

Runaway Train: Problems of Permanence, Accessibility, and Stability in the Use of Web Sources in Law Review Citations*

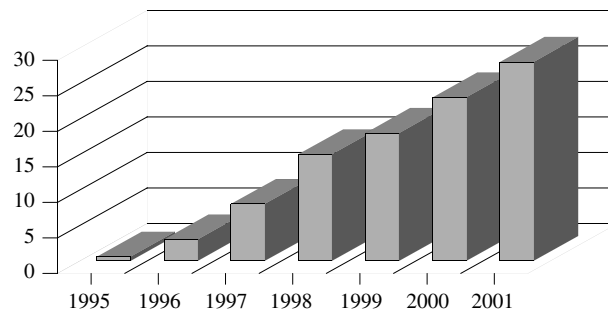
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Ms. Rumsey examines the dangerous use of citations to Web sources in law review articles. URLs in law review citations suffer from “link rot” because Web pages disappear or URLs change. After four years, only 30% still work. Writers and editors can reduce but not eliminate this problem.

Runaway train. Never goin' back.
Wrong way on a one way track.
Seems like I should be gettin' somewhere.
Somehow I'm neither here nor there.¹

¶1 Although the World Wide Web dates back only a few years,² law students and professors have quickly begun to rely on Web sources in their research and writing. A rough measure of that reliance is the increase in the percentage of law review articles that cite to at least one Web source: from half a percent in 1995 to 23% in 2000.³

Figure 1
Percentage of Law Review Articles Citing to the Web



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1. DAVE PIRNER, *Runaway Train*, on GRAVE DANCERS UNION (Sony/Columbia 1992).
2. Michael A. Stoker, Comment, *Framed Web Pages: Framing the Derivative Works Doctrine on the World Wide Web*, 67 U. CIN. L. REV. 1301, 1303–05 (1999) (providing timeline of significant events in development of the Internet and the World Wide Web).
3. See *infra* ¶ 19 for specific data on the percentage of law review articles containing Web citations from 1995 to 2000.

¶2 The use of Web sources as supporting authority in law review article citations raises several questions—some about credibility and authority, others about permanence and stability. While the first issues are certainly important,⁴ this article focuses on the permanence and stability of Web sources. Links to Web pages begin failing even before an article is published. The number of dead links increases rapidly over time. Thus, legal scholars who support their arguments by citing to Web sources lose that support within a few years. The “runaway train” of Web citation leaves broken rails behind it.

Importance of Citations

¶3 As Paul Axel-Lute has stated, “[a] legal citation serves two purposes. First, it indicates the nature of the authority upon which a statement is based. Second, it contains the information necessary to find and read the cited material.”⁵ In law reviews, “[f]ootnotes leave permanent passages and landmarks to obscure information.”⁶ Access to the authority underlying (and cited in) the author’s work is crucial for scholarship. Without it, subsequent scholars cannot examine or re-examine the original author’s conclusions.⁷ Moreover, depending on the reader’s interest, footnotes often point to material more useful than the article itself. Readers frequently skate past an article’s commentary, preferring to look for the original sources cited by the author.

¶4 Legal scholars have been even more compulsive about citations than scholars in other disciplines. For example, one law review article included 4824 citations.⁸ In fact, though often criticized,⁹ footnote citations are a hallmark of legal scholarship. Any practice that undermines the value of citations requires a closer look.

Problems of Permanence, Accessibility, and Stability

¶5 Historically, authors have tried to use citations to sources that are available to all readers. This approach is alive and well in legal scholarship, as evidenced by the current edition of the *Bluebook* which requires that authors cite to printed versions

4. For articles addressing the credibility and authority issues, see Will Manley, *The Worldwide Vanity Press: Reliability of Internet Information*, 29 AM. LIBR. 136 (1998); Pat L. Ensor, *Credibility and Accuracy on the Web: The Librarian’s Role*, TECHNICALITIES, Apr. 1997, at 6; Tschera Harkness Connell & Jennifer E. Tipple, *Testing the Accuracy of Information on the World Wide Web Using the Altavista Search Engine*, 38 REFERENCE USER SERVICES Q. 360 (1999).

