

**THE IMPACT OF GOVERNMENT-
MANDATED PUBLIC ACCESS TO
BIOMEDICAL RESEARCH:**

**AN ANALYSIS OF THE NEW NIH
DEPOSITORY REQUIREMENTS**

Kristopher Nelson¹

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¹ Kristopher A. Nelson (J.D. expected 2009, University of California, Hastings College of the Law) has worked as an information technology professional for the Arnold Library at Fred Hutchinson Cancer Research Center in Seattle, Washington since 1999.

I. INTRODUCTION

On December 26, 2007, President Bush signed the Consolidated Appropriations Act of 2008.² The bill, which became Public Law 110-161, contained a new requirement that manuscripts developed through funding by the National Institutes of Health (NIH) be made available to the public, free of charge, within one year after publication.³ This new mandatory requirement struck a compromise position between the existing pay-to-access model of private journal publishers and the potential free-for-all of the public domain.⁴ But did it go far enough? Should Congress have adopted a more aggressive policy of opening access to research? Alternatively, did Congress go too far, and as a result have we crippled scientific publishing?

In this article, I will examine four models of access: the more *traditional publishing* model, where access to scientific articles requires payment to a private publisher, and where the publisher typically owns the copyright and exercises close control over use; *public domain* access, where all information is freely accessible, freely reusable, and unprotected by copyright; the *open access* model, where articles are free to access immediately upon publication, and many copyright restrictions are lifted, but some still remain; and the *public access* model adopted by Congress and implemented by the National Institutes of Health, where access is granted free of charge after a year, but many copyright restrictions remain.

Throughout my analysis, I will rely on an analytic structure used by others to examine scholarly publishing generally. This structure posits that “[s]cholarly publishing fills at least three purposes within a scholarly community; publicity, access and trustworthiness.”⁵ Publicity is the process by which a potential

² President’s Statement on Signing the 2008 Consolidated Appropriations Act, 43 WEEKLY COMP. PRES. DOC. 1638 (Dec. 26, 2007).

³ Consolidated Appropriations Act 2008, Pub. L. No. 110-161, § 218, 2008 U.S.C.C.A.N. (121 Stat.) 1844, 2187.

⁴ An earlier bill introduced by Representative Martin Sabo (D-Minn) would have mandated that all research “substantially funded by the Federal Government” would immediately enter the public domain. Public Access to Science Act, H.R. 2613, 108th Cong. (2003), 2003 CONG US HR 2613 (Westlaw).

⁵ Mary Anne Kennan & Dubravka Cecez-Kecmanovic, *Reassembling Scholarly Publishing: Institutional Repositories, Open Access, and the Process of Change*, 18 AUSTRALASIAN CONF. ON INFO. SYS. 2 (2007). See also Nicholas Bramble, *Open Access: Problems of Collective Action and Promises of Civic Engagement*, 6–10 (2008) (unpublished comment, available at

audience learns about a work, and includes, for example, advertising and citations by other scholars.⁶ Accessibility refers to the ways in which readers can access the work, including issues of subscription fees, and long-term storage of manuscripts.⁷ Trustworthiness is connected to the quality of a work, and has to do with how much faith a reader can place in a work, even before reading the work itself.⁸ Nicholas Bramble writes that “a description of open access as a robust systemic reform to traditional subscription-based publishing (as opposed to an optional add-on *feature* that sits on top of an existing publishing regime) must account for all three of these functions.”⁹

However, while useful, this structure is grounded firmly in the traditional publishing model. To better understand some of the appeal of other approaches, we need a fourth factor, which I will term “reusability.” Reusability attempts to describe the limits placed on a work’s reuse, such as whether it is acceptable or not to photocopy an article and share it with colleagues, or to put an article you have published on your own Web site. It is important to distinguish this element from the use of what is described within the article, which would bring us into the realm of, for example, patent law. Reusability instead refers to the use and reuse of the work itself, not the processes, methods, discoveries, concepts, or equipment described within it.

Building on these four factors (publicity, access, trustworthiness, and reusability), I will apply this structure to the four publishing models I described above: traditional publishing, the public domain, open access, and, finally, the public-access approach adopted by the NIH, which requires the deposit of manuscripts prepared through NIH funding in a

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1132870 (explaining that open access must account for all three of these primary functions of scholarly publishing); Michael J. Madison, *The Idea of the Law Review: Scholarship, Prestige and Open Access*, 10 LEWIS & CLARK L. REV. 901, 903 (2006) (stating that scholarly publications serve these three primary functions); Rob Kling & Geoffrey McKim, *Scholarly Communication and the Continuum of Electronic Publishing*, 50 J. AM. SOC’Y FOR INFO. SCI. 890, 897–98 (1999) (stating that an effectively published scholarly publication satisfies these three functions).

⁶ See Kennan & Cecez-Kecmanovic, *supra* note 5, at 2 (stating that publicity refers to a range of activities, such as subscriptions, abstracting, indexing, advertising, and citation).

⁷ See *id.* (explaining that accessibility is the stable means by which readers can access a work).

⁸ *Id.*

⁹ Bramble, *supra* note 5, at 7.

centralized, free-of-charge repository. The goal of analyzing and comparing each of these approaches is to better understand the impact of Section 218 of Public Law 110-161 on science and scientific publishing.

A. Background

Copyright, like any form of property right, is a *bundle* of rights.¹⁰ That is, individual rights may be split from the whole and be treated as distinct elements for the purposes of selling, buying, or licensing the property.¹¹ In terms of copyright, these rights generally involve restricting or controlling publication or distribution, performance, and display.¹² In the terms of my analysis, much of the control granted by copyright is thus over the reusability of the work itself, as opposed to what is described therein.¹³

Historically, it was the printing press that drove the desire for copyright protection in Europe for the first time.¹⁴ Once printing and reprinting became mechanized, printers began to want protection for their publishing efforts.¹⁵ Centers of printing became the early adopters of copyright protection.¹⁶ Thus, as a leading publishing center in the 16th Century, Venice enacted what might well have been the first copyright statute in 1517, broadened it in 1533, and then moved beyond printers to consider the rights of authors' works as well as printers.¹⁷ In England, the

¹⁰ 18 AM. JUR. 2D *Copyright and Literary Property* § 77 (2008) (explaining that copyright owners possess a bundle of rights).

¹¹ See *Moore v. Regents of Univ. of Cal.*, 793 P.2d 479, 509–10 (Cal. 1990) (Mosk, J., dissenting) (“[T]he concept of property is often said to refer to a ‘bundle of rights’ that may be exercised with respect to that object—principally the rights to possess . . . , to use . . . , to exclude others . . . , and to dispose of the property by sale or by gift.”).

¹² See 18 AM. JUR. 2D, *supra* note 10, at § 69 (stating that the Copyright Act of 1976 gives a copyright holder the exclusive right to reproduce, distribute, rent, lease, lend, perform publicly, and transmit the copyrighted material).

¹³ What is described in a copyrighted work is not typically protected by copyright, although it may have protection through other forms of intellectual property law, such as patents. For more on intellectual property in general, see ROBERT P. MERGES, ET. AL., *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* (Aspen Law & Business 2d ed. 2000).

¹⁴ Craig W. Dallon, *The Problem with Congress and Copyright Law: Forgetting the Past and Ignoring the Public Interest*, 44 SANTA CLARA L. REV. 365, 366–67 (2004).

¹⁵ *Id.* at 384–85.

¹⁶ *Id.* at 387–89.

