The 2008 AAAS Annual Meeting: Some Sessions Related to Science Editing

Amelia Williamson, Misha Kidambi, and Barbara Gastel

In keeping with its theme, "Science and Technology from a Global Perspective", the 2008 annual meeting of the American Association for the Advancement of Science (AAAS) included sessions on many aspects of science and its communication and emphasized international perspectives. We are pleased to share highlights of some sessions that may especially interest science editors. Other information about the annual meeting, held 14–18 February in Boston, can be accessed at *www.aaas.org/meetings/Annual_Meeting/2008_boston/*.

"Ethical Issues in Scientific Publishing"

Amelia Williamson

Scientific and medical journal editors are responsible for maintaining the integrity of publications and ensuring that research is reported with the utmost regard for ethics. Many professional societies have issued ethical guidelines for scientific publication; one of the most recent is the Council of Science Editors' "White Paper on Promoting Integrity in Scientific Journal Publications". The session titled "Ethical Issues in Scientific Publishing" at the 2008 AAAS annual meeting discussed such guidelines and the role of journal editors in implementing them.

Diane Scott-Lichter, then senior director of publications for The Endocrine Society and CSE president-elect, spoke about the CSE white paper and the responsibilities of editors in ethical publishing. She discussed how editors should establish procedures to ensure the integrity of the journal, clearly communicate its policies, execute them in an unbiased way, and disclose any conflicts of interest. When dealing with a suspect manuscript, Scott-Lichter suggested asking the corresponding author first and proceeding with caution while investigating because careers are at stake.

Michael Zigmond, of the University of Pittsburgh and editor of *Progress in Neurobiology*, spoke about his experience in serving as secretary for the Society of Neuroscience and as chair of the committee that established the society's ethical guidelines. Zigmond discussed some of the "high crimes" (fabrication, falsification, and plagiarism) and "misdemeanors" (authorship issues and duplicate publication) in scientific publishing. He also said that professional societies have a unique and crucial role in the development, dissemination, and enforcement of ethical guidelines. The guidelines, however, are a means, not an end, and editors can have an impact only through courage and hard work.

Ana Marusic, co-editor-in-chief of the *Croatian Medical Journal* and CSE president, spoke about the strengths, weaknesses, opportunities, and threats that affect how journals address scientific misconduct. Strengths include a journal's editorial independence, its authority and expertise, and its ability to formulate editorial policies. Some weaknesses, however, could include lacking a mandate for legal action, being reluctant to get involved, and lacking training in dealing with ethical infractions. Marusic also discussed how editors are now well positioned to identify scientific misconduct and have the opportunity to implement new technology, such as programs that scan images and detect manipulation. Journals face some threats owing to the lack of legal regulation and lack of support from stakeholders in scientific publishing. She stressed that although journal editors cannot be the sole "police force" of the scientific community, they can certainly continue to strive to ensure the integrity of their publications.

Donald Kennedy, editor-in-chief of *Science*, concluded the session by adding that editors receive an enormous number of voluntary "gifts" of research from scientists, and peer reviewers donate their valuable time to review these submissions. Therefore, editors owe it to the scientific community to uphold the integrity of their publications and to retain the trust in the ethical reporting of research.

"English-Only Science in a Multilingual World: Costs, Benefits, and Options"

Misha Kidambi

In a world where English has emerged as the global language of scientific communication, are researchers who are nonnative speakers of English at a serious disadvantage? Is the near-monopoly of English as the language of scientific communication a problem? If so, what are the possible solutions? Those were questions that the speakers tried to answer in the symposium "English-Only Science in a Multilingual World: Costs, Benefits, and Options".

Ulrich Ammon, professor of linguistics at the University of Duisburg-Essen, Germany, pointed out how English has become the major language in science communication, although it is the native language of a minority. The emergence of English as the major language of science communication is the reason that native English speakers enjoy various advantages, such as being editors and reviewers of science journals, he said. He also questioned whether having a single lingua franca will hamper the development of science in a multilingual world. Ammon put forth some suggestions to help place nonnative speakers of English on the same level as native speakers in the scientific commu-

AMELIA WILLIAMSON *and* MISHA KIDAMBI *are former* Science Editor *interns. Williamson recently graduated from the master's degree program in science and technology journalism at Texas A&M University, and Kidambi is currently a student in the program.* BARBARA GASTEL *is the editor of* Science Editor *and a faculty member at Texas A&M University.*

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nity. The suggestions included sensitizing native speakers to the difficulties faced by nonnative speakers, introducing more language editing services, providing greater editorial support, training authors in writing scientific English, and publishing a journal in multiple languages.

