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Public

When a scholarly journal is free for online reading, or when a researcher places a published article in an open access e-print archive, it is first of all a boon for researchers and students the world over. However, open access is also public access. Open access is slowly making a greater portion of the research literature publicly available. This will mean little enough, admittedly, to most of the people most of the time. Still, it is not difficult to imagine occasions when a dedicated history teacher, an especially keen high school student, an amateur astronomer, or an ecologically concerned citizen might welcome the opportunity to browse the current and relevant literature pertaining to their interests. Increased access could also contribute context and depth to the work of investigative reporters and policy analysts. It could assist small-town physicians and lawyers stymied by difficult cases. Or this public right of access could turn up in a William Haefeli *New Yorker* cartoon, depicting a young son sitting on his father's knee and responding to the proverbial patriarchal wisdom with "Please don't be offended if I consult additional sources of information" (2004).

While the public use of research published in a scholarly journal will add little or nothing to the publishing costs of the journal—barring an overwhelming surge of interest in a particular title—it will increase the presence and impact of the work published. And this may lead, in turn, to greater public support for research and scholarship. That is, the public impact of open access forms part of the case for an open access approach to scholarly publishing.

To speak of public access once again raises the issue of a *digital divide* that limits many people's hope of ever visiting the Internet. The digital divide is obviously rooted in larger economic disparities that are unlikely to be overcome within the current world system, and yet when it comes to the public sphere, governments and philanthropic organizations have initiated a number of programs that have substantially increased the presence of the Internet in libraries, schools, and community centers.[1] At any rate, waiting for the divide to be closed somehow is a poor excuse for the academic community's not doing what it can now do about the inequitable distribution of access to research and scholarship. Critiques of the digital divide in hardware and software lose some of their sting if the authors are doing nothing to ensure that their own content contributions are made freely available online and not part of an information divide. On the other hand, increasing public access to relevant research could provide, say, antipoverty organizations in Vancouver, Aborigine organizations in Sydney, union organizers in Washington, and health organizations in Indonesia with the latest findings, historical patterns, international comparisons, and proven methods, all of which would further their efforts and improve the quality of their work (Williams 2002; Edejer 2000; Zielinski 2000).

Opening the research literature's virtual door to the public in this way bears a certain kinship to the nineteenth-century public library movement that took hold during the other age of information, during the nineteenth century. As Alan Rauch points out in his history of that earlier era, this "obsession with knowledge" was led by the Society for the Diffusion of Useful Knowledge, as well as by public libraries and mechanics institutes that operated as self-improvement societies, with libraries and regular lectures, for their craftsmen members. There was a corresponding growth in the publication of periodicals, encyclopedias, and societies, all concerned with fostering public knowledge

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[1] Bill Gates has provided support for Internet access to 95 percent of the public libraries in America, at a cost of $250 million (Egan 2002); in Cameroon, the universities are establishing satellite Internet hookups that will eliminate the faculty's current dependence on Internet cafés for access (Shafack and Wirsiy 2002). Also see the Web sites of the Digital Divide Network 〈http://www.digitaldividenetwork.org/〉 and PowerUP: Bridging the Digital Divide 〈http://www.powerup.org〉.

(2001, 1).[2] The public library, in particular, has long been a beacon of self-directed and deeply motivated learning on the part of common readers. It is not only a vital cornerstone of democracy, but a public site of quiet solace, intellectual inquiry, and literary pleasures. To increase public access to online research and scholarship would add a great deal to what has emerged over the last decade on the Internet as a wired and virtual public library, providing people with an opportunity to explore a new world of ideas that they may have only suspected existed.

Already, with only a limited body of literature freely available online, that portion of the public with Internet access has shown a surprising capacity for delving into studies of relevance and interest to them. As I discuss in this chapter, public interest in the life sciences has reshaped the U.S. National Library of Medicine Web site, as well as altering professional practice in health care. In astronomy, public access is enabling amateur astronomers to contribute to the professional literature. Whereas in chapter 11, I describe how presenting readers of research with related links can help more of them get more out of what they read, here I discuss why public interests already form part of the case for open access.

