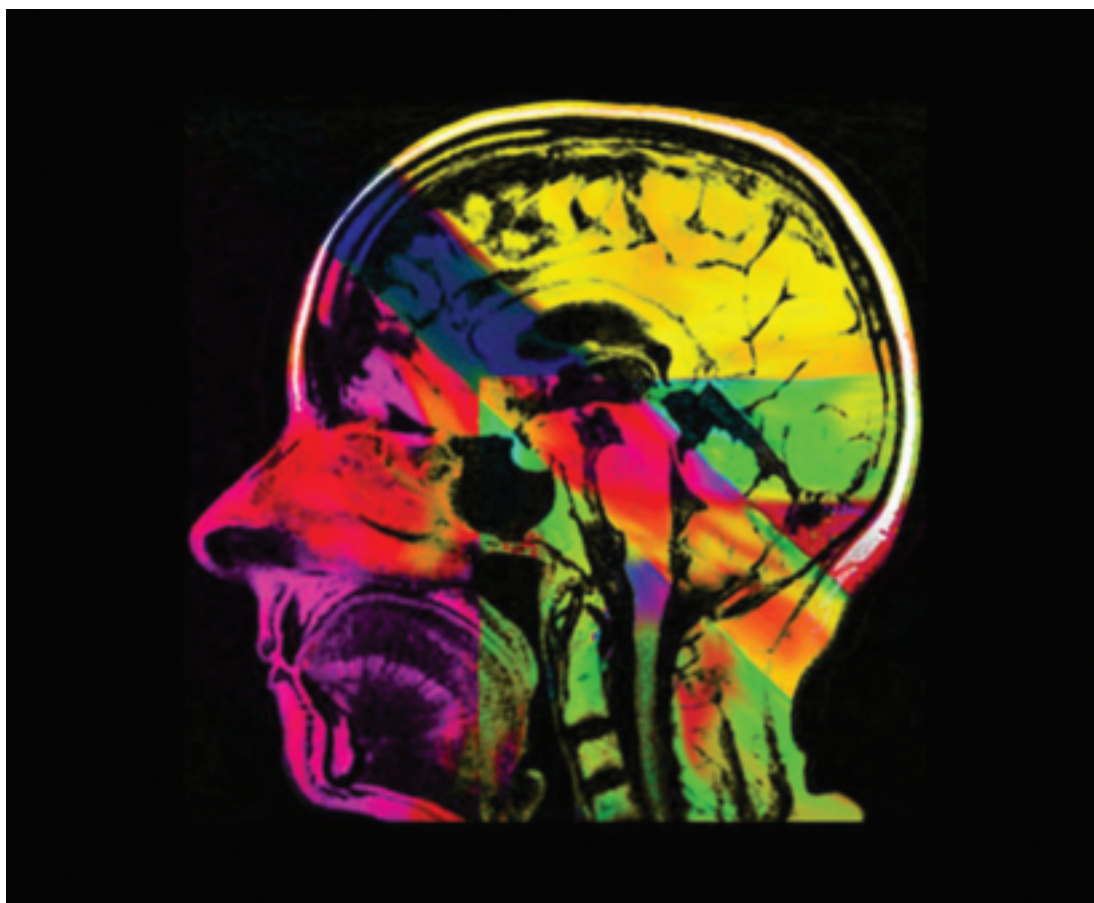# SCIENCE EDITOR

A Publication of the Council of Science Editors

In this issue

- *Scientific Misconduct: CSE's Misconduct Survey, Plagiarism, Image Manipulation, Clinical Trials*
- *Annual Meeting Reports*
- *Research Article from the Annual Conference Poster Winners*

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Cover image: Digital collage of hand-pulled prints and MRIs of the artist's brain, titled *Neuroplasticity I*, created by Elizabeth Jameson, who was diagnosed with multiple sclerosis. See other examples of Jameson's artistic imaging of the brain at www.jamesonfineart.com.

From the President and the Editor

Introducing the New *Science Editor.*

Starting with the extremely successful annual meeting in Seattle, my year as CSE president has so far been charmed. I find myself following in the footsteps of a terrific president, Diane Sullenberger, and working with an incredible group of extremely talented Board members, committee chairs, and all the other members who volunteer their services to further the important mission of CSE. The Resource Center, our management company, continues to provide excellent support. On top of all that, I have the privilege of writing an introduction for the first issue of the revitalized *Science Editor,* which you now hold in your hands or behold on your computer screen. There would be no such issue without the tremendous response to the member survey that asked for opinions and ideas about the best way to relaunch the journal after a year-long hiatus. Even that would not have been enough were we not so fortunate as to welcome Patty Baskin—long-time CSE member, annual-meeting session organizer and presenter, and former short-course chair and continuing faculty member—as the new editor of *Science Editor*. Patty brings not only her wealth of experience in CSE and her career as an executive editor to the job but a commitment to incorporate the feedback from the member survey into future issues of *Science Editor*. With Patty at the helm, and the dedicated Editorial Board and production team in place to assist her, the sky is the limit. Please enjoy this and all future issues of *Science Editor* and continue to let us know how can serve you.

Kenneth F Heideman
President, Council of Science Editors

Beginning Again: Creating Conversations

It's always exciting for me to begin a new project—to think about the possibilities and gather a group of other excited people around me—and, as part of the project, to exchange stimulating ideas and begin new friendships. In this instance, it's doubly exciting—editing *Science Editor* (*SE*) is a new project for me as well as a new beginning for *SE*. My goal for this relaunch of *SE* is to open new conversations among our members. By focusing on a timely topic for each issue, I hope to generate discussion of ideas and processes that members can apply in their own workplaces and to increase their knowledge of scientific publishing. This month's issue focuses on preventing scientific misconduct in our publications, exploring such subjects as image manipulation and plagiarism and reviewing the recent survey by CSE on misconduct allegations. Our next issue will focus on recent developments and growth in open access. I look forward to receiving contributions that further these conversations and create new ones.

Patricia K Baskin
Editor-in-Chief, *Science Editor*

Science Editor Online

Thinking about Publication Ethics: Resources for Editors

Patricia K Baskin

In this issue of *Science Editor*, you'll find a number of articles related to publication ethics. Most editors—including editors-in-chief and their associate editors, staff editors, and freelance manuscript editors—face occasional ethics issues when publishing scientific research papers. The issues range from incidents of outright fraud to less serious breaches of publication ethics, all of which detract from the integrity of the published scientific literature. The repercussions of violating publication ethics are numerous, including incorrect attribution of authorship, risk of copyright infringement, waste of research dollars, and even inappropriate medical treatment of patients. Clearly, prevention of scientific misconduct or breaches of publication ethics and appropriate handling of ensuing situations are serious concerns in any editorial office.

CSE *White Paper on Promoting Integrity in Scientific Journal Publications*

Spring 2012 saw the release of the latest update of the CSE *White Paper on Promoting Integrity in Scientific Journal Publications*. CSE presented its first full-day Short Course on Publication Ethics based on the concepts presented in the white paper, which has two major sections: the first addresses the responsibility of all who are involved in a research study—including editors, authors, reviewers, and sponsors—and the second provides information on identifying research misconduct and presents guidelines for action when misconduct occurs.

Each section of the white paper contains a number of subsections:

PATRICIA K BASKIN *is executive editor of* Neurology® *and* Neurology® Clinical Practice *and editor-in-chief of* Science Editor.

Responsibility of participants in the research process. For editors, topics addressed include confidentiality; conflicts of interest of all those involved; corrections, errata, and expressions of concern; authorship disputes; and allegations or findings of misconduct. The author subsection reviews authorship criteria and contributorship models, acknowledgments, author order, and changes in the author byline. The reviewer subsection deals with reviewer selection, examples of impropriety, and models of anonymity (blind, double-blind, and open). The sponsor subsection includes discussion of publication planning by sponsors, assignment of authorship, disclosure of conflicts of interest, access to data, and clinical-trial registration requirements.

Identification of research misconduct and guidelines for action.

The first subsection of the second section provides descriptions of actions that constitute research misconduct: mistreatment of research subjects, falsification and fabrication of data, and piracy or plagiarism. The next subsection discusses investigations of misconduct by various international bodies, and the following one addresses responsibility for reporting suspect manuscripts. Misconduct in digital imaging, correcting the literature, and handling media inquiries about misconduct make up the final subsections of the white paper.

We encourage CSE members to use the white paper as a supplement to the statements or policies of their own publications. Many of us consult the white paper first when sticky problems arise and an answer is needed quickly.

How the Editorial Office Can Help to Prevent Misconduct and Breaches in Publication Ethics

In addition to following their own publications' policy statements, editorial staff can access many resources that are available, a number of which are listed at the end of this article. Information provided to authors and reviewers should include statements requiring authors to confirm the following in submitting papers: that research studies were approved by institutional review boards, confidentiality of patients was maintained and patients' consents to disclose were obtained, works are original, authors take responsibility for data in articles, authorship criteria were adhered to (no ghostwriting or guest authorship!), and disclosure of conflicts of interest were made by authors, reviewers, and editors. We can ask for standardization of reporting by our authors, using reporting guidelines—such as CONSORT, STARD, and others curated on the EQUATOR site for health research—to prevent misconduct. We should also present clear definitions of scientific misconduct and breaches of publication ethics for authors and reviewers and indicate that violations may have serious consequences.

In addition to consulting the white paper and other professional resources, such as the Committee on Publication Ethics (COPE) flowcharts, we are fortunate to be able to network with other CSE members at the annual meetings, hear presentations at the meetings, and read the advice of fellow members. The articles related to publication ethics in this issue include the following topics:

- Summary of CSE misconduct surveys.
- Detection and prevention of image manipulation.
- Detection and prevention of plagiarism with iThenticate software.
- History of COPE and the COPE resources.
- Using instructions for authors to demystify misconduct issues.

Article

continued

- Knowing why and when to make corrections in the literature.
- Profile of a CSE member who is the publications ethics manager for a scientific society.
- *Ethical Editor* column on research misconduct in clinical trials.

Prevention of problems is the common theme in most of those articles. Our hope is that use of the information provided by both the white paper and CSE members will help us to minimize problems involving publication ethics and to deal with them more effectively when they appear.

Resources

- COPE (http://publicationethics. org/) and COPE Flowcharts (http://publicationethics.org/resources/flowcharts).
- CSE *White Paper on Promoting Integrity in Scientific Journal Publications* (www.councilscienceeditors.org/i4a/pages/index.cfm?pageid=3313).
- EQUATOR Network (reporting guidelines) (www.equator-network.org/).
- Ethics Collaborative Online Research Environment (CORE) (nationalethicscenter.org/).
- International Committee of Medical Journal Editors (www.icmje.org/).
- US Office of Research Integrity (http://healthfinder.gov/orgs/HR2971.htm).
- World Association of Medical Editors (www.wame.org/).

Optimizing the Output of a Freelance Editing Model: Value Added by an In-house Reviewing Team

**Clarinda Cerejo
and Naveen Rajan**

Abstract

Background: In recent years, many journal editorial departments have begun to employ freelance editors rather than an exclusively in-house team. Although a freelance editing model offers greater editor availability and subject-matter expertise, it necessitates better quality control. We hypothesize that although a freelance model is best equipped to offer subject-matter expertise, a uniformly trained, centralized team of reviewers can help to standardize editorial quality and ensure consistency in style. To test our hypothesis, we assessed the value that an in-house reviewing team can add to a freelance editing model.

Methods: The quality of 50 academic research papers in medicine and life sciences was assessed by a panel of external editors in a blinded manner. Each paper had been edited by a freelancer and later reviewed by an in-house editor. All in-house editors were uniformly trained in the mechanics of copyediting. The edited and reviewed versions of each paper were independently rated on clarity, language, and presentation with a four-point scale (*poor* = 1, *excellent* = 4). The results were compared using the Mann-Whitney U test (significance at $P < 0.05$).

CLARINDA CEREJO *is managing editor, scholarly communications, and* NAVEEN RAJAN *is managing editor, medicine, at Cactus Communications Pvt Ltd, Mumbai, India. Editor's note: This article describes the study presented in the winning research poster at the 2012 CSE annual meeting.*

Results: The mean [SD] quality score of the reviewed versions was significantly higher than that of the edited versions ($P < 0.01$). The improvement in score was most significant with regard to presentation ($P < 0.01$), followed by language ($P = 0.01$). With respect to clarity, although the reviewed versions scored higher than the edited versions, the difference was not significant ($P = 0.06$).

Conclusions: The results support our hypothesis that a freelance model can reliably offer subject-matter expertise, whereas a well-trained in-house reviewing workforce can help to implement control over language quality and presentation-related aspects of academic copyediting. Future studies could explore technology-based or training-based methods to enhance the output of this freelancer-reviewer model.