5. Paul Axel-Lute, *Legal Citation Form: Theory and Practice*, 75 LAW LIBR. J. 148, 148 (1982).

6. Arthur Austin, *Footnotes as Product Differentiation*, 40 VAND. L. REV. 1131, 1153 (1987).

7. “Once entrenched, [conclusions] often embarked on a life of their own, endlessly copied from secondary source to secondary source, refractory to disproof because no one examined the fragility of primary documentation.” STEPHEN J. GOULD, *THE MISMEASURE OF MAN* 82 (1981).

8. Arnold S. Jacobs, *An Analysis of Section 16 of the Securities Exchange Act of 1934*, 32 N.Y.L. SCH. L. REV. 209 (1987).

9. See, e.g., Arthur D. Austin, *Footnote Skulduggery and Other Bad Habits*, 44 U. MIAMI L. REV. 1009 *passim* (1990).

of case reports where possible, rather than to less accessible commercial services such as LexisNexis, Westlaw, or Loislaw.¹⁰ And there is even a hierarchy among electronic resources, as noted in a recent review of the *Bluebook*: “[D]isappearing documents or even entire Web pages, changing uniform resource locators (URLs), and access problems make the Internet a relatively unstable environment. . . . For this reason, the *Bluebook* creates a hierarchy among electronic sources, giving priority to commercial electronic databases. . . .”¹¹ Increasing use of Web citations erodes the practice of citing to permanently available sources.

¶6 Web sources raise three distinct problems that I will address in this article.¹² First, permanence—whether a Web page with the cited URL exists when a reader looks for it.¹³ Second, accessibility—whether a Web page is accessible without subscription (or perhaps without registration) on a reliably available server. Third, content stability—whether the Web page has the same content when the reader examines it as it had when the author cited it.¹⁴

Previous Studies of Web Citations

¶7 Previous studies of Web sites (and Web cites) have revealed a disturbing impermanence. For example, Wallace Koehler’s well-documented 1999 study of Web sites and pages reported a 2.9 year half-life for Web sites and 1.9 year half-life for Web pages.¹⁵ Koehler chose Web sites and pages randomly, however, so his results may not apply to the kinds of Web sources cited in law review articles.

¶8 Another study examined the use of Web citations by undergraduates;¹⁶ its authors expressed concern with the impermanence of the underlying sources.¹⁷ This 2001 study by Philip Davis and Suzanne Cohen found that 45% of URLs in year-old student bibliographies failed to lead directly to the cited document.¹⁸ For three-year-old bibliographies, 82% of the URLs failed to lead directly to the cited document.¹⁹ In a different study focused primarily on the quality of undergraduate research sources, Deborah J. Grimes and Carl H. Boening found that about 30% of Web sites listed in their sample were unavailable within *three weeks* of student

10. THE BLUEBOOK: A UNIFORM SYSTEM OF CITATION R. 10.3.1, at 63 (Columbia Law Review Ass’n et al. eds., 17th ed. 2000) [hereinafter BLUEBOOK].

11. Warren D. Rees, *The Bluebook in the New Millennium: Same Old Story?*, 93 LAW LIBR. J. 335, 340, 2001 LAW LIBR. J. 16, ¶ 16 (citing BLUEBOOK, *supra* note 10, R. 18.1, at 130).

12. The additional problems of credibility and authority fall beyond the scope of this article. See *supra* note 4 for articles describing research on these issues.

13. Wallace Koehler, *An Analysis of Web Page and Web Site Constancy and Permanence*, 50 J. AM. SOC. INFO. SCIENCE & TECH. 161, 172 (1999).

14. Koehler calls this concept “constancy.” *Id.* at 174.

15. *Id.* at 179.

16. Philip M. Davis & Suzanne A. Cohen, *The Effect of the Web on Undergraduate Citation Behavior 1996–1999*, 52 J. AM. SOC. INFO. SCIENCE & TECH. 309, 310–11 (2001).

17. *Id.* at 312.

