

Two 50s for CSE's 50th: Research and Resources—Science Editors Share Top Picks

Compiled by Barbara Gastel

As CSE's 50th anniversary was approaching, *Science Editor* board and staff members considered how to observe the occasion in print. Among the ideas: Publish some science-editorial lists of 50. Hence the two lists that follow—of 50 pieces of science-editorial research and 50 resources for science editors. Many thanks to the board and staff members and colleagues thereof who contributed items to these lists. Readers with items to add should send them to b-gastel@tamu.edu. Doing so could be a good way to begin our second half-century!

50 Pieces of Science-Editorial Research

Contributors: Stephanie Deming, Lynn Dirk, Barbara Gastel, Mary Knatterud, Tom Lang, Poly M Potter, Marina Teuber, Ted Wachs, Liz Wager, Stewart Wills

Many reports of research related to science editing have appeared in the last 50 years. Here, listed chronologically, are examples that one or more respondents identified as favorites.

1. Porter JR. The scientific journal—300th anniversary. *Bacteriol Rev* 1964;28:211-230. This presidential address, delivered at the 1964 annual meeting of the American Society for Microbiology, traces the origin and early history of scientific journals; copies of documents are included. The author had been chairman of the Conference of Biological Editors, a forerunner of CSE, in 1961-1963.

BARBARA GASTEL, a faculty member at Texas A&M University, is the editor of *Science Editor*.

2. Crane D. The gatekeepers of science: some factors affecting the selection of articles for scientific journals. *Am Sociol* 1967;2:195-201. Results indicated that, after blinded review, acceptance of papers by authors from minor universities increased as the number of editors from those universities increased. A possible explanation is that editors or reviewers respond to aspects of methodology, theoretical orientation, and mode of expression.

3. Garfield E. Citation analysis as a tool in journal evaluation. *Science* 1972;78:471-479. This was the paper that spawned citation analysis as a science with such findings, at that time, as that the average paper was cited only 1.7 times a year and that 25% of journals published 70% of cited articles. The important point was that citation data could be used to identify research "fronts".

4. Mahoney MJ. Publication prejudices: an experimental study of confirmatory bias in the peer review system. *Cognitive Ther Res* 1977;1:161-175. This is one of the first studies on peer review that created alarm in editorial circles. Journal reviewers reviewed manuscripts describing identical experimental procedures but with positive, negative, mixed, or no results. Reviewers did not agree with each other and were strongly biased against results contrary to their theoretical perspective. Full text available at www.mang.canterbury.ac.nz/writing_guide/review/mahoney.shtml.

5. Peters DP, Ceci SJ. Peer-review practices of psychological journals: the fate of published articles, submitted again. *Behav Brain Sci* 1982;5:187-195. The fate of the articles included rejection. This paper, a classic study on the reliability of peer

review, was published with comments by 33 noted scientists and editors, many of whom were extremely critical that this study was done, partially because of the waste of editorial resources.

6. Wainer H. How to display data badly. *Am Stat* 1984;38:137-147. Presents some good and informative bad examples of figures and tables.

7. Lock S. *A Difficult Balance: Editorial Peer Review in Medicine*. Philadelphia: Institute of Scientific Information; 1986. Also: London: BMJ; 1991. A classic work on peer review, this meticulous and thorough review of a voluminous amount of published material documented the many problems of peer review, including that there was very little empirical evidence on its effectiveness. In the chapter "Research: A Personal Survey", the author (then editor of the *BMJ*) compared his own judgment of papers with those of expert reviewers and the *BMJ*'s "hanging committee" and found considerable agreement. This may simply show what a good editor Lock was, but it is one of only a tiny number of studies to compare different methods of peer review.

8. Stewart WW, Feder N. The integrity of the scientific literature. *Nature* 1987;325:207-214 (with reply by E Braunwald). This paper documented one of the first "modern" cases of scientific fraud that touched Ivy League schools and the most prestigious science journals. The consistency, accuracy, and completeness of more than 100 publications, 18 being full-length research papers, by John Darsee and 47 coauthors published over a 3-year period were analyzed. Two types of lapses from "generally accepted" standards in the papers were identified.