Nowhere has the democratic quality of the open access question played itself out more dramatically in recent years than in the doctor's office. The Pew Internet and American Life Project calls the new level of public access to medical information and research made available on the Internet an "online health revolution" that is helping "American take better care of themselves" (Fox and Rainie 2000).[3] This "new method of care,"

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[2] Rauch writes of the nineteenth century as "driven by remarkable changes in technology and science, [when] knowledge was both inspirational and irresistible in terms of its potential for social and cultural transformation" (2001, 1). It was an age given to "mental improvement" and scientific innovation, taken up in both public forums and private homes, giving rise to an influential knowledge industry, or as David Mason held, in 1862, "an encyclopedia chained at Charring Cross for public reference would be a boon for London worth fifty drinking fountains" (quoted in Rauch 2001, 39).

[3] A related Pew Internet and American Life Project report found that 60 percent of Americans now have Internet access, of which 81 percent expect to find "reliable information about health and medical conditions online," while 45 percent of those who do not have Internet access also see the Internet as a reliable source of this information (Larsen and Rainie 2002).

based on patients' informing themselves on health issues, is being called by physicians—now that they have overcome any initial sense of intimidation by patients—"shared decision making" (Brownlee 2003, 54). I hardly need add that *shared decision making* sounds a lot like democracy on a personal level, and if what it takes is access to relevant and rigorously reviewed information, it could apply equally well to schools, neighborhoods, and workplaces. If nothing else, this public access to research might provide a slight democratic check on the tyranny of expertise, as the experts' sources can be verified and countered. The quality of the information available to the public, however, is dependent on the proportion of peer-reviewed research to which there is open access, compared to the vast amounts of other sorts of online information. As I mentioned in the opening chapter, the NIH is now considering a request that who have received federal funding from the NIH provide open access to any work resulting from the funded research within twelve months of publication, a measure that has attracted support not from Nobel Prize winners, but from the Alliance for Taxpayer Access.

Six million Americans go online each day in search of information about health issues (NIH 2003). A significant proportion of those people report that they have been influenced in their thinking and practice by the information they have accessed, although they also express some concern over the quality and reliability of that information (Fox and Rainie 2000). They are taking what they find to the doctor's office, as suggested by the fact that 85 percent of the physicians in one study noted that their patients had brought Internet materials on health issues when they visited, with some doctors holding that this led to "less time-efficient" visits (Murray et al. 2003; see also Freudenheim 2000). Of course, very little of the health information that patients access is drawn from peer-reviewed journal articles, as the vast majority of that literature is only available to them, if at all, if they come to their computer with a credit card in hand (Okamura, Bernstein, and Fidler 2002).

Still, one study, done with physicians in Glasgow, found that the accuracy and reliability of the information which the patients, working with what is available, brought into their doctors' offices was not a major cause of concern for physicians, although they observed that patients often needed help in interpreting it correctly (Wilson 1999). What was also encouraging in this study was that the majority of the physicians reported that the information brought in by patients was new to them. That patients are contributing, even in a small way, to the education of physicians and that physicians might in turn help patients interpret health information strikes me as a significant contribution to the general level of public education. Certainly, most doctors do not rely on their patients for online research. A great number of them already use the Internet on regular basis, or as one explained, the "newest and best in medical research [is] right at our own desks," leading them to discover, for example, that "leeches, for example, are now used on some patients to treat the pain of arthritis" (Sanders 2003, 29).

In an effort to feed patients' hunger for information, as well as address the right to know, doctors in Georgia are experimenting with a "health information prescription" (Brownlee 2003, 54) that will guide patients to reliable sources, including the U.S. National Library of Medicine's MedlinePlus, which combines a layperson's guide to health with the capacity to search for the latest medical research through the PubMed index.[4] As patients find themselves in a better position to make informed decisions, they may decide at times to exercise their right not to be influenced by the latest study. When the risks of menopause hormone therapy were reported, for example, one patient described her decision to stay with the therapy after learning about its dangers because, in her words, "for me, it's a trade-off," given the increased mental agility she experiences as a result of the therapy (Kolata 2003).

