10-2022

Reforming Copyright or Toward Another Science? A More Human Rights-Oriented Approach Under the REBSPA in Constructing a "Right to Research" for Scholarly Publishing

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REFORMING COPYRIGHT OR TOWARD ANOTHER SCIENCE? A MORE HUMAN RIGHTS-ORIENTED APPROACH UNDER THE REBSPA IN CONSTRUCTING A "RIGHT TO RESEARCH" FOR SCHOLARLY PUBLISHING

Klaus D. Beiter[1]

ABSTRACT

This article identifies copyright impediments existing in the sphere of science, to then make (tentative) suggestions as to how these may be overcome. It focuses on scholarly publishing only, and here primarily on digital content, specifically asking whether expensive commercial scholarly publishers continue to "add value" to research in the digital era. The deficits of copyright law and potential solutions thereto are assessed in the light of the right of everyone "to enjoy the benefits of scientific progress and its applications" (REBSPA) as laid down in Article 15(1)(b) of the International Covenant on Economic, Social and Cultural Rights (ICESCR) of 1966. A substantial part of the discussion examines whether and, if so, in what ways, the REBSPA gives rise to a "right to research," also in an extraterritorial sense that would require the right to be respected beyond borders, and what the normative implications of such a right would be for copyright and science. It is submitted that current interpretations of the REBSPA reveal flaws and gaps. The REBSPA is accordingly reinterpreted in accordance with what is called a more human rights-oriented approach here, its guiding concept being that of "adequacy for science." The article finds that, while existing copyright law needs certain reforms in the interim to accommodate the needs of science, in the longer term, entire institutionalized science may have to be reconceived. Genuinely open science and the creation of a "true" scholarly knowledge commons require far-reaching changes in the way copyright applies in the sphere of science. The continued role of commercial scholarly publishing needs to be questioned. Potentially, it will be necessary to "move beyond" the applicability of copyright in the field of science.[2]

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[2] For some home made instructions, see Merging into a Word Template https://tinyurl.com/MergeTemplateWord If you have seen anything better, please do let me

INTRODUCTION

"Scholarly communication" relates to "how scholars in any field … use and disseminate information through formal and informal channels."[3] Scholarly communication is of crucial importance. Building on Robert Merton's seminal work on the normative structure of science,[4] John Ziman

know.

[3] Christine L. Borgman, *Bibliometrics and Scholarly Communication*, 16 COMM. RES. 583, 586 (1989).

[4] Robert K. Merton, *The Normative Structure of Science (1942), in* THE SOCIOLOGY OF SCIENCE: THEORETICAL AND EMPIRICAL INVESTIGATIONS 267–78 (Norman W. Storer

identifies as two fundamental principles of science those of "originality" and "scepticism."[5] While the former signifies that scientists engage in a process of creating new knowledge (or understanding), the latter makes it clear that any advance can count as such only once knowledge (or its understanding) has been universally validated by the scientific community. Hence, new knowledge emerges only once scientists have disseminated their findings to researchers around the world and these have tested and confirmed the conclusions concerned. The latter researchers in turn rely – and depend – on these conclusions to further develop their own theories. New knowledge is seldom constructed out of the blue. As Isaac Newton famously remarked, "[i]f I have seen further it is by standing on the shoulders of giants."[6] The scientist "who is unable to give or receive information in his or her field of work might as well not exist as far as the world of science is concerned."[7]

Science accordingly depends on channels of scholarly communication being and remaining open. It is important, therefore, that obstacles impeding the dissemination of, access to, and use of scholarly information "be addressed effectively." A significant obstacle exists in the form of copyright. In doing the research for this article, this writer had sought to digitally retrieve a copyrighted article written by a director of the Max Planck Institute for Innovation and Competition in Munich (a former employer). As none of the libraries to which this author had access subscribed to it and by reason of its paywalled nature, it proved impossible to gain (affordable) access to the article, not even through shadowy channels.[8] The article is ironically entitled, "Copyright Law and the Scientist."[9] This goes to show that the relationship between copyright and science is – mildly put – complex. While scientists desire the unhindered flow of information, at any rate the commercial publishers (academic writers frequently conferring their copyright or substantial entitlements under it to publishers) have an interest in imposing restrictions on the dissemination of, access to, and use of such information in order to make a profit. There exists a clear tension between the needs of science and the interests of publishers. Still prior to the full swing of the digital era, Stewart Brand had noted that

> [i]nformation wants to be free because it has become so cheap to distribute, copy, and recombine – too cheap to meter. It wants to be expensive because it can be immeasurably valuable to the recipient. That tension will not go away. It leads to

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ed., 1973).

5 JOHN ZIMAN, REAL SCIENCE: WHAT IT IS, AND WHAT IT MEANS 40–44 (2003) (explaining these two dimensions).

6 *See* ROBERT K. MERTON, ON THE SHOULDERS OF GIANTS: A SHANDEAN POSTSCRIPT (1965) (the book, right in front, containing a copy of the handwritten excerpt including Newton's quotation).

7 JOHN ZIMAN, PAUL SIEGHART & JOHN HUMPHREY, THE WORLD OF SCIENCE AND THE RULE OF LAW: A STUDY OF THE OBSERVANCE AND VIOLATIONS OF THE HUMAN RIGHTS OF SCIENTISTS IN THE PARTICIPATING STATES OF THE HELSINKI ACCORDS 41 (1986).

8 In my own defense, I may refer to John Bohannon, *Who's Downloading Pirated Papers? Everyone*, 352 SCIENCE 508 (Apr. 29, 2016).

9 Reto M. Hilty, *Das Urheberrecht und der Wissenschaftler*, 55 GRUR INT'L 179 (2006).

> endless wrenching debate about price, copyright, "intellectual property" [IP], and the moral rightness of casual distribution, because each round of new devices makes the tension worse, not better.[10]

This is felt even more intensely in the digital age, since digitization now allows both *full* access and *comprehensive* control (via digital fences and locks). Such comprehensive control has perhaps become the single most important make-or-break factor for a functional system of science. With the ratcheting up of global copyright standards that has occurred in the era of TRIPS (Agreement on Trade-Related Aspects of Intellectual Property Rights)[11] and TRIPS-plus, some now speak of "a hardly resolvable conflict" between the interests of science and those of commercial publishing.[12]

How can the copyright dilemma in the field of science be resolved? The question as to how better dissemination of, access to, and use of scholarly publications might be achieved could be approached in different ways. One could make an economic argument to the effect that a more open science yields increased returns to research and development (R&D) expenditure.[13] One could also adopt a more activist A2K approach, arguing that, as an appropriate response to the demands of the "knowledge economy," innovation and development require better "access to knowledge," including scientific knowledge.[14] Then one could argue from a Senian "capability approach," holding that improved access to scientific information promotes wider human development and advances human capabilities in a way that enhances individuals' freedom to choose their way of life.[15] However, the approach here will be more decidedly from human rights. The question posed is whether the right of everyone "to enjoy the benefits of scientific progress and its applications" (REBSPA) as laid down in Article 15(1)(b) of the International Covenant on Economic, Social and Cultural Rights (ICESCR) of 1966,[16] provides the necessary counterweight to resolve the copyright dilemma. While broad access, free dissemination, and unrestrained reuse of

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[10] STEWART BRAND, THE MEDIA LAB: INVENTING THE FUTURE AT MIT 202 (1987).

[11] Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299 (entered into force Jan. 1, 1995) [hereinafter TRIPS].

[12] RAFAEL BALL, WISSENSCHAFTSKOMMUNIKATION IM WANDEL: VON GUTENBERG BIS OPEN SCIENCE 127 (2021).

[13] *See, e.g.*, John W. Houghton & Charles Oppenheim, *The Economic Implications of Alternative Publishing Models*, 28 PROMETHEUS 41–54 (2010) (finding that more open access to research findings leads to "substantial net benefits" in the longer term, including in the form of returns to R&D).

[14] *See, e.g.*, Ahmed Abdel Latif, *The Emergence of the A2K Movement: Reminiscences and Reflections of a Developing-Country Delegate*, *in* ACCESS TO KNOWLEDGE IN THE AGE OF INTELLECTUAL PROPERTY 99 (Gaëlle Krikorian & Amy Kapczynski eds., 2010) (articulating the need in global IP law to move from access to medicines to access to educational material and scientific knowledge).

[15] For the most comprehensive account of Sen's "capability approach," *see* AMARTYA SEN, DEVELOPMENT AS FREEDOM (1999).

[16] International Covenant on Economic, Social and Cultural Rights, Art. 15(1)(b), Dec. 16, 1966, 993 U.N.T.S. 3 (entered into force Jan. 3, 1976) [hereinafter ICESCR].

scientific knowledge naturally follow from the normative structure, that is, the unwritten laws, of science, the question here is whether these do not also, more explicitly, flow from a "right to research" under the REBSPA. If so, what would be the normative content of such a right? Would it be sufficiently strong to trigger or demand changes to copyright in the field of science? Valentina Moscon opines that access, dissemination, and reuse are a demand of the right to scientific/academic freedom,[17] a right which conceptually implies rather negative obligations under the REBSPA. However, they might also be subsumed under the right of citizens to benefit from scientific progress, this being the conceptually more positive element of the REBSPA. A more open science enhances other researchers' use of certain literature, news and social media coverage thereof, possibilities to mine text and data in commercial and non-commercial research contexts, access to research in the R&D sector, access for citizen scientists, medical patients, NGOs, law-makers, and governments, and may thus influence science and socio-economic policy, lead to further scientific knowledge, and precipitate actual beneficial applications (notably technology), which can improve the lives of citizens.[18] Additionally, one may ask, does a "right to research" under the REBSPA also have extraterritorial applicability? Does it require countries of the global North to protect access, dissemination, and reuse beyond borders in countries of the global South?

In a sense, this article seeks to further develop aspects of an earlier article of this author, published in the *Israel Law Review* in 2019.[19] This essentially had sought to provide a blueprint for resolving the natural tension that exists between the negative and the positive dimension of the REBSPA. The article was written to influence the drafting of General Comment No. 25 on Science and Economic, Social and Cultural Rights by the Committee on Economic, Social and Cultural Rights (CESCR), the independent expert body supervising implementation of the ICESCR. The General Comment was adopted in April 2020.[20] I had endeavored to argue that, in constructing the positive dimension of the REBSPA, far greater account needed to be taken of the negative scientific/academic freedom element than had been done notably in UNESCO's Recommendation on Science and Scientific Researchers of

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[17] Valentina Moscon, *Academic Freedom, Copyright, and Access to Scholarly Works: A Comparative Perspective*, *in* BALANCING COPYRIGHT LAW IN THE DIGITAL AGE: COMPARATIVE PERSPECTIVES 99, 101 (Roberto Caso & Frederica Giovanella eds., 2015).

[18] See Jonathan P. Tennant et al., *The Academic, Economic and Societal Impacts of Open Access: An Evidence-Based Review* [version 3; referees: 3 approved, 2 approved with reservations], 5:632 F1000RESEARCH 1, 1–23 (2016) (describing the various benefits of OA for science and ultimately citizens).

[19] Klaus D. Beiter, *Where Have All the Scientific and Academic Freedoms Gone? And What Is "Adequate for Science"? – The Right to Enjoy the Benefits of Scientific Progress and Its Applications*, 52 ISR. L. REV. 233 (2019).

[20] U.N. Comm. on Econ., Soc. and Cultural Rts., General Comment No. 25: Science and Economic, Social and Cultural Rights (Art. 15(1)(b), (2), (3), and (4) of the ICESCR), U.N. Doc. E/C.12/GC/25 (Apr. 30, 2020) [hereinafter General Comment No. 25].

2017.[21] Overall, my attempts were not very successful. The Committee member charged with preparing the draft had explained to me that a separate General Comment at some future date might address the right to scientific/academic freedom.[22] Even though the 2020 General Comment, in its title, claims to also address Article 15(3) of the ICESCR, which protects "the freedom indispensable for scientific research,"[23] the General Comment does not deal with scientific/academic freedom issues in depth. The submission here is that, if not interpreted cautiously, the positive dimension of the REBSPA may, in "chasing" scientific progress, readily be implemented in a way that is concomitant with overregulation of science, bureaucratization, hyper-incentives, productivist agendas, and performatist attitudes, all detrimental to science. It is these facets that create a (lucrative) market for scholarly publications in the first place. Commercial publishers and their governments (most of the publishers based in countries of the global North), for obvious monetary reasons, support strong (and ever stronger) copyright laws.[24] The 2019 article had formulated 22 recommendations on how the REBSPA should be construed so as to duly respect scientific/academic freedom. Recommendation 21 reads as follows:

> The market power and profit margins of commercial scientific publishers need to be limited. "Publish or perish" … should be terminated, open access publishing models be promoted, not-for-profit university publishers be well subsidised by states, publishers be required to pay for peer review, and … far-reaching limitations and exceptions to copyright protection be enacted to guarantee access to scientific knowledge.[25]

No strong statement of this caliber can be found in the existing interpretations of the REBSPA. The analysis in what follows will build on the ideas of Recommendation 21, to assess whether it is correct to say that, in the digital era, commercial scholarly publishing and the profit motive lie at the root of the copyright dilemma in science.

The "right to research," in both its domestic and extraterritorial dimension, will be constructed on the basis of existing normative documents relevant to the REBSPA, including General Comment No. 25 and UNESCO's Recommendation on Science and Scientific Researchers of 2017 and that on Open Science of 2021.[26] However, the REBSPA will also be

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[21] UNESCO General Conference, Recommendation on Science and Scientific Researchers, Doc. 39 C/Res 85 (Nov. 13, 2017) [hereinafter UNESCO Recommendation (2017)].

[22] E-Mail, Mikel Mancisidor de la Fuente (Spain), July 1, 2017, on file with this author.

[23] *See supra* note 19. ICESCR, *supra* note 15, Art. 15(3).

[24] *See, e.g.*, Philip G. Altbach, *The Subtle Inequalities of Copyright*, 8(15) THE ACQUISITIONS LIBRARIAN 17, 20–21 (1996) ("There is a kind of OPEC of knowledge in which a few rich nations and a small number of multinational publishers have a great deal of control.").

[25] Beiter, *supra* note 18, at 290. "Payment for peer review" was intended as somewhat of a sarcastic statement here.

[26] General Comment No. 25, *supra* note 19; UNESCO Recommendation (2017), *supra* note 20; UNESCO General Conference, Recommendation on Open Science, Doc. 41 C/Res 22 (Nov. 23, 2021) [hereinafter UNESCO Recommendation (2021)]. General

*re*interpreted in accordance with what may be considered a more human rights-oriented approach. Its guiding concept is that of "adequacy for science," borrowed from German law, but developed further. The aim is to show what, in this writer's view, is missing from existing interpretations of the REBSPA, namely, a deeper understanding of the breadth and richness of the concept of scientific/academic freedom, its normative demands for the scientific enterprise, and its implications for copyright in the field of science. Altogether, one could say that the REBSPA will be *purposively* interpreted to construct a *derivative* "new" human right (more on this later).

The article finds that a strong case can be made for a bold "right to research," in both its domestic and extraterritorial dimension, under the REBSPA (and associated rights). This right – with one component focusing on scientists' research freedoms, another on citizens' claims to access research findings – it is argued, would require copyright law to undergo certain reforms in the interim to accommodate the needs of science better, for some time to come. However, in the specific way the right is understood here, it would further constitute a weighty argument in support of, in the longer term, entire institutionalized science being reconceived, science becoming genuinely open, and a "true" scholarly knowledge commons being created. This would mandate a largely reduced role for the scholarly publishers and far-reaching changes in the way copyright applies in the sphere of science.

Section I will outline the deficiencies of existing copyright law, also from a North-South perspective, detail three possible future scenarios for copyright and the role of the commercial scholarly publishers (a "milder" subscription model with a clear role for the commercial scholarly publishers, open access, also with a clear role for them, and "genuine" open access with a new, reduced role for the publishers), and enquire as to the "value added" by the scholarly publishing industry to research in the digital era. Section II will then define the REBSPA, (re)interpret this in the light of the "adequacy" concept, and construct the domestic and extraterritorial "right to research." Section III will provide an indication of the changes that are mandated by the "right to research" in the field of copyright and digital science, both in the short or medium and in the long term – hence, explain which one or more of the three scenarios for copyright and the role of the commercial scholarly publishers should prevail. The discussion here cannot make a full-fledged international law argument of the exact changes needed. That would have to be part of a subsequent analysis.

"Science," in this article and as internationally understood, refers to the organized attempt of individuals or groups to objectively study any field of knowledge, including the humanities and social sciences (economics, education, history, law, linguistics, philosophy, politics, psychology, and so

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Comment No. 25, as a synthesis document, is relied on in lieu of the CESCR's Concluding Observations, which assess individual states parties' compliance with Covenant rights as part of the state report procedure.

on), in which theoretical elements are capable of being validated.[27]

I. EXISTING COPYRIGHT LAW AND SCIENCE, POSSIBLE FUTURE SCENARIOS, AND THE SCHOLARLY PUBLISHING INDUSTRY

A. The Deficiencies of Existing Copyright Law and North-South Justice

The research needs of scientists need to be taken seriously as the scientist stands at the center of any research and innovation system that is to yield knowledge which advances society. Yet, already in the analogue era copyright posed certain obstacles to research. The Berne Convention for the Protection of Literary and Artistic Works, still in its 1948 Brussels version, had, in Article 10(2), allowed members, by way of legislation, to provide for "the right to include excerpts from literary or artistic works in educational or *scientific* publications … in so far as this inclusion is justified by its purpose."[28] While the limited nature of the provision is clear, members at the time, even so, tried to "squeeze" early limitations and exceptions (L&Es) for science into it.[29] However, "science" was deleted from this provision in 1971. It was now considered that the general reproduction right of Article 9(1) would sufficiently deal with research needs.[30] Article 9(2) however introduced the (in)famous three-step test for permissible reproductions.[31] With the subjection of all L&Es to the three-step test under TRIPS[32] and trends of a(n) (unjustifiably) strict interpretation of that test,[33] the utilization of works for research purposes can hardly be claimed to enjoy the legal standing it should to further science.[34] Many countries adopted a "private use" exception, permitting, for example, limited copies for non-commercial

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[27] *See, notably*, UNESCO Recommendation (2017), *supra* note 20, ¶ 1(a) (definition of "science," "sciences").

[28] Berne Convention for the Protection of Literary and Artistic Works, Art. 10(2), Sept. 9, 1886, revised at Brussels June 26, 1948, 331 U.N.T.S. 217 (entered into force Aug. 1, 1951).

[29] *See* Jerome H. Reichman & Ruth L. Okediji, *When Copyright Law and Science Collide: Empowering Digitally Integrated Research Methods on a Global Scale*, 96 MINN. L. REV. 1362, 1378 (2012) (making this point).

[30] Berne Convention for the Protection of Literary and Artistic Works, Art. 9(1), Sept. 9, 1886, revised at Paris July 24, 1971, 1161 U.N.T.S. 3 (entered into force Dec. 15, 1972), and amended Sept. 28, 1979 [hereinafter Berne Convention].

[31] *Id.* Art. 9(2).

[32] *See* TRIPS, *supra* note 10, Art. 13 ("Members shall confine limitations or exceptions to exclusive rights to certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the right holder.").

[33] *See* Christophe Geiger, Jonathan Griffiths, Reto M. Hilty et al., *Declaration on a Balanced Interpretation of the "Three-Step Test" in Copyright Law*, 39 INT'L REV. INTELL. PROP. & COMPETITION L. 707, 711 (Preamble) (2008) ("national courts and legislatures have been wrongly influenced by restrictive interpretations of that Test") [hereinafter Geiger et al., *Declaration on a Balanced Interpretation of the Three-Step Test in Copyright Law*].

[34] Superbly describing the state of affairs, *see* the thorough analysis by Reichman & Okediji, *supra* note 28.

research purposes.[35] Private copying is sometimes made a remunerated L&E.[36] There may be library L&Es allowing uses toward the preservation or replacement of works or copying for researchers.[37] A common L&E is further that which allows non-commercial "use for the sole purpose of illustration for teaching or scientific research." Use may only be "to the extent justified by the … purpose."[38] If in this L&E, "for the sole purpose of illustration" is read to apply not only to "teaching," but also to "scientific research," then the L&E is quite limited and does not facilitate proper utilization of a work for research. Restricting use to just "non-commercial" purposes is questionable too, as universities these days – whether desirable or not – have become quasi-commercial actors.[39] In the United States and other countries that follow the "fair use" doctrine in copyright, public research fares quite well in the analogue context. Research uses in this respect would often be considered transformative in nature, as advancing the public interest, and thus covered by fair use.[40]

While the First Scientific Revolution (Science 1.0) is associated with the development of the publishing system for printed works, the Second Scientific Revolution (Science 2.0) refers to science facilitated by digitization and the internet, e-science. E-science can, but need not be open.[41] At its best, it is characterized by enormous data storage capacities, the application of various computational methods of data analysis and manipulation, digitally networked communities of scientists, and open repositories of scientific data.[42] However, copyright problems have become much more acute in the digital and e-science era. Printed scholarly literature is physically sold to research institutions. As a consequence, many of the right-holders' copyright entitlements are considered exhausted on first sale. For as long as this was the essential way libraries acquired literature, this arrangement substantially facilitated the use of works by scientists. Digital works, however, are commonly kept behind a paywall and then licensed to (for example) libraries.

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35 Daniel Seng, *Educational Activities Copyright Exceptions: Typology Analysis*, WIPO, Standing Comm. on Copyright and Related Rights, SCCR/38/8, 5 (Mar. 29, 2019).

36 *See specifically* 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, (2001) O.J. (L 167) 10, Art. 5(2)(a), (b) (photocopying and other private copying to be remunerated) [hereinafter Infosoc Directive).

37 Kenneth D. Crews, *Copyright Limitations and Exceptions for Libraries: Typology Analysis*, WIPO, Standing Comm. on Copyright and Related Rights, SCCR/38/4, 6–8 (Mar. 29, 2019).

38 *See* Infosoc Directive, *supra* note 35, Art. 5(3)(a) (providing for this L&E).

39 *See also* Reichman & Okediji, *supra* note 28, at 1381–82 (raising similar points of criticism).

40 *Id.* at 1384–87.

41 *See* Sönke Bartling & Sascha Friesike, *Towards Another Scientific Revolution*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING 3 (Sönke Bartling & Sascha Friesike eds., 2014) (on the First and Second Scientific Revolution, Science 2.0, and Open Access).

42 *See* Reichman & Okediji, *supra* note 28, at 1366–67.

Their utilization is subject to the perpetual contractual control of publishers. The World Intellectual Property Organization (WIPO) World Copyright Treaty (WCT) of 1996, one of the so-called internet treaties, bestows on the copyright-holder of a digital work the exclusive right to communicate that work to the public by wire or wireless means.[43] In consequence, with libraries intending to do exactly that, the lending and terms of use of such works are subject to the stipulations of the publisher. Copyright law is increasingly read not to cover an L&E permitting digital lending by libraries.[44] In many countries, digital library uses are further limited to the premises of the institution concerned. This proved a serious obstacle during the Covid-19 pandemic where researchers had to work remotely.[45] Payment of licensing fees remains a continuous obligation. While library budgets remain stagnant, prices for digital scholarly products have increased at astronomical rates.[46] Hence, subscription fees for journals have outpaced inflation at 250% in the last thirty years.[47]

It has also become customary – with many copyright systems countenancing this – for publishers to summarily render L&Es that were available in the analogue era inapplicable contractually. Digital rights management (DRM) tools are now combined with technological protection measures (TPMs), making it impossible to access or use scholarly literature in accordance with legitimate research needs. Copyright law forbids the circumvention of TPMs, sometimes even stipulating criminal sanctions.[48] Furthermore, as pointed out, science has changed with the advent of new research technologies. It is possible now to rely on facilities that permit browsing, analyzing, and manipulating huge amounts of digital text or data within seconds. "Text and data mining" (TDM), as this is called, requires reproductions to be made at various points.[49] It is not clear, however, whether

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[43] WIPO Copyright Treaty, Art. 8, Dec. 20, 1996, 2186 U.N.T.S. 121 (entered into force Mar. 6, 2002) [hereinafter WCT].

[44] *See* Giorgio Spedicato, *Digital Lending and Public Access to Knowledge*, *in* INTELLECTUAL PROPERTY AND ACCESS TO IM/MATERIAL GOODS 149 (Jessica C. Lai & Antoinette Maget Dominicé eds., 2016) (observing this development in Europe and criticizing it).

[45] *See* Statement on Copyright and Proposal of a Waiver from Certain Provisions of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement for the Prevention, Containment and Treatment of COVID-19 (IP/C/W/669) (Mar. 22, 2021), http://infojustice.org/archives/43020 (drawing attention to this problem).

[46] *See* Peter Weingart, *On the Situation and Development of Academic Libraries*, *in* THE FUTURE OF SCHOLARLY PUBLISHING: OPEN ACCESS AND THE ECONOMICS OF DIGITISATION 95, 96 (Peter Weingart & Niels Taubert eds., 2017) ("an aggressive policy regarding prices").

[47] According to "Open Access," Electronic Frontier Foundation, https://www.eff.org/issues/open-access (last visited on Mar. 31, 2022).

[48] For a discussion of the problem of TPMs in relation to science (focusing on the E.U. context), *see* Reto Hilty, *Copyright Law and Scientific Research*, *in* COPYRIGHT LAW: A HANDBOOK OF CONTEMPORARY RESEARCH 315 (Paul Torremans ed., 2007).