Keywords: editing model, editorial quality, reviewing, outsourcing, in-house team

Background

In recent years, the research output of such non–English-speaking areas as Brazil, China, and the Middle East has been rapidly increasing.[1] China's contribution to the world's aggregate scientific output, in terms of publications, more than doubled from 2002 to 2008 and continues to grow.[2] However, researchers in those areas may have difficulty in writing papers in high quality English that meets international publishing standards. Despite increasing research initiatives in non–English-speaking countries, the rate of publication of papers in international journals remains low, possibly because the language quality does not meet the expected standards.[3]

To address the issue of poor language quality in some of the submissions coming from non–English-speaking countries, journal editors and publishers are increasingly recommending that authors who are not native speakers of English use professional editing services. Concurrently, researchers and scientists worldwide are increasingly availing themselves of manuscript-editing services with a view to polishing their papers before submission or resolving problems that have emerged during peer review.[4]

Against that backdrop, in the face of the global recession and the increasing volumes of research papers that require language editing, many journal editorial departments and publishing houses have begun to use a freelance editing model as opposed to an exclusively in-house model.[5,6] Outsourcing editorial work is a time- and cost-effective strategy that offers greater subject-matter expertise in a wide array of disciplines and functionality across time zones but it also necessitates better quality control to ensure consistency in the application of editorial styles.[5]

More than 35 years ago, Boomhower[7] proposed that producing a high-quality manuscript requires the combined skills of a literary editor who focuses on the mechanics of language and writing and a technical editor who looks into the manuscript content and ensures its suitability for the target reader. To the best of our knowledge, no study has explored that theory in line with the changing landscape of the publication industry. In this study, we hypothesize that although a freelance model is best equipped to offer subject-matter expertise, a uniformly trained, centralized in-house team of reviewers can help to standardize editorial quality and ensure consistency in style. To test our

Table 1. Characteristics of the freelancers and in-house reviewers

Freelancers	In-house reviewers
• Associated with Cactus Communications at the time of the study	• Employed by Cactus Communications at the time of the study
• Held an advanced degree and research experience in a specific area of medicine, life sciences, or related disciplines	• Held a basic degree in the broad domain of medicine or life sciences
• Had varying years of prior freelance editing experience but no uniform training	• Had no prior editing experience but were uniformly trained at Cactus Communications and thereafter acquired editing experience
• Were specifically assigned documents that most closely matched their area of expertise	• Were assigned any documents that fell within the broad domain of medicine or life sciences

hypothesis, we aimed to assess the value that a trained in-house reviewer can offer when working in conjunction with a free-lance editor.

Methods

We retrospectively sampled 50 academic papers in the broad fields of medicine and life sciences. For inclusion, the manuscripts had to be research papers intended for journal publication, 1000–4000 words long, and written by Asian authors. Those inclusion criteria were enforced to ensure that all samples had a similar writing style and were within the generally accepted size range of medical and life-science research papers. All manuscripts had a uniformly poor quality of original writing as assessed subjectively by us. All manuscripts had been edited by a freelance editor (hereafter, *freelancer*) and reviewed by an in-house editor (hereafter, *in-house reviewer*). Table 1 shows the characteristics of the freelancers and in-house reviewers.

The freelancers were associated with Cactus Communications—a company that offers English-language editing services under the brand Editage and is based in Mumbai, India—at the time of the study. They were recruited as subject specialists who held advanced degrees and had research experience in specific fields of medicine, life sciences, or related disciplines. They had various numbers of years of experience as freelance academic editors but were not uniformly trained. During allocation, each manuscript was screened for its technical content and assigned to an editor who was most familiar with the topic of research.

The in-house reviewers, employed by Cactus Communications at the time of this study, held a basic degree in the broad domain of medicine or life sciences. When recruited into Cactus Communications, they had no editing experience but had an aptitude for language editing as assessed by screening tests. They were uniform-

ly trained at Cactus Communications as described elsewhere.[8] The training involved a 1-month program wherein they were taught all aspects of academic editing. They were oriented to common errors in grammar, punctuation, and sentence construction that authors who are not native speakers of English tend to make and to subject-matter conventions and writing styles. The program adopted a holistic approach, using a combination of online modules, instructor-guided discussions, and editing assignments. On successful completion of the program, the trainees' work was reviewed by senior editors until they were deemed competent to edit independently and later to review the work of other editors. By the time of our study, the in-house reviewers had thus acquired various numbers of years of editing experience. In our study, they were assigned any documents that fell within the broad domain of medicine or life sciences.

Table 2. Considerations for assessing each parameter

Parameter	Considerations
Clarity	– Did you feel the document was edited by a subject-area expert? – Did the meaning of sentences come across clearly on the first read?
Language	– Did all sentences read as though written by a native English speaker? – Was the document free of grammatical errors?
Presentation	– Was the format consistent throughout? – Was the document free of typographical errors?

Fig. 1. A sample grading sheet for one version of a manuscript as filled out by an assessor. Alongside the rating for each parameter, the assessors filled in comments to support their ratings. However, the comments were not used in the analysis.

The quality of the pre-review (hereafter, *edited*) and post-review (*reviewed*) versions of the sampled manuscripts was assessed independently by an external panel. The assessing panel comprised freelance editors who were native speakers of English; held master's degrees or doctorates in medicine, life sciences, communication, or related fields; had at least 3 years of experience in academic editing for journal publications; and had published in Science Citation Index–indexed journals or had served as editors or peer reviewers with journals or other publications.

The edited and reviewed versions of each manuscript were independently assessed for clarity, language, and presentation. Clarity was defined in terms of how well the technical content was presented and how easily it would be understood by the target reader; language, in terms of grammatical accuracy and the quality of writing; and presentation, in terms of attention to detail and

consistency in style (Table 2). Each version was rated on a qualitative four-point scale of poor, average, good, and excellent (Fig. 1). A single assessor rated both versions of each manuscript, and the assessor was blinded to which version was being assessed. The ratings were translated into scores (*poor* = 1, *excellent* = 4) in such a way that the maximum score for any given version was 12. The mean scores of the edited and reviewed versions were compared by using a one-tailed Mann-Whitney U test, with SPSS version 16 for Windows (SPSS Inc, Chicago, IL).

Next, we assessed and compared the number of edited and reviewed versions that received a *poor* or *excellent* rating. A poor rating for a given manuscript version was defined as a score of 1 for any of the three parameters (clarity, language, or presentation) or an overall score of ≤6, whereas an excellent rating was defined as a score of 4 for any parameter or ≥10

overall. Scores of 6 and 10 were considered as threshold values because an overall score of ≤6 would imply that the given manuscript version generally received a *poor* to *average* rating by the assessor on individual parameters and an overall score of ≥10 would imply that the given version was largely rated *excellent* or *good* on individual parameters.

Results

The mean [SD] quality score of the reviewed versions was significantly higher than that of the edited versions ($P < 0.01$), and the reviewed versions typically attained scores within a higher range (Fig. 2-A). The improvement in score was most significant with regard to presentation (mean [SD] score of edited versus reviewed versions, 2.42 [0.88] vs 3.18 [0.72]; $P < 0.01$), followed by language (2.44 [0.81] vs 2.92 [0.75]; $P = 0.01$). Although the reviewed versions scored higher than the edited versions with respect to clarity, the difference did not attain significance (2.90 [0.79] vs 3.14 [0.83]; $P = 0.06$; Fig. 2-B). It is consistent with that finding that only two of 50 edited versions received a poor rating (score = 1) for clarity.

In addition, we found that for each parameter the reviewed versions generally received poor ratings less frequently (Fig. 3-A) and excellent ratings more frequently (Fig. 3-B) than the edited versions.

Discussion

Increasing global expenditure on research and development initiatives has resulted in a corresponding surge in scientific output in terms of publications. In particular, China and other Asian countries are expected to continue to contribute substantially to the total global research and development expenditure.[9] Authors in those countries, prompted by the pressure to publish, are increasingly availing themselves of language-editing services to avoid the possibility of rejection of their papers on grounds of poor language quality.[4] This situation has spurred the establishment of many freelance editing companies and agencies and has prompted many journal

continued
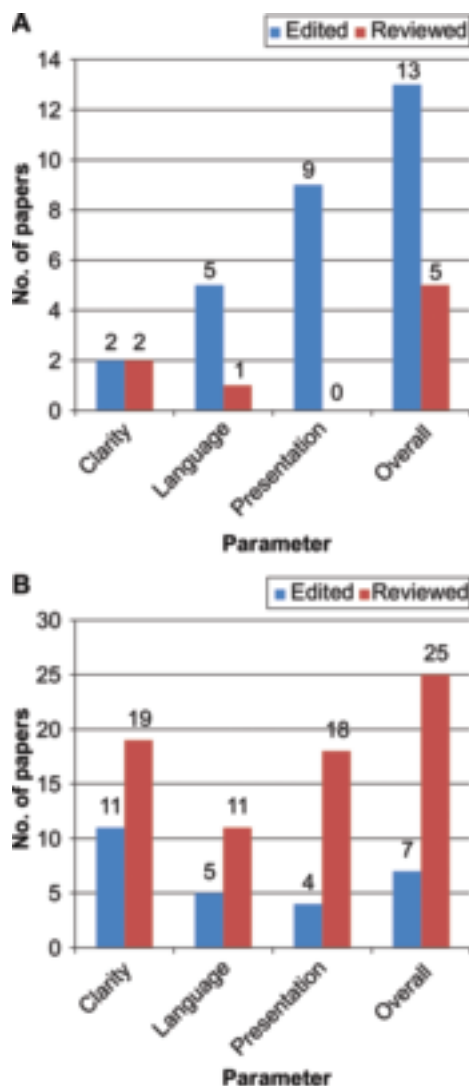
Fig. 2-A. Distribution of overall scores for edited and reviewed versions of the manuscripts. Most of the edited versions received scores in the range 7–9, which we considered average, whereas most of the reviewed versions were in the range 10–12, which we considered excellent. **2-B.** Mean scores for each version on each parameter (clarity, language, and presentation). Reviewed versions scored higher than edited versions on all parameters, but the difference was most prominent in presentation.
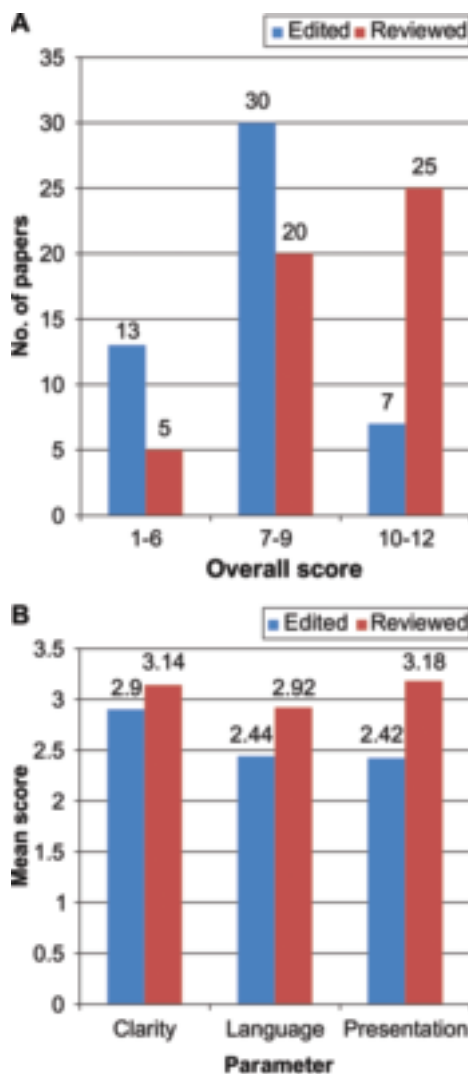
Fig. 3-A. Edited and reviewed versions that received poor ratings. Edited versions received poor ratings more frequently than did reviewed versions except in clarity, in which the two versions received poor ratings with the same frequency. The difference in frequency of poor ratings was most prominent in presentation. **3-B.** Edited and reviewed versions that received excellent ratings. In general, reviewed versions received excellent ratings more frequently than did the edited versions on all parameters; this outcome was most apparent in presentation.

pool of subject-matter experts among various disciplines and across time zones and can thus serve as an efficient system for catering to increasing volumes of papers that require editing. However, because editorial styles can vary widely, a freelance model requires stringent quality control—a fact that has been recognized by various established publishers in the field of scientific, technical, and medical communication.[5]

To extract the benefits of both the above models and achieve an optimal balance of cost and quality, we adopted a combined freelancer–reviewer model involving a large pool of freelancers and a small team of in-house reviewers and assessed the quality of the resulting editorial output. With our evaluation method, we aimed to simulate the blinded peer-review process used by journals. To that end, we chose to assess clarity, language, and presentation—copy–editing–related aspects that peer reviewers would usually consider in evaluating manuscripts.[11,12]

Our results showed that the reviewed versions had significantly better language quality than the edited versions. That indicates that a two-editor team can more reliably produce high-quality editorial output than can a single editor; this is in line with Boomhower's long-standing hypothesis that technical editing requires a two-step process that should be performed either by two persons or by the same person in multiple passes.[7]

We also found that the reviewers' contribution to the manuscripts was most prominent with respect to presentation, followed by language, whereas their contribution to clarity, although positive, was not significant. The ability to attain clarity through editing is determined largely by the editor's understanding of the manuscript subject matter. In our model, the freelancers were subject-matter experts, whereas the reviewers, who had some background in the relevant broad subject fields, were trained specifically in language and presentation. Thus, our results strongly support our hypothesis and are consistent with Boomhower's finding that

editorial departments to shift from an in-house model to a freelance editing model with a view to reducing costs and improving the efficiency of the editorial process.[5,6,10]

Both models have obvious advantages and disadvantages. The chief benefit of an in-house model is that the quality of

editorial output can be monitored and standardized through intensive and uniform training. However, the model cannot be scaled up, owing to the costs associated with managing an in-house team. A freelance model undoubtedly offers better cost effectiveness and flexibility[10] and is supported by the availability of a large

technical editing is best achieved when one editor focuses on technical content, with special consideration of the target audience, and another focuses on language and the mechanics of copyediting.[7] That division of responsibilities is important in that two editors working on a single document might otherwise end up undoing each other's changes or making contradictory changes owing to the arguably subjective nature of language editing.

On the basis of the assessors' ratings, we classified each edited and reviewed version of the sample set as poor (score of 1 for any parameter or ≤6 overall) or excellent (score of 4 for any parameter or ≥10 overall), considering that a poor manuscript was likely to be rejected on grounds of language by a journal peer reviewer and an excellent manuscript would definitely not be rejected on grounds of language. Our finding—that the reviewed versions were rarely classified as poor and often classified as excellent—implies that the review process, by and large, improved the manuscripts to a publishable standard with respect to the parameters assessed.