José A Vergara, a physician with Puerto Montt Regional Hospital in Chile, said that UNESCO has marked 2008 as the International Year of Languages and that science should be made available in languages accessible to all intelligent people. The third speaker, Humphrey Tonkin, professor of the humanities and president emeritus of the University of Hartford, Connecticut, noted that multilingual journals (journals with versions in more than one language) are rare. He said that even countries that initially followed the practice of publishing papers in their own languages, like France, have abandoned the practice. He showed the audience some numbers to put his point across: 80.5% of humanities publications and a whopping 90.7% of natural-science publications worldwide are in English. Tonkin said that the "self-reinforcing loop of English" makes it difficult for researchers who do not publish in English to gain credibility. If a work is not published in English, it is not included by indexers who require at least the abstract to be published in English. He and Vergara said that the use of a neutral language, such as Esperanto, would be helpful.

Moderator James Lieberman, clinical professor in the Department of Psychiatry and Behavioral Sciences at George Washington University School of Medicine in Washington, DC, agreed that native English speakers should be made aware of the problems faced by nonnative–English speakers when they try to publish papers in English. Although discussant Lenore Grenoble, professor of linguistics at the University of Chicago, agreed that assistance should be offered to nonnative–English speakers by such means as help with writing for scientific publications, she differed with the speakers about the use of a neutral language and said that high costs would be incurred if publications had to be in multiple languages. She said that because nonnative-English speakers outnumber native-English speakers, the former will change how English is used, thus molding it into a global language.

"Unlocking the World's Science: Increasing Access, Adding Visibility, and Aiding Authors"

Barbara Gastel

Global communication of research is crucial for the advancement of science and the application of science for global well-being. Yet barriers to such communication exist: scientists in much of the world lack access to research literature, research from many countries is largely invisible because of language barriers and absence from bibliographic databases, and developing-country authors trying to publish in international journals face linguistic and cultural challenges. In keeping with the 2008 AAAS theme, "Science and Technology from a Global Perspective", a session titled "Unlocking the World's Science: Increasing Access, Adding Visibility, and Aiding Authors" described efforts to help overcome such barriers.

INASP: Julie Walker, head of publishing support at the International Network for the Availability of Scientific Publications (INASP, *www.inasp.info*), focused on some major INASP activities in her presentation, "Joining the Global Research Community—Models for Increasing Visibility and Access to International and National Research Information". INASP, Walker noted, was established in 1992 to help to meet information needs of scientists in developing and emerging countries. Funded mainly by European governments, it works in Africa, Asia, and Latin America. Among those involved are researchers, librarians, information- and communication-technology professionals, publishers, and professional associations. All national activities are managed through locally based country-coordination teams.

Walker described two models or approaches used by INASP. One, "research in", consists of increasing access to international research by negotiating, country by country, free or greatly discounted access to electronic journals, books, and databases from many international academic publishers and aggregators. The other model, "research out", increases access to and visibility of national and regional research through regional and national online journal databases. The databases include African Journals Online and three Asian Journals Online databases (those in Vietnam, Nepal, and Bangladesh); in addition, databases in Pakistan, the Philippines, and Sri Lanka are anticipated. Recurrent themes of INASP activities include training, sustainability, holistic approaches, and individualization to suit conditions in specific countries.

SciELO: Abel L Packer, director of the Latin American and Caribbean Center on Health Sciences Information, presented a 10-year overview of the Scientific Electronic Library Online (SciELO, *www.SciELO.org*), which was launched in Brazil in 1997. Packer noted that SciELO—which contains materials in English, Spanish, and Portuguese—includes 532 journals. In addition to collections from several countries in Latin America and from Spain and Portugal, it contains collections by discipline (public health and social sciences). "More or less a metapublisher", Packer said, SciELO has stimulated the improvement of journals. Articles in SciELO can be available ahead of print—a particular advantage, Packer noted, because articles accepted by Latin American journals often face considerable lags before printing and before indexing in databases, such as MEDLINE. The more rapid availability, Packer observed, increases the impact of the research.

Packer's data-filled presentation included many statistics related to SciELO. He reported substantial increases over the years in total numbers of downloads and citations. However, he showed that as the number of journals in SciELO has increased, the number of citations per journal has decreased. In addition, Packer discussed the preference of many authors in

developing countries for publishing externally, in journals with higher impact factors and greater prestige, which tends to relegate developing-country journals to continued secondary status. It was noted that efforts, such as SciELO, to increase accessibility and quality may help to counter such trends.