[49] Hence, temporary copies are made during any query of a database. More permanent copies are necessary to construct any database to be mined. Copies of a database itself

current copyright L&Es would permit this.[50] Added to this, there is a legitimate need to mine text or data that may not have been ordinarily licensed to a research institution. The WCT, in its preamble, recognizes the need to protect the public interest in "education, research and access to information."[51] Yet, the treaty does not add special L&Es in the field of science. It repeats the three-step test of Berne and TRIPS.[52]

Although the discussion here focuses on scholarly publishing, a few comments on *sui generis* database protection rights are in order – ultimately, also a collection of journal articles could qualify for separate database protection. The notorious blueprint for legal protection in this regard is the European Union's (EU) Directive on the Legal Protection of Databases of 1996.[53] While copyright law itself offers limited protection for databases – because the selection or arrangement of their contents must be original[54] – the Directive accords automatic protection by virtue of "substantial investment" related to a database having been effected. Protection is for a period of fifteen years and, unlike in the case of copyright law, starts to run anew once a "substantial change" to the database has been made.[55] L&Es may (but need not) cover the extraction of "substantial parts" "for the purposes of *illustration* for teaching or scientific research … to the extent justified by the non-commercial purpose to be achieved."[56] Clearly, database protection is problematic. It may restrict access to, and use of, many scientific datasets and make them the object of commercial exploitation to the detriment of science. Database protection further often accords protection to ideas rather than expression and to other materials that, from a copyright perspective, fall into the public domain.[57]

If scientists' unfettered access to, and use of, scholarly literature is the one side of the medal, then the ability of each scientist to make available their published research in a way that others can access and use it without problems

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may be necessary to permit other researchers' use thereof, including for replicability tests: *see* Sean Flynn, Christophe Geiger & Joao P. Quintais et al., *Implementing User Rights for Research in the Field of Artificial Intelligence: A Call for International Action*, 42 EUR. INTELL. PROP. REV. 393, 394 (2020).

50 As Jerome Reichman and Ruth Okediji explain, one way of seeing this is to argue that, by virtue of the comprehensive use of information which TDM entails by scientists as the primary market of published scientific works, TDM constitutes an instrument of "massive infringement" of copyright: Reichman & Okediji, *supra* note 28, at 1412, 1426–28.

51 WCT, *supra* note 42, Preamble, Recital 5.

52 *Id.* Art. 10(1).

53 Directive 96/9/EC, of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases, (1996) O.J. (L 77) 20 [hereinafter Database Directive].

54 To this effect, *see* TRIPS, *supra* note 10, Art. 10(2); WCT, *supra* note 42, Art. 5.

55 Database Directive, *supra* note 52, Arts. 7(1), 10(1), (3).

56 *Id.* Art. 9(b). The sporadic extraction and re-utilization of "insubstantial parts," also for research purposes, is permissible: *id.* Arts. 7(5), 8(1).

57 For a discussion and related criticism of the Directive, *see* Reichman & Okediji, *supra* note 28, at 1414–25.

is the other side of it. However, in exchange for the opportunity to publish in a journal with a high impact factor – most of these paywalled and held by commercial publishers – authors are willing to either assign their copyright or license significant entitlements to the publishers.[58] (However, authors have been willing to do so readily for monographs too.) Publishers will publish and distribute authors' works. While digital fences and locks will restrain access and use by others, authors themselves lose many of their rights too – rights to republish or otherwise reuse their work (e.g., in another publication or a presentation), to distribute it (e.g., for teaching in a classroom setting), to produce derivative works thereof (e.g., adaptations, translations, abridgements, or condensations) – all acts that would enhance dissemination of a work. The author might for that reason prefer to publish "open access" (OA). In this instance, in accordance with "the author pays" principle, commonly applicable in the case of OA publishing, the author could – against payment (for articles often in the form of so-called "Article Processing Charges" (APCs)) – potentially retain copyright. As for commercial publishers, fees or charges can be prohibitively high, beyond the ability of the author or even their institution, where these commit to pay.[59]

Research findings, as has been explained above, need to be validated *universally* before they can be considered to constitute new knowledge. In other words, the global South would have to be fully engaged in scholarly communication processes across borders toward this end, for its own findings to achieve universal validity and those of the global North as well. This presupposes the free flow of scientific information on a transboundary scale. "[U]nduly strong copyright rules" would not only impede this endeavor, but – as already pointed out by the famous 2002 Report of the U.K. Commission on Intellectual Property Rights – they also prevent affordable access to scientific works essential for development in countries of the global South.[60] The report thus refers to the problem of paywalls for development.[61] Similarly, it states that development through research is stifled by TPMs, supplemented by contract law allowing legitimate uses of works to be excluded, and *sui generis* database protection (which the E.U. compels developing countries to emulate), these measures effectively restricting forms

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[58] Marco Bellia & Valentina Moscon, *Academic Authors, Copyright and Dissemination of Knowledge: A Comparative Overview* 11–12 (Max Planck Inst. for Innov. & Competition, Research Paper No. 21-27, 2021).

[59] *See* Weingart, *supra* note 45, at 106 ("In recent years, the APCs have increased significantly."); David J. Solomon & Bo-Christer Björk, *A Study of Open Access Journals Using Article Processing Charges*, 63 J. AM. SOC'Y INFO. SCI. & TECH. 1485, 1485 (2012) ("The average APC was $906 U.S. dollars (USD) calculated over journals and $904 USD calculated over articles. The price range varied between $8 and $3,900 USD.").

[60] COMM'N ON INTELL. PROP. RTS. (CIPR), INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY 18 (Sept. 2002 Report of the U.K. CIPR, 3d ed. 2003) [hereinafter COMM'N ON INTELL. PROP. RTS., 2002 Report].

[61] *Id.* at 100.

of fair use.[62] Joe Karaganis observes that, differential pricing benefiting developing countries notwithstanding, "these practices also produce a system that operates at the edge of affordability for all players."[63] Moreover, insofar as OA publishing is concerned, UNESCO's Recommendation on Open Science of 2021 notes that "increased costs for scientists and high article processing charges associated with certain business models in scientific publishing … may be causes of inequality for the scientific communities around the world."[64] Finally, countries of the global South are likely to experience a need for bulk access to scientific works, that is, for original language or translated versions of whole works for use by a large number of institutions or users. The Appendix to the Berne Convention, adopted by states in 1971, provides for a compulsory licensing scheme that may be applied by developing countries, permitting translation and/or reproduction of a (whole) work against compensation without the consent of the copyright holder, for defined purposes, if a translation of a work does not exist or if a work has not been distributed in a country at a reasonable price. While the Appendix could have been a good solution for scientific works, there are a number of problems. First, reproduction licenses can only be obtained "in connection with systematic instructional activities."[65] This excludes licenses for scientific works.[66] Translation licenses, however, can be obtained "for the purpose of teaching, scholarship or research."[67] Second, the Appendix was drafted in the analogue era. While Alberto Cerda Silva correctly points out that there are many arguments why the Appendix may well be held to be applicable to digital works too, most commentators hold that it does not.[68]

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[62] *Id.*

[63] Joe Karaganis, *Introduction: Access from Above, Access from Below*, *in* SHADOW LIBRARIES: ACCESS TO KNOWLEDGE IN GLOBAL HIGHER EDUCATION 1, 12 (Joe Karaganis ed., 2018).

[64] UNESCO Recommendation (2021), *supra* note 25, ¶ 20. *See also* Suzanne Day et al., *Open to the Public: Paywalls and the Public Rationale for Open Access Medical Research Publishing*, 6:8 RES. INVOLVEM. & ENGAGEM. 1, 5 (2020) ("potential to create a two-tiered system … entrenches the dominance of scientific outputs from richer countries"); Alf Butenschøn Skre & Asbjørn Eide, *The Human Right to Benefit from Advances in Science and Promotion of Openly Accessible Publications*, 31 NORD. J. HUM. RTS. 427, 445 (2013) ("could … relegate researchers in materially speaking less resourceful countries").

[65] Berne Convention, *supra* note 29, app. Art. III(2)(a).

[66] SAM RICKETSON & JANE GINSBURG, INTERNATIONAL COPYRIGHT AND NEIGHBOURING RIGHTS: THE BERNE CONVENTION AND BEYOND ¶ 14.86 (2d ed., 2006).

[67] Berne Convention, *supra* note 29, app. Art. II(5). It may be noted in this respect that neither Berne, the WCT, nor TRIPS provide explicit L&Es for translation, also not in the research context. Translation L&Es for research purposes would thus have to be implied within the respective limits of the reproduction or other relevant L&Es: *see* RICKETSON & GINSBURG, *supra* note 65, ¶ 13.83 (making this argument for L&Es for translation in Berne generally). For an instructive discussion of Berne translation rights, L&Es, and the Appendix provisions, *see* CHAMILA S. TALAGALA, COPYRIGHT LAW AND TRANSLATION: ACCESS TO KNOWLEDGE IN DEVELOPING ECONOMIES 126–55 (2021).

[68] For detail in this regard, *see* Alberto J. Cerda Silva, *Beyond the Unrealistic Solution for Development Provided by the Appendix of the Berne Convention on Copyright*, 60 J.

Third, the Appendix has for many reasons been a failure (e.g., long waiting periods or the requirement of first seeking consent) and has, therefore, not been made use of by many countries.[69] Consequently, while digital connectivity offers enormous opportunities for development through research in developing countries, restrictive copyright law at this point rather exacerbates the digital divide between the North and the South.

B. Three Possible Future Scenarios for Copyright

Addressing the needs of the research community and the wider public, any one (or the first two jointly) of the following three scenarios for copyright and the role of the commercial scholarly publishers could, in principle, prevail, each in the nature of a model of reform of copyright:

1. *A "Milder" Subscription Model:* In the subscription (also "toll access" (TA)) model, access to journal content is restricted to those that subscribe to and pay for the content. In the print world, access is accomplished by physically handing over journal issues. In the digital world, authentication mechanisms allow paying subscribers to access digital content. This model is associated with journals publishing a certain number of issues with a clearly limited number of pages in any year. While, in the print era, this restriction also had to do with "physical" restraints of space, the restriction, according to orthodox dogma, serves another important purpose. It means that, from among the many article submissions received by a journal, not only those that are "scientifically valid," but also only those "with impact" should be selected for publication.[70] The result hereof is that the peer review process becomes a powerful tool in the hands of journals. The higher the rejection rate for articles and the stricter the choice of only those articles that will yield many citations by other researchers, the higher a journal's "impact factor" will be.[71] Traditionalists say that this mechanism serves to ensure quality in science. Yet, it is also true that, the higher the JIF, the higher the subscription rate a publisher can charge academic libraries for the journal.[72] The more "high impact" journals a publisher holds, the greater

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COPY. SOC'Y U.S.A. 581, 607–12 (2013).

[69] For an excellent discussion in this regard, *see* Silva's article: *id.* "[T]he Appendix comes across as an obsolete, inappropriate, bureaucratic, and extremely limited attempt to provide an air valve for developing countries.": *id.* at 590.

[70] *See* Peter Binfield, *Novel Scholarly Journal Concepts*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 155, 157–58 (mentioning these two functions of traditional peer review).

[71] The Thomson-Reuters, now Clarivate, JIF means the average number of times articles from a specific journal published in the past two years have been cited in the calculation year.

[72] *See* INTERACADEMY PARTNERSHIP, COMBATTING PREDATORY ACADEMIC JOURNALS AND CONFERENCES 62 (InterAcademy Partnership, 2022) ("the highest impact factor journals … the most expensive in terms of annual subscription fees" [hereinafter COMBATTING PREDATORY ACADEMIC JOURNALS].

its economic bargaining power.[73] The subscription model is for this reason very attractive to the commercial publishers. For books, mechanisms may be somewhat different. Yet, also here peer review, (supposed) quality, and economic power (the latter often associated with a publisher's journals) will determine prices. As described under the previous heading, in this model authors will often hand over their copyright to publishers and lose many of their entitlements to use and reuse their own works.[74]

One might argue that the subscription model has largely served science well, but that the obvious copyright restrictions it produces for the dissemination of, access to, and use of scholarly information need to be addressed. New copyright L&Es could be created, or existing ones widened, to promote the best interests of science. This could cover more generous entitlements, for research purposes, to reproduce, format-shift, quote, adapt, translate, or distribute works or parts thereof. It could also encompass clear entitlements for libraries to deal with works in the endeavor of creating and maintaining an adequate research environment (preserving, replacing, copying for users, on and off-premise access, and so on). A specific TDM exception could be designed. Additionally, the contractual evasion of L&Es should be forbidden. As far as possible, TPMs for digital media should be avoided as regards scientific literature. As appropriate, their circumvention should be allowed and, at any rate, may never be criminalized. Moreover, prices for access should be controlled. A statutory body could suggest, or lay down binding, general maximum charges. A tribunal could be granted the competence, on application, to rule that certain fees are "unreasonable." Competition law might be applied to hold that prices are excessive. Compulsory licenses might even be granted to force publishers to open their content to other publishers. Finally, contract law can constitute an appropriate instrument to ensure authors will retain adequate rights to use and reuse their own works.

In this model, it should be noted, commercial scholarly publishers retain their "traditional" role of being the most important – and a powerful – intermediary between academic author and the public. This is a consequence of the subscription model's potential for enormous profits.

2. *Gold/Green Open Access (Open Access "Light") and a Clear Role for Commercial Scholarly Publishers:* In this model, access is not dependent on the payment of an access fee. Here access to digital media is free for the public. Open access follows from either publication in an OA journal (golden OA path) or the self-archiving of works in an OA subject or institutional repository (green OA path).[75]

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[73] *See* Weingart, *supra* note 45, at 98 (explaining this connection between the JIF and economic power).

[74] *See supra* Section I.A., notes 57–58 and accompanying text.

[75] For good descriptions of the golden and green OA paths, *see, e.g.*, David Ball, *Open Access: Effects on Publishing Behaviour of Scientists, Peer Review and Interrelations*

In *the golden path*, the author customarily grants a publisher the non-exclusive license to publish a work and communicate it to the public. The publisher publishes the work "open access," that is, freely available online for the public, and deposits it in an online archive. The author retains the copyright and (may) grant(s) an open content license facilitating wide use of the work by the public. Very often, the Creative Commons Licenses are used to this end.[76] A journal may also be "mixed" in nature in that publication by default occurs in the TA mode, but that the OA mode may be negotiated for individual articles. L&Es retain their relevance in this path. The OA mode entails free consumption by the public, use in accordance with existing L&Es, and, beyond this, use as permitted under an open content license.[77] Enacting new or wider copyright L&Es remains important therefore, as the scope of permitted uses under a license is ultimately contractually negotiated. OA publishing is financed in various ways. Notably, authors are required to pay APCs. Additional funds may flow from advertising, sponsorships, or the sales of print copies. OA journals can also be free for authors. Clearly, high APCs would be problematic for authors and their research institutions.

The green path is essentially directed at subscription articles. Authors deposit these in an OA archive. As copyright has been handed over to the publisher, authors' right of deposit needs to be granted by the publisher. Publishers often set embargo periods of 6 to 12 months. They further do not allow the archiving of articles in their published format.[78] To secure the author's legal position, it is advisable for legislation to grant authors an inalienable right to self-archive, also restricting embargo periods to a minimum. Self-archiving does not require separate peer review. This has

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with Performance Measures, *in* THE FUTURE OF SCHOLARLY PUBLISHING: OPEN ACCESS AND THE ECONOMICS OF DIGITISATION, *supra* note 45, at 165–98; Lucie Guibault, *Owning the Right to Open Up Access to Scientific Publications*, *in* OPEN CONTENT LICENSING: FROM THEORY TO PRACTICE 137–67 (Lucie Guibault & Christina Angelopoulos eds., 2011); HEATHER MORRISON, SCHOLARLY COMMUNICATION FOR LIBRARIANS, esp. Ch. 6 (2009).

[76] The basic Creative Commons Licenses are: *Attribution CC BY* – use and dissemination allowed, subject to crediting the author; *Attribution-NonCommercial CC BY-NC* – as for the first license, however only non-commercial purposes are covered; *Attribution-NoDerivs CC BY-ND* – as for the first license, however no derivate works may be produced and distributed; *Attribution-ShareAlike CC BY-SA* – as for the first license, however derivate works must bear the same license as the initial work; and as combinations of the previous, *Attribution-NonCommercial-ShareAlike CC BY-NC-SA* and *Attribution-NonCommercial-NoDerivs CC BY-NC-ND*. There is also an option *No Copyright: Public Domain CC0* – copyright is waived. For a summary of all these, *see* Sascha Friesike, *Creative Commons Licences*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 287–88.

[77] OA in a comprehensive sense, therefore, means not only *gratis* access, but also *libre* access, that is, access (largely) free from copyright/licensing restrictions.

[78] "Pale green" limits self-archiving to pre-prints only (articles prior to peer review); "dotted, or some form of mitigated green" limits self-archiving to post-prints (articles after peer review); and "solid green" allows self-archiving of both pre-prints and post-prints: Guibault, *supra* note 74, at 156.

usually already been completed for the subscription publication. Archiving entails limited costs relating to establishing and maintaining a repository only. While gold OA can also be applied to books, green OA is normally only intended for articles. Access to archived articles is *gratis*, but usually not *libre*. Hence, enacting new or wider copyright L&Es remains important also in this instance. Additionally, contract law constitutes an appropriate instrument to protect authors' rights to use and reuse their own works.

The European Commission recommends and many governments require scientists to make scholarly publications resulting wholly or partially from publicly-funded research available open access. Many funding agencies and research institutions nowadays mandate OA availability.[79] OA journals are often falsely associated with no or inadequate peer review. There is no basis for this view. Open access relates to access, not the absence of peer review. There is no reason why peer review would be better or worse than in the case of subscription journals. As has been held, open access is "agnostic" insofar as peer review is concerned.[80] What is true is that, while in the case of the subscription journals published for profit, there is a financial incentive to reject articles in high impact journals (and yet to accept many of the rejected articles in lower impact journals, often even those held by the same commercial publisher), there is, in the case of OA journals, an obvious financial incentive to accept as many articles as possible for publication, namely, "the author pays" principle! In the current science environment to which researchers are exposed, this is a factor spurring predatory publishing practices.[81]

Also in this model commercial scholarly publishers retain their "traditional" role as powerful and most important intermediary between academic author and the public. Also here there are enormous profits to be made. Ultimately, the green OA path is primarily directed at subscription articles. In the golden OA path, high APCs can be charged. Even if the copyright here vests in the author, its de facto monopoly remains intact for publishers, essentially because gold OA is contractually agreed. It exists "at the mercy" of publishers.

3. *Genuine Open Access (Open Access 2.0) – Another Science and a New World of Scholarly Publishing:* One could, however, also make more radical demands for "genuine" open access. In this third model, authors and

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[79] As will be explained below, such policies or laws can at most be considered "green." *See infra* Section II.D., notes 298–302 and accompanying text.

[80] Ball, *supra* note 74, at 184.

[81] *See* COMBATTING PREDATORY ACADEMIC JOURNALS, *supra* note 71, at 63 ("the author-pays model of OA is particularly prone to abuse and thus vulnerable to predatory incursion"); THOMAS EGER & MARC SCHEUFEN, THE ECONOMICS OF OPEN ACCESS: ON THE FUTURE OF ACADEMIC PUBLISHING 109 (2018) (explaining that, in order to increase the subscription rate, a journal would have to improve its quality by restricting article acceptance; for an OA journal to increase profits, it could reduce quality and increase quantity, in the extreme become a predatory journal).

research institutions regain "ownership" over their articles, journals, books, and book series. Hence, "a university may host and publish an open access journal, and task its researchers and other staff to perform editorial and administrative tasks for the journal."[82] Copyright would not vest in publishers. Authors would be enabled, and agree, to publish open access, to make their research freely available online for everyone globally without undue restrictions. Publishers would not require reimbursement based on copyright or a de facto copyright monopoly. Publication may occur with or without the infrastructure, facilities, or technical support of publishers, whether commercial, or learned society or university-based. They may thus assist with copy-editing, lay-out, production, circulation and indexing. In this conception, a new, reduced role is envisaged for the scholarly publishers. They (may) contribute to producing a certain product, but they do not hold proprietary rights in that product. Their reimbursement is based on delivering a service.[83] As the enormous profit potential would thus fall away, commercial publishing, in its current form, would lose its lucrativeness. Two subtypes of the model are discernible. In the first, copyright continues to apply in the world of science, but its default positions are contractually modified to make the model work. In the second, copyright is dispensed with.[84] Overall, the third model would remove most or all copyright restraints to the dissemination of, access to, and use of scholarly publications.

Arguments to the effect that this model would likely fail because any research institution or institutionalized science simply lacks sufficient financial, human, and time resources to properly assume the publishing task may not be irrelevant at this point. However, if "industrial science" were pushed back,[85] this would free the required resources. Jerome Reichman and Ruth Okediji argue:

> Scientists, in short, will increasingly have to manage their own upstream research assets as global public goods, sheltering them within a reinvigorated sharing ethos, in the interests of a more productive downstream innovation system otherwise driven by the incentives of industrial property laws.[86]

In the long run, the management of created academic knowledge would become the responsibility of research institutions and libraries jointly (consortia of actors) and ultimately that of scientific communities as a whole. Journals would become mega journals and would be integrated into, or even merge with, huge subject archives.[87]

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82 Skre & Eide, *supra* note 63, at 446.

83 In this sense, *see also* Reichman & Okediji, *supra* note 28, at 1466 (while publishers may charge for their "technical *services*," there is no longer a justification for granting them "exclusive rights" to downstream uses of the "scientific *product*").

84 It is important to understand that doing away with copyright is not the same as not protecting authors' rights in scholarly publishing. On this point, *see infra* Section III.B., notes 403–06 and accompanying text.

85 The case for "another science" is made further below: *see infra* Sections II.C. & III.B.

86 Reichman & Okediji, *supra* note 28, at 1459.

87 On the future of scholarly publishing, *see also infra* Section III.B.

The third model is based on the assumption that science is a public good.[88] Science, which is directed at the discovery of "the truth," yields knowledge of such importance to the progress of society and the betterment of each individual's life, that each capable person must, on the basis of equality, be allowed to contribute to science (as a qualified or even citizen scientist) and to benefit from its achievements. Moreover – and certainly where science is publicly funded, whether in universities, non-university research institutes, or commercial enterprises[89] – research findings must be openly shared with the scientific community and the public. Consequently, in this model it would be necessary to redesign authors' rights and strictly limit the customary interests of the commercial publishers. As it were, the entire organization of science would have to be placed on a new footing. The IP claims of the scholarly publishing industry – effectively precipitating the privatization of research findings – are directly linked to an increasingly commercialized science system. Governments deliberately underfund and simultaneously artificially incentivize science (competition for research funding at all levels), introducing a business analogy to the organization of science. Two notable features of "new public management" (NPM) in science are the installation of administrative hierarchy (top-down or line management) and science evaluation (audit culture, performance management), directed at increasing "research output," including publications.[90] "High impact" publications, but also long publication lists, become the currency for good evaluations, avoiding teaching-only contracts, continued employment, promotion, and the award of research funding. Governments continuously decrease their direct funding for research. Nowadays, most research is funded competitively. In national research assessment exercises, funding bids to research councils, and competition for research contracts, scientists will now have to satisfy their (potential) funders through publications. This is the foundation of the "publish or perish" ideology in science. It creates an artificial market for scholarly publications, where more is published than is good for science and alleged quality and impact become conflated and confused with marketability, profits, and the economic power (and IP rights) of publishers. Not only does science not benefit from such a design, it is effectively damaged.

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[88] This point is uncontested these days: *see, e.g.*, Reichman & Okediji, *supra* note 28, at 1459 ("upstream research assets as global public goods"); Skre & Eide, *supra* note 63, at 430 ("the right to benefit from progress in science and technology is … a public good"); UNESCO Recommendation (2017), *supra* note 20, Preamble, Recital 4(a) ("science as a common good"); UNESCO Recommendation (2021), *supra* note 25, Preamble, Recital 11 ("science as a common good").

[89] On this differentiation (also followed in this article), reflective of the increasing degree to which an "impact agenda" may legitimately be pursued, *see* Beiter, *supra* note 18, at 244, 255–58.

[90] For a detailed account of NPM in science, *see, e.g.*, ROSEMARY DEEM, SAM HILLYARD & MIKE REED, KNOWLEDGE, HIGHER EDUCATION, AND THE NEW MANAGERIALISM: THE CHANGING MANAGEMENT OF UK UNIVERSITIES (2007).

The literature frequently emphasizes the need for copyright reforms on the understanding that the first two models will continue to be operational, alongside each other, at least for some time to come. Hence, the need for a comprehensive research exception has been expressed.[91] In the context of the increased reliance on computational methods in research, this must cover the right to carry out text and data mining.[92] Others have lauded legislative provisions adopted in certain countries which create a right for authors to have their scholarly articles published open access via the green mode if the research was funded (in part, at least) by public money.[93] An interesting suggestion has been made, envisaging automatic OA of academics' scientific works against fair compensation for publishers by research institutions and funders, which is organized collectively.[94] In terms of the models above, this last model would probably have to be considered a further development of model 2, that is, perhaps a model "3 minus." The element of negotiation is retained at least insofar as publishers' compensation is concerned. A fairly "stable" position of commercial publishers seems to be supposed to remain intact. Initial ideas in the sphere of model 3, questioning the "traditional" role of (especially the commercial) scholarly publishers, have also been articulated by some.[95]

C. Any "Value Added" by the Scholarly Publishing Industry in the Digital Era?

The scholarly publishing industry has been making "obscene" profits in the digital era.[96] With profit margins around 30 percent at the turn of the century, some of the big players in the field now have profit margins of over

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91 *See, e.g.*, Reichman & Okediji, *supra* note 28, at 1439 ("adopt a broad and uncompromising exemption for scientific uses"); *see* esp. Part II of the article.