Two 50s continued

9. Mullins N, Snizek W, Oehler K. The structural analysis of a scientific paper. In: van Raan AFJ, editor. *Handbook of Quantitative Studies of Science and Technology*. New York: Elsevier Science; 1988. p 81-105. This chapter is a fascinating and detailed analysis based on the premise that the scientific paper is an underused resource in empirical examination of science; for example, structural analysis of scientific papers can be used to answer questions about major changes in theory occurring in a discipline.
10. Gross AG. *The Rhetoric of Science*. Cambridge, MA: Harvard University Press; 1990. This eye-opening, myth-shattering book by a University of Minnesota rhetoric professor is a scholarly yet readable analysis of the conventions of scientific discourse, whose so-called objectivity is revealed as "a carefully crafted rhetorical invention".
11. Phillips DP, Kanter EJ, Bednarczyk B, Tastad PL. Importance of the lay press in the transmission of medical knowledge to the scientific community. *N Engl J Med* 1991;325:1180-1183. Does coverage in the popular media increase researchers' awareness of journal articles? A natural experiment, which occurred when *The New York Times* was on strike but prepared an "edition of record", suggests that the answer is yes.
12. McLellan MF, Case LD, Barnett MC. Trust, but verify: the accuracy of references in four anesthesia journals. *Anesthesiology* 1992;77:185-188. More than half of 348 citations in four anesthesia journals contained an error in at least one element. The percentage of citations containing at least one error ranged from 44% (*Anesthesia and Analgesia*) to 56% (*British Journal of Anaesthesia*).
13. Menger FM, Haim A. Struggles to correct published errors. *Nature* 1992;359:666-668. An account of efforts of scientists from 8 March 1991 to 12 June 1992 to publish information that disputed the methods and results of a published article. The authors maintained that scholarly rebuttals to published articles in the same journal are an important mechanism to protect against errors in journals.
14. Frank E. Authors' criteria for selecting journals. *JAMA* 1994;272:163-164. In this survey, faculty members rated prestige of a journal as most important when deciding where to submit a paper. However, for submission of a rejected paper to another journal, likelihood of acceptance rated most highly. Ratings of other factors also are presented.
15. Goodman SN, Berlin J, Fletcher SW, Fletcher RH. Manuscript quality before and after peer review and editing at *Annals of Internal Medicine*. *Ann Intern Med* 1994;121:11-21. One of the few studies looking at the effects of both peer review and technical editing on the quality of papers. The effects were positive but small.
16. Hansen ME, McIntire DD. Reference citations in radiology: accuracy and appropriateness of use in two major journals. *AJR Am J Roentgenol* 1994;163:719-723. Of 47 randomly selected references in the 1993 issues of *AJR*, one had a major error and 21 had a minor error in accuracy. Of the 48 in *Radiology*, two had a major error and 11 had a minor error in accuracy.
17. Asano M, Mikawa K, Nishina K, Maekawa N, Obara H. Improvement of the accuracy of references in the *Canadian Journal of Anaesthesia*. *Can J Anaesth* 1995;42:370-372. Among the hundreds of studies bemoaning inaccuracy of citations, this stands out as virtually the only one to measure the effect of doing something about it. Accuracy improved substantially after authors had to submit a photocopy of the first page of each reference. This elegant solution has probably disappeared now that most journals use electronic submission.
18. Gibbs WW. Lost science in the Third World. *Sci Am* 1995;273(2):92-99. Contains remarks by Richard Horton that are particularly relevant to the concerns of promoting publication by authors in developing countries.
19. Moher D, Jadad AR, Nichol G, Penman M, Tugwell P, Walsh S. Assessing the quality of randomized controlled trials: an annotated bibliography of scales and checklists. *Control Clin Trials* 1995;16:62-73. The definitive review of scales and checklists used to assess the quality of reporting of clinical research. Although the scales and checklists do not provide valid measures of quality, they do identify the most important aspects of clinical research that should be reported.
20. Lang T. Physical and processing characteristics of manuscripts submitted for author's editing. *CBE Views* 1996;19:111-115. The typical article reporting original research submitted for editing consisted of a median of 14 pages of text, 23 references, four figures, and three tables, for a total of 21 pages (interquartile range, 16 to 28 pages).
21. Pierie JP, Walvoort HC, Overbeke AJ. Readers' evaluation of effect of peer review and editing on quality of articles in the *Nederlands Tijdschrift voor Geneeskunde*. *Lancet* 1996;348:1480-1483. A study asked regular readers to rate papers before and after peer review and editing and measured the effects of each of these processes. Although papers improved between submission and publication, they remained hard to read.
22. Bhopal R, Rankin J, McColl E, et al. The vexed question of authorship: views of researchers in a British medical faculty. *BMJ* 1997;314:1009-1012. An interesting study showing ignorance of, and disagreement about, the International Committee of Medical Journal Editors authorship criteria among academics.