AuthorAID: Anthony Robbins, coeditor of the *Journal of Public Health Policy*, spoke on "AuthorAID: The Concept". He recalled that when he and Phyllis Freeman became coeditors of the journal, they wanted to publish more research by authors in developing countries. They then broadened their goal to fostering publication by developing-country authors, regardless of scientific discipline or journal. The approach they conceived, termed AuthorAID, centers on scientific mentoring and developmental editing via the World Wide Web. Robbins and Freeman envisioned that mentors would come mainly from two groups: scientists in or near retirement and author's editors. Another aspect of AuthorAID they envisioned was a knowledge-community Web site containing materials that teach scientific communication.

Robbins summarized efforts thus far to establish AuthorAID projects and test the AuthorAID concept. He noted initial AuthorAID projects under way through the International Society for Environmental Epidemiology (*www.iseepi.org/about/authoraid.html*) and through INASP (*www.authoraid.info*). He said that discussions with CSE seemed to be leading mainly to explorations into helping developing-country editors. In closing, Robbins presented the following questions: Does e-mentoring work? Can AuthorAID projects meet the demand? Can publishers fund AuthorAID, or is such activity an extension of research-capacity strengthening? Can AAAS create an AuthorAID?

"Global Warming Heats Up: How the Media Cover Climate Change"

Amelia Williamson

At a time when it's trendy to "go green", the issue of global warming is front and center in the media spotlight. But are the stories that journalists are telling effective, and are they getting the message across to the public? The session titled "Global Warming Heats Up: How the Media Cover Climate Change" addressed those issues.

Andrew Revkin, a science reporter for the *New York Times*, said that global warming by its very nature does not make good news. News is usually something that happens right now and hits close to home, but human-caused climate change is a process that occurs over hundreds of years on a global scale and has ramifications that are still uncertain. So it is hard for journalists to persuade editors that global warming is worthy of front-page coverage. Revkin also discussed how journalists are squeamish about reporting uncertainty and have a bad habit of always balancing a story. Balance can be a disservice to the public when journalists give a credible voice to outlying skeptics. "I can't think of a better way to disenchant the public interest in journalism and the media as a meaningful part of how we learn about science than to [engage in] whiplash journalism," he said.

Matthew Nisbet, a public-policy mass-media analyst at American University, said that information is not what's driving public opinion on global warming and that instead of relying on science, Americans tend to rely on heuristics and partisanship. "Far-left political groups" and "Hollywood liberals" usually resort to scare tactics to convey the message of global warming, he said. "Green" icons, such as Al Gore, he noted, tend to dramatize the issues, and this "makes the error bars of uncertainty greater" and contributes to counterclaims of alarmism. Nisbet believes that the ways in which journalists are trying to communicate global warming are not working and that we need to come up with more effective ways of packaging the message.

David Dickson, of the London office of SciDev.Net, added that global-warming coverage is an intense debate outside the United States as well and that journalists around the world struggle with the difficulties inherent in covering it. He also addressed the issue of getting large developing countries on board to make more climate-friendly policies. The key to getting those countries on board, he said, is to use the mass media to excite the public about global warming, so that they will see political action as in the national interest and demand it of their governments. He added that journalists have played a key role in getting global warming on the agenda and that they have a responsibility to communicate to the public what is really going on.

John Holdren, director of the Harvard University program on science, technology, and public policy, said that the issue of global warming is "anesthetized" by the term that we use. *Global warming*, he said, suggests something gradual, comfortable, and benign; in reality, it is none of these. He also said that when journalists give outlying skeptics a voice, it puts credible scientists at a disadvantage. There is no penalty for claiming expertise that you don't have or for overstating the evidence as a nonscientist, but there are severe consequences for scientists. Scientists, therefore, are afraid to comment, because they do not want to be accused of alarmism. Holdren concluded the session by saying that although climate change has never had top-tier status in the mass media, he thinks the current coverage will only increase "because the recent dramatic growth of the symptoms of global climate disruption is going to continue and even accelerate . . . and so the coverage is only going to grow".

"Global Issues: Helping the Public Understand When Scientific Information Is Valid"

Misha Kidambi

How does the mass-media treatment of scientific information affect the public understanding of science? And what mea-

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sures can be taken to help the public to understand scientific information that will directly affect their lives? The speakers put forth their ideas on those points and spoke about how the mass media can help shape public understanding of science in the session "Global Issues: Helping the Public Understand When Scientific Information Is Valid".