18. *Id.*

19. *Id.*

use. The authors attributed the error rate to dead links and student misreporting of URLs. They noted that students' citations to Web documents were often "muddy, with a high degree of faulty links and errors."²⁰

Design of Current Study

Hypotheses and Research Questions

¶9 In designing a study of law review citation of Web sources, I began with one of those self-evident hypotheses beloved of researchers: writers of law review articles have begun citing to the Web, and Web citations have increased in the last several years. I hypothesized further that law review citations to Web sites suffer from significant "link rot"²¹ that will worsen over time.

¶10 To test these hypotheses, I posed the following research questions:

- How many law review articles contain citations to Web pages?
- Have citations to the Web in law review articles increased?
- What percentage of citations to Web sources have parallel citations to a paper source?
- Do law review citations to the Web suffer from link rot?
- If law review citations to the Web suffer from link rot, does the percentage of nonworking citations increase over time?

¶11 In considering the results of the previous studies of Web citations, I expected undergraduate works to contain more broken links than law review articles, primarily because of the extensive cite-checking process conducted by law review staff. This process should reduce URL citation errors significantly, in comparison to unreviewed student work. Even scholarly works in other fields, while peer-reviewed, do not get the same citation-by-citation testing that law review staffs give articles.²² Thus, I expected a higher percentage of law review Web citations to be free of initial errors. Cite checking should reduce two kinds of initial errors—simple typographical mistakes and more complex errors (such as the use of a site's home page to cite to a temporary news article or use of password-protected sites²³).

20. Deborah J. Grimes & Carl H. Boening, *Worries with the Web: A Look at Student Use of Web Resources*, 62 C. & RES. LIBR. 11, 13 (2001).

21. Link rot is "the problem of links that lead the reader to defunct sites." Howard A. Denemark, *The Death of Law Reviews Has Been Predicted: What Might Be Lost When the Last Law Review Shuts Down?*, 27 SETON HALL L. REV. 1, 32 n.77 (1996) (citing *CGI Joe's Guestbook*, <http://heron.tc.clarkson.edu/odonnell/cgi-bin/guestbook.pl.cgi>, which, in a bit of cheap irony, is no longer available at that URL).

22. Ann C. Weller, *Editorial Peer Review: Research, Current Practices, and Implications for Libraries*, SERIALS REV., Spring 1995, at 53, 56–57 (noting that reviewers presume that references and quotations are correct).

23. Because many law schools have access to subscription-based resources through IP address validation, students and faculty at these schools may not even realize that access outside the schools requires a password. Ideally, cite-checking at another law school should catch this problem.

¶12 On the other hand, passage of time can be expected to rot Web links as documents age. Unlike undergraduate paper-writing (in which many students do research just hours before their papers are due, as librarians can attest), the nature of law review publishing creates a significant delay between when an article is written and when it finally reaches print.²⁴

Methods and Definitions

¶13 I used randomly selected²⁵ law review articles from Westlaw's JLR (Journals and Law Reviews) database. To focus on scholarly articles, I excluded Practising Law Institute and ALI-ABA continuing legal education materials.²⁶ From the hundreds or thousands of documents retrieved, I selected one hundred documents from each year. I focused on the years 1997–2001 because earlier years contained relatively few articles citing the Web, and many of those articles were Web research guides. If a selected document happened to be a Web research guide, I threw it out and chose another document at random.

¶14 I excluded citations that I concluded had not been intended to support scholarly arguments. In effect, this rule meant I tested almost every citation by seeing whether the URL took me to the cited document. I excluded citations intended as legal research suggestions: for example, if an author writing on legal ethics noted in passing that ethics opinions for various states were available at certain URLs, I did not count those citations as substantive. Occasionally, an author would include his or her home page in a footnote; I excluded this kind of cite as well. I counted citations each time they appeared, even when an author cited to a Web source repeatedly. The exception is citations signaled by “*id.*” or “*supra.*”²⁷

¶15 I defined a “nonworking” link as one that neither takes a user to a Web page on which the document appears, nor takes a user to a page that lists the document by title. Thus, a citation to a Web document “available from” a home page was counted as “working” only if the document's title appeared on that home page. This approach mirrors the assumptions in at least one other study of link rot.²⁸ URLs that worked because of a redirecting link were counted as working.

¶16 Links become unavailable for many reasons, including content reorganiza-

24. Kenneth Lasson, *Scholarship Amok: Excesses in the Pursuit of Truth and Tenure*, 103 HARV. L. REV. 926, 933 (1990) (noting delays in publication of law review articles).