23. Lang TA. Assessing the productivity and value of a hospital-based medical editing service. *AMWA J* 1997;12:6-14. Median editing time for a typical article reporting original clinical research was 5 stopwatch hours (interquartile range, 3.5 to 7.5 h) over 2 days; the variability was great, however. The typical full-time editor processed about 125 manuscripts a year over the course of the 5-year study.

24. Teuber M. To nost bibliografskih navoda u medicinskim asopisima (Accuracy of references in medical journals). *Vjesnik bibliotekara Hrvatske* 1997;40:117-130. Includes a true tale in which repeatedly copying a citation from elsewhere, rather than obtaining the original article, perpetuated for decades the substitution of an article title for the author's name. The meaning of the title: "On Dysentery".

25. Tramèr MR, Reynolds DJ, Moore RA, McQuay HJ. Impact of covert duplicate publication on meta-analysis: a case-study. *BMJ* 1997;315:635-640. Despite its modest title of "case study", this paper was an important demonstration of the harmful effects that redundant publication can have on evidence-based medicine.

26. Callaham ML, Wears RL, Waeckerle JF. Effect of attendance at a training session on peer reviewer quality and performance. *Ann Emerg Med* 1998;32:318-322. and Callaham ML, Knopp RK, Gallagher EJ. Effect of written feedback by editors on quality of reviews: two randomized trials. *JAMA* 2002;287:2781-2783. Two studies at *Annals of Emergency Medicine* showed that training reviewers had disappointingly little effect on their performance.

27. Godlee F, Gale CR, Martyn CN. Effect on the quality of peer review of blinding reviewers and asking them to sign their reports: a randomized controlled trial. *JAMA* 1998;280:237-240. The *BMJ* sent out articles containing deliberate mistakes and used reviewers' ability to spot the errors to determine whether the quality of reviews was affected by revealing the

reviewers' names. Although the effect of masking reviewers proved equivocal, the small number of errors picked up by most reviewers was alarming.

28. Pitkin RM. The rewards of reading instructions from journal editors. *N Engl J Med* 1998;339:1006. A delightful (yet sobering) study in which Roy Pitkin proved that virtually no one reads journals' instructions to authors by offering a financial reward to anyone who read his.

29. Juni P, Witschi A, Bloch R, Egger M. The hazards of scoring the quality of clinical trials for meta-analysis. *JAMA* 1999;282:1054-1060. The same set of articles was analyzed with each of 25 quality scales and checklists. Not only did different scales identify different articles as being of high or low quality but the pooled results of "high-quality" articles differed in both direction and magnitude, depending on which scale was used.

30. Cooper RJ, Schriger DL, Tashman DA. An evaluation of the graphical literacy of *Annals of Emergency Medicine*. *Ann Emerg Med* 2001;37:13-19. The majority of graphics in 147 articles, although internally valid, failed to take full advantage of the graphic's potential and often depicted summary data when portrayal of subject-specific data was possible.