An additional benefit of the present freelancer–reviewer model is that it can allow two-way exchange of information between freelance editors and centralized reviewers. That provides a channel by which freelance editors can receive reliable comments on the quality of their work; similarly, in-house reviewers can acquire subject-matter expertise by studying the changes made by the freelance editors.

Our study has some limitations. Although our results support the hypothesis that trained language editors can enhance the quality of manuscripts that have previously been edited by subject-matter experts, our quality assessment did not factor in whether the editors involved were freelancers or in-house employees. It is possible that the

quality of the output would be the same if the roles of the two editors involved in the process were reversed; this could be a subject of future investigations. Moreover, it would be interesting for future studies to compare manuscripts edited by freelance subject-matter experts with those edited by in-house editors alone. Another limitation of the study is that the time spent by the freelancer and the in-house reviewer on each manuscript—a factor that could influence the quality of editorial output—was not considered in the quality assessment. Finally, a few papers received poor ratings even after review, and we were unable to explore the reasons for such a finding because this was a retrospective study; nevertheless, the finding implies that the editing and reviewing processes can be refined for better outcomes. Future studies could use an analysis that accounts for editing time and could explore technology-based or training-based methods to enhance the results attained with the combined model.

Conclusion

Our results support our hypothesis that a freelance editing model offers subject-matter expertise as its main strength, whereas a well-trained in-house reviewing workforce helps to implement strict control over language quality and presentation-related aspects of professional scientific editing. Combining freelance editing with in-house review can optimize the output achieved in language editing.

Acknowledgments

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CSE 2012 Survey on Research Misconduct Allegations

Debra M Parrish

Five years ago, the Council of Science Editors conducted a survey regarding editors' responses to allegations of research misconduct in manuscripts and publications. The survey, repeated in 2012, was divided among issues involving manuscripts and those involving publications. The purposes of the surveys have been to prompt editors to consider such issues before an incident occurs, to offer benchmarking for editors, and to provide a vehicle by which editors can share their experiences in handling such matters. Unfortunately, since the initial 2007 survey, more editors have had experience with allegations of misconduct. Although many of the editorial responses remained consistent, a few reflected editors' greater awareness of the tools for addressing problematic articles or manuscripts or the refinement of survey options that allowed more subtle answers. For example, relative to the 2007 survey, a much larger number of editors indicated that they would use an expression of concern if an institutional official indicated that an article should be withdrawn but authors did not (8%), if an author submitted a revised figure after admitting that a published figure was incorrect (8%), if an author expressed concern about the integrity of data (27%), or if an institution made a misconduct finding but the relevant government agency did not (31%).

Fewer editors would report an incident to an institution for investigation, preferring to resolve issues by communicating with authors. For example, in the 2007 survey, if a researcher wrote to an editor and asserted that he or she should have been included as an author, 32% of

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editors indicated that they would write to the institution to investigate the claim. In the 2012 survey, only 11% of editors would use that approach; instead, most editors would write to the corresponding author (48%) or all the coauthors (34%) to ask whether the researcher should be included. However, if an author indicated that he or she wanted to be removed as an author of a published paper because of integrity concerns, many editors would immediately contact the institution for investigation (16%), and some would ask the authors to address those concerns and then provide the information to the institution for investigation (23%). Nonetheless, a large fraction of editors would simply work with the authors on the issues and not involve the institution (34%).

Like the 2007 survey, the 2012 survey indicated that few editors would report an incident to government authorities. Only 12% indicated that they would contact a government agency if they were aware that a prior allegation of misconduct had been made against an author. The lack of involvement of a government agency is not surprising in countries in which the relevant government body has little experience. However, the failure to involve federal agencies in the United States is somewhat surprising in that those agencies would have reports of prior findings of misconduct that editors could consider in assessing a new allegation.

In the 2007 survey, 69% of editors indicated that they would retract a paper if the authors indicated that they could not locate the primary data and wanted to retract the paper. In the 2012 survey, only 25% of editors would retract an article on such a basis. Rather, 25% of editors indicated that they would retract only if the article were less than 6 years old, 24% would retract only if a concern had been raised about data fabrication or falsification, and 19% would

publish the letter from the authors but not retract the article.

About 30% of editors indicated that they would ban a researcher from submitting articles if the researcher's institution found the researcher guilty of misconduct, and an additional 30% indicated that they would ban the researcher if the institution found misconduct and a pattern of misconduct. Some 16% of editors would not ban a researcher found guilty of misconduct, 8% would ban a researcher only if he or she refused to correct the literature, and 18% would ban a researcher only if a government agency found him or her guilty.

Although 41% of editors would not impose a sanction against an author of a multiauthor paper if another author were found guilty of misconduct, 14% would sanction the author if he or she did not help with correction of the literature, 28% if the institution found the author remiss in his or her obligations as a coauthor, and 16% if the researcher did not advise the journal as soon as possible that the published research was flawed.

During the session about the survey at the 2012 CSE annual meeting in Seattle, a number of questions were posed comparing the survey responses with the approaches suggested by the Committee on Publication Ethics (COPE) flowcharts. Some characteristics of the environment in the United States contributed to approaches different from those recommended by COPE, for example, the existence of institutional and government infrastructure and the proclivity toward litigation threats. Accordingly, questions were posed about the best options to mitigate against the risk of being sued. Editors are encouraged to review the complete survey results (*www.councilscienceeditors. org/i4a/pages/index.cfm?pageid=3332*) and to contribute to this growing body of collective knowledge.

Image Manipulation: Process for Review of Digital Images by Publications Staff

Christina N Bennett

Image manipulation (cropping extraneous information, slightly adjusting image contrast, and resizing an image) is a standard and necessary practice for authors who are preparing figures for publication. However, in light of the rapid advances in digital image technology, including image-editing software, authors now must determine how much image "polishing" is acceptable. Thus, like many basic-science publishers, the journals of the American Physiological Society (APS) now provide guidance to authors about appropriate image manipulation (*www.the-aps.org/mm/Publications/Preparing-Your-Manuscript/Preparing-Figures*). The guidelines were adapted from the *Journal of Cell Biology* (Rossner and Yamada, *Journal of Cell Biology*, Volume 166, Number 1, 2004) and emphasize that digital images should be presented as they appear in the original "capture". That is, editing of the image should not change the content of the data unless the changes are justified and fully declared in the figure and caption.

Evaluation of Digital Images

Several years ago, the editorial art staff of APS began to review all digital images in figures for manipulation. The review occurs after an article is accepted but before it is published online in the non-copyedited "early view" or in final print

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format. Because only accepted articles are reviewed, corrections do not have to be initiated for manuscripts that may not ultimately be accepted for publication. If an accepted manuscript is determined to have serious problems with figures, its acceptance may be rescinded. It is important to consider at what point in the publication process staff should review figures for manipulation.

Digital images are checked for consistency in brightness and contrast adjustment, composition, and editing. The initial review can be done on the source file by looking at the entire figure and zooming in. Unnatural solid lines and discontinuity between features in an image are often readily detectable with magnification. Image composition can also be assessed by using such software program tools as "touchup object" (Adobe Acrobat) and "Group Objects" or "Ungroup Objects" (Microsoft PowerPoint). Similarly, adjusting the contrast and brightness in the image may help to determine whether all portions were uniformly adjusted and free of selective editing.

In addition to those simple steps, the US Office of Research Integrity has developed a set of forensic tools for Adobe Photoshop that can be downloaded (*ori.hhs.gov/forensic-tools*) to analyze the "fingerprint" of digital images, details that are not visible by eye. Although these tools may require a little training, they provide a thorough evaluation of an image's composition, particularly for identifying unnatural repetitive patterns, duplication, selective editing, and compositing.

Inquiry and Resolution

When a concern is identified, the editor-in-chief and other designated members of the publications staff should discuss the concern and determine whether a query should be initiated. It is important to assume that all items of concern identified during review are nonmalicious and will be readily corrected. With that in mind, the publications office sends a letter to the corresponding author, via e-mail, with a figure document that visually details the problem identified. The letter asks the author to review the figures in question as outlined in the figure document and make the necessary corrections to the submitted figures. Original captures are requested if it is thought that the images in question may be composed of multiple pieces or selectively edited.

Usually, authors supply original captures and correct the figures in accordance with the image-manipulation guidelines within a week of the request. Once the original captures and corrected figures are reviewed and approved by the editor-in-chief and other designated publications staff, the manuscript is returned to production. In the rare cases in which the original captures and the figures as submitted do not match, further explanation from all authors of the manuscript may be required before corrections can be considered.

Image-manipulation guidelines that include information about the evaluation and inquiry process help authors prepare figures that meet the standards or correct the ones that do not. They also help journal staff facilitate corrections efficiently and fairly. ◾

COPE in 2012

Ginny Barbour

When three British medical editors sat down in London in 1997[1,2] to consider thorny ethical problems that they were seeing at their journals, they probably did not know that they had just started something that 15 years later would have more than 7000 members around the world and in every conceivable discipline—from medicine to mathematics to dance studies to police negotiations. The primary purpose of COPE (the Committee on Publication Ethics, *www.publicationethics.org*) remains the same as in 1997—to be a group of peers who provide advice and education to editors and publishers on all aspects of publication ethics and, in particular, how to handle cases of research and publication misconduct.

Although the original purpose remains, much else has changed. COPE has changed its logo (from a rather Orwellian red eye to an abstract representation of a bookshelf); overhauled its Web site three times; organized itself to have officers, dedicated staff, and an elected global council[3]; run almost 60 forums on three continents (mostly in the United Kingdom) at which more than 400 cases have been discussed; run more than 20 seminars on three continents (this year will have them on a fourth); and dealt with hundreds of inquiries. It has developed 17 flowcharts[4] (the brainchild of my predecessor, Liz Wager, and COPE's most popular resource), which are available in 12 languages, and a number of guidance and discussion documents. It has participated in the development of ethical guidelines in a number of settings.[5] COPE is now a professionally run, closely

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overseen organization that is constituted as a company and a charity in the United Kingdom and takes enormous pride in the services that it provides to its member editors and publishers.

What is behind the expansion? Has the world of publishing, perhaps driven by the transforming nature of the Internet, become in 15 years a corrupt place where papers cannot be trusted and editors need an armory of tools to defend themselves against scheming authors? Although electronic publishing has contributed to the ease of both perpetrating and detecting ethical issues, I would argue that COPE's expansion is a reflection of the essentially human nature of the publishing world and reflects changes in both editors and publishing more broadly.

Where does COPE fit into this world? There is a misconception that COPE is a regulatory body, but it is not. Rather, it is an organization with a voluntary membership (although many journals are now signed up en masse by publishers). It does not investigate individual cases but encourages member editors and publishers to ensure that cases are investigated appropriately. In addition to the flowcharts (which cover a variety of topics from plagiarism to reviewer misconduct) and guidance documents (for example, on retractions), it provides an online e-learning course[6] (new in 2011), a quarterly newsletter,[7] and a blog on publication ethics-related issues. It is active on Twitter (@C0PE) and on Facebook and Linkedin. To raise standards in publication ethics, it has developed codes of conduct for journal editors and publishers. All COPE members are expected to follow the codes, and COPE considers complaints that members have not followed them.

It has probably never been harder to be an editor. Authors, driven by the need to secure funding and by requirements from their institutions, are increasingly desperate to publish. In many fields, scholarly work itself is becoming more complex and involves multiple collaborators. Two of the first three editors who came together to form COPE were professional editors, with *Lancet* and *BMJ*), and the third was the editor of *Gut*, but the vast majority of current editors are not professional editors, and may have had little (if any) exposure to publication ethics issues before taking up their posts. What seems evident in the editors who come to COPE forums and seminars is a desire to learn about those issues and to do the right thing. It is hoped that that this desire can become part of a larger movement, also driven by organizations like CSE, toward a recognition that scholarly editing, even if done part time, is a professional endeavor, one in which specific skills and knowledge are essential, and one in which knowledge of publication ethics is crucial.

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Literature Corrections: Knowing Why and When to Correct a Publication

Mary D Scheetz

Scholarly journals form a vital link in the research process and serve multiple functions for the scientific community. A journal is "a periodical that an identifiable intellectual community regards as a primary channel for communication of knowledge in its field and is one of the arbiters of the authenticity or legitimacy of that knowledge."[1] Peer review serves as a credible filter for journal publishing, but errors occur and corrections are sometimes necessary. This essay addresses key aspects of correcting the literature to preserve journal integrity and reader trust.

Why Correct?
There are a number of reasons for correcting the literature. Corrections are published to address unreliable information, to aid fellow researchers, to preserve public trust, and protect and promote a journal's integrity. Correcting the literature is as fundamental to publishing as peer review is to vetting credible work. The processes represent different parts of the publishing cycle, but both make it possible for readers to depend on reliable information. It is important to note that although there may be specific reasons to correct, no single method works for all types of literature corrections.

A number of common misperceptions about literature corrections should be considered before publication. In theory, correcting the literature is a straightforward exercise. However, it is not an exact science. Although most would agree that a simple "typo" is easy to amend, corrections are not so transparent if they are warranted because of a finding of scientific misconduct. The

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wording used in corrections can be as varied as the author doing the work. Researchers have invested years in their training and career building and are sometimes hesitant to admit wrongdoing through a published literature correction. It is helpful to keep in mind that some literature corrections may be associated with complicating factors, such as authorship disputes, contribution questions, and current investigations of research misconduct. As a result, there are occasions when an author will be resistant to "owning" a mistake identified in a paper and refuse to participate in correcting it. Despite such resistance, a journal is responsible for providing reliable information, including literature corrections.