Anne Schuchat, of the Centers for Disease Control and Prevention in Atlanta, Georgia, focused on the public perception of vaccination today and the communication challenges faced in helping people to understand vaccination science. She pointed out how low disease awareness and increased focus on vaccine risks have created wariness of vaccines. Schuchat explained why it is important for the mass media to treat uncertainty and risk communication honestly. Summing up the correct way to communicate the science of vaccination, she said that one has to "Do it right, get it right, and say it right."

Carl Bialik, of *The Wall Street Journal*, who writes the weekly column "The Numbers Guy", explained the important role of numbers in news. He said it is important to help people to understand the numbers and to expose the "bad numbers in news". He spoke about how the business of news has changed over the years and how public-relations firms know what numbers should be given out to news outlets to get the desired response.

David Goldston, of the Woodrow Wilson School of Princeton University and former chief of staff for the House of Representatives Committee on Science, spoke about the importance of correct communication and understanding of science for policy makers so that they can reach good decisions. The symposium ended with a lively discussion in which some members of the audience pointed out how the mass media sometimes sensationalize news. Nancy M Gordon, of the US Census Bureau, moderated the symposium, and John L Gardenier, research ethicist and writer, was the discussant.

"Career Workshop: Linguistic Tools for Scientists to Improve Their Writing of Articles"

Misha Kidambi

An understanding of some techniques and nuances of writing articles for English-language journals was the aim of this workshop, conducted by Karen Englander, of the Universidad Autonoma de Baja California, Mexico. Englander spoke about how researchers should approach writing their papers and why nonnative speakers of English find it difficult to write in English. She then provided information about how to use a tool known as corpus linguistics.

Describing the approach required to write a scientific paper, Englander told the participants to think of articles as contributing to a conversation and of each section—the introduction, methods, results, and discussion—as playing a specific role. The introduction, she said, should tell the audience why the investigation is important; methods should include details on how the researcher tried to fill the gap between things that are already known and something is that is not known by carrying out investigations that are careful, methodical, and in accord with accepted practices; results should state what interesting observations worthy of reporting were made; and finally, the discussion should put the study into the context of other studies in the field and include implications, limitations, and how the study will change the field.

Englander explained how the idea of good writing varies among cultures, making it difficult for nonnative speakers to publish in English. Spanish texts, for example, use elaborate and flowery language, unlike English, in which a direct linear approach is preferred. She pointed out that although a high level of certainty in the conclusion is acceptable in texts written in Greek, French, or Hungarian, English texts require some amount of hedging in the conclusion until the findings are confirmed. Another difference, she said, was the reluctance in some cultures, such as Czech, "to give away the whole story" in the abstract by stating the purpose and the findings. The difference between reader-responsible languages, such as French and Arabic, in which it is the reader's responsibility to make sense of the writing, and the writer-responsible approach of English, in which the onus is on the writer to get the information across, is another factor that causes problems for nonnative speakers writing in English.

Next, Englander touched on some common features of scientific papers. She explained how a scientific paper is structured like an hourglass, with the introduction and discussion having broader perspectives covering various points in the field and the methods and results sections being restricted to the study. Some common features notwithstanding, she stressed how a research-paper format is highly discipline specific and noted the importance of using the target journal as a guide to format the writing. She explained how corpus linguistics can be used as a tool and how writers can ensure that they do not use words "that raise flags in the reviewers' minds".

Corpus linguistics, Englander said, "involves understanding the correct use of the most common content words in academic texts". To help researchers to identify appropriate use of words in their fields, Englander advised downloading a free corpus-linguistics tool, known as the concordance tool. To do so, download the AntConc program (*www.antlab.sci.waseda.ac.jp/software.html*). Next, download about 15 pdf articles from one's field and save them as .txt files. When the files are opened in the AntConc program, one can type specific words or phrases and see the contexts in which they are used. (After one types the word or phrase in the search box, the tool highlights it in the selected papers.) Thus, the number of occurrences and the context of usage can be determined. A demonstration of the tool gave the participants a good idea of how it functions.

Englander used various activities to ensure the participants' involvement. She explained how an introduction ideally has three definite moves: move 1 shows that the general research field is important and introduces and reviews previous research

in the field, move 2 indicates a gap in previous research, and move 3 states what the researcher did to fill the gap. The first activity involved identifying linguistic items that "marked" those moves. Another activity involved understanding hedging. Explaining the importance of hedging in presenting conclusions of studies that require further research, she pointed out that researchers could use words that indicate probability, distance, or generalization. For the activity accompanying this explanation, participants received a worksheet on which they were to hedge strong claims and identify weaker ones.