¹⁷ *Id.* at 386–87.

source of our common-law legal system, various royal charters, Star Chamber decrees, and “privileges” existed as early as 1586, but statutory copyright as we know it today first emerged with the passage of the Statute of Anne in 1710.¹⁸ It granted authors and publishers a limited exclusive right to works they wrote or published.¹⁹

In the United States, the early framers of our government enshrined the granting of exclusive rights to intellectual property in the Constitution in 1776, giving Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries[.]”²⁰

Building on this early foundation, we in the United States continue to conceive of copyrights and patents as a *quid pro quo* where exclusive rights for a limited time are granted in return for public benefits. Intellectual property is “a tool that provides necessary incentives to creators and innovators” in order to “encourage the production of new scholarship and inventions,” a view reflected in numerous judicial opinions.²¹ Despite some resistance from our trading and treaty partners,²² the current conception in the U.S. is one of property rights and monetary incentives for copyright and patent holders. The typical belief expressed in our negotiations is that “broader, longer and stronger protection of intellectual property rights provides the right incentives for continuous innovation.”²³

¹⁸ *Id.* at 394.

¹⁹ Dallon, *supra* note 14, at 408–09.

²⁰ U.S. CONST. art. I, § 8, cl. 8.

²¹ David W. Opperbeck, *A Virtue-Centered Approach to the Biotechnology Commons (Or, the Virtuous Penguin)*, 59 ME. L. REV. 316, 317 (2007).

²² Examine, for example, the “moral rights” requirements of integrity and attribution of the Berne Convention, stating:

The Convention also provides for ‘moral rights,’ that is, the right to claim authorship of the work and the right to object to any mutilation or deformation or other modification of, or other derogatory action in relation to, the work which would be prejudicial to the author’s honor or reputation.

World Intellectual Property Organization, Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886), http://www.wipo.int/treaties/en/ip/berne/summary_berne.html (last visited Apr. 18, 2009) (demonstrating that many nations consider these rights to have greater importance than mere property rights and monetary incentives).

²³ Chris Armbruster, *Open Access in the Natural and Social Sciences: The Correspondence of Innovative Moves to Enhance Access, Inclusion and Impact in Scholarly Communication*, 6 POLY FUTURES EDUC. 4, available at

This *quid-pro-quo* balance between the public, who funds research through taxes, and publishers, who benefit by selling access to the fruits of the public's investment, is one that Congress decided needed adjusting.²⁴ A growing bipartisan belief in and out of Congress was that the original funders of research—the public—ought to be entitled more directly to the results of that research.²⁵ In essence, the thought went, if the public funded it, the public ought to have access to it.

In an attempt to achieve this, Public Law 110-161 requires that all investigators funded by the National Institutes of Health must submit an electronic version of their final peer-reviewed manuscript to PubMed Central (PMC).²⁶ PubMed Central will then make the work “publicly available no later than 12 months after the official date of publication.”²⁷ A previous policy provided for a voluntary depository mechanism, but was largely ineffective.²⁸ Other funding organizations, such as the Howard Hughes Medical Institute and the Wellcome Trust, have also recently decided to require scientists to deposit electronic copies

<http://ssrn.com/abstract=849305>.

²⁴ For additional information on the legislative history of Public Law 110-161, see Bramble, *supra* note 5, at 30–33.

²⁵ See *e.g.*, Bramble, *supra* note 5, at 31–32 (describing how a coalition of public interest groups helped compel Congress to disclose research resulting from grants from particular government agencies). See also The Alliance for Taxpayer Access, An Open Letter to the U.S. Congress Signed by 26 Nobel Prize Winners, <http://www.taxpayeraccess.org/bof.html> (last visited Apr. 18, 2009) (“We believe that the time is now for Congress to enact this enlightened policy to ensure that the results of research conducted by NIH can be more readily accessed, shared and built upon—to maximize the return on our collective investment in science and to further the public good.”).

²⁶ See Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, § 218, 2008 U.S.C.C.A.N. (121 Stat.) 1844, 2187 (requiring that the Director of the NIH have all investigators funded by the NIH submit their final, peer-reviewed manuscripts to be made publicly available upon acceptance for publication). See also PubMed Central, PMC Overview, <http://www.pubmedcentral.nih.gov/about/intro.html> (last visited Apr. 18, 2009) (“PubMed Central is a free digital archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health . . .”).

²⁷ Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, § 218, 2008 U.S.C.C.A.N. (121 Stat.) 1844, 2187; National Institutes of Health, Revised Policy on Enhancing Public Access to Archived Publications Resulting from NIH-Funded Research, <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-08-033.html> (last visited Apr. 18, 2009) (stating that the NIH's voluntary Public Access Policy was now mandatory due to Pub. L. No. 110-161).

²⁸ See Rick Weiss, *Government Health Researchers Pressed to Share Data at No Charge*, WASH. POST, Mar. 10, 2006, at A17 (“Less than 4 percent [of NIH-funded scientists] filled out the online form to make their results available for public viewing.”).

of manuscripts in publicly accessible repositories.²⁹

These approaches to adjusting the balance have built on the prior work of the scientific open-access movement, which began to make important gains, starting with the efforts of the Scholarly Publishing and Academic Resources Coalition (SPARC), in 1998.³⁰ This momentum carried through to the eventual founding of the Public Library of Science (PLoS) in 2000 and the creation of a group of open-access journals, primarily focused on medicine and biology in 2003.³¹ Other notable open-access efforts include arXiv, the Social Science Research Network (SSRN), BioMed Central, and Berkeley Electronic Press.³²

The Budapest Open Access Initiative,³³ the Bethesda Statement on Open Access Publishing,³⁴ and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities³⁵ contribute to a broad international movement towards open access generally, and serve to inform open-access approaches advocated within the United States.

B. The Traditional Pay-For-Access Publishing Model

Before we go further into alternative approaches, we must first look at the traditional scientific publishing model. As I noted at the beginning, traditional scientific scholarly publishing serves at least three critical purposes within the scientific community: (1) publicizing or marketing ideas, knowledge, research, and advances; (2) providing access to those same ideas and research; and (3) ensuring the quality and trustworthiness of ideas, knowledge, and research.³⁶

The publishing process typically begins with a scientist

²⁹ Ted Agres, 'Open Access' Opening Wider, SCIENTIST, July 5, 2007, <http://www.the-scientist.com/news/display/53366/>.

³⁰ David W. Opderbeck, *The Penguin's Paradox: The Political Economy of International Intellectual Property and the Paradox of Open Intellectual Property Models*, 18 STAN. L. & POL'Y REV. 101, 107-08 (2007).

³¹ *Id.* See also Public Library of Science, About PLoS, <http://www.plos.org/about/index.html> (last visited Apr. 18, 2009).

³² Armbruster, *supra* note 23, at 5.

³³ Budapest Open Access Initiative, <http://www.soros.org/openaccess/read.shtml> (last visited Apr. 18, 2009).

³⁴ Bethesda Statement on Open Access Publishing, <http://www.earlham.edu/~peters/fos/bethesda.htm> (last visited Apr. 16, 2009).

³⁵ Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, <http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html> (last visited Apr. 18, 2009).