92 *See, e.g.*, Flynn et al., *supra* note 48, at 393 (indicating that there is a need for "WIPO … guidance on the diverse mechanisms that countries may use to authorise TDM research").

93 *See, e.g.*, Dirk Visser, *The Open Access Provision in Dutch Copyright Contract Law*, 10 J. INTELL. PROP. L. & PRAC. 872 (2015) (referring to such provisions in the Netherlands and Germany). Broadly arguing in support of an "improved" model 2, *see* MARC SCHEUFEN, COPYRIGHT VERSUS OPEN ACCESS: ON THE ORGANISATION AND INTERNATIONAL POLITICAL ECONOMY OF ACCESS TO SCIENTIFIC KNOWLEDGE (2015).

94 *See* JOHN WILLINSKY, COPYRIGHT'S BROKEN PROMISE: HOW TO RESTORE THE LAW'S ABILITY TO PROMOTE THE PROGRESS OF SCIENCE, esp. Ch. 6 (forthcoming) (proposing this approach).

95 *See, e.g.*, Moscon, *supra* note 16, at 128–29 (suggesting that one might abolish the economic rights of copyright); Reichman & Okediji, *supra* note 28, Part III (proposing a move toward digital open-knowledge environments managed by institutionalized science); Steven Shavell, *Should Copyright of Academic Works Be Abolished?*, 2 J. LEGAL ANAL. 301, 301 (2010) ("ending academic copyright would be socially desirable").

96 "The Obscene Profits of Commercial Scholarly Publishers," SV-POW! (blog: Mike Taylor, Matt Wedel & Darren Naish) (Jan. 13, 2012), https://svpow.com/2012/01/13/the-obscene-profits-of-commercial-scholarly-publishers (last visited on Mar. 31, 2022).

40 percent.[97] Average profit margins across other industries lie at 7 percent.[98] How then are these enormous profit margins possible? Already in 2006, 62% of academic journals were either commercially owned or commercially published society journals.[99] Five publishers – Elsevier, Springer, Wiley, Taylor & Francis, and SAGE – jointly, published more than 50% of all papers in 2013.[100] If one further considers that research libraries seek to offer complete collections to their users and that the respective publications are not, in competition law terms, 'substitutable', then it becomes quite clear that the commercial scholarly publishing market has an oligopolistic structure facilitating excessive pricing.[101] Additionally, secrecy clauses often forbid details of subscription deals with the big players being disclosed to the public. This in turn facilitates another anticompetitive practice, price discrimination.[102]

The situation for scholarly articles and journals is indeed "grotesque": It is faculty who do the research, write articles, referee texts by other researchers, and serve on editorial boards. They do all of this for free, as it were, the public pays.[103] Yet, the libraries of research institutions buy back the results of faculty's labor at high prices, the public paying a second time for the same content. Added to this, research institutions enter into licensing agreements with collecting societies, undertaking to pay for various uses of works, for instance, the reproduction of articles for research purposes or inclusion in student course packs, this often paid out of tuition fees, the public hence paying a third time.[104] Copyright and its perpetual pervasiveness in relation to digital media make this possible. At the same time, the public thus massively subsidizing private industry, universities and research institutes are

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97 *Id.*; MORRISON, *supra* note 73, Ch. 4 (on scholarly publishing and "the multi-billion-dollar industry"); Jon Tennant, *Elsevier Are Corrupting Open Science in Europe*, THE GUARDIAN (June 29, 2018), https://www.theguardian.com/science/political-science/2018/jun/29/elsevier-are-corrupting-open-science-in-europe ("With profit margins around 37%, larger than Apple and big oil companies").

98 "What Is a Good Profit Margin? Industry Averages and How to Improve Yours," Brex (financial advice company) (July 30, 2020), https://www.brex.com/blog/what-is-a-good-profit-margin (last visited on Mar. 31, 2022).

99 *See* MORRISON, *supra* note 74, at 37 (citing figures provided by scholarly publishing expert Raym Crow in 2006: commercially owned journals – 45 per cent, commercially published society journals – 17 per cent, self-published society journals – 23 per cent, university sponsored journals – 15 per cent).

100 Vincent Larivière, Stefanie Haustein & Philippe Mongeon, *The Oligopoly of Academic Publishers in the Digital Era*, 10(6) PLOS ONE e0127502 1, 3–4 (2015).

101 *See* Weingart, *supra* note 45, at 97, 100 (pointing out that publications are "generally not substitutable" and that large publishers have "an oligopoly status").

102 *See* Karaganis, *supra* note 62, at 20 (on price discrimination through secrecy).

103 While publishers do not pay for articles, scientists do, however, receive (modest) royalties for monographs.

104 See Guibault, *supra* note 74, at 138 ("pay thrice"); Reto M. Hilty, *Five Lessons about Copyright in the Information Society: Reaction of the Scientific Community to Over-Protection and What Policy Makers Should Learn*, 53 J. COPYRIGHT SOC'Y U.S.A. 103, 123 (2005) (saying that the situation is "grotesque").

struggling financially. Students (are unable to) pay ever-increasing fees, libraries are under-resourced, departments are closed for lack of (financial) sustainability, scientists are subject to precarious working conditions.[105] The legitimate question is, what is the "value added" by scholarly publishers that would justify their high prices? In the analogue era, publishers still created a physical product, whose "manufacture" required technical skill, machinery, and material resources. Logistics were subsequently necessarily to ship products to different parts of the world. Much of this falls away in the digital era.[106] A report about Elsevier produced by Deutsche Bank in 2005 accordingly finds the multiple-pay model "bizarre," journals' working capital requirements to be "minimal, " and the professional publishers, overall, to "add little value to the research process."[107]

One might perhaps argue that the commercial scholarly publishers are gatekeepers making sure that only quality science gets published, through the peer review processes they organize. However, not only can peer review be organized as effectively by institutionalized science itself, it is also fundamentally problematic for science to outsource one of its central responsibilities, quality control, to private industry. Sydney Brenner, Nobel Laureate in Physiology or Medicine in 2002, pertinently voices this concern as follows:

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[105] Regarding scholarly libraries, *see, e.g.*, Hilty, *supra* note 103, at 122 (pointing out that many states have reduced expenses for public research); Karaganis, *supra* note 62, at 8 (noting that there have been journal database price increases of 5 to 7 percent per year in the 1990s and 2000s in the U.S., but that library budgets remained static); Weingart, *supra* note 45, at 97 (referring to the financial crisis of libraries). To address the "serial crisis," libraries frequently shift resources from the acquisition of books to journal subscriptions, leading to a crisis in the university presses: Karaganis, *supra* note 62, at 8–9.

[106] For similar observations, *see* Hilty, *supra* note 103, at 120–21 (despite desktop publishing, "surprisingly, journal prices never really sink"); Alexander Peukert & Marcus Sonnenberg, *Copyright and Changing Systems of Scientific Communication*, *in* THE FUTURE OF SCHOLARLY PUBLISHING: OPEN ACCESS AND THE ECONOMICS OF DIGITISATION, *supra* note 45, at 199, 218 ("a traditional knowledge broker is, in principle, no longer necessary"); Reichman & Okediji, *supra* note 28, at 1461 (with desktop publishing, "the value added by such intermediaries has reached diminishing returns").

[107] *See* Samuel J. Klein, "Turning the Supertanker: Deutsche Bank on Elsevier's Excess," KFG Notes (Aug. 5, 2019), https://notes.knowledgefutures.org/pub/supertanker/release/3 (last visited on Mar. 31, 2022) (quoting from the report); MORRISON, *supra* note 74, at 143–45 (arguing that high costs are caused by paid editorial staff, "offices in the world's highest-priced real estate markets," and marketing by large international sales teams); Richard Van Noorden, *The True Cost of Science Publishing*, 495 NATURE 426, 426 (Mar. 28, 2013) ("Cheap open-access journals raise questions about the value publishers add for their money."). Publishers, however, argue that digital publishing has not reduced costs as most costs, so they maintain, are incurred before publication and because higher-level technical experts are now needed: *see* Julie L. Kimbrough & Laura N. Gasaway, *Publication of Government-Funded Research, Open Access, and the Public Interest*, 18 VAND. J. ENT. & TECH. L. 267, 294–95 (2016) (referring to the publishing industry's perspective).

> I don't believe in peer review because I think it's very distorted and … simply a regression to the mean. I think peer review is hindering science. In fact, I think it has become a completely corrupt system. It's corrupt in many ways, in that scientists and academics have handed over to the editors of these journals the ability to make judgment on science and scientists. … [I]t puts the judgment in the hands of people who really have no reason to exercise judgment at all. And that's all been done in the aid of commerce, because they are now giant organisations making money out of it.[108]

There are also many other reasons to question the suitability of (traditional) peer review. Hence, it does not prevent "bad" quality from being published. Simultaneously, it often impedes innovative science. In many ways, as shown below, peer review also conflicts with scientific freedom.[109]

The science evaluation systems governments have directed be put in place in conjunction with the peer review by journals form the basis of the economic power of the commercial scholarly publishers. Evaluation systems require publication in journals with high JIFs. These, in turn, are the product of the way peer review processes are organized by journals (employing, e.g., artificially high rejection rates). JIFs again determine the prices of journals. Authors are willing to hand over their copyright in order to be published in journals with a high JIF, most of these (still) paywalled, thus conferring economic power on the publishers, leading to restrictions on dissemination, access, and use.[110] The logic of this system is that, for scientists to advance

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[108] Elizabeth Dzeng, *How Academia and Publishing are Destroying Scientific Innovation: A Conversation with Sydney Brenner*, KING'S REV. (Feb. 24, 2014).

[109] *See* John Bohannon, *Who's Afraid of Peer Review?*, 342 SCIENCE 60 (Oct. 4, 2013) (bogus paper accepted by credible OA journals); Bill Cope & Mary Kalantzis, *Signs of Epistemic Disruption: Transformations in the Knowledge System of the Academic Journal*, *in* THE FUTURE OF THE ACADEMIC JOURNAL 13, 34–39 (Bill Cope & Angus Phillips eds., 2009) (identifying these deficits: review process hidden to readers, data excluded, reviewers need not defend their views, subversive network effects); Martin P. Eve, *Before the Law: Open Access, Quality Control and the Future of Peer Review*, *in* DEBATING OPEN ACCESS (Nigel Vincent & Chris Wickham eds., 2013) 68, 75 (lack of accountability of reviewers, review process remains invisible); Horace Freeland Judson, *The Problems of Peer Review*, *in* THE GREAT BETRAYAL: FRAUD IN SCIENCE 282–85 (2004) (no proof that peer review yields better quality, conservative, a bureaucratic formality, lack of accountability); Bruno S. Frey, *Publishing as Prostitution? Choosing between One's Own Ideas and Academic Success*, 116 PUB. CHOICE 205 (2003) (pleasing reviewers); IMAD A. MOOSA, PUBLISH OR PERISH: PERCEIVED BENEFITS VERSUS UNINTENDED CONSEQUENCES 120 (2018) (submission outcome "governed by a stochastic process"); Richard Smith, *Peer Review: A Flawed Process at the Heart of Science and Journals*, 99 J. ROYAL SOC'Y MED. 178, 179–80 (2006) (slow, expensive, inconsistent, biased, prone to abuse); U.K. Parliament, HC, Sci. & Tech. Comm., 8th Rep., Peer Review in Scientific Publications ¶¶ 30–58 (July 28, 2011), https://publications.parliament.uk/pa/cm201012/cmselect/cmsctech/856/85602.htm (stifles innovation, biased, expensive, burdensome, lack of evidence of efficacy) [hereinafter U.K. Parliament, Peer Review in Scientific Publications]; JOANNA WILLIAMS, ACADEMIC FREEDOM IN AN AGE OF CONFORMITY: CONFRONTING THE FEAR OF KNOWLEDGE 57 (2017) (pleasing reviewers). On (improving) quality control in scholarly publishing, *see also infra* Section II.C., notes 231–36 and accompanying text.

[110] In this sense, *see also* Bellia & Moscon, *supra* note 57, at 11–13 (arguing that peer review practices plus scientific research evaluation systems lead to authors transferring their

in their careers, they must limit the impact of their writing by "ensuring it goes unread" by other scientists and the larger public.[111] JIFs do not make sense from a scientific point of view. The merit of any one article is determined by the number of citations of *other* articles – and then merely over two years.[112] JIFs may further be artificially boosted by the acceptance of "a few blockbuster articles."[113] Moreover, research demonstrates the absence of any "compelling evidence" that journal rank can reliably predict scientific impact or quality.[114] The U.K. parliamentary Science and Technology Committee has accordingly expressed "concerns about the use of journal Impact Factor as a proxy measure for the quality of an individual article."[115] Overall, JIFs indicate the commercial rather than the scientific value of a journal.[116]

It has cynically been remarked that today's universities are only marginally concerned with gaining knowledge, that they have become "fundraising institutions" and "publication factories" managed by "CEOs."[117] "Quantity" plays a crucial role in the present scheme of things. Success in evaluations and competitions for projects and funding depends on quantity of publications as well. 2.5 million articles are published yearly worldwide in 25.000 peer reviewed research journals.[118] Global scientific output grows by 8 to 9 percent every year, and doubles every nine years.[119] Much of this, even if good, is, however, again quickly forgotten.[120] Too much research is being published; most of this "must be reckoned as merely a distant background noise."[121] The "publish or perish" ideology ("PoP"), at

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rights and publishers acquiring bargaining power).

111 Sarah Kendzior, *Academic Paywalls Mean Publish and Perish*, Al Jazeera, Opinion (Oct. 2, 2012), https://www.aljazeera.com/opinions/2012/10/2/academic-paywalls-mean-publish-and-perish.

112 Cope & Kalantzis, *supra* note 108, at 43 (emphasizing that "good" research takes longer to be appreciated).

113 *Id.* at 43–44.

114 Björn Brembs, Katherine Button & Marcus Munafò, *Deep Impact: Unintended Consequences of Journal Rank*, 7 FRONT. HUM. NEUROSCI. ArtID: 291, 1, 4-5 (2013).

115 U.K. Parliament, Peer Review in Scientific Publications, *supra* note 108, ¶ 177.

116 Weingart, *supra* note 45, at 98.

117 Mathias Binswanger, *Excellence by Nonsense: The Competition for Publications in Modern Science*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 49, 53.

118 *See* Françoise Salager-Meyer, *Open Access: The Next Model for Research Dissemination?*, *in* GLOBAL ACADEMIC PUBLISHING: POLICIES, PERSPECTIVES AND PEDAGOGIES 184, 187 (Mary J. Curry & Theresa Lillis eds., 2018) (mentioning these figures).

119 According to Lutz Bornmann & Rüdiger Mutz, *Growth Rates of Modern Science: A Bibliometric Analysis Based on the Number of Publications and Cited References*, 66 J. ASS'N INFO. SCI. & TECH. 2215, 2218 (2015).

120 *See* Pietro Della Briotta Parolo et al., *Attention Decay in Science*, 9 J. INFORMETRICS 734–45 (2015) (clearly demonstrating how the exponential growth in the number of papers published nowadays leads to papers being forgotten ever more quickly).

121 Derek J. De Solla, *Price Networks of Scientific Papers: The Pattern of Bibliographic*

the heart of "modern" science," quintessentially has to do with quantity. As has been observed, "[t]he only people who benefit from the intense pressure to publish are those in the publishing industry."[122] For science, the consequences are devastating. "PoP" tends to "crowd out" intrinsically motivated curiosity,[123] which is required for groundbreaking discovery.[124] There is clear proof that "PoP" negatively affects accepted tasks of scholars related to expanding and sharing their knowledge, writing referee reports or newspaper articles, or translating research outcomes for the public or policymakers.[125] "PoP" creates a demand for peer review that cannot be met anymore.[126] It leads to a decline in scientific quality. In certain fields of science, up to 90 percent of papers detail research that is irreproducible.[127] More than 80 percent of published papers, in some fields, do not receive a single citation.[128] Research misconduct in the form of plagiarism or the

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References Indicates the Nature of the Scientific Research Front, 149 SCIENCE 510, 515 (July 30, 1965). Generally on the astronomical growth in publications and its detrimental effects on science, *see, e.g.*, Philip G. Altbach & Hans De Wit, *Too Much Academic Research Is Being Published*, U. WORLD NEWS (Sept. 7, 2018), https://www.universityworldnews.com/post.php?story=20180905095203579; Charlotte Price Persson & Johanne Uhrenholt Kusnitzoff, *Crisis in Basic Research: Scientists Publish Too Much*, SCIENCENORDIC (Feb. 13, 2017), https://sciencenordic.com/academia-basic-research-basic-research-crisis/crisis-in-basic-research-scientists-publish-too-much/1442296; GIANFRANCO PACCHIONI, THE OVERPRODUCTION OF TRUTH: PASSION, COMPETITION, AND INTEGRITY IN MODERN SCIENCE (2018).

122 David Colquhoun, *Publish-or-Perish: Peer Review and the Corruption of Science*, THE GUARDIAN (Sept. 5, 2011), https://www.theguardian.com/science/2011/sep/05/publish-perish-peer-review-science.

123 *See* Margit Osterloh & Bruno S. Frey, *Ranking Games*, 39 EVAL. REV. 102, 111 (2015) (making this statement generally for output-related incentives, also in science).

124 EGER & SCHEUFEN, *supra* note 80, at 113.

125 Hendrik P. Van Dalen & Kène Henkens, *Intended and Unintended Consequences of a Publish-or-Perish Culture: A Worldwide Survey*, 63 J. AM. SOC'Y INFORM. SCI. & TECH. 1282–93, 1290–92 (2012).

126 *See* Susan Wright, *Measurements and Distortions: A Review of the British System of Research Assessment* 19 (Working Papers on University Reform, Working Paper 9, June 2008) ("rising demand for peer review," universities "instructing their academics to focus only on producing articles … and to refuse requests to act as a peer reviewer themselves").

127 *See* MOOSA, *supra* note 108, at 71–73 (citing various studies demonstrating the irreproducibility problem). *Generally see* DAVID RANDALL & CHRISTOPHER WELSER, THE IRREPRODUCIBILITY CRISIS OF MODERN SCIENCE: CAUSES, CONSEQUENCES, AND THE ROAD TO REFORM (National Association of Scholars, Apr. 2018) (highlighting the irreproducibility problem in science).

128 Lokman I. Meho, *The Rise and Rise of Citation Analysis*, 20 PHYSICS WORLD 32, 32 (2007) ("some 90% of papers that have been published in academic journals are never cited"); Sierra Williams, "Are 90% of Academic Papers Really Never Cited? Reviewing the Literature on Academic Citations," LSE Impact Blog (Apr. 23, 2014), https://blogs.lse.ac.uk/impactofsocialsciences/2014/04/23/academic-papers-citation-rates-remler (last visited on Mar. 31, 2022) (querying the 90% figure, yet finding that about 82% of articles in the humanities are never cited).

fabrication or manipulation of findings is widespread.[129] "PoP" entails an enormous waste of public resources. The publishing of superfluous texts consumes time that academics could have spent on thorough research or teaching. The libraries of research institutions pay for redundant publications. Researchers spend unnecessary energy first having to separate "good" from "bad" papers.[130] Funding bids – also the many unsuccessful ones – cost money.[131] "PoP" exhausts scientists mentally.[132] With their emphasis on quantity, research evaluation systems create "perverse incentives" and "are a key driver of predatory journals."[133] If "PoP" leads to a thriving scholarly publishing industry as the one side of the coin, then the other is the corruption of science.[134]

A transition to OA publishing, by itself, will not bring about a change of the current state of affairs. While the commercial publishers for a long time lobbied against "open access," claiming, for example, that it was not compatible with peer review, they have meanwhile accepted it as an inevitable reality.[135] However, not only will the transition still take considerable time to be accomplished.[136] Only 28 percent of all scholarly publications are currently "open access."[137] The commercial publishers are retaining their economic power in various ways. On average, APCs of nearly a thousand US dollar are payable. Journals with high JIFs will charge particularly high APCs.[138] Furthermore, while texts in their basic format will

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[129] *See* MOOSA, *supra* note 108, Ch. 4 (furnishing proof of research misconduct as a consequences of "PoP").

[130] *See, e.g.*, Lydia Heller, "Forschung und Corona: Publikationsflut beeinflusst wissenschaftlichen Fortschritt," Deutschlandfunk Kultur (Sept. 24, 2020), https://www.deutschlandfunkkultur.de/forschung-und-corona-publikationsflut-beeinflusst-100.html (reporting on how "bad" Covid-19 studies obstructed Covid research).

[131] *See, e.g.*, Simon Baker, *Failed Horizon 2020 bids "cost European universities £6 billion,"* TIMES HIGH. EDUC. (Mar. 21, 2019), https://www.timeshighereducation.com/news/failed-horizon-2020-bids-cost-european-universities-ps6-billion (demonstrating how much money can be lost in connection with failed funding bids).

[132] *See, e.g.*, Sally Weale, *Higher Education Staff Suffer "Epidemic" of Poor Mental Health*, THE GUARDIAN (May 23, 2019), https://www.theguardian.com/education/2019/may/23/higher-education-staff-suffer-epidemic-of-poor-mental-health ("excessive workloads," "repeated research … audits," "culture of workplace surveillance").

[133] COMBATTING PREDATORY ACADEMIC JOURNALS, *supra* note 71, at 65, 67.

[134] *See* Altbach & De Wit, *supra* note 120 ("drastic cutbacks are needed"); Colquhoun, *supra* note 121 (a maximum of two original papers per year).

[135] *See* MORRISON, *supra* note 74, at 130–31 ("Anti-OA lobbying"); Weingart, *supra* note 45, at 100 (reporting that Elsevier accepts that the subscription model will disappear).

[136] *See* Bellia & Moscon, *supra* note 57, at 15 (pointing out that OA has so far "not disrupted" the subscription model).

[137] Heather Piwowar et al., *The State of OA: A Large-Scale Analysis of the Prevalence and Impact of Open Access Articles*, PEERJ 6:e4375, DOI: 10.7717/peerj.4375 1, 1 (2018).

[138] COMBATTING PREDATORY ACADEMIC JOURNALS, *supra* note 71, at 62. *See also* JOSE L.

be(come) freely accessible, publishers will in future provide a gamut of indispensable ancillary services (access to data, TDM, evaluation of reference lists, etc.) that must be paid for.[139] They may also require that readers be limited to non-commercial reuses only, reserving commercial reuse to themselves.[140] Consequently, the copyright monopoly (will) remain(s) with the commercial scholarly publishers.

I. II. THE REBSPA IN THE ICESCR: GIVING RISE TO A "RIGHT TO RESEARCH"?

A. The REBSPA in Article 15(1)(b): Freedom of, Benefiting from, and Protection against Science

Article 15 of the ICESCR provides as follows:

> 1. The States Parties to the present Covenant recognize the right of everyone:
>
> (a) To take part in cultural life;
>
> (b) To enjoy the benefits of scientific progress and its applications;
>
> (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.
>
> 2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for the conservation, the development and the diffusion of science and culture.
>
> 3. The States Parties to the present Covenant undertake to respect the freedom indispensable for scientific research and creative activity.
>
> 4. The States Parties to the present Covenant recognize the benefits to be derived from the encouragement and development of international contacts and co-operation in the scientific and cultural fields.[141]

PEREZ VELAZQUEZ, THE RISE OF THE SCIENTIST-BUREAUCRAT: SURVIVAL GUIDE FOR RESEARCHERS IN THE 21ST CENTURY 60–63 (2019) (explaining that the rising costs of publishing in journals are disturbing, unfairly affecting many scientists); Peter Weingart, *Trust, Quality Assurance and Open Access: Predatory Journals and the Future of the Scholarly Publication System*, *in* THE FUTURE OF SCHOLARLY PUBLISHING: OPEN ACCESS AND THE ECONOMICS OF DIGITISATION, *supra* note 45, at 265, 268 ("the costs for the public purse [are] incalculable").

139 *See* Weingart, *supra* note 45, at 100 (referring to Elsevier's strategy in this regard).

140 *See* Michael W. Carroll, *Why Full Open Access Matters*, 9 PLOS BIOLOGY e1001210 1, 2–3 (2011) (describing this as "pseudo open access").

141 ICESCR, *supra* note 15, Art. 15. In lieu of an extensive list of literature on the REBSPA in the context of Article 15 here, reference is made to the 27 sources mentioned in Klaus D. Beiter, Terence Karran & Kwadwo Appiagyei-Atua, *Yearning to Belong: Finding a "Home" for the Right to Academic Freedom in the U.N. Human Rights Covenants*, 11 INTERCULTURAL HUM. RTS. L. REV. 107, 166–67 n. 216 (2016) and Beiter, *supra* note 18, at 234–35 n. 7, in addition to all the other sources mentioned in this and those two articles. While a provision largely according with Article 15 may be found in the Inter-American human rights system, no comparable provisions exist in the European or African human rights systems: Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights ("Protocol of San Salvador"), Art. 14, Nov. 17, 1988, OAS Treaty Series No. 69 (entered into force Nov. 16, 1999). However, some scholars opine that most obligations under the right to science also arise under the right to freedom of expression and information: *see, e.g.*, Christoph B. Graber, *Copyright*

The REBSPA in Article 15(1)(b) must be understood in the context of the other provisions of Article 15. Notably, the role of the protection of creators' moral and material interests (Article 15(1)(c)) in its relation to the advance of science (Article 15(1)(b)) needs to be construed correctly.[142] The realization of all human rights, but in particular economic, social, and cultural rights, depends on scientific progress and access to technologies. Good examples are the rights to food or health.[143] Article 15(1)(b) and these rights must be read to mutually reinforce each other.