The government's development of MedlinePlus as an online medical library for the public represents but one instance of how public access is influencing the organization of scholarly resources. More recently, in February 2000, the National Institutes of Health, other Federal agencies,

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[4] For users who do not belong to a life sciences research library, only the abstract of most articles is available without cost through PubMed, although PubMed provides links to purchase the full text of the article from the article's publisher or to locate a library with a subscription to the journal. PubMed offers online tutorials related to the article's content, as well as health consumer information (through MedlinePlus), supplementary genetic data, and author profiles. Initial studies of "information prescriptions" have found that they can increase the use of the high-quality information sources, as well as the sharing of sources with family and others (D'Alessandro et al. 2004).

and the pharmaceutical industry launched ClinicalTrials.gov. The Web site currently lists 11,400 clinical studies, many of which qualified people can elect to participate in, and others of which serve to inform the public about the state of ongoing investigations. The site involves studies in ninety countries, although most are taking place in the United States and Canada, and it receives approximately 16,000 visitors a day. For example, the listing for one study, "Early Characteristics of Autism," at the University of Washington, announces that the study is "currently recruiting subjects" while describing the eligibility and procedures, as well as providing a link to MedlinePlus information on autism.

Following on the growing public and professional expectation of access to clinical trials, the American Medical Association has appealed to the U.S. government to keep a mandatory public registry of all clinical drug trials, in light of the fact that negative or inconclusive results from such trials often do not see the light of day, whether as a result of suppression by the sponsoring pharmaceutical company or implicit journal policies against publishing these types or results. Without waiting for the government to act, a newly formed International Committee of Medical Journal Editors, made up of the editors of a dozen leading journals, including the *New England Journal of Medicine* and the *Lancet*, has announced that the journals the committee represents will not publish the results of a clinical trial that has not been initially registered in a public database (Meier 2004). However, as John Abrahamson (2004) wisely points out, the results of clinical trials, even when publicly available, are not always going to attract sufficient attention or be sufficiently scrutinized, given the massive promotional budgets of the pharmaceutical industry. Abrahamson provides startling instances of research results' being buried beneath marketing efforts, including the fact that $15 billion worth of the arthritis drugs Celebrex and Vioxx has been prescribed by doctors, despite studies publicly available, through a Food and Drug Administration Web site, that show that these medications increase the risk of heart attacks. (Vioxx's manufacturer, Merck & Co., subsequently withdrew Vioxx from the market on September 31, 2004.) He recommends the establishment of an oversight board, modeled on the National Institute of Clinical Excellence in Britain, to review the research and make recommendations.

Certainly I am not claiming that making research freely available will protect public interests in and of itself, especially when contrary forces are at work, such as the pharmaceutical marketing machine.[5] And yet that machine, too, is responding to the new sense of informed empowerment on the part of the public by shifting the way the drug companies pitch their advertising. Instead of the once-typical "nine out of ten doctors recommend" type of advertisement, they are moving to reports on the latest (supportive) research studies, or as a recent full-page advertisement placed by Merck in the *New York Times* proclaimed: "BE INFORMED. The largest clinical study of its kind including the largest number of people with diabetes: It could have an impact on millions" (June 4, 2004, A9).

The Swiss pharmaceutical Novartis announced that it had awarded $4 million in grants on diabetes research to Harvard and MIT, in what *Nature* termed "a rare public-private partnership that will require it to place a mass of genetic data in the public domain" (Knight 2004). Alan D. Cherrington, president of the American Diabetes Association, commented on the change that this arrangement signified: "Often, when the pharmaceutical industry gets into relationships with academia, they do it in a proprietary way, so they fund the lab and in return they have access to insider information. This [the Novartis arrangement with Harvard and MIT] seems extraordinary" (quoted in Krasner 2004).

While ClinicalTrials.gov and the Novartis research agreement with Harvard and MIT are not about open access publishing, they do reflect a new open and public sensibility regarding issues of access to scientific information. Similar sorts of registries of ongoing research could work just as well, one imagines, for educational, anthropological, sociological, and other sorts of research involving people, while incorporating a broader range of research methods than is represented by medical research's gold standard of the clinical trial.