31. Egger M, Juni P, Bartlett C, for the CONSORT Group. Value of flow diagrams in reports of randomized controlled trials. *JAMA* 2001;285:1996-1999. The CONSORT statement for reporting randomized controlled trials recommends including a flow diagram that shows the number and status of patients at each stage of the research. This study showed that few authors are using the diagrams to full advantage.

32. Ioannidis JPA, Lau J. Completeness of safety reporting in randomized trials: an evaluation of 7 medical areas. *JAMA* 2001;285:437-443. A survey of 192 randomized drug trials found that the median

space allocated to safety results was 0.3 page. A similar amount of space was devoted to contributor names and affiliations.

33. Lawrence S. Online or invisible? *Nature* 2001;411:521. Thought-provoking arguments about achieving impact and scientific progress as a result of making research widely accessible free of charge.

34. Balk EM, Bonis PA, Moskowitz H, et al. Correlation of quality measures with estimates of treatment effect in meta-analyses of randomized controlled trials. *JAMA* 2002;287:2973-2982. The inclusion or exclusion of various aspects of clinical research designs and activities was not associated with differences in treatment effect; this finding cast doubt on the validity of component scales and checklists as measures of the quality of scientific articles.

35. Chaudhry S, Schroter S, Smith R, Morris J. Does declaration of competing interests affect readers' perceptions? A randomised trial. *BMJ* 2002;325:1391-1392. Yes. Readers rated findings not only less credible but also less interesting if the authors declared links with a (fictitious) drug company. Readers' skepticism about commercial sponsorship may be healthy, but such findings explain why increasing transparency is sometimes resisted.

36. Gelman A, Pasarica C, Dodhia R. Let's practice what we preach: turning tables into graphs. *Am Stat* 2002;56:121-130. Shows how most tables can be reformatted as figures with better results in communicating data.

37. Schofield EK. Quality of graphs in scientific journals: an exploratory study. *Sci Ed* 2002;25:39-41. Having surveyed editors and evaluated graphs in journals, the author concludes that quality of graphs is often a problem. She recommends that scientific journals have detailed instructions for submitting graphs and that editors enforce them diligently.