While still some fifteen years ago, the normative content of the REBSPA had not been the subject of "more official" deliberation, the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (REBSPA) of 2009, an expert document prepared under the auspices of UNESCO, made an initial attempt to shed light on the right. The REBSPA was considered to cover three claims: *first*, the creation of an enabling and participatory environment for the conservation, development, and diffusion of science and technology, this implying inter alia academic and scientific freedom, *second*, the enjoyment of the benefits of scientific progress and its applications (e.g., access to technology or non-discriminatory participation in the improvement of well-being that scientific advance entails), and, *third*, protection from abuse and adverse effects of science and its applications.[144] One may take note here of the clear links to Article 15(2) and (3). Arranged somewhat differently is the 2012 rendering by Farida Shaheed, former U.N. Special Rapporteur in the Field of Cultural Rights. According to her, the REBSPA encompasses:

> (a) access to the benefits of science by everyone, without discrimination; (b) opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research; (c) participation of individuals and communities in decision-making; and (d) an enabling environment fostering the

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and Access: A Human Rights Perspective, *in* DIGITAL RIGHTS MANAGEMENT: THE END OF COLLECTING SOCIETIES? 71, 81 (Christoph B. Graber et al. eds., 2005). This right is protected by most human rights systems: *see, e.g.*, International Covenant on Civil and Political Rights, Art. 19, Dec. 16, 1966, 999 U.N.T.S. 171 (entered into force Mar. 23, 1976) [hereinafter ICCPR]; European Convention for the Protection of Human Rights and Fundamental Freedoms, Art. 10, Nov. 4, 1950, 213 U.N.T.S. 221, E.T.S. No. 5 (entered into force Sept. 3, 1953) (as amend. and supp.); American Convention on Human Rights, Art. 13, Nov. 22, 1969, 1144 U.N.T.S. 123, 9 I.L.M. 673 (entered into force July 18, 1978); African [Banjul] Charter on Human and Peoples' Rights, Art. 9, June 27, 1981, 1520 U.N.T.S. 217, 21 I.L.M. 58 (entered into force Oct. 21, 1986) [hereinafter Banjul Charter].

142 In this regard, *see infra* Section II.B.

143 *See* ICESCR, *supra* note 15, Arts. 11, 12 ("the right of everyone to an adequate standard of living for himself and his family, including adequate food," "the right of everyone to the enjoyment of the highest attainable standard of physical and mental health," respectively).

144 Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, in UNESCO, *The Right to Enjoy the Benefits of Scientific Progress and its Applications: Venice, Italy, 16–17 July 2009*, 13, ¶ 13(a)–(c) (UNESCO, 2009) [hereinafter Venice Statement].

conservation, development and diffusion of science and technology.[145]

Again, the links to Article 15(2) and (3) are clearly borne out. The latest official statement on the REBSPA is the CESCR's General Comment No. 25. It emphasizes that "benefits" mean (1) technology, (2) scientific knowledge as such (and this would cover scholarly publications), interestingly, (3) capability for critical citizenship, and, significantly, (4) enhanced well-being, peace, and human rights through science.[146] The exact normative implications of the REBSPA may be expressed in the "AAQAF" format.[147] States must make the necessary infrastructure for the conservation, development, and diffusion of science *available*. "Diffusion," it may be observed, includes "the dissemination of scientific knowledge … within the scientific community and in society at large, including through publishing research findings."[148] Instruments for diffusion are, for instance, the internet and libraries. Barriers to *access* the benefits of science must be removed (copyright could thus restrict access). Access must be ensured without discrimination, for example, on the ground of economic situation (high APCs can be a problem). *Quality* is to be assured, for instance, of the science process (e.g., ethics) or technological applications. Also scholarly publications must be of a high quality (rigor, replicability, honesty). *Acceptability* means that science needs to be explained and its applications tailored to suit different socio-cultural contexts and the particularities of various beneficiaries. This surely covers diversified forms of science communication so as also to reach the larger public. Finally, *freedom* of science must be guaranteed (freedom to disseminate, access, use).

Another framework that facilitates deciphering the normative content of the REBSPA is the tripartite typology in terms of which all human rights entail obligations to "respect," "protect," and "fulfil."[149] The negative obligation to respect, requiring states to refrain from action that infringes a right, would thus – to relate this to the copyright and science discussion – expect states not to interfere with the freedom to undertake scientific research, to disseminate its results, or to co-operate with scientists nationally and internationally.[150] The positive obligation to protect requires states to put in place measures protecting citizens against other private actors. This must be held to cover the protection of scientists against the excesses of the

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[145] Farida Shaheed, *Report of the Special Rapporteur in the Field of Cultural Rights: The Right to Enjoy the Benefits of Scientific Progress and its Applications*, U.N. Doc. A/HRC/20/26, ¶ 25 (May 14, 2012).

[146] As condensed from General Comment No. 25, *supra* note 19, ¶¶ 6–8.

[147] *Id.* ¶¶ 16–20. The rendering of the elements and the examples here freely interpret the original text.

[148] Shaheed, *supra* note 144, ¶ 48.

[149] *See* General Comment No. 25, *supra* note 19, ¶¶ 41–50 (applying this framework to the REBSPA).

[150] *See* Audrey R. Chapman, *Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications*, 8 J. HUM. RTS. 1, 18 (2009) (mentioning these three instances).

scholarly publishing industry. Finally, the positive obligation to fulfil, primarily progressive in nature,[151] requires states to actively promote the advancement of science and invest resources toward this end.[152] Hence, General Comment No. 25 posits that states parties are obliged to ensure "equitable and open access to scientific literature."[153]

One should, moreover, take note of the way in which the ICESCR envisages comprehensive norm clarification to occur under the Covenant. The U.N. Specialized Agencies, of which UNESCO is one, in dialogue with the CESCR, are assigned a role in taking "international measures likely to contribute to the effective progressive implementation of the … Covenant," inter alia in the form of "the conclusion of conventions [and] the adoption of recommendations."[154] UNESCO is the U.N. Specialized Agency with a clear mandate in the field of science.[155] Many of its legal instruments must, in this sense, be seen to concretize the content of certain Covenant provisions. Hence, the REBSPA must also be understood in the light of UNESCO's Recommendation concerning the Status of Higher-Education Teaching Personnel of 1997, its Recommendation on Science and Scientific Researchers of 2017, and its Recommendation on Open Science of 2021.[156] In fact, the 2017 Recommendation, in its preamble, refers to Article 27(1) of the Universal Declaration of Human Rights of 1948, which is the "predecessor" provision of Article 15(1)(b) of the Covenant.[157]

As all other rights of the ICESCR, states parties must, in accordance with Article 2(1) of the Covenant, realize the REBSPA "progressively … to the maximum of [their] available resources."[158] Steps toward realization must, however, be taken without delay and they must be "deliberate, concrete and targeted as clearly as possible towards meeting the obligations recognized in the Covenant."[159] Retrogressive measures, as also instances of non-compliance with a minimum core obligation, constitute prima facie

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[151] On the general (often progressive) nature of state obligations under the ICESCR, *see infra* notes 157–59 and accompanying text.

[152] For a list of generic positive duties under the obligation to fulfil the REBSPA, *see* Chapman, *supra* note 149, at 25.

[153] General Comment No. 25, *supra* note 19, ¶ 49.

[154] ICESCR, *supra* note 15, Arts. 22–23.

[155] Constitution of the United Nations Educational, Scientific and Cultural Organization, Art. I, Nov. 16, 1945, 4 U.N.T.S. 275 (entered into force Nov. 4, 1946).

[156] UNESCO General Conference, Recommendation concerning the Status of Higher-Education Teaching Personnel, Doc. 29 C/Res 11 (Nov. 11, 1997) [hereinafter UNESCO Recommendation (1997)]; UNESCO Recommendation (2017), *supra* note 20; UNESCO Recommendation (2021), *supra* note 25.

[157] UNESCO Recommendation (2017), *supra* note 20, Preamble, Recital 2; U.N.G.A. Res. 217 (III) A, Universal Declaration of Human Rights, Art. 27(1) (Dec. 10, 1948) [hereinafter UDHR].

[158] ICESCR, *supra* note 15, Art. 2(1).

[159] U.N. Comm. on Econ., Soc. and Cultural Rts., General Comment No. 3, The Nature of States Parties' Obligations (Art. 2(1) of the ICESCR), ¶ 2, U.N. Doc. E/1991/23 (Dec. 14, 1990) [hereinafter General Comment No. 3].

violations. These but also other limitations of rights would have to be strictly justified under Article 2(1) in the light of resource constraints or the general limitation clause of Article 4, as appropriate.[160]

B. Relationship to Article 15(1)(c): Protecting the Moral and Material Interests of Authors

The delicate nature of Article 15(1)(c) has been alluded to. One may ask, is the realization of the REBSPA and the more open science envisaged by it not frustrated by the requirement that creators' moral and material interests be protected as a human right? Does Article 15(1)(c) not mandate a human rights guarantee of copyright as an institution? This would be highly problematic. As General Comment No. 25 observes, copyright frequently "limit[s] the sharing of information on scientific research." Further, "the excessive price of some scientific publications is an obstacle for low-income researchers."[161]

The nature of Article 15(1)(c) needs to be properly understood. The CESCR has in another General Comment of 2006, specifically on this provision, clarified the purpose of Article 15(1)(c).[162] The Committee underlines that Article 15(1)(c) safeguards "the personal link between authors and their creations … as well as their basic material interests."[163] This has two important implications. On the one hand, creators' moral rights (rights of attribution, integrity, and so on) deserve protection.[164] Moreover, protection is accorded to the actual creator only – and not to any subsequent assignee of rights, for example, a publisher. On the other hand, material interests are protected to the extent only that this is necessary to enjoy an *adequate* standard of living, as contemplated in Article 11(1) of the Covenant.[165] This covers modest, certainly not extravagant benefits. Interestingly, Aurora Plomer has analyzed the *travaux préparatoires* of the second paragraph of Article XIII of the socialist-inspired American Declaration on the Rights and Duties of Man, adopted on 2 May 1948, six months before the Universal Declaration of Human Rights (UDHR).[166] This

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[160] ICESCR, *supra* note 15, Art. 4. For a description of the general nature of state obligations under the ICESCR, *see, e.g.*, General Comment No. 3, *supra* note 158; MATTHEW CRAVEN, THE INTERNATIONAL COVENANT ON ECONOMIC, SOCIAL AND CULTURAL RIGHTS: A PERSPECTIVE ON ITS DEVELOPMENT Ch. 3 (1995); MANISULI SSENYONJO, ECONOMIC, SOCIAL AND CULTURAL RIGHTS IN INTERNATIONAL LAW Ch. 2 (2009).

[161] General Comment No. 25, *supra* note 19, ¶ 61.

[162] U.N. Comm. on Econ., Soc. and Cultural Rts., General Comment No. 17: The Right of Everyone to Benefit from the Protection of the Moral and Material Interests Resulting from Any Scientific, Literary or Artistic Production of Which He or She Is the Author (Art. 15(1)(c) of the ICESCR) U.N. Doc. E/C.12/GC/17 (Jan. 12, 2006) [hereinafter General Comment No. 17].

[163] *Id.* ¶ 2.

[164] *Id.* ¶ 13.

[165] *Id.* ¶ 15. ICESCR, *supra* note 15, Art. 11 (the right of everyone to an adequate standard of living).

[166] O.A.S. Res. XXX, American Declaration on the Rights and Duties of Man, Art. XIII, ¶ 2 (May 2, 1948). *See* Aurora Plomer, *IP Rights and Human Rights: What History Tells Us*

provision, protecting the "moral and material interests" of authors, substantially influenced the similarly worded Article 27(2) of the UDHR, in turn the "predecessor" of Article 15(1)(c) of the Covenant.[167] Plomer explains that the meaning of the "moral and material interests" of authors in Article XIII was "spiritual/mental" and "material/physical" well-being.[168] Hence, in the American Declaration, "moral" was not a *renvoi* to the moral rights of Berne. Yet, holding – as the CESCR does – Article 15(1)(c) to (also) cover moral rights in the sense of Berne is a good approach. However, Plomer's analysis makes one thing very clear: "Material" interests cannot be equated with the copyright holder's (comprehensive) economic rights. Another important point to highlight is that Article 15(1)(c) protects *human* persons only. The Committee correctly emphasizes that *legal* persons do not enjoy protection under this provision. This per se excludes any publishing company as right-holder. Only humans *can* create and be "authors" as understood by Article 15(1)(c).[169]

While human rights are fundamental, inalienable, and universal entitlements, IP rights are temporary in nature, can be revoked, licensed, or assigned.[170] IP regimes protect investments, the right in Article 15(1)(c) inherent dignity.[171] Protection under Article 15(1)(c) is granted if, and only to the extent that, this is required by "human dignity." Claims not founded on this *grundnorm* of human rights do not enjoy protection. It is, therefore, important "not to equate" IP rights with the human right in Article 15(1)(c).[172] Article 15(1)(c) does not afford an institutional guarantee of copyright, also not in the sphere of science.

A question that arises is whether it is not possible to rely on the right to property in support of strong IP, including copyright, protection. Gladly, one might argue in this respect, the right to property is not found in the U.N. Human Rights Covenants.[173] It is, however, protected in various regional human rights treaties.[174] Under the European Convention on Human Rights,

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and Why It Matters, *in* THE RIGHT TO SCIENCE: THEN AND NOW 54, 60–74 (Helle Porsdam & Sebastian Porsdam Mann eds., 2022) (The author analyses the drafting of Article 27(2) of the UDHR in the light of the *travaux préparatoires* on the second paragraph of Article XIII of the American Declaration. The *travaux préparatoires* of the American Declaration were published in 2017 only.).

167 UDHR, *supra* note 156, Art. 27(2).

168 Plomer, *supra* note 165, at 74.

169 General Comment No. 17, *supra* note 161, ¶ 7.

170 *Id.* ¶¶ 1, 2.

171 *Id.*

172 *Id.* ¶ 3.

173 ICCPR, *supra* note 140; ICESCR, *supra* note 15. The right to property is, however, protected by Article 17 of the (non-binding) UDHR: UDHR, *supra* note 156, Art. 17.

174 *See* Protocol to the [European] Convention for the Protection of Human Rights and Fundamental Freedoms, Art. 1, Mar. 20, 1952, 213 U.N.T.S. 262 (entered into force May 18, 1954) [hereinafter Protocol No. 1]; American Convention on Human Rights, *supra* note 140, Art. 21; Banjul Charter, *supra* note 140, Art. 14.

claims based on the right to property may even be raised by legal persons.[175] Yet, three points must always be kept in mind: first, again, the concept of "human dignity" should serve as the deciding criterion in assessing whether *human rights* – as opposed to, potentially, any other "lower tier" form of legal – protection is warranted in a certain type of situation. Hence, "how much" property is needed to confirm human dignity?[176] Second, even where human rights protection is warranted, property in human rights law is always socially constricted by others' human rights (such as the REBSPA).[177] Third, the "fundamental" rights of a company can never be "human" rights, and can, therefore, not rank on a par with actual human rights (e.g., the REBSPA).[178] Accordingly, while the concept of property could include IP, also copyright, claims, corporate IP claims can hardly ever be a matter of human rights. Even where they are, they will struggle to compete with human rights such as the REBSPA.

C. A More Human Rights-Oriented Approach: The Concept of "Adequacy for Science" as the Basis for Another Science

The approach of assessing the need for copyright reform in the field of scholarly publishing on the basis of the REBSPA is novel in itself. The analysis here "goes further," however, by taking the REBSPA "much more seriously." By this I mean the following. In this author's view, current interpretations of the REBSPA reveal certain flaws and gaps. On the one hand, Article 2(1) of the ICESCR, the Covenant's central implementation provision, stipulating that states parties must "take steps," invest "maximum resources," and use "all appropriate means" to fully realize Covenant rights, seems to be understood as implying that states parties must comprehensively regulate all aspects of science. On the other hand, the understanding of science is somehow instrumental, results-based. Science is to solve many problems. Simultaneously, the tone remains neutral and one misses a much clearer stance on the increasing corporatization of science, especially in universities. The reference is to (mere) "balance" between IP law and the interests of science. Overall, in this conception, science that solves "practical" problems and leads to economic growth is seen, it seems, to

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[175] *See* Protocol No. 1, *supra* note 173, Art. 1(1) ("Every natural or *legal* person is entitled to the peaceful enjoyment of his possessions.") (emphasis added).

[176] As a leading constitutional property scholar has stated, "property rights must reflect … the fundamental choices we have made in favour of living in a democracy characterised by dignity": André J. Van der Walt, *The Modest Systemic Status of Property Rights*, 1 J.L. PROP. & SOC'Y 15, 101–02 (2014–2015).

[177] Arguing from a philosophico-juridical perspective that property (and IP) rights, generally, (must) fulfil a social function, *see* Christophe Geiger, *The Social Function of Intellectual Property Rights, or How Ethics Can Influence the Shape and Use of IP law*, *in* METHODS AND PERSPECTIVES IN INTELLECTUAL PROPERTY 153 (Graeme B. Dinwoodie ed., 2013).

[178] One should agree, "there are policy reasons, as well as reasons of principle, that stand against recognition of corporate human rights": Anat Scolnicov, *Lifelike and Lifeless in Law: Do Corporations Have Human Rights?* 25 (U. Cambridge Fac. Law Legal Studies Research Paper Series, Paper No. 13/2013, May 2013).

satisfy the public interest in science. As highlighted earlier, such a performatist vision of the role of science ultimately lies at the basis of the success of the scholarly publishing industry and the abuse of copyright in science. The REBSPA needs to be realized in a way that better respects the dignity of both scientists and citizens. It is necessary to recalibrate its interpretation, and, on that basis, to assess the need for the reform of copyright in the field of science. The term "adequacy for science" has been coined to guide the recalibration process.

The term "adequacy for science" as used here is modelled on the German law concept of "Wissenschaftsadäquanz," which has a related meaning. There it is often used as a yardstick to assess whether governance arrangements in institutions of science are constitutional, in the sense that they ensure that decisions on science which are collective in nature respect freedom of science and will thus be "adequate for science."[179] The concept, it is submitted, could be used in a much broader sense:

> [I]n order to properly implement the REBSPA – to properly realise the human dignity on which that right is founded – the focus, rather than on the individual, society or the economy, should be on science itself. What is good, or "adequate," for science will also realise the human dignity of the REBSPA. Structures, arrangements and decisions in the field of science must, therefore, be such as will be "in the best interest of science and scholarship." There must be respect for the intrinsic requirements of science and the central role that scientists themselves should play in organising science. All this necessarily implies an effective protection of scientific and academic freedom.[180]

Structures, arrangements, and decisions will be "in the best interest of science and scholarship" if they facilitate the discovery of "the truth."[181] Respect for the intrinsic requirements of science means respect for the autonomous character of science, the role of intuition, anarchy, inefficiencies, delay, and risk in science. A central role should be accorded to scientists themselves in organizing science, as they, by reason of their training and experience, understand the needs of science "best" (institutional autonomy, self-governance, collegiality). Naturally, scientists must (be fully enabled to) remain masters of the scientific endeavor itself (individual autonomy, adequate working conditions, voluntary co-operation). Against this description, it will be clear that, in international law parlance, recourse to the

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[179] *See, e.g.*, Hamburgisches Hochschulgesetz [Hamburg Higher Education Law], Decision of July 20, 2010, BVerfG [Fed. Const. Ct., F.R.G.], BVerfGE 127, 87, ¶ 91 (in casu, the legitimacy of assigning collegial powers to the executive level was at issue).

[180] Beiter, *supra* note 18, at 286.

[181] This is commonly accepted as the rationale for academic/scientific freedom. *See, e.g.*, Ronald Dworkin, *We Need a New Interpretation of Academic Freedom*, *in* THE FUTURE OF ACADEMIC FREEDOM 181, 185–89 (Louis Menand ed., 1996) (discovery of the truth and promotion of ethical individualism as rationales); ERIC BARENDT, ACADEMIC FREEDOM AND THE LAW: A COMPARATIVE STUDY 53–63 (2010) (discovery and non-suppression of the truth, and intellectual independence); Beiter et al., *supra* note 140, at 128–32 (discovery and non-suppression of the truth, and ethical individualism, as functions of human dignity).

"adequacy" concept must be understood as an attempt to interpret the REBSPA "in the light of its object and purpose."[182]

The "adequacy" concept allows one to deduce the parameters of "another science." The article in the Israel Law Review had made an initial attempt to do so. It is not necessary to repeat this here.[183] Nevertheless, some crucial points made there may be singled out in the list below, others, and their relevance to the copyright and science discussion, will become clearer in the further discussion under this heading. Salient elements of "another science" are the following:

Scientific freedom: Scientific freedom is the best guarantor of scientific progress in the interest of society at large. There is only one "complete" definition of "academic freedom" in international (soft-)law, namely that laid down in UNESCO's Recommendation of 1997. This also protects freedom of research and the right to disseminate and publish results.[184]

Mertonian norms: The resources, infrastructures, and findings of science should be "commonly owned" beyond national borders. In the digital context, scientific knowledge (publications, research data, software) should be openly disseminated, at no cost to the researcher and at little cost to the research system, and be freely accessible and reusable without impediment for everyone. Science must be universally valid. It must be disinterested rather than guided by political, economic, or social usefulness or expedience. If science is to maximally benefit the human rights of all in society, a prominent role must be accorded to pure science. Science must be original and skeptical.

Components of freedom in different types of entities: Protection levels for individual freedom of enquiry should be the highest in universities. They should be medium-to-high in non-university research institutes. They may be lower in commercial enterprises undertaking research. Institutional autonomy, self-governance, and collegiality are crucial safeguards of freedom of enquiry in universities. They also play a role in non-university research institutes.[185]

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[182] Vienna Convention on the Law of Treaties, Art. 31(1), May 23, 1969, 1155 U.N.T.S. 331 (entered into force Jan. 27, 1980) [hereinafter VCLT].

[183] *See* Beiter, *supra* note 18, Section 6 (enumerating 22 recommendations), and generally the article's points and all the sources it mentions.

[184] *See* UNESCO Recommendation (1997), *supra* note 155, ¶ 27 (the definition encompassing freedom of teaching, freedom of academics to express freely their opinion about the institution/system in which they work, freedom from institutional censorship, freedom to participate in professional or representative academic bodies, the right to fulfil functions without fear of repression by the state or any other source, a democratic atmosphere). Trying to locate the "home" of the right to academic freedom in the U.N. Human Rights Covenants, *see* Beiter et al., *supra* note 140. For a list of General Comments, declarations, and statements by states and civil society at the international level, adopted over the years, on academic freedom, *see id.* at 120 nn. 36–38, 185–86. On the difference between scientific and academic freedom, *see id.* at 163–75.

[185] "Institutional autonomy" protects the institution as such against political or any other

The role of the scientific fraternity: As regards the organization of science, legislation should exhibit a procedural character and a modest level of regulatory "density." The ultimate competence for regulation and decision-making in the field of science should be assigned to the scientific fraternity itself.

The role of government: Insofar as pure science is concerned, the role of the government is to focus on financing, providing, encouraging, mediating, and supervising. State supervision of universities should reflect a hands-off approach, with the state intervening only where academia is clearly in dereliction of its duties.

The neoliberal approach to science: Deliberate public underfunding, an excessive focus on competitive funding, the financial dependence of institutions on contract research for government or industry, top-down forms of governance in universities and research institutions, and the conscious adoption of an audit culture for and in these, are not "adequate for science."

The human rights approach to science: Pure science should be subsidized at high levels. The emphasis on competitive funding should be reduced. Appropriate organizational dynamics in this context include autonomy for scientists, a positive organizational culture, low hierarchies, reduced emphasis on evaluation, and trust. It is necessary to move beyond the public accountability excesses in the science sector of the past three or four decades.

Patents: University inventions should immediately be publicly available through automatic affordable licenses to a patent, or better still, a genuine public domain strategy.

Equipped with the "adequacy" standard, one may have a look at current interpretations of the REBSPA again, to identify if they do, or do not, address aspects important for science and whether they address relevant aspects adequately. The emphasis will be on issues of quality, performativity, and "publish or perish"; NPM and science evaluations; peer review; and intellectual property protection, all these issues that impact on scholarly communication, publishing, and copyright.