When to Correct
An issue often overlooked with regard to literature correction is the timing: when corrections are complete and ready for dissemination. Models and guidance documents are available to help to determine when to publish a correction, but the process is not uniform among journals. Literature corrections are not addressed instantly with a stroke of a pen. Some journals state that all authors are required to sign off on all forms of literature corrections, and others will accept the signature of the lead author or other authorized institutional official.[2]

If research misconduct lies at the heart of a correction, it is important to consider the privacy policies that are in place during an investigation. For example, the Office of Research Integrity, which is responsible for addressing misconduct in research funded by the US Public Health Service, is guided by a specific federal regulation to uphold the privacy of parties involved in research-misconduct cases until an investigation is complete.[3] Confidentiality of parties involved in a research misconduct case is to be protected during an investigation unless the health or safety of the public is at risk. It is incumbent on the editor or the publishing support staff

to be aware of privacy policies before they disseminate corrections related to scientific misconduct. In general, the most prudent approach is to publish a correction as soon as reasonably possible.

Resources to Consult
A number of credible resources are available to help to identify the various types of literature corrections and models for correcting them. The National Library of Medicine, the International Committee of Medical Journal Editors, the Council of Science Editors, and the Committee on Publication Ethics provide thorough definitions and a wide array of examples.[4–6]

The Journal's Best Tool
In addition to the correction models available from professional bodies, all journals have their own instructions for authors that may serve as directives to address literature infractions before they occur. Journals that address, even generally, how they will handle literature corrections will accomplish two primary goals of publishing: serving their readers and protecting their integrity.

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Prevention of Plagiarism: Publishers Can Take Early Action

Angela Cochran

Duplication and plagiarism have dogged publishers and researchers for centuries. In the predigitized world, offenders were caught only by astute readers in the same field. Today, technology simultaneously complicates and simplifies the issue.

Technology, such as word-processing programs, makes it ever so easy to cut and paste content and move it from one place to another. And digitization of scholarly content makes it easy to find content online that may be a little too similar.

Today, there are tools for researchers and publishers to use in weeding out the overlap before time and money are invested in publication.

CrossRef, with its vast database of articles, saw the need to establish a way for publishers to check submitted manuscripts for overlap. In 2008, working with the inventors of the popular academic site TurnItIn, the people at CrossRef developed CrossCheck, a tool for detecting similarities in manuscripts. Publishers must sign an agreement with CrossCheck to allow the software company iParadigms to "crawl" full text; this constitutes a CrossCheck deposit. Publishers that use the software, called iThenticate, upload their full-text manuscripts, and a search of all CrossCheck

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deposits is conducted. A similarity report is provided within a few minutes.

What Publishers Are Finding

Similarity screening opens all kinds of issues for publishers. At what stage do you screen papers? Who will do the screening? Who will review the similarity report? How easy is it to read? Can you really establish a threshold for similarity? How much time will it take? What will we do when we find substantial overlap? A recent CSE webinar looked at two publishers that screen papers through CrossCheck.

Carissa Gilman, managing editor of *Cancer* and *Cancer Cytopathology*, reported that in 2011, about 1.8% of submissions were rejected because of issues noted in similarity reports. Like many publishers, the American Cancer Society (ACS) uses the reports as a teaching tool for authors.

Authors with minor instances of recycled text or self-plagiarism, particularly in the introduction and methods sections, are given an opportunity to rewrite their papers and resubmit. ACS shares the similarity reports with authors. Gilman noted that the most common responses from authors are anger and panic. Her advice was to make thoughtful decisions that can be easily defended, to have the similarity reports accessible in case the authors call and want to go over them, and to make authors understand that your goal is not to get them fired.

ACS screens all new submissions to avoid wasting editor and reviewer time. Gilman said that performing the checks takes 2–10 minutes of staff time for each submission.

Heidi Vermette, a production editor of *Obstetrics & Gynecology*, reported that the journal conducts the checks just before acceptance. She found that the process takes an average of about 20 minutes per manuscript.

Most commercial online-submission systems allow manuscripts to have checks done automatically. But just getting a report and a similarity number is not enough. Both Gilman and Vermette stressed the importance of manually reviewing each report and categorizing problems as redundant (self-plagiarism), minor copying of short phrases (sloppy paraphrasing and referencing), or clear plagiarism.

Although CrossCheck is a powerful tool for publishers, it has some limitations. iThenticate does not check figures or tables, only English-language content is checked, and changes in spelling or hyphenation will break up what would be large chunks of text overlap.

It must also be noted that the search is only as good as the database of deposited articles. If a specific field is not well covered, journals in the field may be missing many publications to check against.

More information about CrossCheck can be found at *www.crossref.org/crosscheck.*

CSE's *White Paper on Promoting Integrity in Scientific Journal Publications*
Update Released Spring 2012
View or download at
www.councilscienceeditors.org

Case Report: AGU's Use of CrossCheck

Graciano Petersen

The American Geophysical Union (AGU) conducted a two-journal test of CrossCheck in 2010. The test helped AGU establish parameters for the editorial boards of their 18 journals to follow in their use of the software. Thirty percent was chosen as the Similarity Index (SI) that triggered a look at the CrossCheck report by the editor for most journals (15% for the letters journal). Matching text less than this percentage tends to be innocuous.

All new submissions are checked for wording overlap with CrossCheck before

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entering the peer-review cycle; one journal also checks revisions using the software. The editorial assistants initially use CrossCheck to check the manuscripts and examine the SI report if the SI exceeds the journal threshold. After review by staff, the manuscript is forwarded to the editor with notes about the matching text. The editor then analyzes the SI to determine the seriousness of the overlap.

AGU editors are not concerned about a high SI until they corroborate problems while examining the matching text. As CrossCheck often points out, matching text is not plagiarism. "Boiler-plate" text was discussed in an *EOS* article written by the editors-in-chief of the pilot-study journals; the authors of the study dislike the practice of reusing methodology text.[1] AGU editors use the CrossCheck results

as an opportunity to educate authors about properly citing previous submissions and the dangers of potential self-plagiarism.

The CrossCheck software is a beneficial tool for AGU journal editors. The editors still rely on reviewers to identify manuscripts they are simultaneously reviewing for other journals and submissions published in other languages. However, CrossCheck allows the editors to eliminate a great deal of plagiarized material, saving time for reviewers and preventing copyright infringement of previously published content.

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Asking for Trouble: Submit questions or problems to "Solution Corner"!

One of the returning features of *Science Editor* will be "Solution Corner", a column that explores problems and challenges that our members deal with in their jobs, be they technical, managerial, or other issues in the STM publishing realm. This column needs your input! If you submit a question that is general enough to be relevant to many of our members to solutioncorner@ametsoc.org, we will run them by two or three professionals in the field; your question and their responses will be printed in *Science Editor*. We look forward to your submissions!

P4 Medicine (Predictive, Personalized, Preventive, & Participatory): Catalyzing a Revolution from Reactive to Proactive Medicine

Plenary address:
LeRoy Hood
President
Institute for Systems Biology

Reporter:
Pam Erickson
Eli Lilly and Company

Leroy Hood, president and cofounder of the Institute for Systems Biology, presented the plenary session at the 2012 CSE annual meeting. Hood, who led the California Institute of Technology team that invented the high-speed DNA-sequencing machines that paved the way for the sequencing of the human genome, defined *P4 medicine* as predictive, personalized, preventive, and participatory. He predicted that within the next 10 years, each of us will be surrounded by a cloud of data that will lead to a revolution in medicine. That revolution will be driven by the systems approach, which examines organisms in terms of their parts, how those parts are connected, and the dynamics of the system—in his words, "how stuff happens".

Hood described five radical changes in science—true paradigm shifts—with which he has dealt: the application of engineering to biology, especially in DNA and protein synthesis; the Human Genome Project; cross-disciplinary departments that couple technology with biology, giving rise to systems biology; the Institute for Systems Biology; and P4 medicine, which will quantify wellness and demystify disease. He observed that scientists were initially resistant to many of these ideas and that new organizational structures are required to support the changes because the old bureaucracies will not work.

CSE President Kenneth F Heideman with plenary speaker Leroy Hood. Photo by Pamela Stukenborg.

The Human Genome Project changed medicine and biology in a number of ways, according to Hood. It provided a complete "parts list" of human genes, made the genome accessible to all scientists, and allowed the development of proteomics. The project also brought software engineers to the field of biology, promoted open data access, led to a standard for DNA sequencing, and set the stage for pharmacogenomics and individualized treatment. It reinforced the ideas that science must be socially responsible and that the human genome is about what it means to be human. The Human Genome Project transformed our understanding of evolution and led the way toward identifying the genomes of other organisms. Finally, the project led to about $800 billion in economic opportunities.

Systems medicine views biology as an information science: information is passed from DNA to RNA, to proteins, then to systems, and finally to the organism. In the systems view, disease comes from the perturbation of the informational network that leads from the genome to molecules, cells, organs, the individual, and social networks. Systems medicine requires an environment in which to study systems biology. That environment must be on the leading edge of research with new tools, technology, and cross-disciplinary partnerships and with strategic partnerships among industry, academe, and government.

Hood described research on blood testing for organ-specific proteins, which provide a window into disease by allowing early detection, disease stratification, monitoring of disease progression and therapy, and assessment of recurrences and wellness.

Demystifying Scientific Misconduct Issues through the Instructions to Authors

Speakers:
Mary D. Scheetz
Research Consultant
Research Integrity Consulting

Patricia K Baskin
Executive Editor
Neurology® Journals

Ken Kornfield
Managing Editor
Journal of Clinical Oncology and *Journal of Oncology Practice*

Reporter:
Mary Anne Baynes
Director, Sales and Marketing
The Charlesworth Group

Scientific misconduct is an important aspect of the instructions for authors of all science, technology, and medicine publications. Instructions must clearly lay out the standards of scientific and publication integrity that are required by a journal and the consequences that may occur if the standards are not strictly followed.

Scientific misconduct may include fabrication of data, falsification, or plagiarism in reporting research results. It does not include honest error or honest differences of opinion.

This session provided examples of instructions for authors of five journals and how they do or do not deal with scientific misconduct and author expectations. Patty Baskin began the session by discussing instructions of the journals

Neurology and *Blood*. *Neurology* defines what it considers to be scientific misconduct and what editorial actions occur when scientific misconduct is discovered. Baskin noted, however, that although *Neurology* has good instructions for submitting images, it does not present any information about image manipulation or consequences of it. Baskin noted that *Blood*'s instructions include links to outside organizations where authors can find more information on scientific misconduct but do not discuss repercussions. *Blood* instructions include information on plagiarism but do not define the terms specifically or state exactly what will happen if plagiarism is detected. They do include information on submitting images but say nothing about rules or consequences of image manipulation.

Ken Kornfield discussed instructions for the *Journal of Clinical Oncology* (*JCO*) and *The Oncologist*. He presented *JCO*'s as doing a fairly good job of covering the various aspects of scientific misconduct except image manipulation. They define what author misconduct is and is not and review the editorial process, potential sanctions, expectations, and recusal guidelines in cases of scientific misconduct. Kornfield pointed out that *The Oncologist*'s policies on author conduct are fairly thorough—again with the exception of image manipulation—and that these policies are easy to find, which is not necessarily true of other journals. He also noted that *The Oncologist* is the only journal he could find that discusses

cases and consequences of misconduct by Editorial Board members.

Mary Scheetz concluded the panel overview with a discussion of the Ecological Society of America (ESA) instructions regarding scientific misconduct. She noted that ESA's instructions for authors include a paragraph on ethical practices of authors; however, the text does not go into detail about what will happen if scientific or author misconduct is discovered.

Overall, the session provided information suggesting journals' instructions for authors should include clear and explicit information that:

- Defines scientific misconduct.
- Explains whether and how the journal addresses research misconduct.
- Reviews processes or procedures that are available for addressing misconduct concerns.
- Describes whether and how the journal addresses breaches of publication ethics.
- Explains what actions will be taken if misconduct of any kind is detected by editorial staff.
- Clarifies how the journal addresses retractions, errata, and other corrections of the literature.

All of the speakers seemed to agree that journals should directly address all aspects of how they deal with misconduct issues and that authors should educate themselves to avoid unintended missteps in research or publication.

Learning the Ropes: Mentorship in Scientific Editing

Speakers:
Ann R Punnoose
Fishbein Fellow in Medical Editing
JAMA

Stacy S Drury
John F. McDermott
Assistant Editor-in-Residence
Journal of the American Academy of Child and Adolescent Psychiatry

Andrés Martin
Editor-in-Chief
Journal of the American Academy of Child and Adolescent Psychiatry

Reporter:
Mary K Billingsley
Managing Editor
Journal of the American Academy of Child and Adolescent Psychiatry

How do scientists and doctors become journal editors? Scientific publishing relies on the contributions and expertise of professionals in specialized fields of study not only for content but also for peer review, editorship, and guidance. However, the education and training of botanists, physicists, and child and adolescent psychiatrists rarely includes lessons in scientific editing. Hinting at the fortuitous beginning of his own editorial career with a picture of the escalator on which it was first suggested that he become an editor, Andrés Martin began the session by discussing how editors have traditionally taken on the role—by being in the right place at the right time, by rising through the ranks, or, less appealingly, by seeking money and recognition. He compared common career-pathway models of doctors, clinicians who are also educators or scholars, and, less commonly, clinicians who are also editors. The knowledge and skill sets for this hybrid clinician–editor model is most typically passed down through mentorship, rather than formal education, when an experienced clinician-editor has an opportunity to share some understanding of the many puzzle pieces involved in creating a publication and, ideally, to help to build a pipeline of future editors capable of taking the reins. Speakers Ann R Punnoose and Stacy S Drury then spoke of their editorial positions with *JAMA* and the *Journal of the American Academy of Child and Adolescent Psychiatry (JAACAP)*, respectively, as two contrasting models of mentorship.

