BioOne COMPLETE

Broadening Biology

Author: Beardsley, Timothy M.

Source: BioScience, 60(2) : 91

Published By: American Institute of Biological Sciences

URL: https://doi.org/10.1525/bio.2010.60.2.1

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://complete.bioone.org/journals/BioScience on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

PUBLISHER
Richard T. O'Grady

EDITOR IN CHIEF
Timothy M. Beardsley

MANAGING EDITOR
Laura C. Sullivan

PEER REVIEW / EXTERNAL RELATIONS
Jennifer A. Williams

Editors: Eye on Education: Cathy Lundmark (educationoffice@aibs.org); Feature articles: Cathy Lundmark (features@aibs.org); Washington Watch: Robert E. Gropp (publicpolicy@aibs.org).
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.
BioScience (ISSN 0006-3568; e-ISSN 1525-3244) is published 11 times a year (July/August combined) by the American Institute of Biological Sciences, 1444 I Street, NW, Suite 200, Washington, DC 20005, in collaboration with the University of California Press. Periodicals postage paid at Berkeley, CA, and additional mailing offices.
POSTMASTER: Send address changes to BioScience, University of California Press, Journals and Digital Publishing, 2000 Center Street, Suite 303, Berkeley, CA 94704-1223, or e-mail customerservice@ucpressjournals.com.
Membership and subscription: Individual members, go to *www.aibs.org/individual-membership* for benefits and services, membership rates, and back issue claims. Subscription renewal month is shown in the four-digit year-month code in the upper right corner of the mailing label. Institutional subscribers, go to *www.ucpressjournals.com* or e-mail customerservice@ucpressjournals.com. Out-of-print issues and volumes are available from Periodicals Service Company, 11 Main Street, Germantown, NY 12526-5635; telephone: 518-537-4700; fax: 518-537-5899; Web site: *www.periodicals.com*.
Advertising: For information about display and online advertisements and deadlines, e-mail adsales@ucpressjournals.com. For information about classified placements and deadlines, contact Jennifer A. Williams, AIBS (jwilliams@aibs.org).
Copying and permissions notice: Authorization to copy article content beyond fair use (as specified in sections 107 and 108 of the US Copyright Law) for internal or personal use, or the internal or personal use of specific clients, is granted by the Regents of the University of California on behalf of AIBS for libraries and other users, provided that they are registered with and pay the specified fee through the Copyright Clearance Center (CCC), *www.copyright. com.* To reach the CCC's Customer Service Department, call 1-978-750-8400 or e-mail info@copyright.com. For permission to distribute electronically, republish, resell, or repurpose material, and to purchase article offprints, use the CCC's Rightslink service on Caliber at *http://caliber.ucpress.net.* Submit all other permissions and licensing inquiries through the University of California Press's Rights and Permissions Web site, *www.ucpressjournals.com/reprintInfo*.asp, or e-mail journalspermissions@ucpress.edu.
Abstracting and indexing: For complete abstracting and indexing information, please visit *www.ucpressjournals.com.*
© 2010 American Institute of Biological Sciences. All rights reserved. Printed at Allen Press, Inc.

BioScience

Organisms from Molecules to the Environment

American Institute of Biological Sciences

Broadening Biology

Those of us who once learned that genes are entities that propagate and manifest themselves within species may find their conceptual categories stretched beyond the breaking point if they dare read the overview of progress in metagenomics on p. 102 by W. Ford Doolittle and Olga Zhaxybayeva. Together with the similarly challenging Feature by Karen Hopkin published in December (*BioScience* 59: 928–931), their article reminds us, if reminding were needed, that there is still a great deal still to be understood about how and where, exactly, natural selection acts on DNA. Critical analysis of new data makes clear that, among the bacteria and archaea that are Doolittle and Zhaxybayeva's focus, the concept of species may hamper the appreciation of more fundamental categories: communities of interacting genes. Moreover, as Hopkin explained, the functioning of genes is not as straightforward as it once appeared. At least in eukaryotes, it is becoming more difficult to define precisely what a "gene" is. And as if this iconoclasm were not enough, biologists are becoming more aware of the importance for evolution of processes that do not principally involve heritable variations in DNA sequences.

Advancing insights into the complexity of life processes do not take anything away from the truths that previous generations of biologists have established. The colors of crossed pea plants can still be predicted using the laws of segregation and independent assortment, and innumerable experiments have confirmed the value of principles of population genetics established a century ago. But Gregor Mendel, G. H. Hardy, and Wilhelm Weinberg considered carefully selected cases amenable to analysis with the tools they had available. It is unsurprising that today, with vastly more powerful tools, we can see realities they could scarcely have been aware of. A sort of selection process will doubtless determine how useful some older concepts will remain.

It's fascinating to consider the extent to which the biologists of the next century, or for that matter, of the coming decade, will rely on ideas familiar today. It would be arrogant to suppose that they will find them sufficient. It would likewise be arrogant to imagine that better understanding will make evolution in the real world predictable in detail. There are good reasons to believe that will remain impossible, which may be comforting to those who fear science's influence.

Yet the most basic biological insight of all—that repeated, controlled experiments can elucidate comprehensible and general mechanisms that constitute life—has come through with flying colors. The understanding of life is deepening, not disintegrating, and explanation is not going out of style, despite the attempts of evolution-deniers to muddy the waters. People who want to see science contribute to solving escalating environmental problems can be grateful: The enlightenment is not repealed. The potential for biology to help has never been greater.

TIMOTHY M. BEARDSLEY
Editor in Chief

doi:10.1525/bio.2010.60.2.1

Downloaded From: https://complete.bioone.org/journals/BioScience on 28 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use