25. Documents, retrieved in reverse chronological order, were selected by their Westlaw “rank” number, using a list of five-digit random numbers. Some nonrandom adjustments were made to pick a wide range of documents within each year's search result. As a specific example, for the 1997 data, I used only the last three digits of the numbers because my result included only 750 documents.

26. A typical search was: date(2001) & http! but not prelim, source(“practising law” or ali-aba).

27. Because I used a rather mechanical “find” function to look for the term “http,” I was unable to count Web citations signaled only by the use of a short form such as “*id.*” or “*supra.*”

28. Carol Anne Germain, *URLs: Uniform Resource Locators or Unreliable Resource Locators*, 61 C. & RES. LIBR. 359, 362 (2000).

tion, “death”²⁹ of a sponsor, loss of interest on a sponsor’s part, deliberate suppression by sponsor, and so on. In this study, I was concerned with the fact of the link’s disappearance rather than the cause. Therefore, I did not try to identify causes systematically.

Process

¶17 After collecting a set of documents, I used WordPerfect’s “Find” function to locate each instance of “http,” whether the reference appeared in text or in a footnote.³⁰ I examined each instance to see whether the Web source was used to support an argument or merely to give identifying information (such as an author’s Web site). I also noted how many citations were to Web pages alone, and how many were given as parallel citations to print documents.³¹ To prevent the introduction of errors, I deleted spaces inserted in the downloading process. The only other adjustment I made to citations was to repair a handful of obvious problems. I inserted missing colons or back slashes after “http” and converted the word “tilde” to an actual tilde.

¶18 Next, during May and June 2001, I tried to locate the cited page, using the URL given. Unlike some other researchers,³² I did not try to retrieve cited documents via search engines or other techniques. References should lead the reader directly to the cited document, not send him or her on a time-consuming, possibly fruitless, search. After a minimum three-day interval, I retested links that elicited a “server down or not responding” message. Links that remained unavailable on the second try were marked as nonworking. I marked any site that required a subscription as nonworking, but sites such as the *New York Times*, which merely require registration, were classified as working.

Results: Links Getting Nowhere

Web Cites on the Rise

¶19 The number of law review articles citing to the Web has increased from 130 articles in 1995 to 5462 in 2000. The percentage of articles during that period that cited at least one Web source are as follows: in 1995, .57% of documents contained at least one Web citation; in 1996, 3%; in 1997, 8%; in 1998, 13%; in 1999,

29. A corporate sponsor may become bankrupt or wind up part of its business; a personal sponsor may lose Web server privileges (e.g., at a university), or die. Richard Wiggins, *Digital Preservation—Paradox & Promise*, LIBR. J. NETCONNECT, Spring 2001, at 12–13, distributed with LIBR. J., Apr. 15, 2001, available at http://www.libraryjournal.com/digital_preservation.asp (listing reasons for disappearance of Web content).

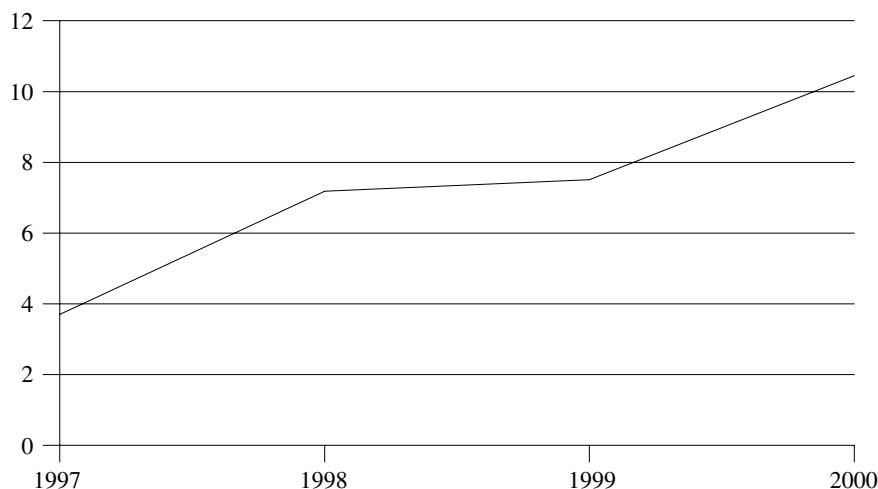
30. I ignored citations to gopher sites, but suspect that these have fared even worse as Internet content has migrated from gopher servers to Web servers.

