

CYBERSCIENCE,  
ACADEMIC PUBLISHING AND THE LAW

by

LEONHARD E. REIS

**Introduction [1]**

**Cyberscience [1.1]**

The term “cyberscience” surely needs an explanation. First we have to admit that this compound word, consisting of cyber (i.e relating to cyberspace) and science, is not our own invention but that of Michael Nentwich, who examined in which manner the creating and development of information technologies had been influencing research in the sciences and the humanities.<sup>1</sup> In his words Cyberscience is *“what researchers do in the cyberspace”* namely *“everything related to Academia which takes place in this new type of virtual space”*.<sup>2</sup> To define in detail according to Nentwich: *“Traditional academics either travelled in ‘thought spaces’ or in real places. Cyberscientists, by contrast, spend a lot of time not only in these, but also in new virtual spaces. Information rooms spread out before them by online databases; chat rooms or discussion lists, where they meet and communicate electronically with fellow researchers; digital libraries which deliver documents in bits and bytes [...] Cyberscience technologies help to transcend real space. It is this strong relationship between these technologies and space which makes it advisable not to use just the prefix “e” electronic, like in ‘e-science’. The connotations of ‘cyber’ are more appropriate in our context science cyberscience is about more than electronic ways of doing science”*.<sup>3</sup>

---

<sup>1</sup> NENTWICH, M. (2003), *Cyberscience. Research in the age of Internet*. Vienna: Austrian Academy of Sciences Press. On the earlier use of this term see his footnote 41. For the meaning of “e-science” and “telescience” see his footnotes 42seq.

<sup>2</sup> NENTWICH, M. (2003). *Ibid.*, p.22.

## From the Past [1.2]

The question may arise what the term “cyberscience” has to do with legal problems. On first sight, it seems to be only related to a philosophical discussion of “philosophy of science” or to the social sciences, e.g. sociology related to science.

Let us take a look back in the history of academia and technology to memorize several developments of the last five centuries: Innovation and technological progress has always been causing legal progress. When Johannes Gutenberg invented the printing press no one cared about copyright protection of the new, printed books,<sup>4</sup> but it allowed the written word to be distributed; the international book exchange of academic libraries was one of the results. Of course books were the most important means of transportation of knowledge in academia in the 17<sup>th</sup> and 18<sup>th</sup> centuries, but the research progress conducted in the newly founded Academies of Sciences (e.g. the Royal Society) made other forms of scientific publication necessary. It was in 1665 when the first scientific journals were published: “Journal Philosophical Transactions of the Royal Society” in London and the “Journal des Sçavans” in Paris. They accelerated once more the dissemination of scientific knowledge that marked a new era of science.<sup>5</sup>

The protection of research results also continued to be a legal problem: Predominantly there existed the issue of illegal reprints of publications.<sup>6</sup> Almost 100 years before Immanuel Kant was engaged with his idea of the

---

<sup>3</sup> NENTWICH, M. (2003). *Ibid.*, p.22. The use of online media in academic teaching can be regarded as another scholarly use of the cyberspace. See LONGDIN, L (2004)., Copyright Dowries in Academia: Contesting Authorship and Ownership of Online Teaching Materials. *Common Law Jurisdictions IIC 2004*, p. 22-45 for an interesting discussion of legal aspects of e-learning.

<sup>4</sup> Cf. e.g. MAYER-SCHONBERGER (2005), *Auf der Suche nach dem Grund – Reflexionen zu Sinn und Bedeutung des Urheberrechts* in: M. Fallenböck, F. Galla, S. Stockinger (eds.), *Urheberrecht in der digitalen Wirtschaft*, Wien: Manz.

<sup>5</sup> E.g. WEBER, W. (2002)., *Geschichte der europäischen Universität*. Stuttgart: Kohlhammer, p. 149-150.

<sup>6</sup> This was first dealt with in the first copyright act, the British Statute of Anne (1710). On the correct date see FEATHER, J. (1980)., *The Book Trade in Politics: The Making of the Copyright Act of 1710*, *Publishing History* 19 (8), p. 39seq. Immanuel Kant invented in his famous article, which is still worth reading, KANT, I (1785)., *Von der Unrechtmäßigkeit des Büchernachdruckes*. the idea of intellectual property, esp. the idea of the moral rights of an author. He was followed by FICHTE J.G (1793), *Beweis der Unrechtmäßigkeit des Büchernachdrucks*. Fichte was one of the first to separate form from content of literary works. For a survey of the early development see SCHACK, H. (2005), *Urheber- und Urhebervertragsrecht*. Tübingen: Mohr Siebeck.

illicit reprints of books, John Locke created the “Labour Theory of Property” in his „*Two Treatises of Government*“.<sup>7</sup> According to Locke, the constitution of the USA entitles the Congress to *promote the progress of science and useful arts, by securing for limited time to authors and inventors the exclusive right to their respective writings and discoveries*“.<sup>8</sup> Locke on the one hand and Kant and Fichte on the other created the idea of copyright protection<sup>9</sup> which was fundamental for research.