There is a danger of accentuating the positive, "provision-of-benefits" dimension of the REBSPA at the expense of its negative, freedom dimension – of failing to appreciate that only a robust protection of scientific freedom

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form of outside interference. "Self-governance" ensures that scientists from within the institution administer it. Governance is thus not to be accorded to managerial experts not originally from within the institution, not scientists themselves, and not actively engaged in science. Managerial or executive governance is not "adequate for science." "Collegiality" is directed against hierarchy in research units and institutions to prevent accumulation of power not "adequate for science." "Self-governance" and "collegiality" may not always be in the interest of efficiency, but efficiency is an irrelevant criterion in science. For an analysis of the meaning and rationale of these three elements, as protected in UNESCO's 1997 Recommendation, *see* Beiter et al., *supra* note 140, at 124–27, 132–38.

makes possible benefits in the first place.[186] Admittedly, this may be oversimplifying things, but one way of reading recent interpretations of the REBSPA is this: One the one side, there are a multitude of noble (and this is not meant disparagingly) goals that have been formulated for science, on the other, there is a citizenry that may claim the benefits flowing from reaching those goals. Squeezed in between the two is a poor caste of scientists singularly made to bear the heavy responsibility of satisfying the enormous demands on science. To secure the delivery of benefits, their freedom may have to be "streamlined." A former member of the CESCR had thus warned that Article 15(1)(b) might be a sleeping dog that one should let lie – at least, however, that one should interpret the provision very cautiously.[187] It is interesting to note that a publication of 1986, which may perhaps be seen as the first interpretation of the REBSPA by notable international law scholars, articulating what would be required within a rule of law paradigm for science to yield advance, essentially focuses on the rights of scientists.[188] While recent interpretations of the REBSPA do include scientists' freedom claims, they do so in a rather brief, enumerative, and formalistic manner.[189]

They do not elaborate on what the research process is, what it constitutionally requires to function properly. Research thus becomes something one can simply have recourse to whenever problems need to be solved. However, it is rather unrealistic to hold out research as being able to deliver benefits, appreciating that the research process itself largely evades control. Indeed, there must, of course, be ample scope for applied research. However, scientific breakthrough is seldom planned. Presupposing a general science preparedness, this may happen or not happen. What pure science could be useful for emerges only much later. Arjun Appadurai therefore refers to "the strangeness" of research:

> [I]ts fundamental mystery is that it purports to be a systematic means for discovering the not-yet-known. How can you have a systematic means for getting to what you do not know? For example, what you do not know might be so profoundly unsystematic that systematically getting to it is logically impossible.[190]

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[186] Further explaining this, *see* Beiter, *supra* note 18, at 250–61 and the sources mentioned there. See also the critical discussion of UNESCO's Recommendation on Science and Scientific Researchers of 2017: *id.* at 269–85 and sources mentioned there.

[187] Eibe Riedel, *Sleeping Beauty or Let Sleeping Dogs Lie? The Right of Everyone to Enjoy the Benefits of Scientific Progress and Its Applications (REBSPA), in* COEXISTENCE, COOPERATION AND SOLIDARITY: LIBER AMICORUM RÜDIGER WOLFRUM, Vol. 1, 503 (Holger P. Hestermeyer et al. eds., 2012).

[188] ZIMAN, SIEGHART & HUMPHREY, *supra* note 6. Sieghart and Humphrey were international human rights scholars.

[189] For example, as for General Comment No. 25, *supra* note 19, *see specifically id.* ¶¶ 13, 43, 46, 50. Frequently, references occur in a context simultaneously emphasizing the point that scientific freedom is not absolute and may be limited: *see id.* ¶¶ 13, 22, 50, 52, 55, 57, 86.

[190] Arjun Appadurai, *The Right to Research*, 4 GLOB., SOC'IES & EDUC. 167, 169 (2006).

The question accordingly is, what should recent interpretations of the REBSPA have emphasized about the research process? A brief look at the literature is instructive. First, science is not really susceptible to being planned. The German Constitutional Court, in its seminal Hochschul-Urteil of 1973, refers to this as "the autonomous character of science."[191] Science follows its own laws, thus requiring large-scale state abstention from interference in the field of science. Robert Merton similarly points out that concrete planning "is inappropriate to most research." He then proposes an attractive definition of scientific freedom:

> The crowning reward of [mere] general planning is that it will preserve a freedom of inquiry, a freedom of opportunity … the opportunity to profit from the unexpected. It is in the best interests of science and of democratic society … that serendipity be held in high esteem.[192]

Max Perutz, who received the Nobel Prize in Chemistry in 1962, held that

> creativity in science, as in the arts, cannot be organised. It arises spontaneously from individual talent. Well-run laboratories can foster it, but hierarchical organisation, inflexible, bureaucratic rules, and mountains of futile paperwork can kill it. Discoveries cannot be planned; they pop up, like Puck, in unexpected corners.[193]

Second, already Max Weber reminded us in his brilliant essay on Science as a Vocation of 1919 that science must remain "disinterested," that is, not guided by notions of value or worth, or usefulness or purpose. These are not scientific, but political considerations.[194] "Disinterestedness" subsequently became one of the central structural elements of science in Merton's analysis as well.[195] "Disinterestedness" preserves the scientist's curiosity, offers protection against any disruption of the natural course of science, prevents fraud, and ensures that science serves all and not only certain interests or groups in society. To quote the German Constitutional Court again, "science free from considerations of social utility and political expedience serves state and society in the final analysis best."[196]

Third, science is slow. Science "indulges in a typical delay and deferral of decisions about what the world is like, how to describe and explain it, and

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[191] Hochschul-Urteil [University Judgment], Judgment of May 29, 1973, BVerfG [Fed. Const. Ct., F.R.G.], BVerfGE 35, 79, ¶ 128 ("*Eigengesetzlichkeit*").

[192] ROBERT K. MERTON & ELINOR BARBER, THE TRAVELS AND ADVENTURES OF SERENDIPITY: A STUDY IN SOCIOLOGICAL SEMANTICS AND THE SOCIOLOGY OF SCIENCE 191–92 (2004) (internal quotation marks omitted).

[193] MAX PERUTZ, I WISH I'D MADE YOU ANGRY EARLIER: ESSAYS ON SCIENCE, SCIENTISTS AND HUMANITY ix (2003).

[194] Max Weber, *Wissenschaft als Beruf*, *in* GESAMMELTE AUFSÄTZE ZUR WISSENSCHAFTSLEHRE 541–45, 550 (1922) (irrelevance of "*Sinn*" or "*Zweck*").

[195] Merton, *supra* note 3, at 275–77.

[196] Hamburgisches Hochschulgesetz Case, *supra* note 178, ¶ 90 (own trans).

what to do about it." It requires "preservation of a place of quiet, stillness, and unhastened reflection."[197] A problem of science today is its ideal of "the fast, cumulative advance of disciplinary knowledge along with a correlative disregard for any question that would slow this advance down."[198] The way out of time pressure is "to challenge the corporate clock by thinking through … the expectation of productivity."[199] As the Slow Science Manifesto formulated by German academics demands, "[s]cience needs time to think. Science needs time to read, and time to fail. … We cannot continuously tell you what our science means; what it will be good for; because we simply don't know yet."[200]

Fourth, scientists know better than politicians or anybody else in society where new knowledge is likely to lie. They "have been shown to have a remarkably good ability either to predict future social problems long before other citizens do or to provide the necessary knowledge base for such predictions."[201] Albert Einstein thus ascribed to scientists a special intuition: For scientists, "[t]here is only the way of intuition, which is helped by a feeling for the order lying behind the appearance and this Einfuehlung is developed by experience."[202] Michael Polanyi held that scientists possess a certain "tacit knowledge," that is, a hidden knowledge of problems, the best way to pursue them, and the as yet indeterminate implications of any discovery.[203]

Fifth – and very important in the copyright debate: "communism," as Merton underlines, is an integral element of the scientific ethos:

> The substantive findings of science are a product of social collaboration and are assigned to the community. They constitute a common heritage in which the equity of the individual producer is severely limited. … Property rights in science are whittled down to a bare minimum by the rationale of the scientific ethic. The scientist's claim to "his" intellectual "property" is limited to that of recognition and esteem … The institutional conception of science as part of the public domain is linked with the imperative for communication of findings. Secrecy is the antithesis of this norm; full and open communication its enactment. The pressure for diffusion of results is reenforced by the institutional goal of advancing the boundaries of knowledge and by the incentive of recognition which is, of course, contingent upon

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[197] Dick Pels, Unhastening Science: Autonomy and Reflexivity in the Social Theory of Knowledge 2 (2003).

[198] Isabelle Stengers, Another Science Is Possible: A Manifesto for Slow Science 98 (trans. Stephen Muecke, 2018).

[199] Maggie Berg & Barbara K. Seeber, The Slow Professor: Challenging the Culture of Speed in the Academy 55 (2016).

[200] "The Slow Science Manifesto" (2010), http://slow-science.org.

[201] Arne Jarrick, *The Scientific Mission and the Freedom of Research, in* Transformations in Research, Higher Education and the Academic Market: The Breakdown of Scientific Thought 53–67, 63 (Sharon Rider, Ylva Hasselberg & Alexandra Waluszewski eds., 2013).

[202] Albert Einstein, *Prologue, in* Max Planck, Where Is Science Going? 10 (1932).

[203] Michael Polanyi, The Tacit Dimension 6 (2009) ("the tacit power of scientific … genius").

publication.[204]

Sixth, Lea Shaver emphasizes:

> The value of science then, is not purely instrumental. … [T]here is also a value inherent in the process itself. … Engaging in scientific discovery … helps us to realize and express parts of our shared humanity, which has value from the perspective of individual development and the shared life of the community.[205]

The above makes it quite clear that science under the REBSPA should always be understood in a qualitative rather than quantitative sense. One implication hereof would be that researchers should only publish if they have "something" to report, after sufficient reflection. Other researchers should spend much more time on validating existing research before proceeding to publish new texts. This may, therefore, be seen as calling for a renunciation of the "publish or perish" ideology in science, as it negatively affects the quality of scholarly work and undermines scholarly integrity. The existing REBSPA texts are weak on the point. What also becomes clear is that the current practices of the scholarly publishing industry significantly contribute to eroding the notion of quality as presented here.

It is interesting to note that, during the drafting of Article 27(1) of the UDHR, a formulation proposed by the Soviet Union, in terms of which science should serve "democracy," "peace," and "co-operation," was rejected by the Western group. Eleanor Roosevelt thus stated that the U.S. delegation "would under no circumstances agree that science should be placed at the service of politics." Even René Cassin for France argued that "that principle might be invoked to justify the harnessing of science to political ends."[206] As never before, one can today witness how science has been made to serve an ideology, that of market fundamentalism, "useful" research, and economic growth.[207] With the passing of the Bayh-Dole Act in the U.S. in 1980, and similar legislation in other parts of the world, requiring universities to marketize their research through IP rights, technology developed in universities, and often even basic research, have not only become a source of revenue for institutions, but now also obstruct societal access to research results.[208] Privatization impedes further scientific progress.[209] Important but

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[204] Merton, supra note 3, at 273–74.

[205] Lea Shaver, *The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress*, 2015 EUR. J. HUM. RTS. 411, 416 (2015).

[206] For a discussion of the *travaux préparatoires* of Article 27(1), *see* William A. Schabas, *Looking Back: How the Founders Considered Science and Progress in their Relation to Human Rights*, 2015 EUR. J. HUM. RTS. 504, 511–12 (2015).

[207] Discussing corporatism in science, *see* Beiter, *supra* note 18, at 261–60 and the sources mentioned there.

[208] *See* Richard R. Nelson, *The Market Economy, and the Scientific Commons*, 33 RES. POL'Y 455, 462 (2004) (mentioning these two "key developments": "at least some of the results of basic research can be patented," "universities … take out patents on their research results").

[209] *Id.* at 455 ("the scientific commons is becoming privatized … bad news for both the future progress of science, and for technological progress").

non-profitable areas of research are neglected.[210] Contract research for governments and private industry is another source of income, but obviously limits curiosity-driven and objective research. Basic research can never be shown to have impact. The "impact agenda" of funding councils pushes science away from disinterested toward (economically) "useful" research.[211] The research topics which funding bodies are prepared to support "can be quite explicitly linked to the political agenda of the government of the day."[212] Competitive funding leads researchers to choose "fashionable" topics.[213] Research, in many ways, has become a matter of short-term task teams "sent out" to solve practical problems.[214] While public research funding thus essentially promotes private industry interests, governments make their citizens believe that all this is in the public interest.[215]

Academic science should be based on the CUDOS norms of science as expounded by Merton in 1942: communism, universalism, disinterestedness, and organized skepticism.[216] These norms legitimately play a reduced role in the sphere of applied science in non-university research institutes that follow a set research agenda. They play no role in research conducted by private business. Industrial science follows the PLACE pattern: Science here is proprietary (not communalist), local (not universal), authoritarian (not disinterested), commissioned (not original), and expert (rather than skeptical). However, the problem is that the PLACE pattern has come to govern academic science, which should essentially be pure science, too.[217]

NPM in science – as it were, a modern form of the bureaucratization in science that already Max Weber had warned against[218] – can only be understood against the background of the commercialization of science just described. Bureaucracy (hierarchy, evaluation) may lead to increased productivity, but also reduced creativity in science.[219] Modern science is

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[210] Chapman, *supra* note 149, at 8–9.

[211] *See* Philip Moriarty, *Science as a Public Good*, *in* A MANIFESTO FOR THE PUBLIC UNIVERSITY 56, 64 (John Holmwood ed., 2011) ("Scientific curiosity, disinterestedness and creativity are all adversely affected by the … impact agenda.").

[212] Williams, *supra* note 108, at 57.

[213] Li Bennich-Björkman, *Has Academic Freedom Survived? An Interview Study of the Conditions for Researchers in an Era of Paradigmatic Change*, 61 HIGH. EDUC. Q. 334, 351 (2007).

[214] Jarrick, *supra* note 200, at 58.

[215] *See* Moriarty, *supra* note 210, at 58 ("*business-led* … focus on … applied research … is 'sold' as being entirely in the public interest").

[216] Merton, *supra* note 3, at 270–78.

[217] ZIMAN, *supra* note 4, at 78–79.

[218] *See* Weber, *supra* note 193, at 526–27 (explaining that, while bureaucracy has clear benefits in any capitalistic enterprise, its application in universities destroys the spirit ("*Geist*") of scholarship).

[219] *See* You-Na Lee & John P. Walsh, *Rethinking Science as a Vocation: One Hundred Years of Bureaucratization of Academic Science*, SCI., TECH. & HUM. VALUES 8–9, 19–20, https://doi.org/10.1177/01622439211026020 (online 22 June 2021) (referring to some evidence in this regard).

about productivity, that is, quantifiably "more" outcome. Researchers receive good evaluations if they can demonstrate that they have secured many patents, if they have published many articles, desirably in journals with high JIFs. This is associated with progress in science. However, as Michael Power demonstrates in his fascinating book about the "audit society" and its "rituals of verification," quantifiable indicators have two major effects. First, the counting of outcome becomes ritualized. Compliance with such targets is falsely equated with quality compliance.[220] Met benchmarks on numbers of articles, for example, say nothing about the quality of the articles, whether they have actually been read (as opposed to merely cited), and whether, in one way or another, they have been valuable to the common good. Even article-level metrics –usage data, citations, altmetrics (metrics based on the social web) – do not measure quality, but something else, namely attention, self-promotion, easy access, ostensible quality based on publication in a journal with a high JIF.[221] Second, the endeavor to achieve targets "colonizes" the minds of scientists and their research units toward focusing on just that.[222] In universities, for instance, important duties, such as expanding one's scholarship through reading, providing wider policy advice, or promoting cultural life on campus, are not attended to anymore because success "cannot be counted."[223] Many academics thus invest enormous time resources into strategically submitting articles to certain rather than other journals and trying to please peer reviewers. Contributing to science through one's writings becomes a secondary concern. In science, quantifiable performance indicators are therefore of particular concern. This has also to do with the "value incongruence" between the tasks of scientists, which are highly uncertain, and the indicators in the form of "inappropriately" deterministic performance standards.[224] There are many unintended consequences flowing from audits in research. Researchers may decide to work within mainstream areas to secure publication in certain prestigious journals. There may be a rush to mediocrity as researchers may choose to do less risky research that will guarantee timely results for publication.[225] Audits

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[220] *See* MICHAEL POWER, THE AUDIT SOCIETY: RITUALS OF VERIFICATION 95–97 (1999) ("decoupling").

[221] *See* Martin Fenner, *Altmetrics and Other Novel Measures for Scientific Impact*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 179, 184, 188 (acknowledging this for altmetrics, but also generally asking whether "numbers [can] reflect the impact of research, across disciplines and over time").

[222] POWER, *supra* note 219, at 97–98 ("colonisation").

[223] *See* Geoffrey Boulton & Colin Lucas, *What Are Universities For?* ¶ 62 (League of Eur. Res. Universities, Sept. 2008) ("To define the university enterprise by these specific outputs, and to fund it only through metrics that measure them, is to misunderstand the nature of the enterprise and its potential to deliver social benefit.").

[224] Michael Power, *Research Evaluation in the Audit Society*, *in* WISSENSCHAFT UNTER BEOBACHTUNG: EFFEKTE UND DEFEKTE VON EVALUATIONEN 15, 15 (Hildegard Matthies & Dagmar Simon eds., 2008).

[225] Lisa Lucas, *Evaluating Academic Research: Ambivalence, Anxiety and Audit in the Risk University*, *in* DEATH OF THE PUBLIC UNIVERSITY? UNCERTAIN FUTURES FOR HIGHER

create mere "images of control." In reality, they prevent the very goals they were put in place for from being attained.[226] The "role" of the scholarly publishing industry in all this is that it capitalizes on NPM in science.

In his analysis of UNESCO's 2017 Science Recommendation, this writer had criticized that document's admiration for performance metrics and the "quantitative tick-box appeal" of its prescribed formula for assessing researcher performance.[227] The 2021 Recommendation on Open Science fares better as it emphasizes that there should be "an increased focus on the quality of research outputs rather than quantity."[228] Even so, the Recommendation remains a prisoner of neoliberalism. Why the prosaic emphasis on evaluation in the first place? As Liz Morrish and Helen Sauntson point out, the notion of the "underperforming professor" is a paradox. Promotion to professorship rewards talent, reputation, and diligence. That is the very purpose of the procedure.[229] The fact that a small percentage of professors may yet not perform well subsequently is an inefficiency one must accept in the larger interest of an academic system that preserves trust. Evaluations overall should play a reduced role in science. The emphasis must be on input rather than output control. The proper selection and socialization of researchers makes repeated evaluations unnecessary.[230] In lieu of performance appraisals, there should rather be "a constructive dialogue" between research institution and scientist on how the former might better facilitate the latter's work.[231]

Quality control in science is important. Nevertheless, it is for the scientific fraternity to decide which forms of quality control it considers "adequate for science." However, UNESCO's 2017 Science Recommendation paternalistically requires states to impose a peer review requirement.[232] The deficits of peer review have been dealt with above.[233]

EDUCATION IN THE KNOWLEDGE ECONOMY 213, 216 (Susan Wright & Chris Shore eds., 2017). *See also* POWER, *supra* note 219, at 100 ("Scientists are changing research habits").

[226] *Id.* at 121. *See also* Weingart, *supra* note 45, at 266–67 (NPM in science leads to the competition for "countable products," not a competition for "new ideas and innovative thinking"; it "threaten[s] the fragile fabric of trust and quality control").

[227] UNESCO Recommendation (2017), *supra* note 20, ¶ 34(a), (c); Beiter, *supra* note 18, at 283–84.

[228] UNESCO Recommendation (2021), *supra* note 25, ¶ 20(c).

[229] Liz Morrish & Helen Sauntson, *Performance Management and the Stifling of Academic Freedom and Knowledge Production*, 29 J. HIST. SOC. 42, 54–55 (2016).

[230] *See* Margit Osterloh & Bruno S. Frey, *Academic Rankings between the "Republic of Science" and "New Public Management," in* THE ECONOMICS OF ECONOMISTS: INSTITUTIONAL SETTING, INDIVIDUAL INCENTIVES, AND FUTURE PROSPECTS 77 (Alessandro Lanteri & Jack Vromen eds., 2014) (thus the essential message of the authors).

[231] Beiter, *supra* note 18, at 290.

[232] UNESCO Recommendation (2017), *supra* note 20, ¶¶ 1(a)(1), 2(c), 26, 34(c). *See* Beiter, *supra* note 18, at 275–76 (criticizing this).

[233] *See supra* Section I.C., notes 107–08 and accompanying text.

Peer review in its traditional form is a dubious way of ensuring quality. A reliable alternative would, for example, be editorial review,[234] which often entails a dialogical process between editor and author. Philip Kitcher correctly holds that

> when it is claimed that inquiry must be free, what seems to be intended is that moral, political, and religious judgments should not enter into two important contexts of decision: the formulation of projects for scientific inquiry and the appraisal of evidence for conclusions.[235]

"Disinterestedness" thus implies that allowing peer reviewers to reach final decisions on "impact" violates scientific freedom. As it were, impact criteria should play a very limited role prior to publication. If a "light" initial review reveals the scientific soundness of a text, it principally qualifies for publication.[236] It is then for the larger science (and other) communities to validate the findings and for published research to acquire real-world impact (or not). The identity of reviewers must always be revealed and their reviews be made openly available. This will very likely prevent unsubstantiated, unfair, or biased commentary. It would also reflect a recognition of their review role. As for OA journals, it is after publication that reviewers may, potentially, be assigned a "more thorough" review role that is visible online. Ideally, a dialogue between author and reviewer, visible to the world, should ensue. Moreover, in the absence of clear errors, it must always, at whatever stage of the process, be left to the discretion of authors whether or not to amend their texts. Otherwise one would be dealing with a case of censorship. Post-publication and peer-to-peer review are interesting options.[237] A final point here, it is crucial that the organization of quality control in science revert to science institutions. As a central function of science, quality control can obviously not be outsourced to commercial publishers whose primary objective has little to do with promoting science.

Current interpretations of the REBSPA frequently call for a "balance" between IP and open scholarly communication, that is, for tensions between

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[234] *See* MORRISON, *supra* note 74, at 15–16 ("peer review is not the only means of ensuring academic quality control … [an] alternative is editorial review").

[235] PHILIP KITCHER, SCIENCE, TRUTH, AND DEMOCRACY 3 (2001).

[236] The role of referees in the process can only be that of offering suggestions. Final decisions must always rest with the editors: Frey, *supra* note 108, at 218.

[237] *See* Binfield, *supra* note 69, at 159–61 ("novelty in the peer review model," referring to various new models followed in practice); Cope & Kalantzis, *supra* note 108, at 52 ("Open peer review … may well produce greater accountability on the part of editors and referees."); EGER & SCHEUFEN, *supra* note 80, at 116 ("increasing importance of OA mega-journals with open post-publication reviews"); Eve, *supra* note 108, at 69 ("a kind of post-publication, or peer-to-peer, review"); FREELAND JUDSON, *supra* note 108, at 285 (hoping for "a time when open commentary and review replace the current, flawed system of closed pre-publication peer review"); Smith, *supra* note 108, at 181 ("a very quick and light form of peer review – and then let the broader world critique the paper"); U.K. Parliament, Peer Review in Scientific Publications, *supra* note 108, at ¶¶ 78, 211 (remarking that open peer review is "attractive," post-publication review "powerful").

these two to be resolved.[238] However, as Laurence Helfer and Graeme Austin observe, the documents do not indicate how tensions are to be negotiated in practice.[239] Strictly, it is also not correct to say that IP rights and the REBSPA need to be balanced. At most, the rights in Article 15(1)(b) and (c) can be balanced on a par. IP rights generically, as indicated, do not constitute a "constitutional" category, or, at any rate, only a very weak one. UNESCO's 2021 Recommendation on Open Science appears to envisage quite a strong position for IP rights. It envisages OA publishing platforms and OA repositories, access free of charge, and possibilities to reuse, repurpose, adapt, and distribute works.[240] However, OA does not cover free publishing for researchers or sincerely require reorientation toward affordable publishing. Paragraph 8 states that access to knowledge should be as open "as possible." Access restrictions are justifiable on the basis of "the protection of intellectual property rights."[241] Paragraph 16(c) requires a "diversity of business models" to be recognized in the sphere of publishing.[242] It seems that the traditionally powerful role of publishers is intended to remain intact. Hence, the question of the huge financial burden of open access for authors and research institutions remains. Especially from the perspective of the global South, matters are not resolved. Taking academic freedom seriously (freedom cannot have a price tag) and considering that scarce public resources should not be diverted to enhance private profits, the REBSPA should be held to protect free publishing for researchers, and also to mandate reorientation toward affordable scholarly publishing to protect funders and institutions.

D. Constructing a "Right to Research" under the REBSPA

To what extent then does the REBSPA cover a derivative "right to research"? An analysis of the relevant normative and quasi-normative documents and authoritative secondary literature reveals that this can perhaps be stated to have a conceptually more negative and a conceptually more positive side.[243] The former is the right or freedom of scientists, but also

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[238] *See, e.g.*, Venice Statement, *supra* note 143, ¶ 10 ("tensions" to be resolved); UNESCO Recommendation (2017), *supra* note 20, ¶ 18(d) ("balancing"); General Comment No. 25, *supra* note 19, ¶ 62 ("balance").

[239] LAURENCE R. HELFER & GRAEME W. AUSTIN, HUMAN RIGHTS AND INTELLECTUAL PROPERTY: MAPPING THE GLOBAL INTERFACE 238 (2011).

[240] UNESCO Recommendation (2021), *supra* note 25, ¶ 7, opening section, (a).

[241] *Id.* ¶ 8.

[242] *Id.* ¶ 16(c). Similarly, Paragraph 20(j) does not require a move toward non-commercial publishing models, but only their "support": *id.* ¶ 20(j).