³⁶ Kennan & Cecez-Kecmanovic, *supra* note 5, at 2.

submitting his or her manuscript to a publisher.³⁷ The manuscript then undergoes peer review, (that is, evaluation by other scientists), which is managed by the publisher using unpaid reviewers who are typically experts in the material.³⁸ This process may generate new edits which are then incorporated back into the original manuscript.³⁹ The end result of this is a final, peer-reviewed manuscript, which is then copyedited by the author and the publisher's editors.⁴⁰

Once approved and copyedited, articles are then published, today usually in both print and electronic form.⁴¹ They are then indexed and stored in various databases or repositories, either maintained by the publisher or by third-party services such as the Science Citation Index by Thomson.⁴² Readers, or the institutions they belong to, (libraries, corporations, universities, and so on) then pay for access to the full text of the published work.⁴³

In the traditional model, publicity typically comes through subscription mailings, abstracting, advertising, indexing, and citation.⁴⁴ Abstracting and indexing are key tools, as publishers typically provide free abstracts and citation information as a means of increasing demand for the full-text article itself.⁴⁵ It is in the best interest of journal publishers to publicize manuscripts in any way possible (short of providing the full text for free), since a greater desire for access means more customers and thus greater profit.

Traditional publishing earns mixed marks in the category of accessibility. In terms of stability of access over time, traditional journal publishers earn relatively high marks by allowing for consistent, long-term access to works. They accomplish this

³⁷ Fred Hutchinson Cancer Research Center, Academic Journal Article Publishing and PubMed Central Deposit Process, http://www.fhcrc.org/science/shared_resources/library/services/authors/pmcdepositprocess.pdf (last visited Apr. 18, 2009).

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² See Thomson Reuters, Science Citation Index, http://www.thomsonreuters.com/products_services/scientific/Science_Citation_Index (last visited Apr. 18, 2009) (“*Science Citation Index* provides researchers, administrators, faculty, and students with quick, powerful access to bibliographic and citation information they need to find relevant, comprehensive research data.”).

⁴³ Kennan & Cecez-Kecmanovic, *supra* note 5, at 2.

⁴⁴ *Id.*

⁴⁵ *Id.*

through archiving printed materials, (which can also be archived by libraries) and maintaining their own databases and repositories.⁴⁶ On the other hand, modern publishers often tend to hinder long-term electronic storage and access in that they typically refuse to allow anyone else to archive the electronic works they publish.⁴⁷ This has the potential to create a situation where the entire record of a journal vanishes with a natural disaster or even the bankruptcy of a publisher. This is one of the concerns addressed by both open and public access.

The greatest limitation on accessibility created by traditional publishers, however, is that of price, and especially fast-rising costs that make it hard for subscribers to afford access to as many titles as they may wish. According to the American Library Association,

Worldwide journal prices continue to rise significantly faster than inflation and library budgets. In North America, for example, research libraries spent 227% more on journals in 2002 than in 1986. The Consumer Price Index rose 57% during this same period. In the United Kingdom, journal prices rose 158% between 1991 and 2001 compared to a 28% increase in inflation. The trends are very similar across higher education institution types.

Journal inflation continues to increase at a rate of 6-12% annually. Purchasing a journal subscription can be described as a mortgage on a library's budget.⁴⁸

⁴⁶ Joan Schlimgen & Michael Kronenfeld, *Update on Inflation of Journal Prices: Brandon/Hill List Journals and the Scientific, Technical, and Medical Publishing Market*, 92 J. MED. LIBR. ASS'N 307, 310, 312 (2004), available at <http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=442172&blobtype=pdf>.

⁴⁷ See Bramble, *supra* note 5, at 22 (“[M]ost publication agreements do not include provisions for institutional archiving. Thus most authors will need to engage in some form of negotiation of copyright in order to secure the rights necessary to promote open access.”). “[B]ut the green road of self-archiving presents dangers of balkanization, especially if authors decide to archive their writings on personal sites rather than on larger searchable repositories.” *Id.* at 20.

⁴⁸ American Library Association, *Economics of Scholarly Publishing*, <http://www.ala.org/ala/mgrps/divs/acrl/issues/scholarlycomm/scholarlycommunicationtoolkit/librarians/librarianeconomics.cfm> (last visited Apr. 19, 2009).

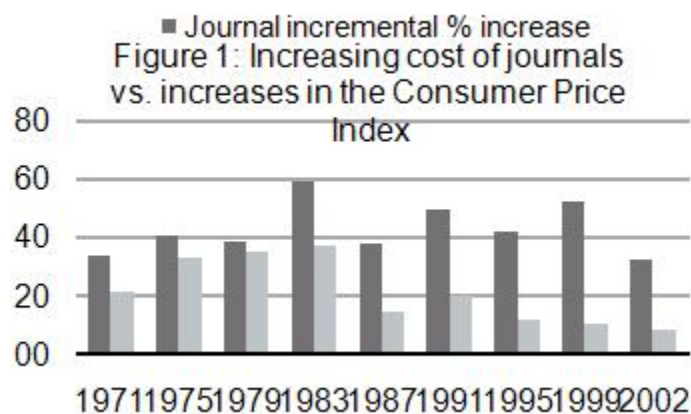


Figure 1 shows the widening disparity between increases in the general Consumer Price Index, (CPI), and that of medical journal prices.⁴⁹

The reasons for rising prices are not straightforward, and include commercial publishers' "relentless drive toward profits;" mergers of major publishers, resulting in reduced market competition; and "bundling" of strong and weak titles into a single purchasing agreement.⁵⁰ The resulting high prices "create barriers to the wide distribution of scientific discovery, and those barriers in turn have serious consequences for the public interest."⁵¹ This is true both within the United States and, perhaps especially, in developing countries where scientists and doctors cannot afford access. The consequences in some cases of not "translating research from the laboratory into life-saving drugs, treatments, and diagnostic tests . . . may ultimately cost lives."⁵²

Trustworthiness and quality are traditionally achieved through editorial standards, a journal's reputation over time, and peer review by other, well-regarded and knowledgeable scientists and scholars who have carefully read and judged published manuscripts.⁵³ In the traditional model, scholars submit their

⁴⁹ Schlimgen & Kronenfeld, *supra* note 46, at 308–09.

⁵⁰ *Id.* at 310.

⁵¹ *Id.* at 311.

⁵² *Id.*

⁵³ Kennan & Cecez-Kecmanovic, *supra* note 5, at 2. See also M. Carl Drott, *Open Access*, in 40 ANN. REV. INFO. SCI. & TECH. 79, 85–87 (Blaise Cronin ed.,

articles to journals, where a professional editorial staff processes them and sends them out to other scientists for peer review.⁵⁴ Unlike professional editorial staff, reviewers are experts in the same field as the author of the article, but are unpaid for their reviewing duties.⁵⁵ Peer reviewers provide comments, suggestions, and criticisms which are usually returned to the author of the article, who revises and resubmits the manuscript.⁵⁶ Alternatively, editors may simply reject an author's submission based on the feedback of reviewers.⁵⁷

The result of this has been a market that favors publishers over both authors and readers. Scientists must author works both to advance their careers and to share their knowledge. On the flip side, they must read published journals in order to understand and benefit from their peers. The publishers are "in the enviable position of selling research which they neither produced nor paid for to a high-demand market."⁵⁸ The resulting "low elasticity of customer demand in this market enables them to function as monopolists in many fields."⁵⁹ This causes one key problem with traditional scientific publishing: limited accessibility due to cost.

One reason for this is that the original authors lack significant rights to their manuscripts once turned over to a publishing company, as most journals require authors to sign over ownership rights in order to be published.⁶⁰ These exclusive rights enjoyed by publishers have allowed the new copyright owners to "rapidly and steeply raise subscription, license and pay-per-view prices."⁶¹ This makes good economic sense if you

2006).

⁵⁴ Peter Roberts, *Scholarly Publishing, Peer Review and the Internet*, 4 FIRST MONDAY (1999), <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/661/576>.