31. In a few cases, it was hard to tell if the author was citing to a print source. For example, one article cited to state bar ethics opinions in *Bluebook* format and gave a Web source. In doubtful cases, I counted the reference as a “URL and print” reference.

32. See, e.g., Davis & Cohen, *supra* note 16, at 311.

18%; in 2000, 23 %.³³ The *average* number of Web citations per article containing such citations has also increased, from about 1.9³⁴ in 1995 to 10.45 per article in 2000.

Figure 2
Average Number of Web Citations per Article Containing Web Citations



Lack of Parallel Citations

¶20 One remarkable result of the study was the percentage of citations that listed Web pages alone rather than including them as a parallel citation to a paper source.³⁵ The *Bluebook* editors seem to envision the use of Web citations primarily as a parallel source.³⁶ Despite the *Bluebook* rules, however, most citations to the Web do not include a parallel citation to a print source, even if such a source is readily available. For various years examined in the current study, the percentage of citations solely to Web pages ranged from 92% to 98% of total citations with URLs. Even when the same information appeared in print, some authors relied solely on a Web source. For example, references to such a law review staple as testimony at congressional hearings were sometimes cited to the Web sites of gov-

33. See *supra* Fig. 1 for a graphic illustration of this dramatic increase in percentages of articles containing Web citations.

34. This figure is debatable; the earliest law review citations to the Web cannot easily be classified as legal research guide citations versus substantive citations.

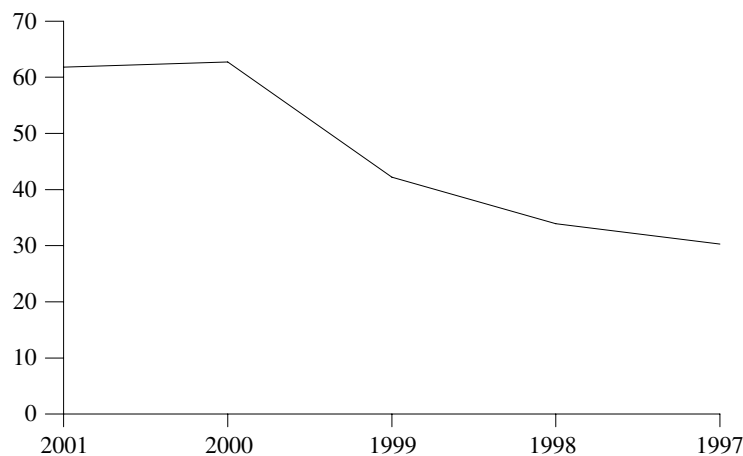
35. Percentage of “parallel” citations—those to both a Web and a print source: 1997, 2%; 1998, 3%; 1999, 6%; 2000, 8%; 2001, 3%.

36. BLUEBOOK, *supra* note 10, R. 18.2.1, at 132–33 (“This rule requires the use and citation of traditional printed sources, except when the information is not available in a printed source, or if the traditional source is obscure or hard to find and when the citation to an Internet source will substantially improve access to the same information contained in the traditional source.”).

ernment agencies or nonprofit organizations.³⁷ Other examples of reliance on Web sources included citations to treaties, the *Federal Register*, the *Federalist Papers*, articles from magazines such as *The Atlantic*, and countless newspaper articles.

¶21 Some of these examples may arise because the author lacks ready access to the print source. The best example of this situation is the newspaper article. Many newspapers publish current news on their Web sites as well as in print. Authors using the Web for research may retrieve articles from newspapers unavailable to them locally. At most of these newspaper sites, current news appears first on the home page. Older stories may be archived electronically. If so, the archives may be freely accessible, but some newspaper sites make archives available only to paid subscribers. Other newspaper sites, such as that of the *New York Times*, make archives available but require users to register.³⁸

Figure 3
Percentage of Working Links



Severe Link Rot

¶22 Unquestionably, law review citations to the Web suffer from link rot, and the percentage of nonworking citations increases over time. Ironically, authors who cite Web sites instead of paper sources probably think they are making their sources *more* available to readers, rather than less. As table 1 shows, however, Web citations lack the necessary stability that guarantees access.