Increased public expectations in regard to the right to know are contributing to changes among what might be called the subscription-based sector of journal publishing. As mentioned in chapter 1, the *New England Journal of Medicine* decided in 2001 to grant free access to its

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[5] See, for example, Marcia Angell's (2004) *The Truth about the Drug Companies: How They Deceive Us and What to Do about It.*

content six months after it is published and made available to subscribers, while offering immediate free online access to 117 of the world's poorest nations. As a result, more than 250,000 people are visiting the journal's Web site each week, three-quarters of whom are not subscribers and over half of whom come from outside of North America. When the journal first announced this new policy of offering delayed open access, the editors spoke in terms of a future that offered complete, if not immediate, access to the research literature: "It should be possible someday to establish a single, searchable archive of biomedical-research reports in a way that does not threaten the peer-reviewed journals that help create the literature We believe our commitment to providing the full texts of past research articles without charge is a step toward a useful central way to search the biomedical literature" (Campion, Anderson, and Drazen 2001). This book argues, of course, that when it comes to what "should be possible someday," that day has arrived. Were the spirit willing, the technology is ready.

The media are also playing a role in the increased access to health information, turning reports on research into a regular news-you-can-use service. Many newspapers now have weekly health sections that present stories on research covering not only the implications for readers, but the reversals and revisions, challenges and controversies surrounding the latest research. In 2003, for example, the *New York Times Magazine* devoted its entire March 16 issue to the theme "Half of What Doctors Know Is Wrong." The articles in this issue included details about sample sizes, risk probabilities, and research design flaws in the studies discussed, which were taken from the *British Medical Journal* and elsewhere. True, the *New York Times* is not everyone's newspaper, but the public's exposure to research reversals (such as that regarding hormone replacement therapy) and design flaws (such as those surrounding mammograms) are also found in the tabloids and on television news. And the greater understanding of research fallibility and contention that results from this increased media scrutiny and exposure has not led to any sort of outcry against continuing public support for medical research. Rather, it has arguably fed public support for this research, judging by how government funding has continued to grow (to well over $28 billion annually) in the United States while funding for other areas of research has remained relatively static.

While interest and access increase, the public's engagement with research will remain a matter of personal interests, pressing public issues, and passing curiosities. Environmentalist groups provide a good example of personal-public interests in research that go beyond concerns with personal health issues. In his study of environmentalists, political scientist Frank Fischer was impressed with how interested these nonscientists were in research results regarding environmental issues, especially if the data were "presented and discussed in an open democratic process" (2000, 130). More than that, these same "ordinary" citizens have in recent times become actively involved in the research process itself, giving rise to, for example, "popular epidemiology," in which the public helps to track the distribution of diseases, especially as this distribution might be related to environmental factors (151–157). To have a researcher-public alliance forming around environmental issues suggests one way in which both local and expert knowledge can play a critical part in what amounts to a deliberative process over what is to be done, for example, to reduce pollution. "Instead of questioning the citizen's ability to participate, we must ask," Fischer insists, "how can we interconnect and coordinate the different but inherently interdependent discourses of citizens and experts" (45). He calls for a reconstructed concept of professional practice among researchers whose task would then be about "authorizing space for critical discourse among competing knowledges, both theoretical and local, formal and informal" (27).

Just how far this public engagement can go in working for both the public and scientific good has been brought home by AIDS activists during the 1980s and 1990s. As Steven Epstein (1996) tells it in *Impure Science*, these activists successfully struggled for public participation in medical knowledge, managing to bring otherwise overlooked research into the limelight and change the conduct of clinical trials related to the disease. Scientists found themselves moved by these activists in both an intellectual and an ethical sense, and activists, as Epstein puts it, "imbibed and appropriated the languages and cultures of biomedical sciences," acquiring their own forms of credibility in public and scientific deliberations over how to respond to AIDS by "yoking together moral (or political) arguments and methodological (epistemological) arguments" (335–356). The AIDS struggle established the need for, in the words of ACT-UP (AIDS Coalition to Unleash Power) activist Mark

Harrington, "a lasting culture of information, advocacy, intervention, and resistance" (quoted in Epstein 1996, 350). One lesson that might be drawn from this chapter in the fight against this tragic pandemic, which is no less with us today, is that enabling people to play a greater part in the research that directly affects their own lives can lead to better science.