"Being an editor at *JAMA* is a humbling job"

Punnoose, the 2011–2012 Fishbein Fellow of *JAMA*, spoke about the year that she spent working full time as a reviewing editor and rotating through different departments with *JAMA*. The Fishbein Fellowship, named for former Editor-in-Chief Morris Fishbein, was established in 1977 to expose physicians to the skills and practicalities involved in scientific publishing. Working at *JAMA*, Punnoose shepherded papers through the peer-review process, presented to *JAMA* editors at manuscript meetings, edited and prepared manuscripts, created podcasts, and wrote several patient pages and a cover essay for *JAMA*. She also covered the conference of the Radiological Society of North America as a member of the press and wrote a news article, for *JAMA*, on research presented at the conference.[1] Punnoose hopes to follow in the footsteps of past Fishbein Fellows, who have gone on to become contributing, deputy, and senior editors, both at *JAMA* and at other organizations.

"Mosaic mentoring"

Drury is the second John F McDermott Editor-in-Residence (EiR) for *JAACAP*. Established in 2008, this position is younger than the Fishbein Fellowship and is still evolving in form and function. In contrast to the Fishbein Fellowship, the position is not on site, and much of the training and mentorship are achieved through e-mails and conference calls. The position is designed to be part time and, given its early development, has permitted each EiR to develop different goals and face different challenges. The inaugural EiR, Schuyler W Henderson, MD, MPH, participated in the coordination of two columns in *JAACAP* and became involved with CSE, writing an article about the development of future editors.[2] During his term, the *JAACAP* editors were able to learn and observe the successful and possibly unsuccessful aspects of the EiR position and to change the course and direction of the position accordingly. Henderson will soon return to *JAACAP* as the assistant editor of the Book Forum. Drury became the EiR after serving as a contributing editor. Although she does not work on site, she has participated in conference calls with senior editors, many of whom have been involved in her mentorship, in a model that she refers to as "mosaic mentoring". During her term, the EiR position has been focused not only on manuscript recruitment but on peer-reviewing and the production process of *JAACAP*. She wrote about her EiR experience in an article published in *AACAP News*.[3] The divergent experiences and achievements of the first two EiRs have provided important information to the *JAACAP* editors as this new position continues to be sculpted to fit the needs of future EiRs but also the goals of the journal in establishing and supporting the position.

Those are just two examples of models for mentorship, but together they raise a number of questions about how to guide early-career clinicians and scientists into editorial roles. Still unanswered

What to Include in Your Instructions for Authors

Speakers:
George Kendall
Managing Editor
Anesthesiology

Dana M Compton
Production Manager
Proceedings of the National Academy of Sciences of the United States of America

Reporter:
Christina N Bennett
Publications Ethics Manager
The American Physiological Society

Instructions for authors (IAs) probably constitute the most substantive document prepared by science journals. IAs are meant to provide authors with the information necessary to submit a manuscript that adheres to a journal's technical and content specifications and federal and ethical guidelines. However, in light of the number of articles that require corrections and clarifications before publication, it is evident that many authors are not reading the IAs before submitting their manuscripts. On the basis of comments made by the audience throughout the session, this is a major issue for most, possibly all, journals.

George Kendall emphasized the need for the IAs to be effective resources that guide authors, reviewers, and editors through the submission, review, and publication process. The IA should convey the personality of the journal (who we are) and state the requirements for publication (what we want). In general, contact information should be placed near the top of the IA, and there should be a table of contents so that readers can readily access a specific section of interest. Kendall suggested that the IA contain four sections: general, including ethical policies; the types of articles that the journal publishes; manuscript content requirements; and how to submit a finished manuscript. He then discussed how reviewer guidelines (RG) should closely parallel the IAs. For example, the RG should clearly define the types of content that the journal seeks to publish, including level of originality and reader interest. Reviewers should also be guided by the manuscript evaluation form, which can be designed to emphasize the journal's interests and technical guidelines. Finally, Kendall emphasized the need for the editorial office to develop clear and concise IA and RG that serve not only authors and reviewers but editors and editorial staff.

Dana Compton provided another perspective on the use and value of the IA. She said that PNAS uses the IA as a resource document for authors, staff, and vendors. PNAS staff rely on the document to answer authors' questions about journal guidelines, and vendors use it to obtain details about the journal's content and scope. She noted that the goal of the IA is to be a central hub for all the journal's resources. Yet, whether it is easy for authors to use is a major concern. In particular, the IA is very long, and this may make it difficult for authors to locate the information that they need. However, PNAS has a resource section in its IA that contains heavily used resources, such as the license for authors, a tool to check the length of a manuscript, and guidelines for preparation of digital art and inclusion of supporting information. She also provided a few tips about what to include in the IA: Make the IA concise by including only essential information, make the format user friendly (tabbed view and searchable), and remember your audience, which may extend beyond authors.

The questions generated from the talks revealed the complexity of keeping the IA user friendly and content rich. Suggestions from the audience included publishing a submission checklist for authors, distributing IAs at society meetings, and visually highlighting the revisions and updates of IA content.

continued (*from page 19*)

questions deal with such issues as the time commitment to the position, the duration of the appointment, funding support both for the time committed to the editorial position and for attendance at editorial meetings to enhance the experiences of the fellows, and balancing of interest and investment in the field of the journal and the process of scientific editing.

The message of this session was two-fold: first, those currently involved in scientific editing should provide comments, share their knowledge and wisdom, and mentor the development of early-career editors as they learn; and second, those interested in scientific editing should get involved where and when they can and take advantage of a wide array of existing opportunities that will enhance their understanding of the many aspects of scientific editing while developing their editing skills.

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Understanding Scientific Research in China: Developing your Market

Speaker:
Philippa J Benson
Director, Education and Author Services
The Charlesworth Group

Reporter:
Renee D Pessin
RDP Editorial Consulting, Inc

Philippa Benson, of the Charlesworth Group (Education and Author Services) first went to China in 1985; she lived there for 2 years, from 1986 to 1988, to earn her designation as a foreign expert in China communication. She has given presentations to Chinese authors at research institutions about navigating publishing systems and now makes a point of giving such presentations to editors who are under increasing pressure to improve impact factors and become financially self-sustaining. Benson has worked with editors of Chinese journals, graduate students, and physicians at research institutions. At the time of the CSE meeting, she had just returned from 2 months in China.

With a land mass not much bigger than that of the United States, China has five financially and politically autonomous regions (Tibet, Xinjiang Uyghur, Inner Mongolia, Guangxi, and Zhuang). Water resources are scarce in China on a per capita basis, and there are still major challenges with respect to food and water delivery. Regional differences are present, just as they are in the United States. For instance, there is typically no centralized heating south of the Yangtze, whereas north of the Yangtze there is central heating. Most key universities are in the eastern region that lies south of the Yangtze. Although five distinct languages are spoken (each unintelligible to speakers of the other four), there is one written language. Typically, a Chinese author writing in English is writing in his or her third language (first is the mother tongue,

then Mandarin, and then English). Since mainland China (the People's Republic of China) "simplified" its written language characters in 1956, character strokes are written in a specific order (top to bottom, then left to right, horizontal before vertical, and character-spanning strokes last). It is necessary to memorize correlations between shape, meaning, and sound because many words look similar but have different sounds and meanings.

When working with Chinese authors, one should keep in mind some facts about Chinese education systems. For China, exact copying is *the* primary pedagogic method, and loose copying is a regular and usual form of learning. Imitation of language in writing and speaking is a primary method of elementary and intermediate language learning and is considered the highest compliment. In China, most adults are taught English by non–native-English speakers, so most people develop better reading than writing or speaking skills. Furthermore, most are taught little about cultural or professional context. Government-developed curricula are used for teaching English, and students are required to pass national tests to graduate from college or graduate school (college is levels 1–6, and graduate school is levels 7–8). Writing skills are evaluated primarily for correctness of grammar and syntax, particularly for technical writing. Researchers who copy construction of sentences by cutting and pasting do not understand that such practices can lead to plagiarism. A major difference between China and other countries is that residents of China generally have little access to the Internet.

From 1996 to 2000, publication output in China increased by more than 20%. Research and development spending is on a steep trajectory, second only to that of the United States. First- or second-author publication in a high-impact journal is

required to get one's PhD in China; in fact, some institutions require two or three publications. In general, to advance in their careers in urban hospitals, Chinese MDs must get PhDs. Currently, the job market is fierce in China. Urban MDs see 50–100 patients per day even while pursuing PhDs. Individuals are not free to choose their own fields of research but are told what research to perform.

To aid non–native-English authors, Benson recommends that journals post "Publishing 101" guidelines (on plagiarism, logic of citations, introductions, and other areas) on their Web sites. Also valuable are examples of abstracts, introductions, and cover letters. It is helpful if editors clarify their rationale in decision letters. For example, editors should make decisions clear and provide nuggets of advice (for instance, "Do not resubmit, because …" or "This is a good paper except …"). They should think about publishing editorials that speak directly to issues relating to international authors, describing the review process and explaining the value of "nonacceptance". Finally, many journals provide vetted resources, such as online writing services and language-polishing services.

Journal leaders are advised to revise and update their instructions for authors and their scope and goals statements. One suggestion is to "Blare out what you want!" in the revised guidelines. When guidelines are undergoing revision, editors should consider collecting data regarding reasons for rejections and addressing such issues.

Authors should be taught to read the instructions for authors before deciding to submit. PhD students' reading comprehension of English in China is excellent inasmuch as they have completed at least level 6 of English-language learning. The last pearl of wisdom: "A good scientist is not necessarily a good science writer (in any language)!"

Social-Media Success Stories

Speakers:

David Bowers
Marketing Manager
Cell Press

Bob Sumner
Editorial Coordinator, *Clinical Chemistry*
American Association for Clinical
Chemistry

Duncan MacRae
Managing Editor, *Neurosurgery*
Congress of Neurological Surgeons

John E Muenning
Director of Editorial Production
Technology
New England Journal of Medicine

Moderator:

Tony Alves
Director of Product Management
Aries Systems Corporation

Reporter:

Elizabeth Gebhardt
Managing Editor, *Crop Science* and *The Plant Genome*
American Society of Agronomy | Crop
Science Society of America | Soil
Science Society of America

Over the last several years, social-media strategies have become common among publishers. However, not all have taken the plunge. During the "Social-Media Success Stories" session at the CSE annual meeting in May, representatives of four organizations talked to attendees about their own social-media initiatives and the road to achieving social-media success.

David Bowers began the discussion by describing his work with 29 academic journals at Cell Press, which includes the flagship journal *Cell*. Over the last year, Cell Press has revitalized its Facebook and Twitter outreach and enhanced the functionality of its own Web site to allow users to share and add value to their content. Through those efforts, it has increased traffic to its content, provided an outlet for users to interact, enhanced its marketing through user recommendations, and added value to its Web site.

Facebook and Twitter afforded unique benefits for Cell Press's social-media campaign. Cell Press launched a Facebook page that featured content from each of its 29 journals and two trial pages that featured content only from *Cell* and *Current Biology*. The Facebook page is used by Cell Press to feature media coverage, podcasts, free issues, articles, video abstracts, and conference announcements. It has offered successes in the form of driving traffic to the Cell Press Web site (the sixth largest driver of traffic), increasing engagement with readers, and increasing the number of signups to Cell Press events, such as Webinars.

Twitter serves a different function. Through 14 Twitter accounts, Cell Press posts announcements and retweets all other journals on a regular basis. The accounts feature new issues, articles, words of the day, podcasts, and job announcements. Twitter also offers the ability to listen to what readers are saying about Cell Press and its competitors and to address concerns. However, Twitter has not served as a large source of traffic, and results are harder to track.

Bob Sumner continued the discussion by discussing his work with *Clinical Chemistry*. He focused on his use of Twitter and offered some pros and cons regarding Twitter versus Facebook.

Sumner explained that scientists, specialists, and technicians in all disciplines are using Twitter to share information. Journal content is excellent for Twitter because it is up-to-date, legitimate content that is critical for specialists; the research is vetted for accuracy; and it encourages collaboration, which is similar to how a journal is produced.

He offered guidance for using Twitter—such items as using applications like HootSuite to manage your posts, not resorting to marketing tropes, emphasizing free content, reposting materials from members, and posting material relevant to journal readers. He also suggested updating Twitter accounts regularly, answering reader questions and encouraging feedback, and providing relevant sources for found materials. Building a network of scientists by "following" them is a useful source of information—both for listening to scientists' comments about your own and related content and for providing content for your Twitter feed when you have exhausted all other resources.

To use Twitter or Facebook? Sumner said that the pros of Facebook include a larger audience, the gleaning of more clicks, and higher character-posting limits. Cons include not reaching all your fans with your posts. Each social-media outlet has benefits, and Sumner advised organizations to play to the strengths of each.

Duncan MacRae offered a different perspective that addressed the issue of limited staff resources to devote to social media. He explained that the goal for his journal, *Neurosurgery*, was simply to reach a transient social-media audience (one that lies on the edge of a specialty) and increase traffic to *Neurosurgery Online*. His social-media strategy for *Neurosurgery* emphasized creating content once with a minimal investment.

The social-media workflow at *Neurosurgery* consists of a few steps: content from the journal is repurposed and posted to a blog, which feeds to other sources, such as Facebook, Google, Twitter, LinkedIn, Reddit, and Digg. After a blog post is created and posted, a nominal amount of time is spent in reviewing and tracking the results. Through a 30-minute/day investment, *Neurosurgery* has increased traffic to *Neurosurgery Online* (traffic to the Web site increased by 4% from 2010 to 2011), created an effective distribution method, and witnessed continual growth in visits to the blog.