37. E.g., John D. Hanson & Kyle D. Logue, *The Costs of Cigarettes: The Economic Case for ex Post Incentive-Based Regulation*, 107 YALE L.J. 1163, 1361 n.301 (1998) (“See Testimony of Jeffrey E. Harris MD PhD Before the Committee on Ways and Means, U.S. House of Representatives (visited July 25, 1997) <http://Web.mit.edu/jeffrey/harris/testimony.html>.”).

38. Some researchers may prefer not to do so, and a print citation would enable them to avoid giving up personal information. Nonetheless, I counted registration-only pages as available.

Table 1
Percentage of Working Links, May–June 2001

Year of Citation	%	No.
2001	61.80%	322/521
2000	62.77	656/1045
1999	42.21	317/751
1998	33.93	244/719
1997	30.27	112/370

¶23 These results suggest that authors who cite to Web sources will see the support for their arguments disappear fairly quickly. Even newly published articles display significant link rot; links in the citations of articles published in 2001 fared about the same as those in articles published in 2000.

¶24 Closer examination of the links that survive shows another disturbing trend. In general, the surviving URLs are those that cite to a home page rather than to a “document-like” Web page. For example, an article on Internet gambling may contain several working links to examples of gambling sites—not particularly useful to the legal researcher. If the article also cites a Web-published study on the harmful effects or economic reach of Internet wagering, however, this link is unlikely to work a few years later. This pattern results because webmasters rearrange site content much more frequently than they change domain names.³⁹

¶25 While librarians may think of government sites as fairly reliable, a test of the 1998 data revealed that only 36% of citations to federal government Web sites worked in June 2001.⁴⁰ (Most of these citations, whether working or not, were to various agency sites, e.g., the EPA, the HCFA, the Fish & Wildlife Service, etc.) This percentage is not significantly better than the percentage of all working citations from 1998 (34%).

Comparison with Nonlaw Scholarship

¶26 I was unable to compare law scholarship with nonlaw scholarship in clean, unambiguous measures. In one longitudinal study of nonlaw scholarly work, Germain looked at the failure rate of URL citations in articles published between 1995 and 1997.⁴¹ In her study, 26.5% of cited Web pages were inaccessible in 1997, 37.5% in 1998, and 48.4% in 1999, an increase of about 11% annually. Since the documents Germain checked were from a three-year period (1995, 1996,

39. Of course, domain names do change occasionally. One article cited to what had been a venture capital firm’s site but which now belongs to a bed-selling company. D. Gordon Smith, *Venture Capital Contracting in the Information Age*, 2 J. SMALL & EMERGING BUS. L. 133, 176 n.143 (1998) (“See Burr, Egan, Deleage & Co. (last modified May 21, 1997) <<http://www.bedco.com>>.”).

40. Results of searching for “govl” within the 1998 datasets and excluding citations to state government sites: twenty-four of sixty-six citations still worked.

41. Germain, *supra* note 28.

1997), and her methods differed (e.g., more attempts to fix “bad” URLs), it is impossible to compare Germain’s results directly with those of the current study. Nevertheless, comparing the average percentage of 1997–1998–1999 law review Web citations that worked in 2001 (35%) with the percentage of 1995–1996–1997 scholarly article Web citations that worked in 1999 (41.6%) suggests that law review citations may be *less* permanent than those in nonlaw publications. Also supporting this conclusion is the figure combining 2001 results from 1999–2000–2001 (44% unavailable) with Germain’s figure for 1997, in which 26.5% of the citations were unavailable.⁴²

¶27 Of course, readers of articles can attempt to find the sources that turn up “bad” in citations that suffer “link rot” by searching the Web. Probably a search engine such as Google could retrieve many of these pages.⁴³ Many other pages, however, have vanished forever. Also, because of the lack of a permanent citation, even a reader who finds a page that “looks right” may never be sure he or she has found the correct page. While we can be sure that only one article will ever appear on page 199 of volume two of the *Yale Journal of Law and Feminism*, we have no such assurances on the World Wide Web. This uncertainty raises the second, potentially more serious, problem with Web citations—content stability.