Up to this point, I have focused on the public value of research in a very practical or instrumental sense with health and environmental issues. However, public access to research and scholarship is also about knowing for its own sake. It is a way of supporting people's disinterested pursuit of knowledge, following in the historical tradition, as I noted, of the public library, mutual-improvement societies, mechanics institutes, and extension courses. In the opening decades of the nineteenth century, working men could be found joining botanical societies in England that, in the case of the Lancashire area, met each month in a local pub, according to the historian Anne Secord (1994), where they identified new specimens to be added to their herbarium and exchanged books from their small collections. By the turn of the nineteenth century, there was a thriving industry of working-class science periodicals that became a mainstay of mutual-improvement and cooperative societies, in which fees for subscriptions to these periodicals could be shared among the members (McLaughlin-Jenkins 2003, 150). As the historian Erin McLaughlin-Jenkins sums up this earlier era of increased access, "the penny press, cheap reprints of scientific texts, free libraries, the secularist and political lecture circuit, middle-class popular science and working-class educational initiatives created greater opportunities for contact with scientific ideas ... [and] as a result, intellectuals and hobbyists were increasingly part of a collective pursuit of knowledge" (2003, 161).

Jonathan Rose (2001) is another historian who, in his *The Intellectual Life of the British Working Class*, has done much to capture the voices of those during the course of the last two centuries who, having been otherwise prevented from attending college, strived to engage with its particular realm of ideas. Rose offers the instance of Ewan MacColl, who came of age in the 1930s and tells of his father, an iron founder by trade and a communist by belief, who, in MacColl's words, "belonged to the generation who believed that books were tools that open a lock which would free people. He really did believe it" (quoted in Rose

2001, 316). And in many ways so did MacColl: "For me to go at the age of fourteen, to drop into the library and discover a book like Kant's *Critique of Pure Reason* or *The Mistaken Subtlety of the Four-Side Figure* . . . the titles alone produced a kind of happiness in me. . . . I can remember the marvelous sensation of sitting in the library and opening the volume, and going into that world of Akaky Akakievich Bashmachkin in *The Overcoat* or *The Nose*, or *The Madman's Diary*" (quoted in Rose 2001, 316).

Now it may well have been that "books were a kind of fantasy life," as MacColl reflects back on it, and a "refuge from the horrors of the life around us" during the Great Depression (quoted in Rose 2001, 316). Yet the era's impressive spirit of autodidactism and self-improvement, which MacColl represents so well and which led many to enrolling in extension courses, was to make this particular realm of ideas part of these working-class lives. And if the golden, heroic era of an independent working-class intellectual life is now long past—with Rose pointing to both state-sponsored educational opportunities and increased entertainment options as causes of its decline—that is no reason to deny public access to current discussions of Kant or Gogol in the scholarly literature, when that public access can be so readily provided. Certainly, many if not most journal articles will remain technically impenetrable for all but a small circle of scholars and students, but there are also pieces that might well engender that "marvelous sensation" MacColl speaks of that comes from seeing how others have managed to make greater sense of the human condition.

Then there is the more contemporary instance of Timothy Ferris's (2002) *Seeing in the Dark: How Backyard Stargazers Are Probing Deep Space and Guarding Earth from Interplanetary Peril.* Ferris not only celebrates in this book the considerable accomplishments of amateur astronomers today, he points to the "flourishing of amateur-professional collaborations" among astronomers in various regions of the world. Columbia University's Center for Backyard Astrophysics coordinates a number of projects involving such collaborations, which sometimes include middle and high school students and have led to amateur access to major telescopes, including the Hubble Space Telescope (51–53). The amateurs, of which there are ten times as many as professional astronomers, are able to generate a considerable body of observational data—

often making significant discoveries in the process—which serves the professionals' theorizing and follow-up.[6]