[243] The "right to research" as constructed here is inferred from existing official texts and "merely" articulates a general aspect of the REBSPA. In that sense, even if inspired by a novel interpretation of the latter right, it is a derivative – as opposed to a free-standing – "new" human right. Applying this distinction in postulating "new" human rights, *see also* Brandon L. Garrett, Laurence R. Helfer & Jayne C. Huckerby, *Closing International Law's Innocence Gap*, 95 S. CAL. L. REV. 311 (2021); Danwood M. Chirwa, *Access to Water as a New Right in International, Regional and Comparative Constitutional Law*, *in* THE CAMBRIDGE HANDBOOK OF NEW HUMAN RIGHTS: RECOGNITION, NOVELTY,

others, "to do research." The latter is the right of citizens to enjoy "access to the benefits of research." This does not mean that the former does not also entail significant positive duties of the state and the latter also important negative duties. What it means is that the former ultimately seeks to ensure that scientists can work in circumstances where they are not prevented from doing their work. This dimension applies most broadly in the realm of the creation of "pure" scientific knowledge in universities and similar institutions. The latter signifies that securing access to the benefits of science can only be achieved in a proactive way. Properly construed, this dimension requires states, first, to *promote* a conducive environment for "pure" science and the dissemination of its benefits, and, second, to *more actively drive* knowledge production, innovation, and technology in the R&D sector at the periphery of universities, in non-university research institutes focusing on applied science, and in the business sector, and the subsequent transfer and diffusion of the benefits.

What are the normative claims encompassed by the *negative* right "to do research" of specific relevance in the copyright and science context?[244]

1. *Status*: Scientists should enjoy a standing which facilitates their research.[245] On the one hand, there needs to be an adequate general appreciation for the research profession.[246] On the other, scientists should enjoy a research environment[247] characterized by security of employment,[248] good salaries,[249] workload that is not excessive,[250] and proper social security

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RHETORIC 55 (Andreas von Arnauld, Kerstin Von der Decken & Mart Susi eds., 2020); Pierre Thielbörger, *Something Old, Something New, Something Borrowed and Something Blue: Lessons to Be Learned from the Oldest of the "New" Rights – the Human Right to Water*, in THE CAMBRIDGE HANDBOOK OF NEW HUMAN RIGHTS: RECOGNITION, NOVELTY, RHETORIC, *supra*, at 71.

[244] See also the list of rights suggested by ZIMAN ET AL., *supra* note 6, adding rights such as the right to education, freedom of movement, or freedom of association and assembly.

[245] UNESCO Recommendation (1997), *supra* note 155, Preamble, Recital 10 ("status commensurate with … role"); UNESCO Recommendation (2017), *supra* note 20, Preamble, Recital 7 ("a fair status").

[246] UNESCO Recommendation (2017), *supra* note 20, ¶¶ 1(e), 24(a) ("level of appreciation," "public recognition").

[247] UNESCO Recommendation (1997), *supra* note 155, ¶ 7 (working conditions "as will best promote effective … research"); UNESCO Recommendation (2017), *supra* note 20, ¶¶ 1(e), 11, 24(a) (addressing rights, working conditions, material assistance, moral support).

[248] UNESCO Recommendation (1997), *supra* note 155, ¶¶ 45–46 (tenure or "its functional equivalent" as a safeguard of academic freedom); UNESCO Recommendation (2017), *supra* note 20, ¶ 27(c) ("address precariousness due to … limited-duration contracts"), ¶ 27(d) (career stability for early researchers).

[249] UNESCO Recommendation (1997), *supra* note 155, ¶ 57 ("remuneration such that they can devote themselves satisfactorily to their duties"), ¶ 58(a) ("reflect the importance to society"), ¶ 58(c) ("a reasonable standard of living").

[250] UNESCO Recommendation (1997), *supra* note 155, ¶ 62 ("fair and equitable … to carry out effectively … research").

benefits.[251] Scientific freedom is simultaneously a precondition for respect for status and facilitates scientific freedom.

2. *Research autonomy*: UNESCO's 2017 Recommendation obliges states to institute procedures ensuring to scientists "the degree of autonomy appropriate to their task." Creativity of scientists is to be promoted "on the basis of utmost respect for the autonomy and freedom of research."[252] Researchers should enjoy the right "to work in a spirit of intellectual freedom to pursue, expound and defend the scientific truth as they see it."[253] The earlier 1997 Recommendation, focusing on researchers in universities, guarantees, as part of academic freedom, the right to carry out research work.[254] Scientists may choose their research topics and methods, draw conclusions from their findings, question accepted wisdom, and create new knowledge.[255] There is also a right of "conscientious objection," permitting withdrawal from participation in research that conflicts with one's moral or religious world views.[256] Research autonomy is most extensive in the sphere of pure science, but may be lower in the sphere of applied science.[257] It is subject to duties of honesty, ethics, and quality.[258]

3. *Guarantees of scientific/academic freedom*: Institutional autonomy, self-governance, and collegiality need to be safeguarded. Low hierarchies are to prevail in the science sector. In universities, line management must be

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[251] UNESCO Recommendation (1997), *supra* note 155, ¶ 63 ("protected by social security measures").

[252] UNESCO Recommendation (2017), *supra* note 20, ¶ 10.

[253] *Id.* ¶ 16(a)(i).

[254] UNESCO Recommendation (1997), *supra* note 155, ¶¶ 27, 29 ("the right … to … freedom in carrying out research," "a right to carry out research work").

[255] General Comment No. 25, *supra* note 19, ¶ 13 (articulating scientists' rights to define the aims and methods); Bonn Declaration on Freedom of Scientific Research, Minist. Conf. on the Eur. Res. Area, Bonn (Oct. 20, 2020) (define research questions, choose and develop theories, gather empirical material, employ sound research methods, question accepted wisdom, bring forward new ideas – see under "A shared definition of freedom of scientific research") [hereinafter Bonn Declaration]; Jogchum Vrielink, Paul Lemmens, Stephan Parmentier & the LERU Working Group on Human Rights, *Academic Freedom as a Fundamental Right* ¶¶ 38, 39 (League of Eur. Res. Universities, Advice Paper No. 6, Dec. 2010) (choose topic, method, mode of analysis, to draw conclusions from findings, subject to limitations); Terence Karran, *Academic Freedom in Europe: Time for a* Magna Charta*?*, 22 HIGH. EDUC. POL'Y 163, 173–74 (2009) (choose subject areas and research methods, subject to limitations).

[256] UNESCO Recommendation (2017), *supra* note 20, ¶ 16(a)(iii); General Comment No. 25, *supra* note 19, ¶ 13; Vrielink et al., *supra* note 254, ¶ 40; Karran, *supra* note 254, at 174.

[257] To this effect, *see* Vrielink et al., *supra* note 254, ¶ 39.

[258] UNESCO Recommendation (1997), *supra* note 155, ¶¶ 33, 34(c) (honesty), ¶ 34(d) (ethics), ¶ 35 ("highest possible standards"); UNESCO Recommendation (2017), *supra* note 20, ¶ 12 (researchers of "integrity and intellectual maturity, combining high, intellectual qualities and respect for ethical principles"); General Comment No. 25, *supra* note 19, ¶ 18 (quality), ¶ 19 (ethics); Vrielink et al., *supra* note 254, ¶ 39 (ethics); Karran, *supra* note 254, at 173 (ethics), 174 (honesty).

abolished. The scientific fraternity enjoys rights of self-regulation.[259] It should inter alia adopt a publishing code protecting the interests of scientists and science.[260]

4. *Absence of censorship*: Scientists should be able to carry out research "without fear of repression by the state or any other source,"[261] there should be "freedom from institutional censorship,"[262] and their intellectual freedom should include "protection […] from undue influences on their independent judgement."[263]

5. *"Ownership" of research*: Researchers in universities and non-university research institutes may claim "ownership" to their scientific works. It is usually said that, contrary to the orthodox rule that copyright vests in the employer, copyright here belongs to the employee.[264] While the bearer of "ownership" here indeed is the researcher, as will be seen later,[265] this need not take the form of economic rights under copyright law to comply with the REBSPA. Authors' rights in need of protection are, for example, the right to publish (listed separately below), or the moral rights of Berne, that is, the right to claim authorship of a work (right of attribution) and that "to object to any distortion, mutilation or other modification of, or other derogatory action in relation to, [a] work, which would be prejudicial to [one's] honor or reputation" (right of integrity).[266] In cases of externally funded research, the allocation of "ownership" claims will have to be clarified contractually.[267]

6. *Access to information*: Scientists have a right of access to information.[268] This covers access to information of public interest held by public authorities and also official documents.[269] It includes access to scholarly literature. Access to the internet must be realized, and up-to-date

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[259] *See supra* Section II.C. (*Components of freedom …, The role of the scientific fraternity*).

[260] *See* Eberhard Schmidt-Aßmann, *Free Access to Research Findings and Its Limitations*, *in* THE PUBLIC NATURE OF SCIENCE UNDER ASSAULT: POLITICS, MARKETS, SCIENCE AND THE LAW 109, 122 (Helga Nowotny et al. eds., 2005) (making such a suggestion in the light of the right to self-regulation).

[261] UNESCO Recommendation (1997), *supra* note 155, ¶ 27.

[262] *Id.*

[263] UNESCO Recommendation (2017), *supra* note 20, ¶ 16(a)(i); General Comment No. 25, *supra* note 19, ¶ 13.

[264] Holding that this is (or should be) the legal position, *see, e.g.*, American Association of University Professors, Statement on Copyright, https://www.aaup.org/report/statement-copyright; Bellia & Moscon, *supra* note 57, at 5–11; BARENDT, *supra* note 180, at 215–19; Ashley Packard, *Copyright or Copy Wrong: An Analysis of University Claims to Faculty Work*, 7 COMM. L. & POL'Y 275 (2002).

[265] *See infra* Section III.B., notes 399–402 and accompanying text.

[266] Berne Convention, *supra* note 29, Art. 6*bis*(1).

[267] Karran, *supra* note 254, at 174.

[268] *See, e.g.*, ICCPR, *supra* note 140, Art. 19(2) (defined as the right of "everyone" with regard to information "of all kinds"); Venice Statement, *supra* note 143, ¶ 14(a) (mentioned in the context of the REBSPA).

[269] Vrielink et al., *supra* note 254, ¶¶ 41–43.

research libraries should be ensured.[270]

7. *Collaboration*: Scientists may collaborate with each other within and across national borders.[271]

8. *Sharing information*: Scientists may share information with other scientists, policy-makers, and the public, within and across national borders.[272]

9. *Freedom of speech*: Researchers enjoy very high levels of freedom of "intra-mural" academic speech (i.e., expression by researchers within their field which is directed at the research community). Levels of protection for "extra-mural" academic speech (i.e., expression by researchers within their field directed at a lay audience) is not as high, yet higher than for ordinary freedom of expression.[273]

10. *Right to publish*: Researchers are entitled to publish their findings "in books, journals and databases of their own choice."[274] This also includes the right *not* to publish, where a researcher no longer agrees with the content.[275] Limitations imposed for instance in the case where research is externally funded must strictly comply with Article 4 of the ICESCR.[276] Moreover, researchers are required always to respect and acknowledge the scholarly work of others.[277] Researchers are entitled to support that helps them to

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[270] UNESCO Recommendation (1997), *supra* note 155, ¶¶ 11, 22(o) ("up-to-date" libraries); UNESCO Recommendation (2017), *supra* note 20, ¶ 13(e) (literature), ¶ 27(f) (literature), ¶ 28 ("international databases and journals, libraries and other sources of information"); General Comment No. 25, *supra* note 19, ¶ 16 (libraries, internet), ¶ 49 (literature); Shaheed, *supra* note 144, ¶ 74(c) (internet, scientific knowledge).

[271] Venice Statement, *supra* note 143, ¶ 14(c); UNESCO Recommendation (1997), *supra* note 155, ¶ 14; UNESCO Recommendation (2017), *supra* note 20, ¶¶ 18(a), 31; General Comment No. 25, *supra* note 19, ¶ 13 – all addressing/including the international dimension.

[272] Venice Statement, *supra* note 143, ¶ 14(c) (including the international dimension); UNESCO Recommendation (1997), *supra* note 155, ¶ 14 (the international dimension is implicit); UNESCO Recommendation (2017), *supra* note 20, ¶¶ 16(a)(v), 18(d), 31 (the latter two provisions addressing the international dimension); General Comment No. 25, *supra* note 19, ¶¶ 13, 78 (the latter provision addressing the international dimension).

[273] Vrielink et al., *supra* note 254, ¶¶ 48–58.

[274] UNESCO Recommendation (1997), *supra* note 155, ¶ 12; *see also id.* ¶ 27 (freedom in "disseminating and publishing … results"); UNESCO Recommendation (2017), *supra* note 20, ¶ 38 (right to publish); General Comment No. 25, *supra* note 19, ¶ 50 (right to publish); Shaheed, *supra* note 144, ¶ 74(f) ("the right to freely publicize results"); Vrielink et al., *supra* note 254, ¶ 47 ("[f]reedom to dispose of research"); Karran, *supra* note 254, at 174–75 (freedom to determine "methods and avenues by which they disseminate").

[275] Vrielink et al., *supra* note 254, ¶ 47.

[276] ICESCR, *supra* note 15, Art. 4; General Comment No. 25, *supra* note 19, ¶ 50. *See also* UNESCO Recommendation (2017), *supra* note 20, ¶ 38(a) (restrictions must be "strictly minimized").

[277] UNESCO Recommendation (1997), *supra* note 155, ¶ 34(e). *See also* UNESCO Recommendation (2017), *supra* note 20, ¶¶ 16(a)(viii), 18(d), 38(a) (appropriate crediting).

publish open access.[278]

11. *Open communication*: The principle of the "open communication" of findings or "open scientific knowledge" underlies the pertinent UNESCO Recommendations. The documents emphasize that this has its basis in academic freedom and serves the purpose of validation.[279] "Openness" regarding publications signifies that there should be facilities enabling the scientist to communicate publications and data related thereto openly so that other scientists can access these freely (without cost) and use them without undue restrictions.[280] APCs should be borne by research institutions or other funders.[281]

12. *Open research data*: Researchers are entitled to make their research data openly available and to support that helps them doing so.[282] This simultaneously facilitates access by other researchers to such data. Research data "belongs" to the researcher(s) concerned. They may decide whether or not to release it. Where a publication relies on such data, however, the data should be made openly available.

13. *Removal of restrictions*: States are obliged to remove barriers to publishing, sharing, and archiving scientific outputs.[283] States should reconsider the "maximalist" IP approach and explore the benefits of a "minimalist" approach.[284] Failure to redress the extraordinary expansion of IP law in the sphere of publishing may violate Article 15(1)(b).[285]

14. *Financing and infrastructure*: Academic freedom requires "stable institutional financing."[286] High levels of funding should be available for pure science. The emphasis on competitive funding needs to be reduced.[287]

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[278] UNESCO Recommendation (2017), *supra* note 20, ¶¶ 27(f), 35, 36.

[279] UNESCO Recommendation (1997), *supra* note 155, Preamble, Recital 8 ("open communication," required by academic freedom, "provides the strongest guarantee of the accuracy and objectivity of scholarship and research"); UNESCO Recommendation (2017), *supra* note 20, Preamble, Recital 4(c) ("open communication," required by academic freedom, "provides the strongest guarantee of accuracy and objectivity of scientific results"); UNESCO Recommendation (2021), *supra* note 25 (this document developing a framework for open science, including open scientific knowledge).

[280] *See* UNESCO Recommendation (2021), *supra* note 25, ¶ 7, opening section, (a) (identifying these elements and envisioning both gold and green OA).

[281] On the cost or affordability issue, including from the perspective of protecting public funds, *see also supra* Section II.C., notes 240–41 and accompanying and subsequent text, and *infra* Section III.B., note 379 and accompanying text.

[282] UNESCO Recommendation (2017), *supra* note 20, ¶¶ 27(f), 35, 36; UNESCO Recommendation (2021), *supra* note 25, ¶ 7, opening section, (b).

[283] General Comment No. 25, *supra* note 19, ¶ 49.

[284] Shaheed, *supra* note 144, ¶ 74(o).

[285] *See* Christine Mitchell, *Epilogue: Tensions in the Right to Science Then and Now*, *in* THE RIGHT TO SCIENCE: THEN AND NOW, *supra* note 165, at 286, 295 (who could be interpreted in this way).

[286] Bonn Declaration, *supra* note 254 (see under "The role of governments to protect the freedom of scientific research").

[287] *See supra* Section II.C. (*The neoliberal vs. the human rights approach to science*).

Freedom of research depends on the necessary "infrastructure,"[288] including in the form of good quality dissemination avenues for research.[289] Not-for-profit university publishers should be well subsidized by states.[290] States are required to allocate maximum resources to science.[291] They must proactively create an "enabling" environment for the enjoyment of scientific freedom.[292]

15. *Slow science v "publish or perish"*: There should be a renewed emphasis on "slow science" as most "adequate for science." "Publish or perish" as a central tool of research management impedes the discovery process, spurs scholarly dishonesty, and results in publications of deteriorating quality.[293]

16. *Peer review*: The scientific fraternity (not the state or publishers) will have to decide on the exact nature of quality control considered "adequate for science." Impact criteria should play a limited role prior to publication. The identity of reviewers must be revealed and their reviews be made openly available. Reviewers may only offer suggestions, while final decisions may only be taken by editors. Post-publication and peer-to-peer review are very promising options. The organization of peer review must be the responsibility of science institutions. JIFs must be abolished. Quality control must respect scientific freedom.[294]

17. *Evaluations*: "Adequacy for science" implies that evaluations must play a reduced role in science. Financial and moral over-incentivization (e.g., performance- or output-based funding) need to be terminated. Performance management leads to the avoidance of risk in science, compromises scholarly integrity, and results in excessive and inferior quality publications corrupting science. Rather than controlling output, input – that is, the selection and socialization of researchers – should be controlled. In lieu of performance appraisals, "a constructive dialogue" between institution and scientist should indicate the latter's support needs. Moreover, publication metrics or altmetrics may play no role in assessments. Publications may only be assessed by reading them.[295]

What are the normative claims encompassed by the *positive* right of citizens to enjoy "access to the benefits of research" of specific relevance in the copyright and science context? These would essentially be *citizens' claims of access and reuse of scholarly publications, research data, and software*. The best way to facilitate such access and use clearly is *open access*.

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[288] *See, e.g.*, UNESCO Recommendation (1997), *supra* note 155, ¶ 5.
[289] *See, e.g.*, *id.* ¶ 12 ("publication and dissemination … should be encouraged and facilitated").
[290] Beiter, *supra* note 18, at 290.
[291] ICESCR, *supra* note 15, Art. 2(1).
[292] *See, e.g.*, General Comment No. 25, *supra* note 19, ¶ 46.
[293] *See supra* Section II.C., notes 189–204 and accompanying text.
[294] *See supra* Section II.C., notes 217–30 and accompanying text.
[295] *See supra* Section II.C., notes 231–36 and accompanying text.

18. *(Evolving) open access for all*: OA scientific knowledge may be useful to the public for many reasons. Insofar as medical research is concerned, the public has an interest in OA "because of their roles as funders, advocates, research participants, and patients."[296] NGOs and governments require access to many types of knowledge to assist them in policy formulation. OA to research for the R&D sector may lead to innovation and new technology, which may broadly be stated to further the public interest.[297] OA would even likely advance science by ordinary citizens. James Boyle holds that one should not underestimate the power of a lay audience, enjoying free access to scholarly work, "to add richness and depth to the world of scholarship." The virtues of a larger-than-expected audience, serendipitous uses, and cooperative enterprise, he argues, may entail scientific progress. Openness to the public "ought to be a general design principle." The success of this vision is based on "the comparative absence" of IP rights, of course.[298]

A crucial precondition to realizing the right of the public to OA scholarly knowledge is to respect all the entitlements covered under the negative right "to do research." This ensures that quality knowledge is (or may be) available for dissemination. Governments, funders, and institutions increasingly require scientists to make scholarly publications available open access. To the extent that publications flow from research wholly or partially funded by public revenue, such mandates are understandable. Yet, caution needs to be exercised. At this point in time, where subscription publishing and gold and green forms of OA exist in the form they do, the legal situation should be held to be as follows: Heather Morrison holds that such policies or laws are invariably "green," this being more inclusive, as it allows both OA publishing and OA archiving.[299] Authors can also not be compelled to follow the golden route against the background that many OA journals presently charge APCs which may be beyond the financial means of authors or their institutions. Apart from that, with many OA journals being "young," they tend to have lower JIFs. For as long as this measure continues to play a role, forcing researchers to publish in a way that might compromise their career advancement cannot be considered acceptable.[300] One may even question

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[296] Day, *supra* note 63, at 1.

[297] *See* Tennant, *supra* note 17, at 14–15 (regarding OA benefiting R&D and having wider societal impact).

[298] James Boyle, *Mertonianism Unbound? Imagining Free, Decentralized Access to Most Cultural and Scientific Material*, *in* UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE 123, 130, 135–36, 138–39 (Charlotte Hess & Elinor Ostrom eds., 2007).

[299] MORRISON, *supra* note 74, at 121. *See also* SCHEUFEN, *supra* note 92, at 154 (gold mandate "neither fair nor reasonable").

[300] *See* EGER & SCHEUFEN, *supra* note 80, at 114–15 (for as long as scholars may perceive OA journals as being of inferior quality, gold OA would conflict with academic freedom); Peukert & Sonnenberg, *supra* note 105, at 226–27 (arguing that the gold mandate would, in the light of the possible negative effects on the distribution of reputation, be unconstitutional); Skre & Eide, *supra* note 63, at 452–53 (the gold mandate "limits faculty freedom").

whether "green" OA archiving can be made obligatory for authors by law or policy without further ado. Appreciating that scientific freedom includes the right not to publish and that, in some countries, there even exists a moral right to withdraw a publication from circulation, researchers must at least possess an opt-out option on a case-by-case basis. Some writers have suggested that institutions should hold a non-exclusive automatic license to non-commercially archive staff articles.[301] Also this can only be acceptable if an author can principally opt out in individual cases.[302] Such a license may further only be executable if an author neglects to self-archive. In any event, an OA requirement is only compatible with scientific freedom if the right to (self-)archive is made an inalienable entitlement vis-à-vis publishers.[303] If this were not so, publishers' contracts could deny archiving, thus limiting scientists' publication choices.

Archiving clearly benefits scientists themselves. Scientists should demand repositories from their institutions.[304] Research shows that scientists often do not self-archive because of a lack of knowledge about OA or a misplaced fear that OA violates copyright, bypasses peer review, or destroys scholarly journals.[305] The approach should be to encourage self-archiving, to provide correct information about it, and to assist scientists in the endeavor.[306] However, policies suggesting that it be "taken into account as a scientific and academic recruitment and promotion criterion," as suggested by UNESCO,[307] seem to conflict with scientific/academic freedom.

In the long term, however, scientists and the public will demand access to scientific knowledge that is not dispersed over manifold archives, with some documents in their published, others in a pre- or post-print format, with different conditions of use pertaining to each document that may often also be unclear, with some information available only after an embargo period, and so on. Hence, in the long term, the "right to research" requires the construction of a "true" scholarly knowledge commons. How this might be

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[301] Robert C. Denicola, *Copyright and Open Access: Reconsidering University Ownership of Faculty Research*, 85 NEB. L. REV. 351 (2006); Eric Priest, *Copyright and the Harvard Open Access Mandate*, 10 NW J. TECH. & INTELL. PROP. 377 (2012).

[302] *See* Guibault, *supra* note 74, at 163 ("may interfere with … academic freedom"; seemingly approving of such an opt-out); Priest, *supra* note 300, at 435 (considering the opt-out "an effective built-in protection").

[303] *See* Bellia & Moscon, *supra* note 57, at 17 (legislation should grant authors "an unwaivable and inalienable right to republish (make available to the public) the work in Open Access"); SCHEUFEN, *supra* note 92, at 155 ("would give the author more bargaining weight").

[304] *See* Dagmar Sitek & Roland Bertelmann, *Open Access: A State of the Art*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 139, 146 (making this suggestion).

[305] *See* Salager-Meyer, *supra* note 117, at 192–93 (citing certain sources mentioning these aspects).

[306] *See id.* at 193 (mentioning raising awareness and helping authors).

[307] UNESCO Recommendation (2021), *supra* note 25, ¶ 20(h).

achieved will be further elaborated on in Section III.B. below.

E. Global Science Inclusiveness: The International Dimension of the "Right to Research"

Increasingly, it is emphasized that science is also a *global* public good.[308] Accordingly, the enclosure of scientific knowledge in the countries of the global North is a problem. Scientific results require universal validation. Research solves problems common to different societies. By its nature, science is "one of the most international of all activities."[309] The dissemination of, access to, and use of scholarly information should, therefore, be possible and facilitated across national borders. "Global science inclusiveness" signifies that the global South may not be excluded from participation in what is ultimately a universal scientific enterprise. Scientific knowledge constitutes a global commons that does not easily permit proprietary or other exclusion.

"The right to research" has an international dimension and the rights and duties this entails must, in constructing "the right to research," be identified as well. Obligations arise for states jointly and separately toward individuals, groups, or whole populations within or beyond their borders under the REBSPA and associated rights, giving rise to concomitant rights:

19. *Right to development*: The right to development as a collective right grants to peoples the right to civil, political, economic, social, and cultural development in accordance with their own priorities and needs, inter alia through science, vis-à-vis the global community of states.[310] One may, for example, observe how countries not belonging to the Western bloc have transformed their universities in the Western image, participating in university rankings, copying science evaluations systems, and emphasizing publication in journals with a high JIF.[311] The consequence of this

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[308] *See, e.g.*, *id.* ¶¶ 13(b), 18, or São Paulo Statement on Open Access, Joint Declaration by the African Open Science Platform, AmeliCA, cOA-lition S, OA2020, and SciELO, São Paulo, Brazil (May 1, 2019), https://www.coalition-s.org/wp-content/uploads/Sao-Paulo-Statement-OA-01052019.pdf (recognizing this).