Two 50s continued

38. Tenopir C, King DW. Reading behaviour and electronic journals. *Learn Publ* 2002;15:259-265. Early attempt to quantify the impact of increasing journal availability in electronic form on patterns of use by scientist-readers.
39. Arunachalam S. Information for research in developing countries: information technology—friend or foe? *Bull Am Soc Inf Sci Technol* 2003;29(5):16-21. First-hand exploration of the problems of “doing science” in the developing world.
40. Kling R, Callahan E. Electronic journals, the Internet, and scholarly communication. *Annu Rev Inform Sci* 2003;37:127-177. Not original research but a nice review of the economics and complexities of the e-journal space.
41. Melander H, Ahlqvist-Rastad J, Meijer G, Beermann B. Evidence based medicine—selective reporting from studies sponsored by pharmaceutical industry: review of studies in new drug applications. *BMJ* 2003;326:1171-1173. An elegant study comparing reports submitted to regulatory authorities with publications in medical journals. The study shows a worrying incidence of nonpublication, duplicate publication, and misleading reporting.
42. Tenopir C, King DW, Boyce P, Grayson M, Zhang Y, Ebuon M. Patterns of journal use by scientists through three evolutionary phases. *D-Lib* 2003; 9: DOI 10.1045/may2003-king (webdoc.sub.gwdg.de/edoc/aw/d-lib/dlib/may03/king/05king.html). Analysis of how use patterns and preferences of scholar-users have changed as journals have passed through “evolutionary stages”, from the earliest emergence of electronic journal delivery to a point where many journals are available in electronic form and heavily interlinked.
43. Chan AW, Hrobjartsson A, Haahr MT, Gotzsche PC, Altman DG. Empirical evidence for selective reporting of outcomes in randomized trials: comparison of protocols to published articles. *JAMA* 2004;291:2457-2465. Important study showing the disturbingly frequent occurrence of selective reporting of outcomes (more than 50%) and investigators’ denials about this despite clear evidence from protocols.
44. Holmgren M, Schnitzer SA. Science on the rise in developing countries. *PLoS Biol* 2004;2(1):0010-0013. Discusses trends in scientific publishing in North America and elsewhere and the need for scientific inputs from developing regions that are important in terms of global processes.
45. Perneger TV. Relation between online “hit counts” and subsequent citations: prospective study of research papers in the *BMJ*. *BMJ* 2004;329:546-547. Comparing early Web activity for research papers in *BMJ* with longer-term citation rate, the author finds a correlation suggesting that “early hit counts capture at least to some extent the qualities that eventually lead to citation in the scientific literature.”
46. Bydder S, Packer D, Semmens J. The value of a scientific writing training workshop for radiologists and radiation oncologists. *Australas Radiol* 2006;50:29-32. Interesting perspective for editors wishing to promote and help with scientific writing by inexperienced authors.
47. Marusic A, Bates T, Anic A, Marusic M. How the structure of contribution disclosure statements affects validity of authorship: a randomized study in a general medical journal. *Curr Med Res Opin* 2006;22:1035-1044. A randomized trial showing that the way in which journals ask for information about individuals’ contributions to papers influences the truthfulness of their answers.
48. Outram SM, Ellison GTH. Improving the use of race and ethnicity in genetic research: a survey of instruction to authors in genetics journals. *Sci Ed* 2006;29:78-81. The authors found that genetics journals provide little or no guidance for improving use or reporting of racial and ethnic categories.
49. Raja UY, Cooper JG. How accurate are the references in *Emergency Medical Journal*? *Emerg Med J* 2006;23:625-626. Errors were found in 19% of all citations checked (n = 2561 in all 2003 issues), and in 8% the errors were major and detracted markedly from the quality of the reference.
50. Stanbrook MB, Austin PC, Redelmeier DA. Acronym-named randomized trials in medicine—the ART in medicine study. *N Engl J Med* 2006;355:101-102. The authors found that trials named with acronyms were cited twice as often as trials not named with acronyms.

50 Resources for Science Editors

Contributors: Seth Beckerman, Grace Darling, Jamie Holaday, Stephanie Deming, Lynn Dirk, Barbara Gastel, Norman Grossblatt, Cheryl Iverson, Lauren Kmec, Mary Knatterud, Peter Mooreside, Leslie Neistadt, Poly M Potter, Jennifer Sills, Ted Wachs, Gabe Waggoner, Trista Wagoner, Stewart Wills, Amy Bertram Wilson.

Many of us would feel lost without our trusted printed and online resources. Below are 50 that one or more respondents cited as favorites.

Books

1. *The ACS Style Guide: Effective Communication of Scientific Information*. 3rd edition. (Anne Coghill and Lorrin R. Garson, editors. Washington, DC: American Chemical Society and New York: Oxford University Press; 2006.) This edition contains new material on markup languages, citation of electronic sources, and online submission of manuscripts. Chemistry-specific content includes chapters on names and numbers for chemical compounds, conventions in chemistry, and chemical structures.
2. *AMA Manual of Style*. 10th edition. (Cheryl Iverson, Stacy Christiansen, Annette Flanagan, et al. New York: Oxford University Press; 2007.) This new edition

contains expanded guidelines for citing electronic references, increased attention to ethical and legal considerations, a new chapter on indexing and searching, an updated section on nomenclature, a more international perspective throughout, and much more.

3. *The BBI Dictionary of English Word Combinations*. (Morton Benson, Evelyn Benson, and Robert Ilson. Amsterdam/Philadelphia: John Benjamins Publishing Company; 1997.) Useful reference work on grammatical and stylistic collocations for editors suddenly unsure of diction or style combinations.

4. *The Chicago Guide to Communicating Science*. (Scott L Montgomery. Chicago: University of Chicago Press; 2003.) Readers expecting a dry handbook of grammar and usage will be pleasantly surprised to find an insightful guide to scientific expression in its various forms (journal articles, proposals, oral presentations, and more) that takes seriously the influence of a scientist's ability to communicate effectively on his or her professional success. Montgomery's own writing is eloquent and masterful, making this book enjoyable to read as well as informative.