John Muenning concluded the session by describing his work with the *New England Journal of Medicine*. He provided insight into the perceptions of social media and offered some tips on using Twitter and Facebook most effectively.

Muenning explained that at first, social media was viewed suspiciously by some

Content Marketing Trends and New Ways to Generate Revenue

Speakers:
Tim Cross
Product Marketing Manager
Allen Press

Lettie Conrad
Manager of Online Product Management
SAGE Publications

Moderator:
Nan Hallock
Director of Publishing
Society for Laboratory Automation
and Screening

Reporter:
Heather Grimm
Writer/Editor
Reznick Group, PC

The lifeblood of scientific publishers is the content of journals. This session discussed how that content can be harnessed for marketing and generating new revenue.

Tim Cross offered eight new ways to generate revenue, seven of which cost little or nothing to implement. The ideas are in three categories: offering different subscription models, using new channels to sell products, and repurposing existing content. Alternative subscription models can be used to supplement, and possibly encourage growth in, the traditional model. For example, publishers can offer shorter, online-only subscriptions (a good way to reach more students) or use patron-driven acquisition, whereby the library pays only for the content that patrons are using.

There are multiple ways of selling products. DeepDyve is an article-rental service with iTunes-like pricing, whereby users can rent or purchase articles—a good option for getting content into the hands of students. Articles or highlights can be recorded and sold on iTunes, potentially reaching nontraditional users. Another opportunity to sell products can be gained by offering free trials directly to libraries and faculty or giving out access tokens and thus allow users access to content; both kinds of offerings can expose new users to journals.

And publishers can repurpose existing content by turning journal articles into e-books or publishing new editions of existing books as e-books, selling commercial reprints as enhanced digital reprints, and optimizing Web sites for use on mobile devices. Although the latter is the only approach that comes with a substantial cost, opting to go this route is an investment in the future in that more and more people are reading on their mobile devices.

Lettie Conrad stressed the importance of content-focused marketing. Traditional marketing focuses on casting as wide a net as possible, often using such tactics as print and mail advertisements. If publishers combine advances in technology with the proper use of their content, they can target marketing efforts more effectively. For example, they can offer users single articles or article collections on specific topics as an alternative to a traditional journal. They can also use existing content as part of an effort to leverage social media or create their own specialized Web communities to find and engage users.

The rapid developments in mobile devices (such as mobile-ready Web sites, apps, and QR codes) can help publishers to extend access to existing content and special content to more users in more places and also help to unite print and Web channels. Other initiatives to consider are podcasts and "pocket articles" (small cards with information about an article distributed at an event, which can be sponsored for a new revenue stream and can save the cost of distributing full journal issues) made from existing content. In addition, technological advances make it easier to tailor marketing communications and allow publishers to recruit high-quality manuscripts, increase use, and promote membership, all of which help to keep more content coming in.

scientists, but many have recognized its value. However, many scientists continue to perceive commenting, for example, as apart from their scholarly activities and something that is certainly not considered part of the formal article record.

He offered suggestions for Twitter campaigns. Keep in mind that users are young (half are less than 30 years of age) and want breaking news; the power of retweeting; and openness to new ways of using Twitter, such as posting electronic tables of contents.

Facebook can be a unique way of showing a journal's history through the "Timeline" format and has good built-in analytics.

Muenning said that you should lead your social-media strategies with your content, engaging users by curating content that is appropriate for them according to your social-media tool and audience. It is very important to highlight the integrity and excellence of the journal.

Offering several perspectives, the speakers in the session gave a current look at the efforts of publishers to reach audiences through social media. They emphasized creating realistic goals and recognizing the strengths and weaknesses of each social-media tool. They also stressed the need to curate content that highlights the integrity of the journal and caters to a particular audience and setting. Perhaps the most important point was that with this knowledge and a little staff time, publishers of all sizes are able to delve into the world of social media.

continued (from page 17)

A microfluidic chip that can be used to analyze organ-specific proteins quickly is being developed.

Family genome sequencing is another frontier of systems biology that integrates genetics and genomics. Hood believes that such testing will be routine in 10 years and will cost less than $500. He pointed out that sequencing of family genomes can find disease and wellness genes. Some 300 gene variants are "actionable"; that is, if you are aware that you carry a variant gene, you can do something about it. The genome can be searched routinely to identify new actionable genes.

The convergence of systems medicine, the digital revolution, and social networking is leading to P4 medicine: predictive because genomics is used, personalized because individual treatments will be under our own control, preventive because we can react to the information provided, and participatory because patient-driven social networks will demand access to data and better treatments. There are, however, technical and societal barriers to P4 medicine. Hood believes that these can be overcome through partnerships that will take on "big science" problems through new approaches to fundraising and through involvement of the best scientists in the world.

P4 medicine also has societal implications, namely, opportunities to revise the business plans of the health-care sectors of the economy, to digitalize medicine for individual patients, to turn around the rise in the cost of health care, and to create substantial wealth through a wellness industry.

Hood advised editors to help people to think outside the box and to think abstractly about new ideas. He suggested that whenever an editor sees an interesting new idea, he or she should strip away what is already known and think objectively about what could be.
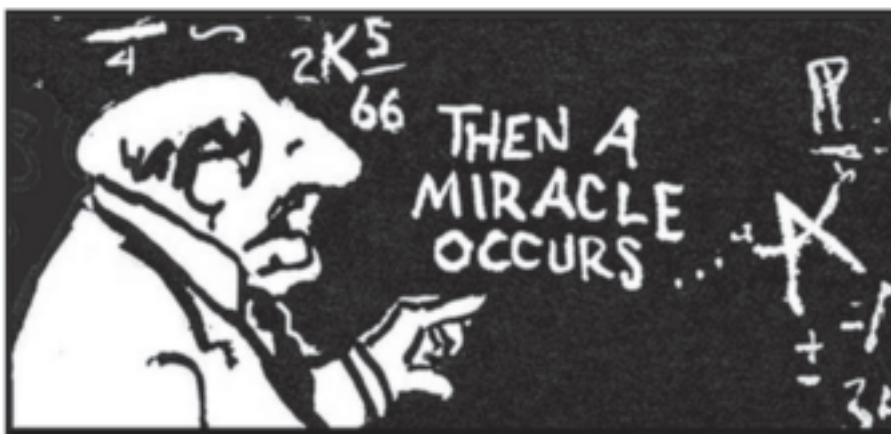
The 2012 AAAS Annual Meeting: Some Highlights of Sessions on Communication of Science

Jessica Orwig, Manjusha Sala, Alejandra Arreola-Triana, and Barbara Gastel

Titled "Flattening the World: Building a Global Knowledge Society", the 2012 American Association for the Advancement of Science annual meeting, held on 16–20 February in Vancouver, British Columbia, included sessions related to science editing and other aspects of science communication. Among the themes of those sessions were increasing international access to electronic information, helping the public to envision effects of climate change, improving peer review, and using pop-culture icons in popular communication of science. The following are some highlights.

Innovations in Reducing International Knowledge Isolation

Jessica Orwig

For some, the Internet has helped to create a flat world where equal access and opportunity are just a click away. But about two-thirds of the world's population has little or no access to current, high-quality scientific literature through online scientific journals, said Charles Dunlap, of CRDF Global. The lack of access is part of a phenomenon called international knowledge isolation.

The session "Innovations in Reducing International Knowledge Isolation" was moderated by a pioneer of the Internet,

JESSICA ORWIG, MANJUSHA SALA, *and* ALEJANDRA ARREOLA-TRIANA *are graduate students in science and technology journalism at Texas A&M University. Faculty member* BARBARA GASTEL *is their adviser.*

Vinton Cerf. Speakers from a variety of settings discussed virtual libraries and open-access databases that are growing in popularity and expanding international communication within the academic world.

First to speak was Dunlap, who discussed the considerable increases in activity of the Iraq Virtual Science Library. When the library was established in 2006, it had about 1000 users. The number grew to 30,000 by 2011.

The Iraq Virtual Science Library is an open-access database. Leslie Chan, of the University of Toronto Scarborough, argued that open access, if more broadly implemented, could substantially reduce the knowledge gap between developed and developing countries. One advantage of open-access journals, Chan said, is the opportunity for research sharing among countries around the world, which could initiate new and improved methods of scientific research.

John Willinsky, of Stanford University, discussed online databases that house open-access articles. One project, Open Journal Systems, acts as both a publishing platform and a resource where viewers can access scholarly material from multiple journals in multiple languages.

Gilbert S Omenn, of the University of Michigan, discussed a database that has thousands of PowerPoint presentations created and shared by 48,000 scientists in 174 countries. The database—known as the Supercourse of Epidemiology, the Internet and Global Health—is targeted to teachers around the world, who can access information on various diseases. When the swine influenza epidemic peaked in 2009 in the United States, a particular H1N1 lecture in the database was accessed by an average of 8,847 people per day.

Alex Dehgan, of the US Agency for International Development, predicted that an increase in the socioeconomic stratification of such countries as Brazil, India, and China will lead to a tremendous strain on energy and food consumption. Therefore, Dehgan said, those countries need to prepare for future hardships through the innovative use of science, technology, and engineering. Ready availability of scientific literature is key to this preparation, Dehgan said.

Beyond Climate Models: Rethinking How to Envision the Future with Climate Change

Jessica Orwig

Shades of red dotted the United States as Mike Hulme, of the University of East Anglia, pointed to a figure and said, "The future is color coded, and the color code is red for danger."

To an audience of scientists, the message of this figure may seem vivid. However, technical graphs and charts tend to make nonacademics' eyes glaze over, noted John Robinson, of the University of British Columbia, who moderated the session "Beyond Climate Models: Rethinking How to Envision the Future with Climate Change".

Graphs and charts might not be helping the public to heed or even acknowledge climate change. Speakers at the session therefore discussed alternative approaches to engage and educate the public. The approaches include interactive Web-based tools for Google Earth and immersive Decision Theatres.

After showing the figure, Hulme proposed a corollary: Climate change communication should integrate the arts and humanities more. As he showed drawings of fictitious cities built on water and

continued

photographs of water-surrounded polar bears, Hulme said that such approaches as narrative and art could lead to more effective engagement of the public.

Richard Moss, of the Joint Global Change Research Institute, proposed the use of scenarios. He showed time-lapse photographs of shorelines expanding and flooding nearby environments as examples of scenarios that portray potential effects of climate change.

Moss emphasized promoting communication between the scientific community and the public. "I think there is a tremendous opportunity for us to bring these worlds together without having lost anything from either side," Moss said. If the scientific community can communicate uncertainties in climate modeling through flexible scenarios, Moss said, the gap that separates the public from the scientists may be bridged.

The third speaker, Stephen Sheppard, of the University of British Columbia, discussed ways of exciting public interest through interactive and visual media. With the use of Decision Theatres—which have near-panoramic screens that immerse the audience—and Virtual Globes, such as are provided by Google Earth, visualizations are expected to be more influential.

Sheppard said that the visualizations make climate change more real and therefore can have a greater effect. Moreover, he presented results of research that suggest that 3-D visuals can increase a population's awareness and understanding of climate change and its environmental effects.

After the set of presentations, the audience members were asked to meet in groups to discuss the various approaches proposed—an apt ending for a session that emphasized engagement!

Global Challenges to Peer Review of Scientific Publications

Manjusha Sala

Why is peer review important? How is it conducted? What are some concerns about the peer-review process? How does

peer review determine funding of projects? Those were some questions addressed at the session "Global Challenges to Peer Review of Scientific Publications", moderated by Leonor Sierra, international science and policy manager at Sense About Science, a nonprofit organization helping people "make sense of science and evidence".

Emilie Marcus, editor of *Cell* and CEO of Cell Press; Linda Miller, dean for basic sciences of New York University; and Chris Biemesderfer, of the American Astronomical Society, spoke.

After summarizing how peer review is done at Cell Press, Marcus focused on concerns expressed about the peer-review process. They included conflicts of interest and reviewer bias. As a solution, Marcus said, authors submitting papers to *Cell Press* can rule out up to three potential reviewers. Marcus described several models of peer review: single blind, double blind, and open. In single-blind peer review, the reviewers know the identity of the authors but not vice versa; in double-blind review, neither group knows the other group's identity; and in open peer review, both groups know each other's identity. "Open peer review, in my opinion, compromises or can compromise constructive criticism," Marcus said.

Marcus and Biemesderfer also addressed the fact that peer review can slow scientific dissemination. Biemesderfer said that a culture of preprints of papers exists in a number of physical sciences, including astronomy. Because preprints aid in rapid dissemination of the latest research, he said, in some fields there is little concern about this.

Miller compared peer review for publication and peer review for funding. Currently, she said, two models for determining funding are in practice in the United States: the National Institutes of Health funds projects, and the Howard Hughes Medical Institute (HHMI) funds people.

To overcome challenges to and dissatisfactions with peer review, Miller suggested the following: Use HHMI's "people funding" model and open peer review. She said that Japan and parts of Europe used the

HHMI model in the 20th century. Their governments released the money to institutes, which gave the money to researchers. That model attracted young scientists who had promising projects and created a hierarchic system.

Open peer review, Miller said, has been successfully used by the journal *Atmospheric Chemistry and Physics*. The process begins with the posting of the paper online. Researchers in the field then post their comments, which are followed by comments from the authors of the paper. After several revisions, the final version of the paper is published on the Web site. Open peer review can reduce bias, Miller said.

Among them, the speakers presented a variety of perspectives on peer review. The session closed with discussion from the standing room-only audience.