The results of these collaborations make their way into the astronomy journals, on occasion, although not always with due credit to the amateurs, according to some whom Ferris interviewed. Yet the shared interest and commitment to learning more about the heavens remains the driving force of their part-time engagement with astronomy. The personal computer and the Internet are what makes this amateur contribution and collaboration possible. These technologies enable amateurs to record and measure activities in the heavens and connect with other astronomers globally. They are also able to consult the considerable array of open access astronomical research papers, through arXiv.org E-Print Archive, and databases, such as the many-terabyte National Virtual Observatory, which is collecting and coordinating images from dozens of ground- and space-based telescopes around the world (Schecter 2003). A similar level of amateur involvement in linguistics, lexicography, and botany also has a long history, with the work of amateur naturalists proving of great benefit, for example, to Newton's work on tides in the seventeenth century and Darwin's studies in the nineteenth century. And today, noted physicist Freeman J. Dyson (2002) asks, "which other science is now ripe for a revolution giving opportunities for the next generation of amateurs to make important discoveries?" (4).[7]

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6. In its analysis of the tragic re-entry breakup of the shuttle Columbia on February 1, 2003, the National Aeronautics and Space Administration (NASA) benefited from having access to 12,000 videos and images collected largely from amateurs, even if not all items collected proved to be reliable records of the breakup (Schwartz 2003, D1).

7. This quote comes from Dyson's review of Ferris's book, in which he points to botany and zoology as ready for great amateur gains: "We may hope that amateurs in the coming century, using new tools that modern technology is placing in their hands, will invade and rejuvenate all sciences" (2002, 8). I have dealt elsewhere (Willinsky 1994) with public participation during the nineteenth and twentieth centuries in the collection of citations for the editing of the *Oxford English Dictionary* (*OED*). For a well-told chapter in this amateur participation in the *OED*, see Winchester 1998. Finally, on the promise of amateur contributions to the study of history, especially through history Web sites, see Rosenzweig 2001.

By way of a final instance of the way access to research might support public interests in knowledge—before dealing in the next chapter with the political import of this access—I turn to the sweeping digitization of collections and artifacts now underway in many of the world's museums. It offers both a parallel open access development and a further argument for opening the research literature. The American Museum of Natural History, for example, now has 400,000 images and catalog entries online, covering portions of its vertebrate and invertebrate fossils, pickled frogs and snake skins, field journals and scientific sketches. On visiting the museum's Web site, one can take in a period photograph of Mrs. M. Brown posing with a shovel at the Jurassic Bone Cabin Quarry in Wyoming in 1897 or turn to the catalogued images of the fossils that she and the others found. The museum's declared goal is to make its entire collection of perhaps thirty million items available to the public online, and its efforts are multiplied across museums the world over. "We're all heading," the librarian of the Field Museum in Chicago observes, "toward a kind of digital global museum," which will amount, adds *New York Times* reporter James Gorman, to "a catalog of the world" (2002, A1).

As museum collections find their way online, some are being helpfully pulled together in thematic portals, such as the University of California's MaNIS (the Mammal Networked Information System). This portal, supported by the National Science Foundation, opens a door on seventeen museums' collections, enabling people to search across the geographical regions and historical eras represented by these collections. Private foundations, as well as federal agencies such as the U.S. National Endowment for the Humanities, see this new level of access as possessing both scholarly and public potential for making much better use of the treasures in these museums' collections. Although many of these sites are providing free access to their online collections, some are turning to subscription services like ARTstor to manage their online collections. ARTstor currently offers access to nine collections, including that of the Department of Architecture and Design at the Museum of Modern Art in New York, and is following, with Mellon Foundation support, in the footsteps of JSTOR as a "not-for-profit, public utility" (Mirapul 2003).