5. *The Chicago Manual of Style*. 15th edition. (Chicago: University of Chicago Press; 2003.) A classic reference work. Includes new coverage of electronic publication, a new chapter on American grammar and usage, an updated and rewritten chapter on preparing mathematical copy, and new diagrams of the editing and production processes for books and journals.

6. *The Copyeditor's Handbook: A Guide for Book Publishing and Corporate Communications*. 2nd edition. (Amy Einsohn. Berkeley: University of California Press; 2006.) Excellent instruction in manuscript editing. Includes exercises.

7. *Dictionary of Soil Bioengineering*. (Matthias Oplatka et al. Verein für Ingenieurbiologie. Zurich and Stuttgart:

Hochschulverlag AG; 1996.) A useful multilanguage compendium of terms concerned with rehabilitation and protection of land. Contains many environmental and other terms not easily found elsewhere.

8. *Elsevier's Dictionary of Environmental Hydrogeology in English, French and German*. (Hans-Olaf Pfannkuch. Amsterdam-Oxford-New York-Tokyo: Elsevier; 1990.) Useful reference for editing articles with hydrologic terminology.

9. *Health Writer's Handbook*. 2nd edition. (Barbara Gastel. Ames, IA: Blackwell; 2005.) Provides guidance, useful to editors as well as writers, on writing for the public about medical topics. Includes examples of excellent medical writing for general readerships.

10. *Rhetorical Grammar: Grammatical Choices, Rhetorical Effects*. 4th edition. (Martha Kolln. New York: Pearson Education; 2003.) Provides clear and interesting examples of the rhetorical effects of different grammatical choices. Excellent for sharpening one's rhetorical skills. Worth reading once a year along with *The Elements of Style*.

11. *Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers*. 7th edition. (Council of Science Editors, Style Manual Committee. Reston, VA: The Council; 2006.) An authoritative reference for writing, editing, and publishing in all scientific fields. New features include a chapter on publication policies and practices, a chapter on copyright, and an expanded chapter on scientific conventions regarding genes, chromosomes, and related molecules. The chapters on references and on book and journal publication have been updated and expanded to address electronic as well as print publication.

12. *What to Charge: Pricing Strategies for Freelancers and Consultants*. (Laurie Lewis. Putnam Valley, New York: Aletheia Publications; 2000). This exception-

ally well written book provides excellent advice on determining how to charge (hourly rates, project rates, retainers, and so on), determining how much to charge, and negotiating with potential clients. The author also recommends that freelancers perform a yearly analysis in which they convert the income from their various projects into hourly-rate equivalents and determine which clients and projects paid the most per hour. Short enough to read in one sitting.

13. *Words Into Type*. 3rd edition. (Based on studies by Marjorie E Skillin, Robert M Gay, and other authorities. Englewood Cliffs, NJ: Prentice Hall; 1974.) This is the book I could not do without. It covers almost every grammatical and usage pitfall, has a wonderful index that leads you directly to your query, and amazingly is still current after more than 30 years except for technologic matters. New copies(!) can be purchased at the large online stores we all know about, and a quick search of *bestwebbuys.com* will lead you to many other sources of used copies selling for under \$30. When you find it, buy it: It's worth its weight in gold.

14. *Wörterbuch der Landwirtschaft*. (Günther Haensch and Gisela Haberkamp. Munich: BLV Verlagsgesellschaft mbH; 1996.) A multilanguage dictionary of terms concerned with agriculture, invaluable to editors working with texts in soil science and agriculture in several languages.

15. *Wörterbuch Umweltschutztechnik*. (Egon Seidel. Thun and Frankfurt: Verlag Harri Deutsch, Thun und Frankfurt; 1988.) A multilanguage dictionary of environmental-protection terminology useful for editors working in environmental fields in various languages.