Content Stability—Neither Here Nor There

¶28 The instability of Web pages threatens legal scholarship even more than simple link rot does. Unlike articles or books in print, Web pages can be easily edited or replaced. Even if a URL is persistent and retrieves a document with the same title as that cited in an article, the contents of the page may have changed since the author created the citation. Nothing about a URL citation guarantees that the page it identifies has remained unchanged. Webmasters may reuse a URL for completely different information. In one case the URL given in a citation to an organization’s 1999 press release had subsequently been used for an entirely different 2000 press release when the citation was checked in June 2001.⁴⁴ Another practice of webmasters is to replace old information with new. For example, one law review article cited the National Park Service, Big Bend National Park 2000 Fact Sheet.⁴⁵ When I checked the page, the site owner had replaced it with the 2001 information, using the same link.

42. *Id.* at 362.

43. *But see* Davis & Cohen, *supra* note 16, at 312 (finding that 53% of cited documents from 1996 bibliographies could not be found by using Google).

44. Sara Rosenbaum & David Rousseau, *Medicaid at Thirty-Five*, 45 ST. LOUIS U. L.J. 7, 51 n. 46 (2001) (citing HIAA press release, “HIAA Is Fortune’s Top Health Insurance Trade Assn. for 3rd Consecutive Year” (Nov. 15, 1999), at http://www.hiaa.org/news/news_current/press_releases/release110.html). When checked in June 2001, this retrieved a press release titled “Kahn: ‘Drug Only’ Coverage For Seniors An Empty Promise” (Mar. 22, 2000).

45. Paul Costa, Comment, *Unbuilding a Bridge to the Twenty-First Century: The Coast Guard, Common Sense, the Law, and Sustainable Development*, 31 ENVTL. L. 95, 123 n.194 (2001).

¶29 Other changes, even more subtle, may not be reflected in the title of a page, making them harder to spot. Although I noted a few examples of changed page contents while checking links, I did not try to decide whether the contents still supported the proposition for which the authors cited them. Journalist Terry Allen documented changes made to the U.S. Fish and Wildlife Service Web site in the week after President Bush was inaugurated.⁴⁶ The Web page originally described damage to the Arctic National Wildlife Refuge if oil and gas drilling were permitted. Suddenly all references to potential damage disappeared, leaving only descriptions of the refuge's wildlife.

¶30 While changes like these are common, documentation of them is not. Koehler, one of the few researchers to have looked at this phenomenon systematically, reported that 98.3% of Web pages show some change in content after six months, and 99.1% do so after a year.⁴⁷ An author who supports an argument by citing a fluid, unstable source like a Web site may appear stupid or dishonest once the source changes.

Conclusions and Recommendations

¶31 The “slow fires” of acidic paper⁴⁸ have met their match in the runaway train of Web citations. In theory, law reviews or authors keep a copy of Web pages cited by authors,⁴⁹ as they do other inaccessible materials, such as unpublished manuscripts. A possible follow-up to this study is to contact the law reviews that published the articles and ask for copies of the cited Web pages. Anecdotal evidence and discussions with law review editors, however, suggest that this method would not provide an acceptable substitute for traditional access. Most law reviews operate with transitory student management, and they lack the personnel and financial resources to operate document delivery services. Moreover, even if law review offices could provide documents to everyone who asked for them, such a cumbersome process would make it much harder for researchers who seek to examine the cited sources.

¶32 No easy answers are in sight. Webmasters will continue to reorganize content, and sponsors will go bankrupt, lose interest, or simply delete pages to save server space. Various attempts to “archive the Web” are underfunded and technologically intimidating.⁵⁰ Copyright restrictions prevent authors from putting up their own mini-archive of sources cited in their articles.