⁵⁵ *Id.* See also B. Gitanjali, *Peer Review – Process, Perspectives and the Path Ahead*, 47 J. POSTGRADUATE MED. 210 (2001), available at <http://www.jpgm online.com/text.asp?2001/47/3/210/189> (stating that peer reviewers "are not paid for this work and give their time freely for the enrichment and promotion of science").

⁵⁶ Roberts, *supra* note 54.

⁵⁷ *Id.*

⁵⁸ Judith M. Panitch & Sarah Michalak, *The Serials Crisis: A White Paper for the UNC-Chapel Hill Scholarly Communications Convocation* (2005), <http://www.unc.edu/scholcomdig/whitepapers/panitch-michalak.html>.

⁵⁹ Bramble, *supra* note 5, at 3.

⁶⁰ See *id.* at 5 (questioning whether authors should be selling their ownership rights to journal publishers).

⁶¹ Armbruster, *supra* note 23, at 6.

are a publisher. From the perspective of universities and other institutions, the traditional model does not make economic sense, as it requires them to pay out at many points in the process: “they pay the salaries and research costs of faculty members and associates, they pay the submissions fees and page charges levied by most subscription journals, and they pay increasingly high subscription fees to read what their own and other authors actually publish in these journals.”⁶²

The traditional model of scientific publishing creates a significant tension between the goals of the publisher and the goals of researchers. “[P]ublishers seek the greatest possible return on their investment” while scientists are much more concerned with achieving “the widest possible distribution and impact of scholarly work.”⁶³ Submission contracts requiring scientists to sign over ownership rights to their articles puts the power of determining accessibility in the hands of the publishers and may frustrate scientists’ attempts to disseminate their own research.⁶⁴ Publishers seek to restrict dissemination and access in order to maximize profits, while scientists wish to share their own research as widely as possible in return for broad and easy access to the research of others.

C. *The Public Domain*

Public domain dissemination stands in stark contrast to traditional publishing models. Putting something in the public domain means relinquishing all rights to it, and allowing anyone to reuse, change, modify, republish, or even to sell it.⁶⁵ In essence, the article now belongs to the public as a whole, not to

⁶² Bramble, *supra* note 5, at 5.

⁶³ Dan Hunter, *Walled Gardens*, 62 WASH. & LEE L. REV. 607, 614 (2005). *E.g.*, Bramble, *supra* note 5, at 5.

⁶⁴ I experienced this conflict first hand while working as an information technology staff member at a cancer research center. Our scientists would, at times, post copies of their own published articles on their own Web sites to facilitate access by other scientists and students. We often had to require them to remove *their own articles* because neither we, nor they, had permission from the copyright owner to publish them in this manner. This often baffled scientists, who, despite having signed the contracts relinquishing their ownership, believed, in a common-sense way, that they still *owned* what they had invested so much time and energy in, and for which they had received no monetary compensation from the new owner.

⁶⁵ See Peter Suber, *Creating an Intellectual Commons Through Open Access* 1, 8 (May 28, 2004), <http://dlc.dlib.indiana.edu/archive/00001246/01/suberrev052804.pdf>.

any one individual. Putting something into the public domain may be voluntary or not, as the public domain is where a work lives once its copyright has expired.⁶⁶

Because the work belongs to the public once it is in the public domain, it often cannot be re-copyrighted.⁶⁷ This is one of the few restrictions on use. But derivative works based upon the original work can be copyrighted with no legal requirements of attribution, licensing, or remuneration, provided sufficiently new material is present.⁶⁸ Thus, in some sense, at least, works in the public domain have the potential to provide the greatest benefit to the public because they allow the public to make the greatest use of them.

In our analytic terms, the reusability of public-domain works is at the extreme end of the scale since the only restriction on reuse is that such materials cannot be re-copyrighted. In one sense, their accessibility could also be considered maximized because works in the public domain are essentially free. However, partly because no one owns these works, anyone in the business of facilitating access is free to charge for the privilege of access.⁶⁹ In other words, to borrow a colorful analogy from the open-source software movement, public domain works are “free as in free speech, not as in free beer.”⁷⁰ Without an intermediary, works in

⁶⁶ See Stanford Copyright & Fair Use, Welcome to the Public Domain, http://fairuse.stanford.edu/Copyright_and_Fair_Use_Overview/chapter8/8-a.html (last visited Apr. 19, 2009) (explaining that, *inter alia*, a copyright owner may deliberately place the work product in the public domain or the work product may automatically enter the public domain upon the author’s failure to renew the copyright upon expiration).

⁶⁷ See *id.*

Thousands of works published in the United States before 1964 fell into the public domain because the copyright was not timely renewed under the law in effect at that time. If a work was first published before 1964, the owner had to file a renewal with the Copyright Office during the 28th year after publication. No renewal meant a loss of copyright.

Id.

⁶⁸ See, e.g., U.S. COPYRIGHT OFFICE, CIRCULAR 14, COPYRIGHT REGISTRATION FOR DERIVATIVE WORKS 1 (2008), available at <http://www.copyright.gov/circs/circ14.pdf>.

⁶⁹ Cf. GNU Project, The Free Software Definition, <http://www.gnu.org/philosophy/free-sw.html> (last visited Apr. 19, 2009) (For public domain works in the open-source software movement, one is “free to redistribute copies, either with or without modifications, either gratis or charging a fee for distribution, to anyone anywhere.”).

⁷⁰ *Id.* E.g., Robin Feldman & Kris Nelson, *Open Source, Open Access, and Open Transfer: Market Approaches to Research Bottlenecks*, 7 NW. J. TECH. & INTELL. PROP. 14, 23 (2008).

the public domain may well simply fall from view entirely, and accessibility is thus tied to the intermediary facilitator and not to the work's public domain status itself.

This is the downside to the freedoms of the public domain: without intervention, there is no compendium of works in the public domain and no consistent system for allowing access. Without an intermediary, there is also no publicity for such works, and no mechanism for quickly determining the trustworthiness of a work. Each individual work must be evaluated on its own merits, and must be sought out by the potential reader.

On the other hand, since items in the public domain belong to everyone, anyone can choose to build mechanisms for facilitating access to public-domain materials, and can even charge for that access. They can publicize this service, of course, and they can evaluate the works in various ways to increase a reader's trust in them. Thus, although the public domain can be seen as the polar opposite of the traditional scientific publishing model, it is in many ways quite amenable to capitalist reuse by for-profit businesses (or to public-spirited reuse by non-profits). But since anyone can take the work and do the same thing again, the incentive for businesses to increase accessibility, publicity, and trustworthiness for public domain materials is often lacking, making this approach a difficult sell as a broadly applicable solution to the current problems of scientific publishing.⁷¹

D. The New Open Access Model

In the traditional model described above, scientists typically sign away most of the sticks in their bundle of rights in order to be published. "Open Access," writes Chris Armbruster, "runs against a publishing model that turns the article into a commodity as scientists and scholars sign away the copyright. Publishers that become the 'content owner' may use exclusive copyright to levy subscription fees, site licences [sic] and pay-per-view charges."⁷² "Moreover," he continues, "the new content owner sells back their work to university libraries, colleagues

⁷¹ At least one scholar has argued that works generated from federally subsidized research should immediately enter the public domain. See Samuel E. Trosow, *Copyright Protection for Federally Funded Research: Necessary Incentive or Double Subsidy?*, 22 CARDOZO ARTS & ENT. L.J. 613, 613-14, 642-43 (2004).