Using Pop-Culture Icons to Slip Science into the Mainstream

Alejandra Arreola-Triana

When Lawrence Krauss, Jim Kakalios, and E Paul Zehr need to sneak science into a conversation, they talk about Captain Kirk and Mr Spock, Spiderman, or Batman, they noted at the session "Using Pop-Culture Icons to Slip Science into the Mainstream".

"The secret in teaching, and that includes public education", said Krauss, author of *The Physics of Star Trek*, "is seduction." He said that the key to catching people's attention is to persuade them that their interests—for example, science fiction— are related to the science that one wants to communicate. "Once they find out that science relates to the things they are interested in", Krauss said, "they get fascinated, and then the questions continue."

Krauss uses the "wacky" universes in science fiction as a hook to get people to learn about the real universe, which is "far more interesting".

Kakalios, who won a regional Emmy Award for the video *The Science of*

Book Alerts

How It All Began (Penelope Lively, 2012)

There is a small group of authors that I am so fond of that I cannot wait for the paperback. I buy the hardcover book (or, more recently, download it to my Kindle) at once—no waiting. Penelope Lively is one of those authors. When you read many books by the same author, you sometimes uncover a story told again and again with different characters in different settings, but the central theme comes back again and again as though the author is still puzzling it out from different angles. Lively seems to have a fascination with "What if?" In her 2005 book, *Making It Up,* she looks at various turning points in her own life and imagines what would have happened if she had taken a direction different from the one she did. What if she hadn't escaped from Cairo as World War II was breaking out? What if she'd become pregnant at 18? She looks at stories that could have been hers. In her latest novel, *How It All Began,* she takes a major event in the life of the main character, Charlotte Rainsford, a retired schoolteacher, and examines how a single event *does* change the direction not only of Charlotte's life but of the lives of

her family, friends and acquaintances, and people she has never even met. When she is mugged on a London street by a petty thief and breaks her hip, her move into the home of her daughter and son-in-law as she recovers is like a pebble in a pond . . . its circles of change spreading out to touch many, some casually, some deeply.

—*Cheryl Iverson*

Indivisible by Four: A String Quartet in Pursuit of Harmony (Arnold Steinhardt, 2000)

Except for my annual participation in Chicago's "Do-It-Yourself Messiah", for me music is a spectator sport. What fun it was to read this book about someone for whom it is a way of life and for whom it provides a living! Arnold Steinhardt was for over 25 years a violinist in the Guarneri Quartet. In this book, Steinhardt examines his own path to this life—from student, to orchestra player, then soloist, and, finally, "at home" as a player of chamber music. The book examines his individual journey at the same time that it describes the relationship of the ensemble.

—*Cheryl Iverson*

Blame (Michelle Huneven, 2009)

As an editor who reads and edits a lot of dialogue, I appreciate a novelist with a deft hand, such as that seen in *Blame*. The author manages to create smooth, almost faultless transitions from spoken to unspoken discourse without the use of quotation marks but simply with well-chosen words. *Blame*'s protagonist is Patsy MacLemoore, a late 20-something professor of history and a serial alcoholic who is convicted of "criminal negligence resulting in loss of life"— two lives, that is, those of a young mother and her 12-year-old daughter, hit and run over in Patsy's driveway and with Patsy's Mercedes. After 2 years in prison, Patsy embarks on getting sober, making amends, and transforming her life until, years later, a remarkable and unexpected revelation changes everything. This thought-provoking and memorable novel will stay with you for many years to come.

—*Roxanne K Young*

continued *(from page 26)*

Watchmen, stated that comic books can be used to teach science. He said that the comics from the late 1950s were "jam-packed with science". He noted several examples of the science in those comics, which in some cases can be "more exciting than what you get in your textbooks".

Kakalios, who has also been a science adviser for several superhero movies, including *Watchmen* and *The Amazing Spiderman*,

said that using popular culture to teach science allows him to communicate to a wider audience. He said that his *Watchmen* video has allowed him to reach more people than he could if he "taught a thousand students a year for 17 centuries".

Zehr, author of *Becoming Batman: The Possibility of a Superhero*, uses superheroes as a way of explaining physiology and neuroscience. He said that the advantage of using references to superheroes or popular

shows is that it puts the scientists and the audience "in the same head space". The approach could aid in translating science into something "meaningful to the people once they are already hooked," he stated. Zehr emphasized that such translation does not mean just reducing the things to a simple reading level; rather, it includes describing the science in terms and contexts that the audience already understands.

Research Misconduct in Clinical Trials and Clinical Research

Debra M Parrish

Scientific misconduct is not limited to the milieu of basic science but also occurs in clinical research—a striking context for misconduct given its immediate implications for patient care and treatment. This essay discusses the federal agencies that may have jurisdiction when misconduct occurs in a clinical trial, the differences between a federal agency finding of misconduct and an institutional finding, the differences between accusers and accused, and the process for finding misconduct and the sanctions imposed.

Multiple Agencies

When research misconduct occurs in clinical research in the United States, numerous government agencies may have jurisdiction. If the research involves Public Health Service (PHS) funds, the Office for Human Research Protections (OHRP, formerly known as the Office for Protection from Research Risks) and the Office of Research Integrity (ORI) will have jurisdiction. The Food and Drug Administration (FDA) will have jurisdiction over cases if falsification or fabrication occurred in the context of an FDA clinical trial. Similarly, if the case involves research conducted in a Department of Veterans Affairs (VA) hospital, VA will have jurisdiction. If the research is conducted with funding from the National Science Foundation, that agency will have jurisdiction.

Although only research supported by federal funding is subject to federal research-misconduct regulations, most academic and research institutions have research-misconduct policies and procedures that apply to all misconduct allega-

DEBRA M PARRISH *is a partner with Parrish Law Offices, Pittsburgh, Pennsylvania.*

tions, regardless of funding source. Many of those policies are based on federal regulations. Many sponsor agreements require notification of any allegations of research misconduct. Thus, a large number of cases not involving federal funds are investigated under research-misconduct policies and procedures that mirror those imposed by federal agencies, although the outcomes of these investigations are not necessarily reported to federal authorities.

Because of the breadth of types of cases handled, the following will focus on cases that were reported to ORI, the federal agency that has the most experience with research-misconduct cases. Since 1994, ORI has made about 190 findings of research misconduct, including about 70 findings in the context of clinical research. Misconduct cases that have arisen in the context of clinical research have included allegations of falsification and fabrication of interview data, alteration (fabrication or falsification) of a patient's medical record, fabrication of medical data without alteration of a patient's medical records, and failure to adhere to the study protocol. Other violations have involved fabrication or falsification of consent forms or substitution of a personal physical specimen for the study specimen.

Different Standards for a Finding of Misconduct by the Office of Research Integrity?

Although ORI has made about 190 findings of research misconduct and about 70 findings of research misconduct on the basis of falsification or fabrication in clinical research, ORI declined to make a misconduct finding in about 250 cases. Of the cases in which ORI did not make a finding, about 60 cases involved fabrication and falsification in the context of clinical research, including at least 16 cases in which ORI declined to make a finding

of misconduct even though the institutions in question found that researchers had committed misconduct. Despite those statistics, ORI has made more findings—in terms of the percentage of total allegations reported—of research misconduct against clinical researchers than against basic scientists. From 1993 to 2007, ORI made findings of misconduct after 72% of allegations regarding clinical research compared with 40% after all allegations.

ORI has declined to make a finding of research misconduct on the basis of violation of human-subjects regulations even when falsification and fabrication occurred, despite the institutions' deeming such violations a "serious departure" from standards of conduct of research. And ORI does not deem deviation from study protocol, failing to document informed consent properly, breach of human-subjects confidentiality, forging a physician's signature, failing to report an adverse event, or failing to secure institutional review board or FDA approval of a protocol change as falling within the definition of research misconduct. Despite ORI's exclusion of those actions from the definition of misconduct, many institutions deem them misconduct.

Although it has occurred in a rather small number of cases, ORI's decision not to make a finding of misconduct when an institution has made such a finding raises concerns. When declining to convert an institutional finding of misconduct to a federal finding of misconduct, ORI has asserted a lack of adequate documentation, a lack of sufficient evidence to pursue a finding of research misconduct, a poor institutional investigation, a lack of sufficient evidence of a respondent's intent to deceive, and the significance of the amount of data fabricated. In one case, ORI declined to make a finding of misconduct because of the time (a decade) that had passed between the alleged misconduct

and the conclusion of the institutional process, the sufficiency of the institutional sanctions, and the respondent's retirement. Conversely, in the last 10 years, ORI has found no person guilty of misconduct if the person's institution did not. That is logical: the institution is closer to the misconduct and typically conducts its investigation when witnesses and evidence are still available and fresh, whereas ORI's reviews are often completed years after the original allegations.

Accusers and Accused in the Context of a Clinical Trial

The majority of those found to have committed misconduct in a clinical trial are not the principal investigators (PIs) on particular studies but study staff. In many of the cases of misconduct, the misdeeds are identified by others involved in a study and include co-workers, temporary personnel, and study monitors, and the misconduct is detected before publication of any scientific articles based on the tainted data. Although study staff constitute the majority of the targets of misconduct investigations, PIs may be investigated for research misconduct committed by a supervisee either under the "captain of the ship doctrine" or because of the failure to detect the supervisee's misconduct. However, ORI has not found a PI guilty of the misconduct of a supervisee. The latter point may be best illustrated by the cases of Cynthia King and Patrina Lowe. ORI found that the PI did not exercise sufficient supervision over study staff. ORI concluded that "negligence, lack of competence, lack of supervision, and inadequate assignment of authority all contributed significantly to the problems that arose in the ALLHAT program." Despite that conclusion, ORI did not find that the PI had committed research misconduct.

Investigating an Allegation

The process of investigating potential misconduct generally begins with the institution. If an institution receives PHS funds, it must have policies and procedures for responding to allegations of research misconduct. The first analytic question typically is whether the alleged behavior meets the definition of misconduct. The second question is whether the allegation is sufficient to begin an inquiry. The sole purpose of an inquiry is to determine whether there is sufficient information to warrant opening an investigation into the alleged misconduct. A finding of misconduct requires finding that the behavior was a substantial departure from accepted practices of the relevant research community; that the misconduct was committed intentionally, knowingly, or recklessly; and that the misconduct was proved by a preponderance of the evidence. The burden of proving misconduct is on the institution.

When an institution makes a finding, it produces a written report; if the case involves PHS funding, the institution must report its finding to ORI for review. After ORI concludes its review, it may make a federal misconduct finding and propose sanctions. It also may approve closing a case without a finding or refer the matter for further investigation, including criminal investigation. The ORI finding and sanctions constitute the final determination unless the accused seeks review of ORI's finding by appeal to an administrative law judge within 30 days of the notice.

Investigating research misconduct results in considerable delay. Although federal regulations prescribe a limited timeline for conducting investigations, the timelines typically are not honored, and extensions are extremely common. For clinical research, in which timing is often critical, that can have devastating effects on quality and reliability. On average, it takes more than 11 months for an institution to complete its investigation of research misconduct and 8 months more for ORI to make its findings. In cases of clinical-research misconduct, the institutional investigations have been completed in as little as 3 months and as long as 15 months. ORI has taken an additional 5–20 months to complete its review of institutional investigations.

Administrative Sanctions

When a finding of research misconduct is made in the context of a PHS-sponsored grant, the sanction typically imposed is a 3-year exclusion from receiving federal funds or serving in an advisory capacity to PHS (serving on study sections). A few cases have resulted in lifetime debarment or exclusion, and one case resulted in the very modest sanction of mandatory ethics counseling and exclusion from attending an ORI conference. More recently, ORI has favored supervision plans in lieu of debarment or exclusion. In recent years, ORI has resolved a substantial number of cases with respondents' agreeing to a plan of supervision rather than debarment or exclusion from federal funding or from participation in federally funded projects.

A finding of research misconduct, particularly one resulting in a short exclusion period, may not end a person's research career. However, a number of physician–researchers found guilty of research misconduct have given up their research careers. Although professional societies sanctioned some of those physicians, most were able to continue in their clinical careers. One nurse found guilty of research misconduct went to law school and is a member of a large international law firm.

For cases involving misappropriation of research funds, the Department of Health and Human Services (DHHS) may seek to recover the lost monies. However, apart from misconduct cases that reached the district-court level for civil or criminal action, repayment of misappropriated funds has been infrequent. In the cases of Eric Poehlman and Pat J Palmer, misappropriated funds were recovered, and Roxana Gonzales, found guilty of misconduct for falsifying research funded by the National Institute of Mental Health, voluntarily offered to make restitution of lost funds.

Criminal Investigations and Sanctions

Although most misconduct allegations are evaluated in the context of administrative

investigations and sanctions, some are evaluated and resolved in the context of civil and criminal venues. In 2005, ORI closed the Kornak case involving falsification in a clinical trial in connection with VA, and Kornak was sentenced to federal prison for criminally negligent homicide of a research subject during the course of a drug trial. Kornak had pled guilty to mail fraud, making a false statement, and criminally negligent homicide in January 2005. The court ordered him to pay restitution to the pharmaceutical companies. A lifetime debarment was imposed by VA and DHHS. The US attorney's office chronicled Kornak's offenses as defrauding the clinical-trial sponsor by submitting false documentation about study subjects who did not qualify for the trial and falsifying forms that were crucial for determining whether subjects could take part in the study. Kornak falsely reported that the person who died had matched the criteria for enrolling in the study although the subject had damaged organs and died as a result of the drugs administered as part of the study.