46. Terry Allen, *Department of Corrections*, HARPER'S, June 2001, at 14.

47. Koehler, *supra* note 13, at 179.

48. See, e.g., Charles L. Cali, *A Hidden Enemy: Acidity in Paper*, LIBR. & ARCHIVAL SECURITY, Fall–Winter 1995, at 33, 34; Patricia M. Battin, *The Importance of Archives: Effects of Acid Paper*, 53 AM. ARCHIVIST 188, 188–89 (1990). Both articles describe the deterioration of acidic paper.

49. The *Bluebook* encourages preservation of Web pages and a notation of such preservation after the URL. BLUEBOOK, *supra* note 10, R. 18.2.1(h), at 137.

50. Wiggins, *supra* note 29, at 15 (describing Brewster Kahle's work on the Internet Archive).

¶33 If authors and publishers cannot effectively supply the vanished Web pages—and Web pages will continue to change and disappear—should authors stop citing to the Web? Probably not. As librarians know, the U.S. government has embarked on an unstoppable program of transforming its printed products to Web pages.⁵¹ Thus, many valuable sources may now or in the near future be available only on the Web or from commercial publishers. State governments have used the Web to make their documents, never easily accessible, much more widely available than before. Numerous nonprofit organizations, such as human rights groups, also use the Web as a low-cost publishing tool. Corporations, law schools, professors, and law firms have all placed valuable content on the Web, much of it unavailable from libraries or commercial databases. Even quixotically, no one would propose that scholars ignore this content. Citations to Web sources are unavoidable.

¶34 A better approach, then, is for authors and editors to try to minimize the problem. First, authors should include complete citation information, such as title, site owner, and any category under which the page was listed (e.g., “Publications” or “Resources”). Authors should also increase the amount of parenthetical information used to summarize a source’s content. These latter two suggestions will help readers use search engines to locate pages when links break or to find comparable paper sources.

¶35 Most important, authors should select sources with permanence in mind. Certain printed materials (such as pamphlets, conference proceedings, trade brochures, dissertations, and government agency publications) are “almost impossible to retrieve and thus are generally not cited in scholarly work.”⁵² (Of course, the real reason they are not cited may be that the original researcher has trouble getting them, not that the researcher fears that others will be unable to do so.) These sorts of printed materials resemble many of the Web pages to which law review authors have begun citing. Authors may need to reconsider the use of such sources. Some information, such as census results or other statistics, may appear in several Web sites and publications. Authors should look beyond the Web for alternate, permanent authority.

¶36 Moreover, authors should provide a parallel print citation where possible. For example, law students and professors with access to LexisNexis and Westlaw databases should use them for newspaper citations, since those databases usually include page citations. In Warren Rees’s review of the seventeenth edition of the *Bluebook*, he recommends “staying away from” parallel citations for electronic

51. See, e.g., Wendy R. Brown, *Federal Initiatives to Promote Access to Electronic Government Information: The Impact on the Federal Depository Library Program*, 91 LAW LIBR. J. 291, 292–99 (1999); George D. Barnum & Steven P. Kerchoff, *The Federal Depository Library Program Electronic Collection: Preserving a Tradition of Access to United States Government Information*, 6 NEW REV. ACAD. LIBRARIANSHIP 247, 247–48 (2000). Both articles trace the history of federal electronic publishing.

52. Germain, *supra* note 28, at 360.

sources; though acknowledging the problem of link rot, he argues that “commercial databases and government Web sites have achieved a fairly high level of stability.”⁵³ While commercial databases may be stable, my results show that even government Web pages disappear, get renamed, migrate to other servers, or morph into different content.

¶37 Law librarians who work with law students and professors should encourage them to cite to paper sources or commercial databases if possible. Many law librarians work with law review students on cite checking and source finding; this is an opportunity to suggest alternate sources. Webmasters, some of whom are librarians, should include redirecting links to minimize the disruption of site reorganizations. Authors and law review organizations should retain copies of all Web pages cited to in published articles.

¶38 These remedies will not solve the whole problem. Unlike most Web sites, which this study shows are far from permanent, link rot in law review articles lasts forever. The Web is a great treasure trove of information; unlike a library, however, it is not an archive. As law librarians, we should help authors and editors strike the best balance between taking advantage of the Web’s riches and citing to stable and permanently accessible sources.

53. Rees, *supra* note 11, ¶ 25.