⁷² Armbruster, *supra* note 23, at 4.

and students at monopoly prices.”⁷³

According to Peter Suber, a policy strategist for open access to scientific and scholarly research literature, true open access “removes [both] *price barriers* (subscriptions, licensing fees, pay-per-view fees) and *permission barriers* (most copyright and licensing restrictions).”⁷⁴ It “means immediate, permanent, free online access to the full text of all refereed research journal articles (2.5 million articles a year, published in 24,000 refereed journals, across all disciplines, languages and nations).”⁷⁵ Importantly, open access is *not* the same as public domain. Instead, copyright owners give away some sticks in their bundle of property rights, while retaining overall ownership and control, in the hopes of a greater return on their investment than they would get by holding on to those rights or by selling them to a publisher. Open access as described above by Peter Suber is one of many possible compromised positions on the continuum between traditional scientific publishing and the public domain.

The vision of open access is often an idealistic one: “[a]s Open Access becomes the standard academic publishing model a level and competitive field of innovation emerges for all kinds of new tools that will aid scholars in retrieving, evaluating and utilising [sic] publications and data.”⁷⁶ But despite this idealism, open access is intended to achieve realistic goals from the perspective of the scientist: increased dissemination of research, increased collaboration, and increased status for the author.

But how well does the open-access model fit what we posited as the four critical elements of scientific publishing (publicity, accessibility, trustworthiness, and reusability)? The short answer is that open access helps most with the second requirement, accessibility.⁷⁷ In addition, open access, in the form articulated by Peter Suber and implemented by the Public Library of Science and BioMed Central, makes major changes in the area of reusability as well.

⁷³ *Id.* at 6.

⁷⁴ Peter Suber, Open Access Overview, <http://www.earlham.edu/~peters/fos/overview.htm> (last visited Apr. 19, 2009).

⁷⁵ Stevan Harnad, *The Implementation of the Berlin Declaration on Open Access: Report on the Berlin 3 Meeting Held 28 February - 1 March 2005, Southampton, UK*, 11 D-LIB MAG., Mar. 2005 (emphasis omitted), available at <http://www.dlib.org/dlib/march05/harnad/03harnad.html>.

⁷⁶ Armbruster, *supra* note 23, at 18.

⁷⁷ See Bramble, *supra* note 5, at 6–10 (explaining three analytical factors to open access).

Instead of charging for access to published articles by readers, open-access journals typically require authors to pay an “article-processing charge” (expecting most scientists to pass those costs back on to their funding agency or institution).⁷⁸ In order to make this economically feasible, open-access journals publish exclusively online. This is the model followed by BioMed Central and the Public Library of Science.⁷⁹ Many provide discounted rates for certain classes of authors, such as those from developing countries.⁸⁰ This “author-pays” model is unheard of in traditional journal publishing, as many journals require that authors pay certain costs related to publishing their manuscript, such as costs for printing color images, and for “reprints” (copies of their own published article for their use).⁸¹ In this manner, open-access tackles one of the key problems with traditional publishing: lack of access due to cost. In order to deal with the problem of long-term archiving of manuscripts, open-access journals maintain their own electronic archives, support and allow archiving by other repositories, and, finally, encourage self-archiving by authors.⁸²

Like traditional publishers, open-access journal publishers try to publicize manuscripts submitted to them. As they typically cannot afford to pay for advertising, and because they do not have subscribers in the same sense as traditional journals, open-access journals have had to find different means to publicize themselves and the manuscripts they publish. Like traditional publishers, open-access journals rely on citations by scientists, along with indexing and impact tracking by services such as Thomson Reuter’s ISI Web of Knowledge (which includes the Journal Citation Reports, Journal Use Reports, Biological Abstracts, and more).⁸³ In addition, they have looked to newer

⁷⁸ Schlimgen & Kronenfeld, *supra* note 46, at 312.

⁷⁹ *Id.* at 311–12.

⁸⁰ See Armbruster, *supra* note 23, at 12.

⁸¹ Schlimgen & Kronenfeld, *supra* note 46, at 312; Bramble, *supra* note 5, at 4–5. See also National Institutes of Health, Policy on Enhancing Public Access to Archived Publications Resulting from NIH-Funded Research, <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html> (last visited Apr. 19, 2009) (allowing publications costs to be charged against NIH research awards because NIH funded researchers are expected to share the results of their activities with the public).

⁸² See Schlimgen & Kronenfeld, *supra* note 46, at 312.

⁸³ Thomson Reuters, ISI Web of Knowledge, Products and Tools, http://isiwebofknowledge.com/products_tools/products/ (last visited Apr. 19, 2009). See also Bramble, *supra* note 5, at 25.

technological methods to compute and share usage and citation statistics in order to publicize manuscripts.⁸⁴

One criticism of open access is that readers will have less trust in the articles because there will not be professional editors managing the peer review process, or, alternatively, that there will not be a peer review process at all.⁸⁵ But the Public Library of Science, for example, still conducts a robust review process, even though it is an open-access journal.⁸⁶ And as we will see later, the public-access policy adopted by the NIH simply “piggy backs” on the existing journal peer-review and publishing system.

Peer review is possible whether the work is published through a traditional or an open-access journal.⁸⁷ Traditional publishers argue that they play a critical role in managing the peer review process.⁸⁸ Even though they typically do not pay for peer review itself, publishers argue that managing the back-and-forth of peer review is a costly and time consuming, yet critically important, part of modern science.⁸⁹ However, peer review is not limited to traditional publishing: the largest open-access publisher in the biomedical field, BioMed Central, maintains a high level of commitment to peer review.⁹⁰ Finally, it is important to remember that traditional peer review is not perfect, as “[e]ven the most prestigious [of the traditionally-managed] journals have

⁸⁴ See Bramble, *supra* note 5, at 8.

⁸⁵ See, e.g., PRISM, Problems With Government Intervention: Threats to Peer Review, http://www.prismcoalition.org/problems_threats.htm (last visited Apr. 19, 2009).

Peer review involves the combined efforts of authors, editors, reviewers and publishers, and is financed entirely by publishers, who invest hundreds of millions of dollars in the process. Journals finance the peer review process through journal revenues. It is this business model that has been responsible for the development of the system of global scientific communication over hundreds of years, and it is this model that ensures its sustainability, integrity and independence.

Id.

⁸⁶ Public Library of Science, FAQs, <http://www.plos.org/about/faq.html> (last visited Apr. 19, 2009).

⁸⁷ Bramble, *supra* note 5, at 18–19 (“It bears repeating that open access publishing is perfectly compatible with traditional peer review.”).

⁸⁸ *Id.* at 18 (citing Weiss, *supra* note 28).

⁸⁹ See *Approaching the Critical Task of Peer Review*, ASCB NEWSLETTER (Women in Cell Biology, Bethesda, Md.), Sept. 2006, at 24, available at <http://www.ascb.org/files/0609wib.pdf>.

⁹⁰ BioMed Central, About Us, <http://www.biomedcentral.com/info/> (last visited Apr. 19, 2009) (“BioMed Central is committed to maintaining high standards through full and stringent peer review.”).

published results that later turned out to be fraudulent (Nature, the cloning fraud) and to have sparked a public health crisis (The Lancet, the MMR vaccine).⁹¹

Open-access journals have a completely different relationship with article reuse than traditional publishers do. For example, the open-access charter of the Public Library of Science (PLoS) allows “all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work” and requires “[a] complete version of the work and all supplemental materials . . . in a suitable standard electronic format [to be] deposited immediately.”⁹² Under this approach, “authors retain ownership of the copyright for their article, but authors allow anyone to download, reuse, reprint, modify, distribute, and/or copy articles in PLoS journals, so long as the original authors and source are cited. No permission is required from the authors or the publishers.”⁹³ BioMed Central has a similar approach to article reuse.⁹⁴

E. The Compromise of Public Access

Looking for a compromise position that would increase the accessibility of publicly-funded research while still protecting the traditional scientific publishing industry, the National Institutes of Health, as directed by Congress, has adopted a less-stringent “public access” standard that primarily addresses only price barriers (subscription fees, for example), not permission barriers (licensing restrictions and other aspects of copyright). From our analytical perspective, that means greater accessibility than traditional publishing, but no real change in terms of publicity,

⁹¹ Chris Armbruster, *Cyberscience and the Knowledge-Based Economy, Open Access and Trade Publishing: From Contradiction to Compatibility with Nonexclusive Copyright Licensing*, 12 INT’L J. COMM. L. & POL’Y 20, 30 (2008), available at http://www.ijclp.net/files/ijclp_web-doc_2-12-2008.pdf.