In the case of Pat J Palmer, ORI found her guilty of scientific misconduct for fabricating records of interviews with the families of autism patients and for fabricating her credentials by claiming to have a BS and a PhD, and inserting her name among the lists of authors of 10 publications. Palmer was criminally charged with stealing $53,857 in travel vouchers and claiming to have a degree in violation of state law. She faced 10 years in prison for each count of first-degree theft and 5 years for each count of second-degree theft. In October 2003, she pled guilty to first-degree theft and falsifying academic degrees. She received 3 years of supervised probation and a $1,250 fine, and she paid her institution $18,976.80 for travel-voucher money that she had pocketed. ORI imposed a 3-year exclusion on Palmer.

Conclusion

Many institutions consider research misconduct in clinical trials the most egregious form of research misconduct. Because of the wide-ranging effects that clinical research can have on the direction of future endeavors and on public welfare and the public perception of science and medicine, this type of misconduct should result in immediate corrective action. However, a review of the cases handled by ORI does not indicate that cases of clinical-research misconduct result in much stronger sanctions or action against the perpetrators than cases of non–clinical-research misconduct. Most of the cases are referred to OHRP, which takes action against institutions and not against individual investigators. For cases in which ORI does take action, the sanctions are not more severe than those for misconduct in non-clinical trials.

Member Profile: Christina Bennett

Stacy Christiansen

To tie in with this issue's focus on scientific misconduct, *Science Editor* profiles a CSE member whose job is based in the prevention and correction of potential ethical breaches. Christina Bennett, PhD, is the publications ethics manager of the American Physiological Society (APS), Bethesda, Maryland.

Christina's career path began at the University of Virginia, where she majored in biochemistry and minored in bioethics. Her science courses prepared her for graduate school, but she particularly enjoyed the philosophical and religious discussions in her bioethics classes. Christina believes that ideally scientists should have some training in bioethics.

After completing her studies in Virginia, Christina joined the Department of Molecular and Integrative Physiology of the University of Michigan. "I was always interested in how our bodies work," she notes. In her doctoral studies, she used mouse models to examine obesity. She continued her research focus when she moved to the National Cancer Institute to use mouse models to study breast cancer.

A decade or so into her life as a researcher, Christina wanted to change her focus. She is a member of APS and saw an advertisement for ethics manager of the society's publications. "It was as though [the position] was written for me," she says. She

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joined the staff of APS in January 2011 as the publications ethics manager.

In her current position, Christina handles ethical issues that arise in the 13 journals that APS publishes. She fields questions and sometimes seeks expert opinions. Typical topics range from copyright issues, corrections, and plagiarism to screening for digital manipulation of images in all accepted manuscripts. She admits that when she applied for the job, she did not expect to encounter many cases. However, she notes, she did not fully appreciate the number of quality controls in place to protect both the authors and the publisher. Christina does not believe that most of the problems she sees are of malicious intent.

Christina is a relative newcomer to CSE, having joined just this year. However, she has "always wanted to teach a science and ethics course" and was able to do something similar at the 2012 CSE annual meeting. Christina was a faculty member of the Short Course on Publication Ethics and shared her perspective on image manipulation. She discussed such topics as how to check for digital manipulation, how to resolve problems that are identified, and what tools are available to help editors and journals to identify tampering. She feels that she not only contributed to the meeting but learned a lot by listening to others throughout the day. "It's good to hear what others are doing; journals have different issues and different resources." She was encouraged to hear that other editors face similar issues and are able to get together to share ideas.

Her science background is clearly vital in her role at APS, but equally important,

Christina Bennett

Christina says, she has always had a strong interest in English and writing. "I'm a big reader; I always have a book in hand," she notes. One of the other attractions of her job at APS has been the ability to gather more often with family, many of whom live in Maryland.

She enjoys walking, not only for exercise, but also as a means of catching up with friends, and she enjoys dance, having taken several years of jazz and funk dance classes in graduate school. Christina enjoys being on the beach; her recent vacation destinations have included the Bahamas and Aruba.

Christina finds her job rewarding, as she helps bring the highest quality possible to the society's publications. But even though catching and correcting errors and ethical breaches is her charge, "I always remember that there are people behind these mistakes."

Barbara Meyers Ford

Finch report on open access

The Finch report on open access in the UK was released on July 16, 2012. See the report at http://tiny.cc/7a44fw. *Accessibility, Sustainability, Excellence: How to Expand Access to Research Publications*, is the product of a year's work by a group drawn from academe, research funders, and publishing.

Infographic: Research misconduct

Research misconduct allegations and retractions are increasing, and the increase is causing concern about the costs of misconduct and the future of research and publishing. An extension of the report *True Costs of Research Misconduct*, this infographic illustrates the growing problem of plagiarism, other forms of misconduct in research, and the types of damage incurred by misconduct. See *iThenticate Original Thoughts Newsletter, May 2012, http://www.ithenticate.com/ research-misconduct-infographic/?&t=34428 &Preview=true*.

Will a new literature format "radically alter" how scientists write, review, and read papers?

A group of authors at a Pittsburgh company have proposed a new way to write, review, and read scientific papers that they claim will "radically alter the creation and use of credible knowledge for the benefit of society". Go to *http://online.liebertpub.com/doi/abs/10.1089/ dst.2012.0002* to read the abstract of a paper appearing in the new Mary Liebert journal *Disruptive Science and Technology*, which promises to "publish out-of-the-box concepts that will improve the way we live".

Making smart content work in a clinical setting

Discussion surrounding applications for the Semantic Web have focused on discoverability. Beyond its ability to help readers and researchers find new books or articles that they might otherwise not uncover, the Semantic Web has exciting practical applications. The technology is ideally placed to help clinicians leverage vast stores of published medical information and even perform as a diagnostic tool. Imagine a medical library so intelligent that a doctor has only to list the combination of a patient's symptoms to receive a list of possible diagnoses—even suggestions of suitable treatments. Seems like science fiction? Elsevier has begun to do this with its experimental platform *Clinical Key*, which aggregates huge amounts of medical and surgical content to create what it calls a Clinical Insight Engine. See the discussion posted July 17, 2012, by the blog *Publishing Technology* (*http:// blog.publishingtechnology.com/author/ publishingtechnology*).

Ocean Exploration: Why We Need to Continue It

Meika Jensen

This sample of an online graphic on the reasons that oceans need to be explored was submitted by Meika Jensen from MastersDegree.net. To see the full graphic, go to *www.councilscienceeditors/ ocean*.
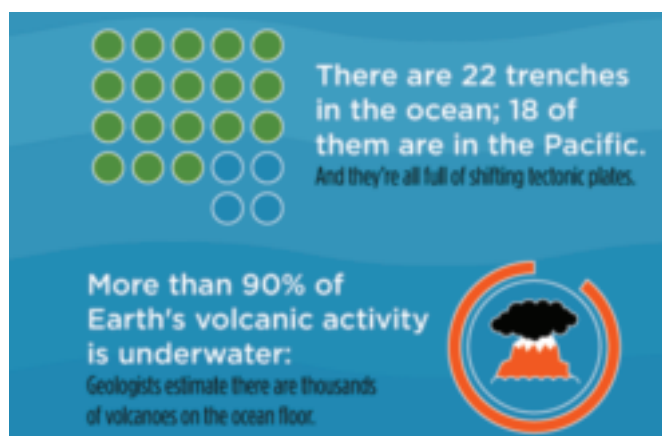
Visiting Montreal Effectively: *The 2013 Annual Meeting!*

Michael A Friedman

From the top of Mount Royal to the middle of the Old Port to the depths of the Underground City, Montreal is a city not to be missed! CSE's 56th annual meeting, titled "Communicate Science *Effectively*: The World Depends On It!", will take place 3–6 May 2013 in cosmopolitan and beautiful Montreal, Quebec, Canada.

Work has already begun on the seminars, programs, and fun events for the meeting, which will be held at The Fairmont Queen Elizabeth Hotel. Stay tuned in the coming weeks and months for registration and other information about the program and activities associated with the 2013 Annual Conference.

How many big cities have a mountain in the middle of them (and are situated on an island, no less)? Mount Royal is small enough to hike or bike to the top and the spectacular views are worth the effort. From the summit lookout terrace (and park designed by Frederick Law Olmsted), downtown Montreal is at your feet, with a view to the river and beyond to the Monteregian Hills. There are three peaks, the tallest of which is 233 m (764 ft) above mean sea level.

With its cobblestone streets and old stone buildings and churches, Old Montreal is the historical heart of the city, founded in 1642. After a 5-minute walk along the St. Lawrence River from downtown, you

Montreal viewed from Mount Royal

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can catch the street performers in Place Jacques-Cartier, indulge in a horse-drawn carriage ride, stop at a café, or just enjoy people watching. Lively Old Montreal is a key part of the city's cultural and economic life; about 4,000 people live here, and more than 35,000 travel to it daily to work.

For above-ground shopping, try rue Ste-Catherine, but you must also check out the Underground City. Montreal has 33 kilometers (about 20 miles) of interconnected, underground tunnels in and around downtown, connecting shopping malls, banks, office buildings, apartments, museums, universities, metro and

bus stations, and hotels, including our host hotel, The Fairmont Queen Elizabeth. The Underground City is one of the largest underground complexes in the world.

And if that's not enough to keep you entertained (outside of the meeting of course), other attractions farther afield include the unique Olympic Stadium built for the 1976 Summer Olympics, the Biodome and Montreal Botanical Garden, the Montreal Casino, and a variety of museums and other cultural activities from music and art to theater and sporting events. Start making your plans now to join us in Montreal this coming spring.

CSE Members Receive Awards at 2012 Annual Meeting

At our 2012 annual meeting, Diane Lang, chair of the 2012 Awards and Honors Committee, presented the Council's highest award, the Award for Meritorious Achievement, to the Committee on Publication Ethics (COPE). COPE was established in 1997 by a small group of journal editors who recognized that they encountered similar ethical issues. The organization now has more than 7000 members.

Virginia Barbour, chair of the COPE Council, noted that not only do well-known journals need help with ethical issues in publishing, but small journals do too. She encouraged everyone to visit the COPE Web site and investigate the resources posted there.

Diane also presented awards to Angela Cochran and Patty Baskin, who each received the CSE Certificate of Appreciation for their efforts in launching the new certificate program in scholarly publication management, and Jennifer Fleet, who was instrumental in establishing the CSE Webinar program.

CSE Board of Directors 2012–2013

As the result of the 2012 CSE elections, Tim Cross, of Allen Press, was elected vice president; May Piotrowski, of the National Academy of Sciences, was elected treasurer-elect; and Angela Cochran, of the American Society of Civil Engineers, was elected a director. Jennifer Fleet, of Aries Systems, was appointed by the Board to fill the director's position formerly held by Tim Cross. The new Board members join continuing members President Kenneth Heideman, President-Elect Heather Goodell, Treasurer Michael Clarke, Secretary Pamella Erickson, Past President Diane Sullenberger, and Director Anna Trudgett. Patty Baskin, editor of *Science Editor*; Amanda Ferguson, Web editor; and David Stumph, executive director, are *ex officio* members of the Board. Thomas Farquhar, associate director, joined the Resource Center for Associations in the summer of 2012 as the liaison to CSE.

New CSE Publication Certificate Program

Spring 2012 saw the launch of CSE's certificate program in scholarly publication management. About 30 members have been accepted into the program. Any member may apply; accepted applicants will receive a 20% discount on related activities (Webinars, conferences, and short courses). Over a 3-year period, participants must attend two CSE annual conferences, including four sessions at each meeting that are identified on the program as part of the "track"; three CSE Webinars (one may be recorded); and two CSE short courses (choice of Publication Management, Journal Editors, Publication Metrics, or Publication Ethics). Each participant will propose an independent research project, prepare a poster presentation for an annual meeting, and submit a research paper based on the project to *Science Editor*. Go to *www.councilscienceeditors.org* to complete an application.

Virginia Barbour speaks after accepting an award for COPE. Photo by Pamela Stukenborg.

Award winners Angela Cochran, Jennifer Fleet, and Patty Baskin with Awards Committee Chair Diane Lang. Photo by Pamela Stukenborg.

Calendar

2013

14–18 February	**American Association for the Advancement of Science annual meeting**. Boston MA. *www.aaas.org*.
16 February	**BELS (Board of Editors in the Life Sciences) examination**. Atlanta GA. Registration deadline is 26 January. Contact: Leslie E Neistadt, BELS Registrar, The Hughston Foundation, 6262 Veterans Pkwy, Columbus GA 31909; (706) 494-3322; fax (706) 494-3348; *lneistadt@hughston.com; www.bels.org*.
13–16 April	**Association of Clinical Research Professionals annual conference**. Orlando FL. *www.acrpnet.org*.
17–19 April	**American Society for Indexing annual conference**. San Antonio TX. *www.asindexing.org*.
3–6 May	**Council of Science Editors annual meeting**. Fairmont Queen Elizabeth, Montreal QC. Contact: CSE: 10200 W 44th Ave, Suite 304, Wheat Ridge CO 80033; (720)881-6046; *www.CouncilScienceEditors.org*.
4 May	**BELS (Board of Editors in the Life Sciences) examination**. Montreal QC. Registration deadline is 13 April. See preceding BELS listing for registration information.
5–7 June	**Society for Scholarly Publishing annual meeting**. San Francisco CA. *www.sspnet.org*.
7–9 June	**Editors' Association of Canada annual meeting**. Halifax NS. *www.editors.ca*.
24–26 June	**Drug Information Association annual meeting**. Boston MA. *wwwdiahome.org*.
1–6 November	**Association of American Medical Colleges annual meeting**. Philadelphia PA. *www.aamc.org*.
6 November	**BELS (Board of Editors in the Life Sciences) examination**. Columbus OH. Registration deadline is 16 October. See preceding BELS listing for registration information.
7–9 November	**American Medical Writers Association annual meeting**. Columbus OH. *www.amwa.org*.

Information for Contributors

In the Next Issue

- Open access
- More annual meeting reports
- COPE seminar highlights