[309] Chapman, *supra* note 149, at 27.

[310] This definition is broadly based on U.N.G.A. Res. 41/128, Declaration on the Right to Development, Art. 1(1) (Dec. 4, 1986). The normative basis for the REBSPA "as" a binding right to development lies in Article 15(1)(b) of the ICESCR read with Article 1 on the right of "all peoples" (as collectives) to self-determination: ICESCR, *supra* note 15, Arts. 1, 15(1)(b). Identifying aspects of the REBSPA as a group right in various international legal instruments, see Gianpaolo M. Ruotolo, *Right to Science and Open Access to Legal Knowledge in International and European Law*, *in* KNOWLEDGE OF THE LAW IN THE BIG DATA AGE 101, 102–03 (Ginevra Peruginelli & Sebastiano Faro eds., 2019).

[311] Providing background in this regard, *see, e.g.*, Rosemary Deem, Ka H. Mok & Lisa Lucas, *Transforming Higher Education in Whose Image? Exploring the Concept of the "World-Class" University in Europe and Asia*, 21 HIGH. EDUC. POL'Y 83 (2008); William Y. Lo, *Soft Power, University Rankings and Knowledge Production: Distinctions Between Hegemony and Self-Determination in Higher Education*, 47 COMP. EDUC. 209 (2011).

transformation – due in no mean measure to "soft" pressure exerted by Western states and entities such as the Organisation for Economic Co-operation and Development (OECD) – is that scientists in the developing world will refrain from publishing in local journals, because most of these are not indexed.[312] To be published in a journal with a (high) JIF, they will have to write about problems of the developed world, in the languages of the developed world, and satisfy a readership in the developed world.[313] This not only prevents local knowledge generation, but also leads to the subsequent copyright enclosure of that knowledge in the countries of the global North. Under the right to development, developed states could, for instance, be held to be obliged *not to* obstruct the development of strong local science systems in developing states, impede the free flow of scholarly knowledge to developing states through restrictive copyright laws, or refuse support to a more lenient treatment of developing states in a global copyright context which would allow the relaxation of copyright rules in accordance with development needs.

20. *Right to international solidarity*: The right to international solidarity, a right of more recent theorization, is a collective right of nations, applicable vis-à-vis the global community of states. The Independent (U.N.) Expert on Human Rights and International Solidarity identifies "international co-operation" and "preventive solidarity" as two possible forms of international solidarity directed at the fulfilment of human rights.[314] As regards the REBSPA, the former would require concrete assistance in the field of the international transfer of scientific knowledge (providing aid, funding, research findings) by developed to developing states, their incentivization of such transfer by other actors in developed states, and further their encouragement of direct contacts between scientific communities in their and other countries (inter alia aimed at knowledge creation and exchange).[315] The

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[312] *See* MORRISON, *supra* note 74, at 13 (noting that most journals in the developing world are not covered).

[313] *See* Sami Mahroum, "'Publish or Perish': The New Brain Drain in Science," World Economic Forum (Nov. 8, 2016), https://www.weforum.org/agenda/2016/11/publish-or-perish-the-new-brain-drain-in-science (explaining this dilemma).

[314] *See* Virginia Dandan, *Report of the Independent Expert on Human Rights and International Solidarity: Human Rights and International Solidarity*, U.N. Doc. A/70/316, ¶¶ 34–53, 23–33 (Aug. 12, 2015) (addressing "international co-operation" and "preventive solidarity," respectively). The normative basis for the right to international solidarity as a binding right in the sphere of science lies in reading Article 2(1) of the ICESCR (general state obligation "to take steps … through international assistance and co-operation") with Article 15(1)(b), (4) and further Article 1 on the collective right to self-determination: ICESCR, *supra* note 15, Arts. 1, 2(1), 15(1)(b), (4).

[315] *See, e.g.*, ICESCR, *supra* note 15, Art. 15(4) (developing "international contacts and co-operation" in the scientific field); Venice Statement, *supra* note 143, ¶ 24 (promoting "international cooperation and assistance" in developing science policy); UNESCO Recommendation (1997), *supra* note 155, ¶ 14 (extending "direct contacts"); UNESCO Recommendation (2017), *supra* note 20, ¶ 18(a) ("associating scientific communities"); WIPO, The 45 Adopted Recommendations under the WIPO Development Agenda, Recomm. 26 (2007), https://www.wipo.int/export/sites/www/ip-

latter would require states to work together in the endeavor of creating an international enabling environment conducive to the international transfer of scientific knowledge (e.g., urging courts and tribunals to follow REBSPA-supportive interpretative practices of copyright law or WIPO adopting a legal instrument on L&Es inter alia facilitating access to scientific knowledge).[316]

21. *Extraterritorial state obligations (ETOs) to fulfil and related claims*: According to the expert Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights of 2011, extraterritorial state obligations to respect, protect, and fulfil arise under all human rights, including the REBSPA.[317] These are obligations which states owe to individuals in other states and which, at any rate in theory, give rise to individually enforceable legal claims. The obligation to fulfil would entail duties to *provide* and *facilitate*, effectively replicating duties under "international co-operation" and "preventive solidarity," respectively, here, however, giving rise to claims held by individuals.[318] By way of example, the CESCR's General Comment No. 25 may be read to suggest that states parties to the ICESCR be held obliged to negotiate international IP agreements or adopt domestic IP regimes in a way that fosters freedom to do research and rights of citizens to enjoy access to scientific knowledge (thus both components of the "right to research") beyond their own borders.[319] Similarly, as members of WIPO or the WTO, they would have to direct their efforts in these organizations toward facilitating the "right to research" globally.[320]

22. *ETOs to protect and related claims*: Without prejudice to the right of

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development/en/agenda/recommendations.pdf (driving co-operation between scientific institutions) [hereinafter WIPO Development Agenda Recommendations]; General Comment No. 25, *supra* note 19, ¶¶ 97–80 (allocating development aid and funding, sharing the benefits of scientific progress).

316 *See, e.g.*, ICESCR, *supra* note 15, Art. 15(4) (co-operation in the scientific field); Shaheed, *supra* note 144, ¶ 75(c)(i) (holding that WIPO should elaborate compilations of good practices on measures to promote access to scientific knowledge).

317 Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights, Principle 3 (2011). For a reproduction of, and commentary to, the Maastricht Principles, *see* Olivier De Schutter et al., *Commentary to the Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights*, 34 HUM. RTS. Q. 1084 (2012). This author has previously endeavored to exemplify how the ETOs concept might be operationalized for the right to education to address copyright-related impediments to access to textbooks in a global context: Klaus D. Beiter, *Not the African Copyright Pirate is Perverse, But the Situation in which (S)He Lives: Textbooks for Education, Extraterritorial Human Rights Obligations, and Constitutionalization "From Below" in IP Law*, 26 BUFF. HUM. RTS. L. REV. 1 (2019–2020). A similar analysis should be attempted for the REBSPA and copyright-related impediments to the freedom to do research and the rights of citizens to enjoy access to scientific knowledge.

318 On ETOs to provide, *see specifically* Maastricht Principles, *supra* note 316, Principle 33, on ETOs to facilitate, *id.* Principle 29.

319 Based on General Comment No. 25, *supra* note 19, ¶ 83.

320 Based on *id.*

the host state of an agent, branch, or subsidiary of a foreign publishing company to apply its own law, copyright-related conduct by the home/parent company that affects the freedom to do research or the rights of citizens to enjoy access to scientific knowledge abroad, or conduct of that nature by the local agent, branch, or subsidiary, must be regulated and monitored by the home state insofar as the latter may be considered to be "in a position to regulate" the actor or its conduct concerned. Relevant conduct should be required to comply with REBSPA standards with respect to the freedom to do research and the rights of citizens to enjoy access to scientific knowledge.[321] This may entail obligations for publishing firms to apply differential pricing for their products in developing states or to offer waiver schemes for APCs benefiting scientists in poorer countries.[322]

23. *ETOs, domestic state obligations, and individual rights*: As regards the REBSPA, the obligation to *respect* would require states to (negatively) refrain from copyright-related conduct, including in international organizations, which impedes the freedom to do research or rights of citizens to enjoy access to scientific knowledge abroad.[323] ETOs to respect, and to facilitate, when read in conjunction with domestic state obligations under the REBSPA, imply many of the individual rights identified under the previous heading, now, however, emphasizing the transnational context. One state must allow and facilitate knowledge exportation, the other allow, and create capacity for, knowledge importation.[324] The rights thus include: collaboration by scientists across national borders,[325] sharing of information by scientists across borders,[326] the right to "freely publicize results regardless of frontiers,"[327] the freedom of scientists and citizens to "seek, receive, and impart" scholarly knowledge "regardless of frontiers,"[328] or their right to participate in open science through the unrestrained dissemination of, access

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[321] On ETOs to protect, *see* Maastricht Principles, *supra* note 316, Principles 23–27. *See also* General Comment No. 25, *supra* note 19, ¶ 84 (ETOs to protect under the REBSPA).

[322] *See, e.g.*, Helfer & Austin, *supra* note 238, at 336 (suggesting that multinational publishers should engage in differential pricing); Tennant, *supra* note 17, at 13 ("68.8% of publishers offer fee waivers to low- and middle-income countries").

[323] On ETOs to respect, *see* Maastricht Principles, *supra* note 316, Principles 19–21.

[324] In this vein, *see also* Chapman, *supra* note 149, at 28 (negative and positive obligations for the country in which knowledge originates and the receiving country).

[325] *See* note 270 *supra*.

[326] *See* note 271 *supra*.

[327] Shaheed, *supra* note 144, ¶ 74(f).

[328] ICCPR, *supra* note 140, Art. 19(2) (defined as the right of "everyone" with regard to information "of all kinds"). *See also* UNESCO Recommendation (1997), *supra* note 155, ¶ 14 ("access by higher education teaching personnel from other states to open information material in public archives, libraries, research institutes and similar bodies"); UNESCO Recommendation (2017), *supra* note 20, ¶ 18(b) ("ensuring equal access to science and the knowledge derived from it," benefiting citizens and scientists, "worldwide"); UNESCO Recommendation (2021), *supra* note 25, ¶ 13(c) ("equal access to scientific knowledge … regardless of location").

to, and use of scholarly knowledge across borders.[329]

II. III. THE "RIGHT TO RESEARCH" AND THE FUTURE OF COPYRIGHT LAW

A. The Short or Medium Term: Copyright Law Reforms

The above analysis shows that there exists quite a solid basis for the "right to research," in both its domestic and extraterritorial dimension, under the REBSPA (and associated rights). In the light of recognized access to scientific knowledge needs, this must have implications for existing strict copyright protection in the sphere of science. It is submitted that the way forward for copyright and science is for the solutions of the first and second models of reform of copyright, as outlined earlier,[330] to be made operational in the short and medium term (the solutions of the first, the "milder" subscription model, to the extent that, and for as long as, scholarly publishing continues to follow the subscription model). These models do not question the traditional role played by the commercial scholarly publishers. In the longer term, as will be discussed under the next heading, the solutions of the third model should, in principle, come to prevail. Clearly, these will take longer to realize as they presuppose a wholesale reconceptualization of institutionalized science. As it were, dissemination of, access to, and use of scholarly publications should be as unencumbered by copyright as possible until such time that science is genuinely open. Models 1 and 2 assume less relevance, as model 3 becomes operational.

Mindful of the deficiencies of existing copyright law, also from a North-South perspective, as reported on earlier,[331] an inventory of necessary copyright reforms under models 1 and 2 could or should encompass the following solutions:

Dissemination (the problem of limited authors' rights under the subscription model): Author-publisher standard contracts (or contract law as such) should be redesigned to ensure that no assignment of copyright takes place and that authors' rights of reuse (republish, distribute, produce derivatives, etc.) are preserved.[332]

Access (the problem of high prices and perpetual control under the subscription model): Price control will be necessary. A statutory body could determine maximum charges. A copyright tribunal could find certain fees to be "unreasonable." Under competition law, subscription charges might be

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[329] UNESCO Recommendation (2017), *supra* note 20, ¶ 21 ("international aspect," "establish and facilitate mechanisms for collaborative open science"); UNESCO Recommendation (2021), *supra* note 25, ¶ 7, opening section ("access, re-use … regardless of location"), ¶ 13(b) ("open science should … benefit humanity as a whole"), ¶ 22(b) ("efforts towards universal access to the outputs of science").

[330] *See supra* Section I.B. (1., 2.).

[331] *See supra* Section I.A. and the various sources cited there.

[332] *See* Guibault, *supra* note 74, at 161–62 (referring to model clauses that may be used in this regard).

considered excessive. Compulsory licenses might be granted to compel publishers to open content to other publishers.[333] Secrecy clauses in licensing agreements must be forbidden to ensure transparency and prevent price discrimination. It must be ensured that subscription agreements subtract charges for "golden" open content in subscription journals.[334] Developed states should require "their" publishers to apply differential pricing benefiting libraries in developing states.

Use (the problem of use often being excluded, of insufficient scope, and expensive): There is a need for a comprehensive research L&E, permitting use and reuse of research materials for all scientific purposes (clearly covering reproduction, format-shifting, storage, archiving, data extraction, linking, quotation, translation and other forms of derivative use, communication to the public, etc.), subject to a broad fairness test. This L&E should expressly cover computational uses, including TDM.[335] This, in turn, should cater for all relevant uses, such as reproduction, data extraction, communication to the public (sharing a database with other scientists, also in another country), adaptation (e.g., to make texts machine-readable), storage, and so on, subject to the broad fairness test.[336] Moreover, libraries should explicitly be allowed to take such measures as are necessary to preserve works or replace them in certain instances. L&Es must permit digital lending by libraries, remote access (even, as appropriate, from overseas) to library

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[333] *See* Reto M. Hilty, *Renaissance der Zwangslizenzen im Urheberrecht? Gedanken zu Ungereimtheiten auf der urheberrechtlichen Wertschöpfungskette*, 111 GRUR 633, 641 et seq. (2009) (making this suggestion).

[334] MORRISON, *supra* note 74, at 146.

[335] *See* Reichman & Okediji, *supra* note 28, at 1439–41 (proposing such a broad research exemption). UNESCO calls on member states to promote L&Es for research "that allow distribution and re-use of a copyright work …, including partial or derivative use, on the condition that the creator is appropriately credited, in accordance with international law." The express reference to derivative use is commendable, but there is no specific reference to TDM: UNESCO Recommendation (2021), *supra* note 25, ¶ 20(l).

[336] *See* Flynn et al., *supra* note 48, at 393, 396–97 ("mechanisms" are needed "to authorise TDM research," including these uses). It may indeed be so that TDM, strictly speaking, does not require specific exemption: *see, e.g.*, Reto M. Hilty & Heiko Richter, *Text and Data Mining (Article 3 COM(2016) 593 final)*, *in* MODERNISATION OF THE EU COPYRIGHT RULES: POSITION STATEMENT OF THE MAX PLANCK INSTITUTE FOR INNOVATION AND COMPETITION 25, ¶¶ 6, 13–20 (Reto M. Hilty & Valentina Moscon eds., Max Planck Inst. for Innov. & Competition, 2017) (arguing that TDM itself is a "normal use" for which no consent is required; reproductions and extractions are implicitly authorized); Martin Kretschmer & Thomas Margoni, *Data Mining: Why the EU's Proposed Copyright Measures Get It Wrong*, THE CONVERSATION (May 24, 2018), https://theconversation.com/data-mining-why-the-eus-proposed-copyright-measures-get-it-wrong-96743 ("TDM refers to the use of ideas, principles, facts and correlations"); Matthew Sag, *Copyright and Copy-Reliant Technology*, 103 NW. U.L. REV. 1607 (2009) (arguing that TDM is a (permitted) "non-expressive use"). Nevertheless, specific exemption would provide legal certainty and (must) prevent the contractual exclusion of TDM. "Lawful access" requirements should be interpreted leniently: Flynn et al., *supra* note 48, at 398. Against reasonable payment, TDM should be possible with regard to whole datasets to which otherwise no lawful access exists: Hilty & Richter, *supra*, ¶¶ 25–28.

collections, and copies for larger groups and classes. Use should generally encompass commercial uses since also these often are in the public interest.[337] The above shows that L&Es should, where relevant, grant rights extraterritorially. Finally, in developmental contexts, L&Es may legitimately permit much wider research uses. In the global South, most copying should be allowed without remuneration. Similarly, the reproduction or translation of whole scholarly works may thus be acceptable, potentially subject to a moderate remuneration obligation.[338] The "subscription" agreements should cover not only access charges, but also fixed compensatory charges for "all needed research uses," under remunerated and beyond L&Es, and potentially even APCs for researchers at the research institution concerned, all built into the "subscription" price, to facilitate more transparent and affordable deals.[339] The contractual restriction or exclusion of L&Es for research must be forbidden.[340] Because TPMs easily obstruct legitimate use, they should, as far as possible, be avoided as regards scientific literature.[341] Their circumvention must be permissible where this is to secure user rights otherwise available by law.[342] It has also been stated that circumvention

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[337] In this sense, *see, e.g.*, Flynn et al., *supra* note 48, at 397 (explaining that also commercial TDM often is in the public interest); Hilty & Richter, *supra* note 335, at ¶¶ 8, 10–12 (pointing out that it may be difficult to distinguish between commercial and non-commercial research and further underlining the high potential of commercial TDM for innovation); Peukert & Sonnenberg, *supra* note 105, at 220 (referring to the comprehensive access needs of businesses, concluding that L&Es for science should include commercial research); Reichman & Okediji, *supra* note 28, at 1440–41 (arguing that a broad research exemption should not distinguish between commercial and non-commercial research because "basic scientific research results are … a public … good").

[338] *See, e.g.*, (civil society) Treaty on Access to Knowledge, Art. 3-12(a)(iii), Draft, May 10, 2005, https://www.keionline.org/book/proposalfortreatyofaccesstoknowledgemay102005draft (developing countries need "easier and less costly access to … science") [hereinafter Access to Knowledge Treaty].

[339] *See* Reichman & Okediji, *supra* note 28, at 1467 (making this suggestion for "all needed research uses").

[340] *See* Access to Knowledge Treaty, *supra* note 337, Art. 3(6)(a)(i) ("DRM/TPM measures may undermine traditional limitations and exceptions"); COMM'N ON INTELL. PROP. RTS., 2002 Report, *supra* note 59, at 109 (holding that such contract provisions should be treated as void); Hilty, *supra* note 47, at 351–52 (arguing that Infosoc Directive, *supra* note 35, Art. 6(4)(4), to the extent that it allows the restriction of L&Es for on-demand online services, must be deleted); P. Bernt Hugenholtz, *Copyright vs. Freedom of Scientific Communication*, 13 LEARNED PUBLISHING 77, 81 (2000) ("to preserve basic scientific freedoms it is vital that copyright limitations protecting scientific uses be granted 'imperative' status"); Reichman & Okediji, *supra* note 28, at 1447 (emphasizing that L&Es for research must be non-waivable). *See generally* Philippa Davies, *Access v Contract: Competing Freedoms in the Context of Copyright Limitations and Exceptions for Libraries*, 35 EUR. INTELL. PROP. REV. 402 (2013) (recommending recourse to mechanisms of contract law, such as misuse of copyright, unfair contract terms, or abuse of rights, to protect freedoms of access to and use of information in libraries).

[341] *See* Hugenholtz, *supra* note 339, at 81 (through TPMs, "scientific freedoms are at risk of being further compromised").

[342] Access to Knowledge Treaty, *supra* note 337, Art. 3-6(d). See also the interesting suggestion for a "reverse notice and takedown" regime to protect legitimate research uses

should generally be permissible in the case of "works of medical and scientific literature."[343] Circumvention may, most certainly, never be criminalized.

Sui generis *database protection*: The focus here has not been on *sui generis* database protection. Suffice it to state that the comprehensive research L&E, including the L&E for computational uses detailed under "use" above should apply to databases as well. No *sui generis* database protection should be enacted in developing countries.[344]

Bulk access: With the Berne Appendix being dysfunctional, in order to satisfy, in developmental contexts, any need for bulk access to certain digital (or print) scientific works that do not exist as translation in a country, or are not available or only at an unreasonable charge, countries might adopt a mechanism entitling the government or one or more research institutions to apply for compulsory translation and/or reproduction licenses to a national authority. The procedure should be as uncomplicated as possible. Modest compensation would be payable.[345]

Green and gold OA: In a world where the commercial scholarly publishers (still) play a crucial role, options of green and (affordable) gold OA must be guaranteed to authors. Legislation should grant authors an inalienable right to self-archive and restrict embargo periods to a minimum. In the case of gold OA, APCs should be borne by research institutions or other funders. A global APC fund should be created for the benefit of scientists working in countries of the global South.[346] Developed states should require "their" publishers to offer waiver schemes for APCs benefiting scientists in developing states. Gold OA cannot be mandated. Green OA should be encouraged rather than mandated to protect scientific/academic freedom.

Without examining this in detail, it is submitted that most, if not all, of the above solutions could be realized under existing international IP law. IP treaties, such as Berne, TRIPS, or the WCT – and thus also the three-step test laid down in these instruments – must be interpreted "in the light of [their]

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against TPMs: Jerome H. Reichman, Graeme B. Dinwoodie & Pamela Samuelson, *A Reverse Notice and Takedown Regime to Enable Public Interest Uses of Technically Protected Copyrighted Works*, 22 BERKELEY TECH. L.J. 981 (2007).

[343] Access to Knowledge Treaty, *supra* note 337, Art. 3-6(c)(ii).

[344] COMM'N ON INTELL. PROP. RTS., 2002 Report, *supra* note 59, at 109. Generally querying *sui generis* database protection, see Hugenholtz, *supra* note 339, at 77–78 (potentially in conflict with scientific freedom); Reichman & Okediji, *supra* note 28, at 1424 ("conflicts head on with customary scientific research practices").

[345] In a similar vein, *see* Access to Knowledge Treaty, *supra* note 337, Art. 3-12(a)(3)-(5), (b)(1)-(6) (affirming that a new protocol for compulsory licenses is needed, covering scientific works, also in electronic formats, entailing simpler procedures and faster decision-making).

[346] *See* SCHEUFEN, *supra* note 92, at 155–56 (proposing a transnational funding agency).

object and purpose"[347] and further "any relevant rules of international law applicable in the relations between the parties."[348] The latter, as the integration rule of international law, establishes the link between international IP law and other fields of international law, including human rights, and is directed at achieving an overall harmonized reading of international law rules.[349]

Regarding treaty "object and purpose," one should certainly take note of Article 7 (Objectives) and Article 8 (Principles) of TRIPS. The former refers inter alia to the goal of IP rights "contribut[ing] … to the transfer and dissemination of technology."[350] Technology transfer must be read to include transfer of scientific knowledge, seeing that technological advance flows from such knowledge. In its 2002 Report, the U.K. Commission on Intellectual Property Rights therefore articulates the need for technology transfer agendas to include commitments of access to the benefits of publicly funded research and open access to scientific databases.[351] The latter, in Article 8(1), allows TRIPS countries to "adopt measures necessary … to promote the public interest in sectors of vital importance to their socio-economic and technological development" (provided these are "consistent with" provisions of TRIPS).[352] Science undoubtedly is a sector of vital importance to such development.[353] The WCT, in its preamble, specifically emphasizes the larger public interest in research in the copyright context.[354]

Regarding relevant international human rights law for purposes of interpreting international IP treaties, this includes ICESCR provisions protecting the REBSPA, the right to development, and the right to international solidarity – and consequently also the "right to research" in its domestic and extraterritorial dimensions, as deductively constructed in this article. Limitations and exceptions to exclusive rights must comply with the

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[347] VCLT, *supra* note 181, Art. 31(1).

[348] *Id.* Art. 31(3)(c).

[349] On the integration rule in its application to international IP law, *see* HENNING GROSSE RUSE-KHAN, THE PROTECTION OF INTELLECTUAL PROPERTY IN INTERNATIONAL LAW Chs. 12–14 (2016).

[350] TRIPS, *supra* note 10, Art. 7.

[351] COMM'N ON INTELL. PROP. RTS., 2002 Report, *supra* note 59, at 26. One may well argue that "technology" should, generally, be read widely as encompassing also scholarly or cultural knowledge not related to "technological" advance in a strict sense. In this wide sense, *see* WSIS, Declaration of Principles: Building the Inform. Soc'y: A Glob. Chall. in the New Millennium, World Summ. on the Inform. Soc'y, Geneva 2003 – Tunis 2005, WSIS-03/GENEVA/DOC/4-E, ¶ 24 (Dec. 12, 2003) ("Intellectual Property protection is important to encourage innovation and creativity in the Information Society; similarly, the wide dissemination, diffusion, and sharing of knowledge is important to encourage innovation and creativity.").

[352] TRIPS, *supra* note 10, Art. 8(1).

[353] *See* CARLOS M. CORREA, TRADE RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS: A COMMENTARY ON THE TRIPS AGREEMENT 106 (2007) (stating that it is for the particular member state to decide which sectors are implicated and whether they are of vital importance).