⁹² Public Library of Science, Definition of Open Access, <http://www.plos.org/oa/definition.html> (last visited Apr. 19, 2009).

⁹³ Public Library of Science Medicine, Open-Access License, <http://journals.plos.org/plosmedicine/license.php> (last visited Apr. 19, 2009) (emphasis omitted).

⁹⁴ BioMed Central, Copyright and License Agreement, <http://www.biomedcentral.com/info/about/license> (last visited Apr. 19, 2009) (“Anyone is free . . . to copy, distribute, and display the work; to make derivative works; [and] to make commercial use of the work[.]” But attribution is a required condition: “the original author must be given credit; for any reuse or distribution, it must be made clear to others what the license terms of this work are; any of these conditions can be waived if the authors [sic] gives permission.”).

trustworthiness, or reusability. The law now reads:

The Director of the National Institutes of Health shall require that all investigators funded by the NIH submit or have submitted for them to the National Library of Medicine's PubMed Central an electronic version of their final, peer-reviewed manuscripts upon acceptance for publication, to be made publicly available no later than 12 months after the official date of publication: *Provided*, That the NIH shall implement the public access policy in a manner consistent with copyright law.⁹⁵

Unlike the open-access licensing used by the Public Library of Science, the NIH does not require that the author or copyright owner give up more of parts of their bundle of rights they enjoy in the copyright of the work deposited with PubMed Central, except that an author funded by the NIH must reserve the right to deposit the article in the NIH's centralized repository for eventual viewing by the public.⁹⁶ With this limited reserved access, anyone can read the full text of an article, cite to it, and take advantage of general "fair use" exceptions to copyright.⁹⁷ However, unlike other open-access approaches, teachers cannot, for example, freely duplicate their favorite articles and distribute them to their classes without additional authorization to do so.⁹⁸ In other words, accessibility is improved as compared to traditional publishing, but reusability is unchanged.

To accomplish this "in a manner consistent with copyright law,"⁹⁹ the NIH asks authors to add language such as the following into the contractual copyright agreements they sign with publishers: "Journal acknowledges that Author retains the right to provide a copy of the final . . . manuscript to the NIH upon acceptance for Journal publication, for public archiving in PubMed Central as soon as possible but no later than 12 months after publication by Journal."¹⁰⁰

⁹⁵ Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, § 218, 2008 U.S.C.A.N. (121 Stat.) 1844, 2187. *See also* National Institutes of Health, NIH Public Access Policy Details, <http://publicaccess.nih.gov/policy.htm> (last visited Apr. 19, 2009).

⁹⁶ National Institutes of Health, Public Access Frequently Asked Questions, <http://publicaccess.nih.gov/FAQ.htm> (last visited Apr. 19, 2009).

⁹⁷ For more on fair use and copyright, see, e.g., LEE WILSON, FAIR USE, FREE USE, AND USE BY PERMISSION: HOW TO HANDLE COPYRIGHTS IN ALL MEDIA, (Allworth Press 2005).

⁹⁸ PubMed Central, PMC Copyright Notice, <http://www.pubmedcentral.nih.gov/about/copyright.html> (last visited Apr. 19, 2009).

⁹⁹ Consolidated Appropriations Act 2008 § 218.

¹⁰⁰ National Institutes of Health, *supra* note 96.

The main goal of the new policy is to increase the accessibility to scientific research funded by taxpayers.¹⁰¹ Behind this goal is the premise that increased accessibility “will speed discoveries, resulting in the prevention of death and disability[.]”¹⁰² Like the Constitutional balancing of intellectual property rights, the NIH policy balanced the goal of accessibility with the concerns of publishers that their markets would be undermined by allowing for a “reasonable period of embargo” lasting for twelve months.¹⁰³ So how well does the NIH’s public-access approach meet this goal in terms of our four analytical factors of scientific publishing (accessibility, publicity, trustworthiness, and reusability)?

The policy does achieve an increase in the accessibility of federally-funded scientific research, although only after significant time has passed. This compromise, intended to substantially protect the markets of traditional publishers, does exactly that. The largest, most important customers of scientific journals are the same people who author the manuscripts, and scientists need immediate access to the latest scientific advancements. Free access that comes many months later may prove useful in certain situations, but this does not provide a significant amount of access, such that researchers’ institutions will be able to reduce their journal subscriptions. Nonetheless, this access will provide the general public, scientists researching across disciplines, and scientists and doctors in developing nations with useful access to resources they would, in many cases, be unable to read otherwise. So, while it is a compromise that fails to address the budget needs of medical libraries, for example, it will increase access overall. In addition, by archiving works in a centralized repository, it will reduce the likelihood of the loss of future access to major portions of a journal’s archives.

Since there are no other changes to the journal publishing business in the public-access model as implemented by the NIH, traditional journals will still perform their usual quality-control in terms of peer review and trustworthiness, and they will still use their traditional publicity-generating methods. Finally,

¹⁰¹ *The Public Access Policy of the National Institutes of Health: Testimony Before the Subcomm. on Courts, the Internet, and Intellectual Property*, 111th Cong. 6–7 (2008) (statement of Elias A. Zerhouni, M.D., Director, National Institutes of Health), available at <http://judiciary.house.gov/hearings/pdf/Zerhouni080911.pdf>.

¹⁰² *Id.* at 6.

¹⁰³ *Id.* at 7. See also Feldman & Nelson, *supra* note 70, at 29.

other than carving out a narrow, contractual exception to permit placing manuscripts in the NIH's public-access archive, nothing is changed in terms of reusability versus traditional publishing.

II. CRITICISM OF THE PUBLIC ACCESS LAW

Perhaps in some ways conflating concerns about *public* access with concerns about the broader impact of *open* access, the Bush Administration expressed concern with Public Law 110-161 when it was still pending legislation, arguing that it would negatively impact scientific research publishing, including peer review, and would threaten "the United States' longstanding leadership in upholding strong standards of protection for intellectual property."¹⁰⁴ The Administration indicated that these concerns should be balanced against "the benefit of public access to taxpayer supported research."¹⁰⁵

Agreeing with the Bush Administration, the traditional publishing industry argued that public access would increase their costs and make them less profitable. David Opderbeck writes that "publishers argued that the public database would erode their subscription bases and drive smaller publishers out of business."¹⁰⁶ This is one key reason why the requirement allows for twelve months of exclusivity by the publisher before necessitating deposit with the NIH.¹⁰⁷ Publishers argued that the law would cut their subscription revenues, and hamper scientific advancement by threatening the peer review process.¹⁰⁸

¹⁰⁴ OFFICE OF MGMT. & BUDGET, EXECUTIVE OFFICE OF THE PRESIDENT, S. 1710—DEPARTMENTS OF LABOR, HEALTH AND HUMAN SERVICES, AND EDUCATION, AND RELATED AGENCIES APPROPRIATIONS ACT, 2008 5 (2007), *available at* <http://www.whitehouse.gov/omb/legislative/sap/110-1/s1710sap-s.pdf>.

