BioOne COMPLETE

Onward and Outward

Author: Beardsley, Timothy M.

Source: BioScience, 58(3) : 187

Published By: American Institute of Biological Sciences

URL: https://doi.org/10.1641/B580301

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://bioone.org/journals/BioScience on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

PUBLISHER
Richard T. O'Grady

EDITOR IN CHIEF
Timothy M. Beardsley

SENIOR EDITOR
Donna Daniels Verdier

PRODUCTION MANAGER / ART DIRECTOR
Herman Marshall

PEER REVIEW / EXTERNAL RELATIONS COORDINATOR
Jennifer A. Williams

EDITORIAL ASSISTANT
Laura C. Sullivan

Editors: Eye on Education: Samantha J. Katz (educationoffice@aibs.org); Feature articles: Cathy Lundmark (features@aibs.org); Washington Watch: Robert E. Gropp (publicpolicy@aibs.org).
Editorial Associate: Barbara J. Orton.
Editorial Board: Agriculture: Sonny Ramaswamy; Animal Behavior: Janice Moore; Animal Development: Paula Mabee; Botany: Kathleen Donohue; Cell Biology: Randy Wayne; Ecology: Scott Collins, Daniel Simberloff; Ecotoxicology: Judith S. Weis; Education: Gordon E. Uno; Environmental Policy: Gordon Brown, J. Michael Scott; Evolutionary Biology: James Mallet; Genetics and Evolution: Martin Tracey; History and Philosophy: Richard M. Burian; Invertebrate Biology: Kirk Fitzhugh; Landscape Ecology: Monica Turner; Microbiology: Edna S. Kaneshiro; Molecular Biology: David Hillis; Molecular Evolution and Genomics: David Rand; Neurobiology: Cole Gilbert; Plant Development: Cynthia S. Jones; Policy Forum: Eric A. Fischer; Population Biology: Ben Pierce; Professional Biologist: Jean Wyld; Sensing and Computation: Geoffrey M. Henebry; Statistics: Kent E. Holsinger; Vertebrate Biology: Harvey B. Lillywhite.
Editorial Correspondence: 1444 I Street, NW, Suite 200, Washington, DC 20005; telephone: 202-628-1500; fax: 202-628-1509; e-mail: bioscience@aibs.org. Instructions for preparing a manuscript for *BioScience* can be found at *www.aibs.org/bioscience/resources/Info_for_contribs.pdf.*
Advertising: For information on both display and line classified advertisements and deadlines, contact John Rasanen, American Geological Institute; telephone: 703-379-2480, ext. 224; fax: 703-379-7563; e-mail: jrasanen@aibs.org.
BioScience (ISSN 0006-3568) is published monthly except July/August combined by the American Institute of Biological Sciences. To subscribe, call 1-800-992-2427, ext. 29. Individual membership: sustaining, $90/yr; individual, $70/yr; family, $90/yr (includes $36 for *BioScience*); emeritus, $50/yr; K–12 teacher/administrator, $45/yr (includes $22 for *BioScience*); graduate and postdoctoral students, $40/yr (includes $21 for *BioScience*); undergraduate and K–12 students, $20/yr (includes $15 for *BioScience*); lifetime, $1400 (one-time fee). Institutional subscriptions: domestic, $367/yr; foreign, $440/yr. Single copies: $14 plus shipping and handling for up to 20 copies; volume discounts available for more than 20 (call 1-800-992-2427, ext. 29). Subscription renewal month is shown in the four-digit year–month code in the upper right corner of the mailing label.
© 2008 American Institute of Biological Sciences. All rights reserved. Periodical postage paid at Washington, DC, and additional mailing offices.
POSTMASTER: Send address changes to *BioScience* Circulation, AIBS, 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101. Printed in USA. AIBS authorizes photocopying for internal or personal use, provided the appropriate fee is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923; telephone: 978-750-8400; fax: 978-750-4744; Web site: *www.copyright.com.* To photocopy articles for classroom use, request authorization, subject to conditions thereof, from the Academic Permissions Service at CCC. Each copy must say "© [year] by the American Institute of Biological Sciences." Statements and opinions expressed in *BioScience* are those of the author(s) and do not necessarily reflect the official positions of the American Institute of Biological Sciences, the editors, the publisher, or the institutions with which the authors are affiliated. The editors, publisher, and AIBS disclaim any responsibility or liability for such material.

BioScience

Organisms from Molecules to the Environment

American Institute of Biological Sciences

Onward and Outward

The philosophical tension between researchers who pursue explanations of complex phenomena in terms of small-scale, even molecular, events and those who stress the importance of large-scale context and contingency has been characteristic of biological and philosophical debate for decades. The academics building their careers on explaining and commenting on the differences between these views are probably grateful, and even those of us who merely occasionally sit in on such discussions might miss the thrust and parry, the move to the right followed by one to the left, that predictably emerge from these duels.

In many ways, molecules are now easier to study than biological populations, and nobody disputes the power of studying them to predict outcomes in isolated experimental systems. On the other side of the fence, those who want to understand how the world came to look the way it does point out that nothing in nature is in fact isolated—they seek multiple pathways of causation. But falling back on the platitude that everything is connected to everything else doesn't get anyone very far.

Happily, molecular technology can be married to the view from eternity, or at least the view from a landscape perspective. Some of the most creative strides in biology have been achieved by identifying where the very big engages with the very small. The article on landscape genetics that starts on p. 199, by Rolf Holderegger and Helene H. Wagner, describes a notable instance. The authors explain and set forth an agenda for what seems likely to become a key new frontier in the understanding of evolution. This article, the second in *BioScience*'s series on 21st Century Directions in Biology, shows how analytical techniques from landscape ecology as well as from molecular genetics are being combined in ways that could throw real-world evolutionary processes into unprecedented relief. Other researchers have similarly combined molecular biological data with surveys of ocean basins and lakes spread across continents.

Holderegger and Wagner survey methods for assessing not just the static spatial pattern of genetic variation, a staple of population genetics, but also how this pattern relates to landscape features and to the rate of flow of genes, even in organisms that cannot be radio tracked or marked and recaptured. When these approaches are focused specifically on adaptive genetic variation, by scanning genomes from organisms sampled in different circumstances, they are likely to yield crucial insights into how advantageous genes spread. One result could be a better understanding of the ways animal, plant, and microbial populations respond to habitat fragmentation and to climate change, dominant influences on biota worldwide.

Landscape genetics might thus in principle bring the predictive capability of molecular-scale research to studies that seek multiple causes and effects over geographic regions. This capability could be hugely important for intelligent planning of conservation efforts and for raising awareness of the awe-inspiring complexity of the ecosystems that support us. On this, even holists and reductionists can presumably agree.

TIMOTHY M. BEARDSLEY
Editor in Chief

doi:10.1641/B580301
Include this information when citing this material.

Downloaded From: https://bioone.org/journals/BioScience on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use