problems.

**Prof. A. A. Velichko** was one of the top specialists in paleogeography, known for his works on the history of man and nature interaction. He was the first chair and founded the IGU Commission for Environment Evolution.

**Prof. S. A. Vasil'ev** is a Professor with the Institute for the History of Material Culture at the Russian Academy of Sciences. He is a foremost archeologist whose studies are centered on the early man colonization of the middle and high latitudes of the Northern Hemisphere.



[elsevier.com/books-and-journals](http://elsevier.com/books-and-journals)

ISBN 978-0-12-813532-7



9 780128 135327