The time of Industrialization forced legislation to create the possibility for protection of inventions that could be of industrial application. Patent law gained importance. The international regulation of technical standards led to a juridification and formalization of legal norms during the second half of the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> centuries. International treaties and an intensive national legislation initiated by experts accompanied the technical progress in this time.<sup>10</sup>

Another aspect of the history of science is worth mentioning: The invention of the postal services increased scholarly communications providing a means of widespread and effortless dissemination; not only could scholars communicate with each other more easily, the distribution of scientific publications was also facilitated.

## **Recent Legal Problems of Cyberscience The Case of Scholarly Communication [2]**

The presented examples have a strong emphasis on scholarly communication. Nowadays there are also the legal issues of cyberscience to discuss. Several notes on new developments and recent problems may illustrate the difficulties of this field of law.<sup>11</sup>

---

<sup>7</sup> J. LOCKE (1680-1690), *Two Treatises of Government*.

<sup>8</sup> The Constitution of the United States, Art. 1, Sect. 8, Clause 8.

<sup>9</sup> Cf the first use of the term „intellectual property“ in 1834 in the decision of the Massachusetts Circuit Court Davoll et al v. Brown „[...] *only in this way we protect intellectual property, the labors of the mind, productions and interests as much a man's own[...]*as the wheat he cultivates, or the flocks he rears“

<sup>10</sup> VEC, M. (2006)., *Recht und Normierung in der Industriellen Revolution. Neue Strukturen der Normsetzung in Völkerrecht, staatlicher Gesetzgebung und gesellschaftlicher Selbstnormierung*. Frankfurt am Main: V. Klostermann; SECKELMANN M.(2006), *Das Patentrecht als „Reaktionsbeschleuniger“*. Zur Rolle des Patentschutzes in der Industriellen Revolution. Frankfurt am Main: V. Klostermann.

## Science Blogs [2.1]

During the last two years a totally new form of communication occurred: Weblogs written by scientists. Blogs, the word itself being a portmanteau of “web log” are websites where entries are made in journal style and displayed in a reverse chronological order. Blogs may provide commentaries or news on a particular subject combining texts, images, and links to other blogs or websites.<sup>12</sup> Out of the almost 60 million blogs counted by the search engine Technorati<sup>13</sup> there are is a small number of blogs concerning scientific issues which, and that is the second important characteristic, were written by a scientist; other blogs related to science but written by amateurs or journalists must not be regarded as science blogs. This new form of scientific publication can mostly be traced within the natural sciences.<sup>14</sup> The success of science blogs in the public increased due to the nature of some topics discussed like the critical observation and discussion of the intelligent design and creationist movements by scholars.

Although blogs are “rather more like the conversation you have at the bar after a scientific meeting” or “summaries like basic concepts in classrooms” and the fact that blogs do not reach the quality of texts for peer-reviewed journals, they still fill the need for “raw but accessible information that goes deeper than newspaper articles, but is more easily understood than the scientific literature”.<sup>15</sup>

Science blogs facilitate the rapid and efficient publication of latest research news and may enable discussions in much shorter time than printed publications.<sup>16</sup> The legal issue we face is the protection of the content science blogs and the proper assignment to the authors. The information

---

<sup>11</sup> In spite of the positive effects of cyberspace on research one should not neglect that cyberscience also offers opportunities for “scientific fraud”. The possibility of “copy and paste” is one of them. WEBER, S. (2007), *Das Google-Copy-Paste-Syndrom. Wie Netzplagiate Wissen und Ausbildung gefährden*. Hannover: Heise.

<sup>12</sup> Wikipedia s.v. Blog. Retrieved January 10, 2007, from <http://en.wikipedia.org/wiki/blog>.

<sup>13</sup> Retrieved January 10, 2007, from <http://technorati.com/about>.

<sup>14</sup> Cf *The list of 50 popular science blogs (written by scientists)*. Retrieved January 10, 2007, from [www.nature.com/news/2006/060703/multimedia/50\\_science\\_blogs](http://www.nature.com/news/2006/060703/multimedia/50_science_blogs).

<sup>15</sup> *Nature* 442, p. 9.