16. *Writing with Style: Conversations on the Art of Writing*. 2nd edition. (John R Trimble. Upper Saddle River, NJ: Prentice Hall; 2000.) Written by an English professor at the University of Texas, Austin, this compact and truly fun book teems with pointed advice and pithy quotations that

Two 50s continued

writers and editors in any genre (including scientific discourse) should take to heart, for example, this line from critic Wayne Booth: “The writer who assumes that it is enough merely to write an exposition of what he happens to know on the subject will produce the kind of essay that soils our scholarly journals, written not for readers but for bibliographies” (page 88).

Articles

17. Gopen GD, Swan JW. The science of science writing. *Am Sci* 1990;78:550-558. An authoritative description of the special editing required to make science text easily comprehensible. Full text at www.mang.canterbury.ac.nz/writing_guide/writing/gopen.shtml.

18. Sun XL, Zhou J. English versions of Chinese authors' names in biomedical journals: observations and recommendations. *Sci Ed* 2002;35:3-4. This review of Chinese author names recommended writing surnames in all capital letters and hyphenating two-syllable given names.

Online Resources

19. The Accelerator toolbar (dev.cadmus.com/products_and_services/detail.asp?itemID=388B21D2-718B-49BB-A73B-ACB3FC7654EB). Cadmus Professional Communications developed a plug-in document template that enhances Microsoft Word and makes common copyediting tasks more efficient. Transposing letters, changing case, inserting special characters, and toggling among word choices (for example, while/whereas/although, since/because, based on/on the basis of, U.S./United States, numbers/numerals) are some of its features.

20. Amazon.com (www.amazon.com). A reliable source for locating both old and new books. Offers not only citation information but (often) tables of contents and text selections.

21. arXiv.org (arxiv.org). E-print archive in physics, mathematics, computer science, and quantitative biology.

22. Babel Fish Translation (babelfish.altavista.com/raging/translate.dyn). An easy-to-use translator.

23. Bartleby.com Great Books Online (www.bartleby.com). Provides full text of a few of the required editorial references, including Fowler's *The King's English*, Strunk's *Elements of Style*, and the 1922 and 1995 editions of Roget's *Thesaurus*. Also contains many classics and other works, so it's extremely useful for checking the accuracy of material quoted from them.

24. Biology Online Wiki dictionary (www.biology-online.org/dictionary.asp) Includes well-developed definitions and abundant cross-links.

25. The Chicago Manual of Style Online. 15th edition. Chicago, IL: University of Chicago Press; 2006 (www.chicagomanualofstyle.org/home.html). This online version of the venerable Chicago manual contains the popular Q&A feature in a fully searchable format and offers helpful tools, such as “Chicago-style citation quick guide”. A 1-month free trial subscription is available.

26. CitingMedicine: The NLM Style Guide for Authors, Editors, and Publishers. 2nd edition. Bethesda, MD: National Library of Medicine, Reference Section (list.nih.gov/archives/citingmed.html). This resource, scheduled for publication in 2007, will provide guidelines on how to cite almost any type of document, including online references. You may sign up for information on its publication through the URL.

27. Clusty search engine (clusty.com) Clusty queries several search engines, combines the results, and then generates an ordered list based on a comparative ranking. Clusty groups similar results into clusters by topic, thus helping to obviate scrolling through multiple pages of search results. Free.

28. CNN.com (www.cnn.com). Because editors like to know what's going on outside the science world, too.

29. CrossRef (www.crossref.org). Good source for reference links, DOIs, and so on.

30. A Dictionary of Units of Measurement (www.unc.edu/~rowlett/units/index.html). Lists a wide variety of units, their abbreviations, and, for each, a definition, comments, or both. Also includes a useful index of tables and scales.

31. The Digital Object Identifier (DOI) System (www.doi.org). The “Resolve a DOI Name!” feature lets the user acquire bibliographic information for a known DOI name.