¹⁰⁵ *Id.*

¹⁰⁶ Opderbeck, *supra* note 30, at 118.

¹⁰⁷ *Id.*

¹⁰⁸ *See, e.g.*, Martin Frank, *Free Access for All! Can We Afford It?*, 21 *PHYSIOLOGY* 372 (2006), *available at* <http://physiologyonline.physiology.org/cgi/content/full/21/6/372> (arguing that libraries will only be able to save money by canceling subscriptions thereby depriving journals of revenue); Press Release, Washington DC Principles for Free Access to Science Coalition, Nonprofit Publishers Oppose Government Mandates for Scientific Publishing (Feb. 20, 2007), <http://www.dcprinciples.org/press/2.htm> (arguing that the law would threaten a journal's ability to fund peer review); Press Release, American Association of Publishers, Publishers Say Enactment of NIH Mandate on Journal Articles Undermines Intellectual Property Rights Essential to Science Publishing (Jan. 3, 2008), <http://www.publishers.org/main/PressCenter/Archives/NIHMandatoryPolicy.htm> (arguing that undermining publishers' copyrights, would threaten their means of support).

While conceivable, it is unlikely that scientists, who require immediate access to up-to-date research information, would choose not to subscribe to journals simply because they can access the same information a year later. Instead, it is likely that mostly archivists, historians, and the public will make use of this older information and their newfound freedom of access. Open-access publishing, since it pushes for immediate publication and free access to up-to-date research, would put far more pressure on traditional publishers than the new public-access scheme does.

Since the new law builds on the existing publishing process, including peer review, concerns by publishers and the Bush Administrations about the impact on peer review are secondary to the discussion of costs and profits.¹⁰⁹ If the new policy drives some publishers out of business and costs others significant amounts of money, publishers could conceivably cut back on their management of the peer review process.¹¹⁰ Doing this, however, would likely hurt the profits of publishers even more, since it would impact the trustworthiness of their publication, a factor that is absolutely key to their selling to scientific subscribers. In addition, publishers already do not pay peer reviewers. Their costs consist mostly in managing the process.¹¹¹ Thus, it is much more likely that other cost-cutting measures would be introduced long before cuts were made that would undermine peer review.

A. Intellectual Property Issues

Critics of public access have argued that the approach threatens the existing intellectual property protection schemes used in this country, and also undermines our role in relation to the rest of the world. Arguments have ranged from suggestions that our treaty obligations would be violated, that the law would constitute a compulsory license, that it would be a “taking,” and that it might damage future patent applications. Such concerns need addressing in order to understand the impact of the law.

¹⁰⁹ See, e.g., Peter Suber, *Will Open Access Undermine Peer review?* (Scholarly Publishing and Academic Resources Coalition Open Access), Sept. 2, 2007, <http://www.earlham.edu/~peters/fos/newsletter/09-02-07.htm#peerreview> (listing examples of publishers’ objections focused on the impact on subscription revenues before the impact on peer review).

¹¹⁰ See *id.* (arguing that even if subscription-based journals fail, peer review could survive under an open access business model).

¹¹¹ *Id.*

They are also key to understanding limitations of the NIH's public-access approach, especially in comparison to open access, since many of these limitations come as a reaction to these concerns.

In letters to Congress arguing against requiring public access to federally-funded research, some publishers argued that the law violated U.S. treaty obligations “under Article 13 of TRIPS and Article 9 of the Berne Convention,” and that it would potentially be a “compulsory license.”¹¹² Although the mandatory depository requirements could have been implemented in a potentially problematic fashion, the statutory language of the law itself directs the NIH to implement the policy “in a manner consistent with copyright law.”¹¹³ To accomplish this, the NIH asks authors, when they sign agreements to publish their articles, to include a clause stating that the author “retains the right to provide a copy of the final . . . manuscript to . . . NIH.”¹¹⁴ Such an addition is expressly *contractual*, and thus does not alter copyright as a whole. Authors are free to propose (and journals to accept or not) limited or constrained transfers or licensing of copyrighted works. From the author's perspective as well, the legislation in no way alters their copyright: instead it creates a contractual obligation based on their receipt of NIH funding. In short, no fundamental alteration of intellectual property law is required to implement the new mandate.¹¹⁵

1. Public Access Requirements as a “Taking”

Some have also suggested that the provision constitutes a “compulsory license” or, in Constitutional property terms, a

¹¹² AM. LIBRARY ASS'N ET AL., MANDATORY PUBLIC ACCESS TO FEDERALLY FUNDED RESEARCH DOES NOT VIOLATE COPYRIGHT OBLIGATIONS 1 (2007), http://www.arl.org/sparc/bm~doc/nih_copyright.pdf.

¹¹³ Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, § 218, 2008 U.S.C.C.A.N. (121 Stat.) 1844, 2187.

¹¹⁴ National Institutes of Health, *supra* note 96.

¹¹⁵ AM. LIBRARY ASS'N ET AL., *supra* note 112.

The proposed legislation concerns contract terms, not copyright exceptions. As such, the proposed legislation in no way implicates Article 13 of TRIPS or Article 9 of the Berne Convention, which address permissible copyright exceptions. These treaty provisions are completely silent on the issue of the terms a funder or other licensee can require of a copyright owner in exchange for valuable consideration.

Id. (emphasis omitted).

“taking.”¹¹⁶ However, as noted above, the implementation of the statute involves a contractual arrangement between the NIH and the scientist, and then between the scientist and the publisher. The legislation does not take away something the author already has, but only conditions receipt of federal dollars on specific future actions. This is little different than the government purchasing anything else: in return for payment (NIH funding) the scientist provides a copy of his or her published work for publication in a publicly-accessible forum.¹¹⁷

2. Patents and “Printed Publications”

Concerns regarding patent issues focused on the “statutory bars” under United States patent law especially, but also under non-U.S. law.¹¹⁸ Specifically: “[s]ince any printed publication that precedes the filing date of an application can be used as prior art when determining novelty of an invention, published NIH documents could jeopardize U.S. patent rights if patent applications are not timely filed and could entirely destroy patent rights in many foreign countries.”¹¹⁹

The NIH has responded by saying they do not believe courts will consider deposit of a manuscript with the NIH to constitute a “printed publication,” and that they expect courts to continue to use the date of publication in the journal itself instead.¹²⁰ In addition, manuscripts may be embargoed for publication in the NIH public-access database for up to twelve months after publication in the journal itself.¹²¹ As such, the public-access law is unlikely to materially impact patent protections.

B. The Ideal of Free Access by the Public

One of the underlying ideals behind the push for public access

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ Opderbeck, *supra* note 30, at 118–19. See also 35 U.S.C.A. § 102 (West 2008) (explaining that, among other things, there is a statutory bar against granting a patent when the invention has already been disclosed in a printed publication anywhere in the world more than one year previous to the U.S. application for a patent).

¹¹⁹ *Examining NIH Policy to Enhance Public Access: Importance of Sharing Results of Government-funded Research*, 25 GENETIC ENGINEERING & BIOTECH. NEWS, June 1, 2005, available at <http://www.genengnews.com/articles/chitem.aspx?aid=443&chid=0>.

¹²⁰ Opderbeck, *supra* note 30, at 118–19.