<sup>16</sup> For jurisprudence we can also see a possibility to use blogs in scholarly work: Legal blogs may enable a faster and more intensive discussion of court decisions and journal articles. We can already trace this effect on the “Jurablogs” website, where most of the German speaking law blogs, or “blawgs” as they are called, are collected ([www.jurablogs.com](http://www.jurablogs.com)). Recently the German Federal Constitution Court even quoted scientific discussions from a blawg in a decision (2 BvR 1339/06).

disseminated is made available to the public. The protection as a trade secret or as know-how is not possible any more.<sup>17</sup> One has to consider copyright protection as a literary work that includes – according to the Berne convention<sup>18</sup> – “every production in the literary or scientific domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings”.

So far, so good, but several jurisdictions expect a certain level of creativity to provide copyright protection.<sup>19</sup> Often this level of creativity is not reached by short notes or some listings of data. Therefore the blog entry may not be protected by copyright. Another problem occurs: There is no obligation to indicate source and author because the legal basis for the enforceable right to be quoted correctly is copyright protection.<sup>20</sup>

### **Research Data under Open Content-Licences [2.2]**

Another modus operandi has appeared within the last few years: Research data is made available online under open content licences.<sup>21</sup> That means data is published in an online format that allows any copying of the information under conditions of “share alike”, “non-commercial” or “royalty free”.

The idea of using an open content licence to create a kind of protection that does not allow any commercial redistribution is crucial. It is dependent on the fact that only a copyright holder is able to grant some of his rights to the public while retaining other through a variety of licences and contract schemes.

The data itself is not protected by copyright law at all: Copyright Acts do

---

<sup>17</sup> For the importance and protection of trade secrets see generally NN (2002), Trade Secrets are Gold Nuggets, *WIPO magazine* 4, p. 12-14

<sup>18</sup> Berne Convention for the Protection of Literary and Artistic Works, Article 2.

<sup>19</sup> Cf. for Germany VON GAMM, E.-I. (2004), *Die Problematik der Gestaltungshöhe im deutschen Urheberrecht - Unter besonderer Berücksichtigung europarechtlicher Vorgaben und der Überschneidung mit dem deutschen Geschmacksmuster-, Wettbewerbs- und Kennzeichnungsrecht*. Baden-Baden: Nomos.

<sup>20</sup> One has to distinguish between the (legally) free use of quotations (cf. Berne Convention for the Protection of Literary and Artistic Works, Article 10) and the academic principle of traceability of research according to Sir Karl Popper which is rather a moral obligation of the publishing researcher.

<sup>21</sup> LIANG, L. (2004), *A Guide to Open Content Licences*. Rotterdam: Piet Zwart Institute; On Open Content and Copyright see PLASS, G (2002), *Open Contents im deutschen Urheberrecht*, *GRUR* 2002, 670 seq.

not allow for intellectual property protection of raw facts. In this respect it is almost the same as with the science blogs. Therefore it is a good idea to use Open Content licences for web content that is protected by the copyright law. Using these licences does not differ from other contractual relationships between authors and users, but open content licences are not suitable at all for online research data.

### Open Access<sup>22</sup> [2.3]

One of the most impressive results of the occupation with cyberspace by scientists is the Open Access movement. This initiative has to be considered the groundbreaking reaction of scholars to the policy of publishing houses concerning online-publishing during the 1990s, after many of them started to publish scientific journals either exclusively online or both online and printed. Scholars could and can access these online-journals via their institutional libraries that pay the access fees. This situation led a group of scientists to claim that: *“The literature that should be freely accessible online is that which scholars give to the world without expectation of payment. Primarily, this category encompasses their peer-reviewed journal articles, but it also includes any unreviewed preprints that they might wish to put online for comment or to alert colleagues to important research findings. [...] By ‘open access’ to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.”*<sup>23</sup> Another definition says: *“For a work to be OA, the copyright holder must consent in advance to let users “copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose,*

---

<sup>22</sup> A very good survey on the idea of OA is provided by SUBER P. (2006)., *Open Access Overview. Focusing on open access to peer-reviewed research articles and their preprints*. Retrieved January 10, 2007, from <http://www.earlham.edu/~peters/fos/overview.htm>. Cf. also the online journal by SUBER,P. (ed.), *The SPARC Open Access Newsletter*. Retrieved January 10, 2007, from <http://www.earlham.edu/~peters/fos/newsletter/archive.htm>. See also REIS, L. (2006)., *The two roads to open access – not only an IP-law problem*. In: Sint, P./Schweighofer, E. *KnowRight 2006. Knowledge Rights – Legal , Societal and Related Technological Aspects*. Vienna: Austrian Computer Society for a legal introduction.