32. Editing Checklists (www.copyediting-l.info/images/checklist.pdf). Freely available on the Copyediting-L listserver, this checklist (submitted by Kathy Frost) contains items of interest to copyeditors, substantive editors, production editors, online editors, and indexers. The list includes helpful computer shortcuts and recommendations for usage and style.

33. EFA's Common Rates for Services (the-efa.org/res/rates.html) This table on the Editorial Freelancers Association Web site includes fee ranges for services that copyeditors, substantive editors, proofreaders, designers, writers, and translators provide.

34. Frontiers in Bioscience: Journal Name Abbreviation, ISSN Number, and Coverage (www.bioscience.org/atlas/jour-abbr/list.htm). Useful resource for reference editing in the biological sciences.

35. Google (www.google.com). This popular search engine probably needs no introduction. However, it merits mention here because of its usefulness in fact checking and other editorially related tasks.

36. Google Images (images.google.com).

Great for finding photographs, diagrams, and other images.

37. Google Scholar (scholar.google.com). Convenient resource for broadly searching the scholarly literature.

38. Grammar Girl Podcasts (grammar.qdnw.com). Offers 5-minute grammar lessons on common mistakes.

39. IUPAC Compendium of Chemical Terminology (www.iupac.org/publications/compendium/index.html). Valuable resource for those editing in chemistry and related fields. Includes a link to an interactive version.

40. Library of Congress Online Catalog (basic search) (catalog.loc.gov/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=First). Helpful in verifying bibliographic information on books (for example, city and country of publication).

41. MathType: a downloadable fully functional 30-day trial version (www.dessci.com/en/products/mathtype/). MathType is an equation editor that works with many word processors on both Windows and Macintosh systems. The program augments conventional programs by setting complex inline or display equations, stacked fractions, derivatives, matrices, geometric components, and many special characters.

42. The Merck Manuals Online Medical Library for Health Professions

(www.merck.com/mmpe/index.html). *The Merck Manual* but better, with material not available in the print version.

43. Merriam-Webster Collegiate Dictionary, 11th edition (www.merriam-webstercollegiate.com). Online searching of the dictionary, thesaurus, encyclopedia, and Spanish-English dictionary. Requires a modest annual subscription.

44. Other helpful Microsoft Word macros (www.copypediting-l.info/macros). This compilation of Word macros on the Copyediting-L listserv can save editors valuable time. Submitted by a list subscriber, the macro file includes nine tools that can be installed individually or together. They have been tested only on her Macintosh running Word 97/98, but she believes they will work with other platforms and versions.

45. PubMed (www.pubmed.gov). Allows users to rapidly access abstracts of published biomedical articles dating back to the 1960s. Through the integrated LinkOut service, links to many full-text articles are also available. The PubMed search interface is powerful and easy to use, and the clear online tutorials make it easy to become a "power user" of this interface. PubMed is an excellent resource for finding helpful background information on new and unfamiliar topics. It is also invaluable for finding information needed to correct or patch holes in authors' confusing descriptions of previously published studies.

46. PubMed Single Citation Matcher (www.ncbi.nlm.nih.gov/entrez/query/static/citmatch.html). Allows one to enter partial bibliographic data and retrieve citations.

47. Reference Links (www.CouncilScienceEditors.org/links.cfm). This part of the CSE Web site includes a wide variety of links useful to science editors. The 34 categories include more than 160 links, including 2 dozen dictionaries, 20-some entries under the broad heading of Medical Internet, and more specific topics, such as Time, Travel, Online Books, Measurement, and Glossaries.

48. Thomson Scientific Master Journal List (scientific.thomson.com/mjl). Lists all journal titles covered in ISI products.

49. Wikipedia (www.wikipedia.org). A quick way to gain broad knowledge on an unfamiliar topic. Not suitable for fact checking.

50. Wolfram Research: Eric Weisstein's World of Physics (scienceworld.wolfram.com/physics). This online encyclopedia was developed by astronomer and physicist Eric Weisstein. Companion encyclopedias exist in astronomy, chemistry, mathematics, and scientific biography.

Again, thanks to all who contributed to these compilations! 🙏