THE AMERICAN BIOLOGY TEACHER

Editorial Staff

Editor: William F. McComas

Parks Family Professor of Science Education

University of Arkansas ABTEditor@nabt.org

Assistant Editor: Kathleen Westrich

Ronald Wilson Reagan College Preparatory H.S.

kmwestrich@yahoo.com

Reviewing Editors: Peggy Ward

University of Arkansas pdward@uark.edu

Kim Murie

University of Arkansas ksj002@email.uark.edu

Kevin Bonney New York University kevin.bonney@nyu.edu

Emily Weigel

P.O. Box 3363

Michigan State University emilygweigel@gmail.com

Managing Editor: Mark Penrose

managingeditor@nabt.org

ABT Production
Office:

: Warrenton, VA 20188 Phone: (888) 501-NABT

Web site: www.nabt.org

Contributing Douglas Allchin
Columnist: University of Minnesota allch001@umn.edu

In Appreciation

Christine S. Chantry • 1952-2003

Department Editors

Book Reviews: Elizabeth Cowles, cowlese@easternct.edu

Classroom Materials & Media Reviews: Remy Dou, douremy@gmail.com

Advertising Sales

Allison Zippert, Account Executive, Network Media Partners (410) 584-1965, azippert@networkmediapartners.com

Guidelines for Authors

Guidelines for authors may be found at http://www.nabt.org/publications

Printed by The Sheridan Press, on Forest Stewardship Council®–certified paper

© 2015 National Association of Biology Teachers All rights reserved.

The American Biology Teacher (ISSN 0002-7685, e-ISSN 1938-4211) is published nine times a year (monthly except June and July, Nov/Dec combined) for the National Association of Biology Teachers in collaboration with University of California Press, 155 Grand Avenue, Suite 400. Oakland, CA 94612-3764. Periodicals postage paid at Oakland, CA, and additional mailing offices. POSTMASTER: Send address changes to ABT, University of California Press, 155 Grand Avenue, Suite 400. Oakland, CA 94612-3764. E-mail: customerservice@ucpress.edu.

The American Biology Teacher is the official peer-reviewed journal of the National Association of Biology Teachers. All manuscripts must be submitted online at http://mc.manuscriptcentral.com/ucpress-abt. The comments and opinions expressed in this publication are not attributed to and do not necessarily represent the views of the National Association of Biology Teachers. Announcements and advertisements in this journal for products do not imply endorsement of or by NABT.

Membership Information

NABT membership is \$79 a year for full membership and \$149 for organizational membership in the United States, Canada, and Mexico; \$150 for full membership elsewhere. \$48 of annual membership dues applies to a subscription of *The American Biology Teacher*. Student, adjunct faculty and early career teacher memberships are \$35 and retired membership is \$60 (\$35 online only) if that person has been an NABT member for 10 years or more and is retired.

Subscriptions are offered on a calendar-year basis; members and subscribers receive all issues in the volume for the year in which their subscription is entered.

See http://abt.ucpress.edu/content/subscribers for single issue and institutional subscription orders, back issues from volume 69 forward, and claims information. Domestic claims for nonreceipt of issues should be made within 90 days of the mail date; overseas claims within 180 days. Mail dates can be checked at: http://www.ucpress.edu/journals.php?p=release. UC Press does not begin accepting claims for an issue until thirty (30) days after the mail date. For back issues before volume 69, contact NABT at publication@nabt.org.

Inquiries about advertising can be sent to abt@networkmediapartners.com. For complete abstracting and indexing coverage for the journal, visit http://abt.ucpress.edu. All other inquiries can be directed to customerservice@ucpress.edu.

Copying and permissions notice: Authorization to copy article content beyond fair use (as specified in Sections 107 and 108 of the U.S. 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 the National Association of Biology Teachers 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, phone 978–750–8400 or write to info@copyright.com. For permission to distribute electronically, republish, resell, or repurpose material, use the CCC's Rightslink service, available on JSTOR at http://abt.ucpress.edu. Submit all other permissions and licensing inquiries through University of California Press's Reprints and Permissions web page, http://www.ucpress.edu/journals.php?p=reprints or via email jpermissions@ucpress.edu.

For more information, visit www.nabt.org

Executive Director

Jaclyn Reeves-Pepin

Board of Directors

President: Bob Melton President-Elect: Susan Finazzo

Past President: Jane Ellis

Secretary/Treasurer: Steven Christenson Director-at-Large: Sherry Annee Director-at-Large: Elizabeth Cowles Director/Coordinator: Margaret Carroll Director/Coordinator: Chris Monsour

Regional Coordinators

Region I (CT, ME, MA, NH, RI, VT): Margaret Carroll
Region II (DE, DC, MD, NJ, NY, PA, VA): Karen Lucci
Region III (IL, IN, MI, OH, WI): Chris Monsour
Region IV (IA, KS, MN, MO, NE, ND, SD): Harry McDonald
Region V (KY, NC, SC, TN, WV): Brenda Royal & Kim Sadler
Region VI (AL, FL, GA, LA, MS, PR): Medelene Loftin
Region VII (AZ, AR, NM, OK, TX): Bethany Lorenz
Region VIII (CO, ID, MT, NV, UT, WY): Cindy Gay



Region IX (AK, CA, HI, OR, WA, Pacific Territories): Bethany Dixon Region X (Canadian Provinces & Territories): TBD

Committee Chairs

ABT Journal Advisory Committee: William F. McComas

Archival Committee: Carrie Boyce & Jill Maroo

Awards Committee: Priya DasSarma

Constitution & Bylaws Committee: Ann Lumsden Finance Committee: Steven Christenson

Honorary Membership Committee: Bob Melton Global Perspectives Committee: Jackie McLaughlin

Long Range Planning Committee: Todd Carter

Membership Committee: Sherry Annee & Sue Trammell

Nominating Committee: Betsy Ott

Professional Development Committee: Catherine Ambos Retired Members Committee: Dennis Gathmann

Section Chairs

AP Biology Section: Sharon Radford BioClub Section: Andrew Corless

Four-Year College Biology Teachers Section: Anneke Metz Two-Year College Biology Teachers Section: Mary Phillips