<sup>23</sup> The Budapest Open Access Initiative. Retrieved January 10, 2007, from [www.soros.org/openaccess/](http://www.soros.org/openaccess/).

*subject to proper attribution of authorship”*.<sup>24</sup>

Although these definitions demand free access to all scientific publications without any legal restriction, the idea of open access has to be examined from a legal point of view. Obviously intellectual property rights are concerned, especially copyrights and publishing rights.

Scientific papers and articles, either available via Open Access or not, are without any doubt literary works and therefore legally protected by most of the national Copyright Acts. This protection causes several legal consequences for the author: Copyright Acts grant the scientific author the exclusive right to exploit his work and guarantees him the protection of his non-material interests. Among the other author's rights, the right of publication (of his scientific work) is one of the most important for an analysis of the legal aspects of Open Access. The author has the sole right to decide if, by whom, and how his work will be made accessible to the public. An author is legally able to licence someone else to use one or all of his rights or he can licence someone else to exploit the work exclusively.<sup>25</sup>

Once the manuscript exists, the author usually publishes the article either as a self-publisher or via a publication house; either as a printed publication or online. If the author decides to make his work accessible as a so called “pre-print” in an Open Access-archive after finishing the manuscript and before negotiating about publication or before submitting to a publication house, he is exploiting his right of making available according to the most applicable copyright acts.<sup>26</sup> As the granting of the rights of publication is non-exclusive, the author is allowed to use and exploit his work himself and make it available, even online.

Open Access is also recognized by recommendations of the European Community that want “*research funding agencies to establish a European policy mandating published articles arising from EC-funded research to be available after a given time period in open access archives*”.<sup>27</sup> The European Community is in

<sup>24</sup> The Berlin Declaration. Retrieved January 10, 2007, from [www.zim.mpg.de/openaccess-berlin/berlindeclaration.html](http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html)

<sup>25</sup> On the legal consequences of copyright see any introduction in this field.

<sup>26</sup> Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

<sup>27</sup> EUROPEAN COMMISSION (2006), *Study on the economic and technological evolution of the scientific publications markets in Europe*. EUROPEAN COMMISSION (2006). *Scientific Publications*.

good company: Almost all important research funding organizations recommend Open Access publishing.<sup>28</sup>

We can also spot the importance of the relation between cyberscience and copyright law in the current discussion of an amendment to the Copyright Act in Germany.<sup>29</sup> One of the aspects discussed nowadays is the author's right to publish a post print in non-commercial content after a blocking period of six months. This is claimed by the Upper House of the German Parliament, but requests a different formatting of the text. This would be in order even if this claim does not meet the ideas of Open Access. There is another discussion to prohibit the online publication of pre-prints of German publishing houses. If this provision were finalized one of the most important chances of cyberscience would be ruined.<sup>30</sup>

### **Conclusion [3]**

One can summarise the issues sketched in this paper by saying that cyberscience has to deal with the distribution and also the protection of the results of academic research. To put it into legal terminology: First and foremost the legal field of intellectual property law seems to be concerned; among them primarily copyright law combined with publishing law and almost equally patent law and technology transfer law.

It may not be surprising that the genres of legal problems in science, especially in academia remain roughly the same; only the details of methods of research and means of communication have changed. So all that lawyers and legislation have to do is adopt the existing legal framework of academic research to the needs of cyberscience.

---

<sup>28</sup> See EUROPEAN RESEARCH ADVISORY BOARD (2006), *Scientific Publication: Policy on Open Access*. Retrieved January 10, 2007, from [ec.europa.eu/research/eurab/pdf/eurab\\_scipub\\_report\\_recomm\\_dec06\\_en.pdf](http://ec.europa.eu/research/eurab/pdf/eurab_scipub_report_recomm_dec06_en.pdf).

<sup>29</sup> Cf. Among many others the discussion at <http://www.urheberrechtsbuendnis.de/>; HECKMANN, J., WEBER, M.P. (2006), Open Access in der Informationsgesellschaft - § 38 UrhG de lege ferenda, *GRUR Int.* 2006, p. 995 seq.

<sup>30</sup> Other provisions under discussion concern workplaces in libraries with electronic media facilities. The idea is to allow such workplaces in public libraries, archives or museums under the severe conditions and a high fee payable to the collecting societies. High fees shall also be charged for electronic document delivery services of libraries. In the sciences document deliveries don't have much importance but in the humanities in history linguistics, philology or cultural studies, where publications from the 19th century are still of particular interest for the researchers, such a prohibitive provision would make research more difficult.