¹²¹ *Id.* at 119.

has been the idea that, if taxpayers fund research, then those same taxpayers ought to be able to access that research.¹²² But while appealing from a rhetorical standpoint, the idea of allowing the public free access to published journal articles whose development was funded with public monies does have critics:

First, who is and isn't a tax-paying member of the public? And secondly, how does one address this issue on an international scale, i.e. with an international public? In other words, will the taxes paid in one country entitle one to view the content of a journal which is based in another country? . . . [T]his tax-based approach to publishing is far too problematic and contains elements of demagoguery. It is simply not workable. It is important to note that paying taxes does not necessarily grant anyone the right to free access to any goods or services that receive public money in any form.¹²³

Another related argument involves the lack of benefit to the public that can be achieved by allowing general access to scientific research and publications:

[S]uch reports use professional, often highly specialized terminology, so it is really questionable whether those who are not part of the scientific community . . . will benefit from the provided information. Secondly, the average taxpayer is probably most interested in clear and simple information relevant to their own daily lives, such as "is there a cure for my disease?"¹²⁴

A *New York Times* editorial rebuts this position:

Most of us, admittedly, will not have much use for free access to new discoveries in, say, particle physics. But it is a different matter when it comes to medical research. Popular nostrums abound on the Web, but it can be very hard, if not impossible, to find the results of properly vetted, taxpayer-financed science—and in some cases it can be hard for your doctor to find them, too. The Public Library of Science could help change all that, creating open access to research. The publishers of scientific journals are naturally skeptical, but the real test will come in the marketplace of ideas.¹²⁵

¹²² Press Release, The Alliance For Taxpayer Access, Public Access Mandate Made Law: President Bush Signs Omnibus Appropriations Bill, Including National Institutes of Health Research Access Provision (Dec. 26, 2007) <http://www.taxpayeraccess.org/media/release07-1226.html>.

¹²³ Mark Graczynski & Lynn Moses, *Open Access Publishing: Panacea or Trojan Horse?*, 10 MED SCI MONITOR ED2, ED2 (2004).

¹²⁴ *Id.* at ED3.

¹²⁵ Editorial, *Open Access to Scientific Research*, N.Y. TIMES, Aug. 7, 2003, available at <http://www.nytimes.com/2003/08/07/opinion/07THU3.html>.

The lack of public benefit argument neglects several beneficial aspects of public access. First, the scientific community *is* part of the public. Publicly-accessible research will directly benefit this population. Second, although the average taxpayer may not immediately and directly benefit, there is (to borrow from economics) a “trickle down” effect of providing access to scientific literature: if it is easier and cheaper for scientists and medical professionals to access information, the average taxpayer will indirectly benefit by more informed care providers and by better-informed articles in publications aimed at the lay public. Third, and finally, if taxpayer-funded researchers have cheaper access to scientific information, that drives down the cost of their research, consequently benefiting the average taxpayer through reduced costs and faster scientific advancement. However, since the new public-access law only requires free access to manuscripts months after they’re first published, the opportunity for the law to radically change the marketplace in this way is limited.

III. CONCLUSION

Public Law 110-161 contained a potentially radical new requirement: “[a]s of April 7, 2008, final peer-reviewed manuscripts arising from NIH funds must be submitted to PubMed Central upon acceptance for publication.”¹²⁶ The goal of this new mandate was a compromise position that attempted to improve access to government-funded medical research without overly damaging the business model of traditional scientific publishers.

Certainly the new law opens up access to medical research in a way never before required by law. However, this greater openness is tempered by some key limitations, above all the length of time journals are permitted exclusive rights to control access: twelve months. A year is simply too long a time period for the law to have a significant impact on how scientists learn from other scientists. Nonetheless, this time frame is good enough in many cases for the general public, for students, and for researchers working outside their primary discipline. It also provides useful access for scientists and doctors in developing countries. For these groups, free access may well open up

¹²⁶ National Institutes of Health, Public Access Homepage, <http://public.access.nih.gov> (last visited Apr. 19, 2009).

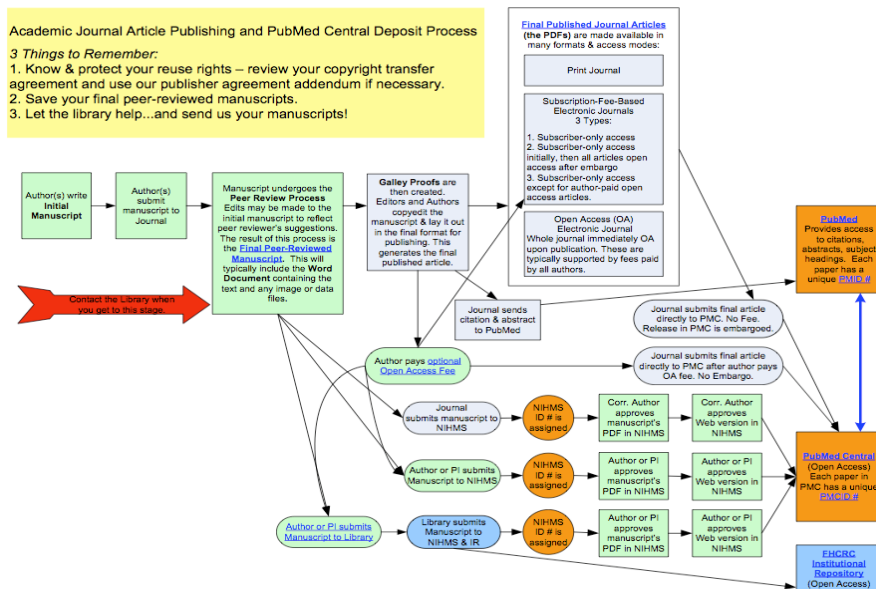
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opportunities for research that they would otherwise never have had. A move from no access to some access is significant. In addition, by retaining works outside the bounds of the business operations of journal publishers, there is a much-reduced possibility that large swaths of manuscripts will be lost over time. PubMed Central will likely prove a gold mine of useful research for historians of medical science in the future.

One unanticipated negative impact has been on the scientific support staff at institutions and universities. Previously, authors typically managed their own journal publishing process. With the seemingly simple new requirement of depositing manuscripts with the NIH post-publication, along with the increase in non-traditional journals, support staff have stepped in to better manage the increasingly complex process.

The result has been a shift to a more complex process of manuscript submission. The following diagram, prepared by Ann Marie Clark, director of the Arnold Library, illustrates the new process at Fred Hutchinson Cancer Research Center, a Seattle-based, heavily NIH-funded non-profit institution:¹²⁷



¹²⁷ Fred Hutchinson Cancer Research Center, *supra* note 37.

Major proponents of open and public access—librarians and other scientific support staff—have been surprised by the complexity and additional processing required to comply with the new public-access mandate, especially when the additional complexity of managing multiple types of publisher (traditional and several varieties of open access, and everything in between) is factored in as well.¹²⁸

But overall, the move towards greater public access to research is a move in the right direction. The benefits of long-term archiving and free access by those who might not otherwise be able to afford it outweigh the negatives of increased support-staff workload and potentially reduced markets for traditional publishers. Certainly the law could have done more, but in many ways it is up to scientists and researchers themselves to push for greater moves in the direction of open access, if that is what will benefit science and discovery in the long term. Government can only mandate so much; beyond that, it is up to us to go the rest of the way.

¹²⁸ See generally Interview by Library Journal Academic Newswire with Heather Joseph, Executive Director, Scholarly Publishing and Academic Resources Coalition (Jan. 8, 2008), available at <http://www.libraryjournal.com/info/CA6518133.html> (discussing the immediate impact of the NIH mandate on librarians, administrators, faculty members, researchers, and students).