Ending the workshop with emphasis on the importance of good writing, Englander quoted from the chapter "English—The Accidental Language of Science?" by Robert B Kaplan: "Good scientists who cannot write English to meet the standards of journal editors are deprived of the opportunity to have their views and contributions disseminated through the global information networks."[1]

"Career Workshop: Gatekeepers, Midwives, and Wordsmiths: Career Options in Science Editing"

Barbara Gastel

At a scientific conference a decade ago, a session on science-editing careers might well have played to an empty hall. At the 2008 AAAS annual meeting, however, the career workshop "Gatekeepers, Midwives, and Wordsmiths: Career Options in Science Editing" drew a standing-room–only crowd.

The workshop featured five speakers, each in a different field of science editing. First, Monica Bradford, executive editor of *Science*, spoke about editorial positions at scientific journals. Bradford summarized the activities of various categories of editors—such as copyeditors, associate editors, and online editors—and identified qualifications needed for each. A less-known category she mentioned was that of commercial editor, someone who works with the business department to develop content opportunities for advertisers. Bradford noted that one way to begin to gain editorial experience is to serve as a peer reviewer. Among attractions of science editing at a journal, she said, were opportunities to interact with and learn from scientists, chances to attend scientific meetings, the satisfaction of helping to communicate science, and, in many cases, flexibility regarding the times and locations of work.

Next came a presentation by Stephen Morrissey, managing editor of the *New England Journal of Medicine*, which —like *Science* (but unlike many smaller journals)—has a full-time professional staff. Morrissey noted that some editorial roles at medical journals require medical degrees. He said that for manuscript editors, a science background is very useful, but a sense of language is more important. Morrissey presented information on medical-editing fellowships offered by the *New England Journal of Medicine*, *JAMA: the Journal of the American Medical Association*, *CMAJ*, *PLoS Medicine*, the American Academy of Family Physicians, and the Radiological Society of North America.

Michael Fisher, editor-in-chief of Harvard University Press, spoke about book editing in the sciences. He described various categories of editor, including acquisitions editors (who identify prospective authors, persuade them to submit manuscripts, and manage peer review), developmental editors (whose roles can include working with authors and advisers to help ensure that textbooks suit markets), and manuscript editors. Fisher said acquisitions editors should be good networkers, be skillful in juggling many projects, and have patience ("authors take a long time to write books"). Among satisfactions that Fisher identified were chances to "work with brilliant people", learn about many fields of science, and work on publications that affect the wider culture; frustrations, he said, can occur when books do not receive the attention that the editor thinks they deserve.

Kelley L Hill, manager of medical writing at Shire Human Genetic Therapies, discussed editing in the pharmaceutical industry and other corporate settings. She noted that opportunities exist in scientific editing (such as editing journal submissions), medical editing (such as editing materials for health professionals), regulatory editing (such as editing documents to submit to the Food and Drug Administration), and corporate editing (such as editing press releases and marketing materials). Challenges of editing in corporate settings, Hill said, can include time pressure, the difficulty of editing collaboratively written documents, and the need to manage multiple cycles of editing ("version control can be a nightmare"). However, Hill portrayed science editing in industry as satisfying and stimulating; she mentioned, for example, electronically coordinated live editing sessions with people on multiple continents. Before closing her presentation, Hill provided information about professional certification by the Board of Editors in the Life Sciences (*www.bels.org*).

The final speaker, Jeffrey B Tatro, discussed freelance editing in the sciences. Tatro, a faculty member at Tufts University School of Medicine, has a freelance editing business, GrantRescue/WinningSubmissions; items edited include grant applications and manuscripts for publication, both for individuals and for companies. Motivations of clients, he said, include lack of time, the need to resubmit items after responding to reviewers' comments, a recognized lack of writing skills (such clients "become your students", Tatro said), and lack of interest in writing. Tatro portrayed the role of freelance science editor as that of a problem solver and a consultant, including an advocate and cheerleader. He recommended having scientific experience and learning both how to write and how to run a business. In closing, he said that opportunities in freelance science editing abound and recommended identifying them through networking.

Materials available for attendees included a recently published issue of *Science Editor* containing an article on careers in science editing.[2] The several dozen copies quickly disappeared. That might bode well for the future of the profession.

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