Subscription services such as ARTstor may encourage museums to place their collections online as well as assist them in doing so, but even with very reasonable fee structures, they will leave the museum field divided between open and closed online collections, much like the journal literature. In comparison to the journals, the museums have always had a public mandate, and one would hope that they will make as much of their collections as possible as open as possible to the public. Still, something is missing from these museum initiatives to digitize their collections. For to find oneself absorbed by a work of art or a natural-history artifact is an experience that could well be enriched by being able to learn more about these images and objects from the scholars and researchers who are studying them with such care. Access to the literature that documents these studies could bring related materials to light, situate fragments within wholes, reveal connections, provide contexts, and pose hypotheses about form and function, origin and evolution. By visiting selective museum Web sites, people are increasingly able to find their way into vast publicly sponsored storehouses of information, whether on paleontology or space travel, ceramic glazes or early typewriters, which they have not otherwise been able to view, even in the museums themselves, which have always faced constraints imposed by limited display space. Yet at the same time that the museums are opening their collections to online visits, the public is being excluded from no less a publicly sponsored effort at making greater sense of these holdings through related scholarship, which is also being rendered digitally in research journals.

At stake in this divide is, for example, an ability to move readily from museum catalogs on amphibians to the scientific analysis of increased mutations among these creatures, where there is some uncertainty about the contribution of pollution, ultraviolet radiation, or the most likely culprit, parasites. Even to begin to create common indexes that, in this example, link museum collections with open access abstracts in *Ecology Letters* or *Conservation Biology* would be a move in the right direction.[8] The educational and scientific potential of connecting artifact with anal-

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[8] Closely related work is already underway, fortunately, on linking "scientific data from museum specimen databases and library catalogs of scientific literature" at the Florida Museum of Natural History; see Caplan and Haas 2004.

ysis is about gaining an understanding that goes well beyond the level that can be obtained from viewing the typical museum exhibit. To create open access to museum collections and to the related research literature would facilitate linking digitized artifact to study and digitized study to artifact. The benefits for each would surely be reciprocal.

Now despite the weight that I am giving public access to research in this book, I understand that the common reader's downloading of the latest article on trilobites from the *Journal of Paleontology* is unlikely to be the number-one argument in convincing researchers, scholarly associations, and journal editors that the circulation of knowledge would be better served by open access to the journal literature. Although I have tried to present evidence from medical research and astronomy of the public's stake and interest in research, it is hard to determine in advance what the public will make of the growing access to all fields of scholarly endeavor. Yet I would argue that proving that the public has sufficient interest in, or capacity to understand, the results of scholarly research is not the issue. The public's right of access to this knowledge is not something that people have to earn. It is grounded in a basic right to know. As online technologies appear capable of extending that right to a greater portion of research and scholarship, it falls to the scholarly community to experiment and test just how far such access can be pursued with new publishing models.

Some will still object that the public already has too much information to deal with and that it is very unlikely to be interested in finding the virtual doors of the university libraries of the world suddenly opened to it. Will public exposure of this academese only further obfuscate the common sense and public knowledge that is democracy's great hope? Well, open access is certainly not about simply dumping shelf-loads of journals into people's laps or laptops. It falls to the scholarly community to keep its work in an orderly and well-indexed form, so that precisely what is needed on a given topic can be brought to bear on it. Having access to indexes that enable one to identify what work deals precisely with the topic of one's interest, following the model of PubMed in the life sciences, complete with user supports that enable further precision in searching, could minimize the dangers of the public's being overwhelmed or overloaded by the amount of available research. Access to high-quality indexing of the scholarly literature needs to go along with open access to the literature itself, as I go on to describe in chapter 12.

All of this is only to say that public access to research literature should not be dismissed as an incidental side-effect of the open access movement. Although it may seem that a vast, rich world of information is now within a click or two of most connected computers, the toll gates that surround the carefully reviewed and well-financed information constituted by scholarly research have grown more expensive and restrictive, even as many pockets of open access have emerged. Whether one considers how dependent research is on public support and good will, or the broader educational goals that could be served by making research more widely available, public access needs to figure in both the case for open access and, as I go on to explore, in the very design of electronic journals for readers. But before I take up the questions raised by the reading and indexing of research, I want to pursue the democratic and human-rights side of public access research and scholarship.