[354] WCT, *supra* note 42, Art. 10.

three-step test of international copyright law.[355] The Max Planck Institute's Declaration on a Balanced Interpretation of the "Three-Step Test" in Copyright Law of 2008 points out that, under the test, the legitimate interests of third parties "deriving from human rights and fundamental freedoms" and "the public interest in scientific progress" must be taken into account.[356] Its more recently proposed International Instrument on Permitted Uses in Copyright Law reiterates this and suggests that states should permit uses for the purpose of research.[357] As it were, the three-step test "must *perfectly mirror* the demands of human rights. Or, stated differently: the three-step test must permit any such use as constitutes an entitlement under human rights."[358] Interestingly, TRIPS and the WCT contain various provisions implying linkage with the right to development. The preamble of TRIPS recognizes that national systems for the protection of IP rights may validly be designed to pursue "developmental and technological objectives."[359] It also recognizes the needs of least-developed countries with respect to "maximum flexibility" in the design of national IP systems.[360] Both TRIPS and the WCT require implementation in accordance with a state's "own legal system and practice."[361] The WIPO Development Agenda of 2007 affirms the linkage. Expressly referring to Article 7 of TRIPS, it underlines that IP rights should be implemented in the context of "especially development-oriented concerns."[362]

B. The Long Term: Regulating, Reordering, or Removing Copyright Claims in Constructing a "True" Scholarly Knowledge Commons?

In the light of the far-reaching needs for unimpeded dissemination of, access to, and use of scientific knowledge – strongly backed by the "right to research" – it is doubtful that the reforms of copyright outlined above will be sufficient to meet the demands of science in the final analysis and comply with the REBSPA (which, it should be remembered, is to be realized progressively until an "ideal" state of realization has been reached). The discussion has borne out the excesses of the scholarly publishing industry and the role copyright plays in making these possible. The crucial question – as pertinently posed by Reichman and Okediji – therefore is, "should scientific publishers' customary interests be preserved at the expense of scientists' need for wholesale access to, and reuse of, the exploding universe of published

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[355] Berne Convention, *supra* note 29, Art. 9(2); TRIPS, *supra* note 10, Art. 13; WCT, *supra* note 42, Art. 10.

[356] Geiger et al., *Declaration on a Balanced Interpretation of the Three-Step Test in Copyright Law*, *supra* note 32, at 712, ¶ 6.

[357] Reto M. Hilty et al., *International Instrument on Permitted Uses in Copyright Law*, 52 INT'L REV. INTELL. PROP. & COMPETITION L. 62, 65 (A.II.2.(d)), 66 (B.II.2) (2021).

[358] Beiter, *supra* note 316, at 54–55.

[359] TRIPS, *supra* note 10, Preamble, Recital 5.

[360] *Id.* Preamble, Recital 6.

[361] *Id.* Art. 1(1). Similarly, *see* WCT, *supra* note 42, Art. 14 (1) ("in accordance with their legal systems").

[362] WIPO Development Agenda Recommendations, *supra* note 314, Recomm. 45.

scientific literature and data?"[363] Related to that, what role, if any, can copyright continue to play in the sphere of science? In the light of the parameters of "another science," as based on the concept of "adequacy for science," it is submitted that the solutions of model 3 should ultimately be implemented. These envisage nothing less than a full reconceptualization of institutionalized science, science becoming genuinely open, and a "true" scholarly knowledge commons (SKC) being created.

In "The Tragedy of the Commons," Garrett Hardin had maintained that the unavoidable fate of the traditional commons was their demise, as everybody would just use, but not feel obliged to "look after" them, to ensure, as we would say today, their sustainable use. This supports arguments in favor of private property. A private owner would invest in the preservation of the property because he could then draw a continuous rent from controlled access to the property.[364] Assuming this reasoning to be correct (and it may not be), it clearly cannot apply to knowledge. Knowledge is not depleted by its consumption. On the contrary, it increases.[365] While the "first" enclosure of physical property has largely been accomplished, James Boyle recommends recourse to "the language of the commons" to offer limits to the "second" enclosure, that of knowledge as an intangible creation of the mind.[366]

What then would be the demands for a "true" SKC? This should realize both the right or freedom of scientists, but also others, "to do research" and the right of citizens to enjoy "access to the benefits of research." It should operate globally.[367] It should maximize the benefits of OA. Some say these include more citations.[368] They certainly include facilitating validation and

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363 Reichman & Okediji, *supra* note 28, at 1413.

364 Thus the gist of the argument: Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (Dec. 13, 1968).

365 *See, e.g.*, Rainer Kuhlen, *Knowledge and Information: Private Property or Common Good? A Global Perspective*, *in* ETHICS AND LAW OF INTELLECTUAL PROPERTY: CURRENT PROBLEMS IN POLITICS, SCIENCE AND TECHNOLOGY 213, 215 (Christian Lenk, Nils Hoppe & Roberto Andorno eds., 2007) (digital intellectual works "are not consumed in use, but rather gain value"); Lea Shaver, *The Right to Science and Culture*, 2010 WIS. L. REV. 121, 156 (2010) ("Knowledge is a unique resource in that it actually increases … as it is shared").

366 James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 L. & CONTEMP. PROBS. 33, 62 (2003).

367 *See* Reichman & Okediji, *supra* note 28, at 1371 ("digital scientific research is necessarily global in its sweep"); Salager-Meyer, *supra* note 117, at 185–86 ("enhances the flow of knowledge between the global North and South and between South and South").

368 *See* Ball, *supra* note 74, at 183 (based on available research, concluding that "there is a clear indication that there is some citation advantage in OA," but that "it is not clear whether OA is a factor of causation or a positive correlation"); Salager-Meyer, *supra* note 117, at 185 (referring to various sources, concluding that OA "may increase … citations"); Tennant, *supra* note 17, at 6, 8 (following an analysis of many sources, concluding that "OA is broadly related to increased academic impact in terms of citations"). It should be noted, however, that more citations do not necessarily equal a

enhancing impact.[369] They encompass easy sharing of research data, reducing duplicative research, and limiting blind alley research,[370] fast communication, the ability to perform TDM and reuse material, and the public's insight into scientific outcomes,[371] "the progressive generation of further research,"[372] promoting technological innovation and economic growth, meeting the needs of a knowledge-based society, and advancing vital interests of the *Kulturstaat*.[373]

As to the essential OA parameters, according to the Declaration agreed on by the Budapest Open Access Initiative in 2001, the adoption of which must really be seen as the starting point of the OA debate in science, OA means free digital availability on the internet and consumption and use by any person for any purpose "without financial, legal, or technical barriers."[374] The Declaration points out that free access does not mean "costless to produce," to then add that costs would be lower though and that "new cost recovery models and financing mechanisms" would be required.[375] The only requirement set by the Declaration is that authors' moral rights must be respected.[376] The Budapest Declaration forgot to mention that OA availability needs to be immediate. This has been rectified in the Bethesda Declaration of 2003.[377] Peter Suber defines OA similarly, making visible the nuance, however, that OA means access "free of *most* copyright and licensing

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higher impact of the actual knowledge concerned: Cope & Kalantzis, *supra* note 108, at 46. Furthermore, a study of ecology papers showed that only 76% of citations clearly supported the claim which they were intended to reinforce: Peter A. Todd & Richard J. Ladle, *Hidden Dangers of a "Citation Culture,"* 8 ETHICS SCI. & ENVTL. POL. 13, 14 (2008).

369 Reichman & Okediji, *supra* note 28, at 1374 ("verification"); Schmidt-Aßmann, *supra* note 259, at 117 ("validation"); Sitek & Bertelmann, *supra* note 303, at 151 ("faster … discussion"); UNESCO Recommendation (2021), *supra* note 25, Preamble, Recital 6 ("quality, reproducibility and impact").

370 *See* Kimbrough & Gasaway, *supra* note 106, at 270 (mentioning these aspects).

371 *See* Sitek & Bertelmann, *supra* note 303, at 151 (mentioning these aspects).

372 Reichman & Okediji, *supra* note 28, at 1374.

373 *See* Schmidt-Aßmann, *supra* note 259, at 117 ("knowledge-based society," "*Kulturstaat*"); UNESCO Recommendation (2021), *supra* note 25, Preamble, Recital 17 ("economic benefits").

374 Budapest Open Access Initiative, Budapest Declaration, Budapest, Hungary (Feb. 14, 2002), https://www.budapestopenaccessinitiative.org/read, 3d section.

375 *Id.* 4th section

376 *Id.* 3d section.

377 The principles of the Budapest Declaration have been reiterated in subsequent civil society statements. *See*, *e.g.*, Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, adopted by German research organizations and certain other signatories, Berlin, Germany (Oct. 22, 2003), https://openaccess.mpg.de/67605/berlin_declaration_engl.pdf; Bethesda Statement on Open Access Publishing, adopted by representatives of the wider biomedical research community, Bethesda, MD, U.S. (June 20, 2003), https://www.ouvrirlascience.fr/bethesda-statement-on-open-access-publishing; recently, in 2019, São Paulo Statement on Open Access, *supra* note 307.

restrictions."[378] Also he points out that OA literature is "free of charge for readers and users, but not for producers."[379] If OA is to be considered a human right,[380] then it should be underlined, as has been done in this article, that a "true" SCK must include free publishing for researchers and overall a reorientation toward affordable scholarly publishing to safeguard research resources and protect funders and institutions. Otherwise, the SKC would essentially be a libertarian project. Similarly, the fewer the restrictions, the higher the compliance with the "right to research."[381]

Another crucial point to mention is that the SKC must exist in consonance with criteria of "scientific adequacy," as described in this article. Hence, published research should be the result of slow science. Articles and books may be subjected to post-publication and peer-to-peer review, but should not undergo traditional peer review. The SKC should exist in an environment in which science evaluation focuses on quality, but also plays a much reduced role. The SKC itself should largely refrain from displaying article metrics/altmetrics. Various human rights-related concerns need to be attended to in establishing the SKC. Internet access must be established as a universal right.[382] Information should not be censored or filtered.[383] Access for the visually impaired must be ensured.[384] Language barriers must be removed. Publication should be possible in various languages, automated translation services be offered.[385] Tolerance of "accented" English should be displayed.[386] There should be a move toward mega journals and huge subject archives, facilitating overall "coherence" in science.[387] Platforms could use

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[378] Peter Suber, *Creating an Intellectual Commons through Open Access*, *in* UNDERSTANDING KNOWLEDGE AS A COMMONS 171, 171 (Charlotte Hess & Elinor Ostrom eds., 2007).

[379] *Id.* at 172. In principle, OA publishing is cheaper than subscription publishing as costs for TPMs and subscription agreements and management fall away: *id.* at 182.

[380] *See* Skre & Eide, *supra* note 63, at 430 ("Approaching Open Access as a Human Right").

[381] Open content licenses not permitting commercial use would not comply with the commons ideology: Guibault, *supra* note 74, at 165; neither would those not permitting the creation of derivate works.

[382] *See* Łukasz Szoszkiewicz, *Internet Access as a New Human Right? State of the Art on the Threshold of 2020*, 8 ADAM MICKIEWICZ U.L. REV. 49, 59 (2018) ("current developments allow us to claim that we may be indeed witnessing a process of a new human right being recognized, or rather forged").

[383] Suber, *supra* note 377, at 183.

[384] *Id.*

[385] *Id.*; Cope & Kalantzis, *supra* note 108, at 53.

[386] *Id.*

[387] *See, e.g.*, Binfield, *supra* note 69, at 158 (stating that the typical features of a mega journal include that articles are judged only on scientific soundness (not impact), the journals have a very broad subject scope, they are "open access," and have a large editorial board of academic (not professional) editors); Margot Wehrmeijer, Exposing the Predators: Methods to Stop Predatory Journals 71 (Master thesis, Leiden University, 2014), https://studenttheses.universiteitleiden.nl/handle/1887/28943 (explaining that, over time, there should be one or a few platforms encompassing all fields, which include journal articles, books, software, and datasets and are owned by one or more consortia of universities and other research institutions).

open source software providing a guided path to authors from submission to publication.[388] Datasets should accompany books and articles. Journal quality is overseen by editorial boards of established experts.[389] Lay summaries to publications should be provided.[390] Scientists "need to diversify the way [they] write," addressing also lay audiences.[391] While the SKC would include both articles and books as still recognizable genres, blogs, online discussions, abstracts, articles in the lay press, or social media texts, could share ideas, preliminary results, and negative results at earlier stages.[392] Finally, OA publishing or archiving should not be "enforced" or "incentivized." To respect scientific/academic freedom, mere good argument (and the availability of technical support) should encourage scientists to follow that practice.[393]

If the aim is to avert the looming neoliberally-induced "breakdown of scientific thought,"[394] and to realize "another science" and create a "true" SKC, what would be the implications for the role of the commercial (and other) publishers and copyright? It is clear that the proprietization of science has made the business model of the scholarly publishing industry possible in the first place. This – built on the edifice of copyright monopoly – obstructs the dissemination of, access to, and use of scientific literature. Especially scientists and research institutions in the global South are detrimentally affected. "Another science" would thus require some form of control of the commercial scholarly publishers, limiting their market power and profit margins. This could occur in three conceivable ways.

First, one could seek to *mitigate (regulate)* the *copyright claims of scholarly publishers*. A statutorily regulated collective approach to bargaining in relation to reimbursement accompanied by automatic open content licenses benefiting users would be a possibility. Publishers, research institutions, and funders would be mandatory members of a collecting society, agreeing on what should be paid to publishers. Copyright here could remain with authors. The collecting society would be responsible for

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388 *See, e.g.*, James MacGregor, Kevin Stranack & John Willinsky, *The Public Knowledge Project: Open Source Tools for Open Access to Scholarly Communication*, *in* OPENING SCIENCE: THE EVOLVING GUIDE ON HOW THE INTERNET IS CHANGING RESEARCH, COLLABORATION AND SCHOLARLY PUBLISHING, *supra* note 40, at 165, 165 ("open source software (free) publishing platforms as an alternative path").

389 *See, e.g.*, EGER & SCHEUFEN, *supra* note 80, at 110 (arguing that leading scholars in a discipline should serve as members of the editorial board).

390 Day, *supra* note 63, at 6.

391 Andrew Walker, *Shift Away from "Publish or Perish" Puts the Public Back into Publication*, THE CONVERSATION (Dec. 4, 2015), https://theconversation.com/shift-away-from-publish-or-perish-puts-the-public-back-into-publication-51580.

392 Broadly in this sense, *see* Bartling & Friesike, *supra* note 40, 8–9.

393 *Cf.* Suber, *supra* note 377, at 192 (universities should "requir[e] OA to all the research articles that faculty would like the P&T committee to consider").

394 Thus broadly the message of the edited volume: TRANSFORMATIONS IN RESEARCH, HIGHER EDUCATION AND THE ACADEMIC MARKET: THE BREAKDOWN OF SCIENTIFIC THOUGHT, *supra* note 200.

"scientific works." A mechanism would have to be identified for categorizing works as "scientific." The collecting society would collect payments and reimburse publishers. Such an interesting model has been proposed by John Willinksy (I termed this model "3 minus" earlier), who argues that it complies with the three-step test.[395] This first approach seeks to keep the monetary claims of publishers within bounds, simultaneously securing automatic OA to scientific works. Yet, it largely accepts the traditional role of the commercial scholarly publishers, who would, de facto, retain their monopoly claims grounded in copyright, based inter alia on the assertion that quality control (peer review) continues to be carried out under their auspices. A substantial financial burden would still rest on institutions and funders. The reimbursements claimed by a publisher would notably depend on the quantity it publishes. Commercial considerations will thus continue to play an important role in decisions whether and how to publish. Moreover, would this model as installed at the national level benefit users globally or would that only follow if the collecting society operates at the international level for various or all countries? Or would the benefits of national schemes accrue to users as between states on a reciprocity basis? It may be noted in this regard that the feasibility of the collecting society model has generally be questioned for developing countries, as the societies concerned collect mainly for foreign right-holders and because of the costs entailed.[396]

Second, one could seek to *reorder* the *copyright claims* of the *various stakeholders* in the science sector. Authors, research institutions, and scientific communities regain "ownership" (managerial, editorial, quality control, production, circulation, etc.) over their articles, journals, books, and book series. Copyright is not assigned to publishers. This remains with authors. Authors would be enabled, and agree, to publish open access, to make their research freely available online for everyone globally without undue restrictions.[397] Publication could occur with or without the support of commercial or other publishers. As these would "merely" be rendering contracted services, they could not require reimbursement based on copyright or a de facto copyright monopoly. Reliance on open source software, in-house capacities of research institutions, and the services of not-for-profit university publishers may perform many of the services traditionally performed by commercial publishers. This approach envisages a new, reduced role for the scholarly publishers. Commercial publishing, in its current form, would lose much its attractiveness.[398] As there exists no

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[395] Willinsky, *supra* note 93, esp. Ch. 6. Another way to mitigate copyright claims of scholarly publishers would be to introduce the doctrine of "first sale" for digital (scholarly) works to eliminate the problem of perpetual control and charges: Suber, *supra* note 377, at 178. This would require the amendment of international copyright law.

[396] COMM'N ON INTELL. PROP. RTS., 2002 Report, *supra* note 59, at 98–99.

[397] On open content licensing options, see *supra* note 75 & note 380.

[398] *See, e.g.*, Reichman & Okediji, *supra* note 28, at 1472 ("absorbing the publishing function, when feasible, into integrated, open-knowledge environments"); Wehrmeijer, *supra* note 386, at 71 ("disseminating research completely independent of publishers

institutional guarantee of the commercial publishing industry, its disappearance would not be "unconstitutional."[399]

The approach, as outlined, cannot really be imposed by way of state legislation. It largely depends on the self-organizing capacities of institutionalized science. The approach can, however, only be realized if science is adequately funded by the state. Research institutions and scientific communities would clearly need additional infrastructural, human, and technical resources. In this sense, this approach does require a new legislative framework, namely one that renounces the neoliberal approach to science based on the state's underfunding and the commercialization of science. A new science environment, in turn, would free required time resources lost in the current system.

The second approach is still founded on the category of copyright. It operates on the premise that copyright's default positions will be contractually modified to achieve the desired ends (allowing free use to all and generally waiving economic copyright). From a doctrinal point of view, this is rather awkward. Furthermore, while authors have traditionally not claimed payment for articles from publishers, they do so – and may be adamant to be allowed to continue doing so – for monographs. However, there is no problem of underproduction for monographs either. On the contrary, the economic incentive leads to an overproduction of truth detrimental to science also in this respect. Copyright, even if now with the author, thus remains a problem.

Third, one could *remove* the *copyright claims* of the *various stakeholders* in the science sector. This third approach replicates the previous, just without the availability of copyright protection for scientific works. There are a number of good reasons why dispensing with copyright protection in the sphere of science makes sense. Article 9(2) of TRIPS and Article 2 of the WCT restate the accepted maxim that copyright protection extends "to expressions and not to ideas."[400] It should be appreciated that scientific works, more often than not, capture mere ideas. Where writing must narrowly focus on raw data, reflect a certain scientific methodology, use as lucid a language as possible, and comply with technical conventions, the scope for original expression is limited.[401] It is probably correct to say that creativity in

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might become possible").

399 Peukert & Sonnenberg, *supra* note 105, at 226.

400 TRIPS, *supra* note 10, Art. 9(2); WCT, *supra* note 42, Art. 2.

401 In this sense, *see* Krzysztof Gienas, *Scientific Works: Another Dimension of Copyright Protection*, 3 J. INTELL. PROP. L. & PRAC. 801, 801 (2008). *See also* Christophe Geiger, *Copyright as an Access Right: Securing Cultural Participation through the Protection of Creators' Interests*, *in* WHAT IF WE COULD REIMAGINE COPYRIGHT? 73, 101 (Rebecca Giblin & Kimberlee Weatherall eds., 2017) (arguing that, ideally, "[o]nly expressions that are the result of a creational process in which the freedom of the creator has been superior to imposed necessities … may enjoy copyright protection").

science exists at a different, the pre-fixation level.[402] At any rate, however, awarding blanket protection to scientific works is not even in accordance with current copyright law.

More generally, there is no problem of underproduction of articles and books in science. Scientists do research by reason of their curiosity (intrinsic motivation) and their incentive to publish is primarily in order to gain a reputation (extrinsic motivation), as the impact of their work depends on their standing in the scientific community.[403] Copyright as an economic incentive is not needed in this regard. Naturally, scientists do depend on financial, employment, and science-adequate work environment security. However, this assumes the form of adequate salaries, permanent contracts or tenure, and wide scientific/academic freedom, guaranteeing more security than a copyright approach, and, for that reason, better suited to serve the best interest of science. One might, of course, argue that the economic incentive of copyright is needed for the scholarly publishing industry to flourish. However, the argument in this article has been that commercial scholarly publishers add little value to the research process. While economic copyright can therefore be dispensed with, it needs to be acknowledged that rights currently protected as moral rights (rights of attribution, integrity, and so on) remain important. Also some of the economic rights, "stripped of" their remunerative element, are important. Hence, the right to publish is a crucial right of scientists. However, in constructing the "right to research" above, it has been shown that what are now moral rights and rights such as the (non-economic) right to publish are part of the "right to research" in any event. It may be necessary to strengthen some of these. While in a world without scientific copyright the "owner" could not, for instance, prevent a user from adapting (e.g., translating) their work, a robust right of integrity could offer protection against any adaption clearly lacking in quality. Scientists could also always make a public declaration to the effect that they disapprove of the way in which a certain work of theirs has been used.

The third approach is not tantamount to saying that authors' rights, as human rights, insofar as scientific works are concerned, should not be

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[402] *See* Gienas, *supra* note 400, at 801 ("one may express some doubt as to whether scientific activity is really also creative activity in the copyright sense"). *Cf.* Peukert & Sonnenberg, *supra* note 105, at 201 (arguing that, in the sphere of science, the transition between form and content "is, in certain cases, fluid").

[403] *See* Budapest Declaration, *supra* note 373, 1st section ("scholars … publish … without payment, for the sake of inquiry and knowledge"); Bellia & Moscon, *supra* note 57, at 4 ("scholarly literature is in no way affected by underproduction problems"); EGER & SCHEUFEN, *supra* note 80, at 10–11 (explaining the reward structure in science along similar lines); Moscon, *supra* note 16, at 101 ("The incentive … is mostly reputational"); Reichman & Okediji, *supra* note 28, at 1427–28 (authors' "primary interests in publication are the rewards of attribution and integrity"); Shavell *supra* note 94, at 305 ("academics are motivated to write to gain scholarly respect"); Skre & Eide, *supra* note 63, at 439 ("The incentives … would seem to be to achieve impact of the research results, in the form of attention, influence and citations").

protected. Consequently, it does not conflict with Article 15(1)(c) of the ICESCR, obliging states parties to protect the right of authors "[t]o benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which [they are] the author."[404] Scientific productions, as the CESCR points out, include "scientific publications."[405] Yet, protecting these moral and material interests need not occur in the form of awarding copyright. Effective protection against plagiarism and misrepresentation, adequate salaries, and so on, may achieve the same goal.[406] However, the approach, it needs to be conceded, would require an amendment of the Berne Convention. This requires copyright protection to be available for "literary and artistic works," these including "every production in the literary, *scientific* and artistic domain."[407]

One must agree with Morrison when she states that "[t]he pursuit of scholarship is inherently incompatible with the goal of profit."[408] The practices of the commercial scholarly publishers conflict with slow and quality science, editorial independence, and the unimpeded dissemination of, access to, and use of scholarly publications. Copyright's main function in science at the moment is to make these corrupting practices possible, purely in the interest of profit. All this contradicts the concept of "adequacy for science," which has been central to the discussion in this article. It is submitted that the third approach – that of dispensing with copyright in the sphere of science – complies with the normative demands of the "right to research" under the REBSPA best. It guarantees most facilely and effectively that scientific knowledge can be disseminated, accessed, and used without obstruction, domestically and internationally. It ensures most securely that the commercial scholarly publishers cannot exploit copyright to cause harm to the fabric of science. It eliminates unnecessary transaction costs. Conceptually speaking, it is the soundest. It best facilitates the creation of a "true" scholarly knowledge commons. All the rules of copyright that would retain their relevance in a future world of science form part of the unwritten laws of science and are effectively protected by the "right to science" under the REBSPA.

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404 ICESCR, *supra* note 15, Art. 15(1)(c).

405 General Comment No. 17, *supra* note 161, ¶ 9.

406 Thus the overall tone of the CESCR's General Comment No. 17.

407 Berne Convention, *supra* note 29, Art. 2(1). For an account of the difficult history of scientific works under Berne, *see* SARA BANNERMAN, INTERNATIONAL COPYRIGHT AND ACCESS TO KNOWLEDGE 34-46 (2016). It is problematic in this context that the wording of UNESCO's relevant Recommendations is couched in strict IP terms: UNESCO Recommendation (1997), *supra* note 155, ¶ 12 ("The intellectual property of higher-education teaching personnel should benefit from appropriate legal protection."); UNESCO Recommendation (2017), *supra* note 20, ¶¶ 16(b)(iii), 37 ("fully respect the intellectual property rights of individual researchers"; ensure that the scientific results of researchers enjoy "the protection afforded by patent and copyright law").

408 MORRISON, *supra* note 74, at 51.

CONCLUSION

A global scholarly knowledge commons of sorts does exist: Sci-Hub.[409] It is, however, illegal. It was developed in 2011 by Aleksandra Elbakyan, a Kazakhstan national, who, as a student, due to paywalls, did not have access to research papers needed for her research project. She therefore started pirating them. She created the website to help others in the same situation.[410] According to Sci-Hub, there are now almost 88.000.000 million "papers" on the platform.[411] Sci-Hub is widely used by scientists around the world.[412] In the same way that the poor, who have been left destitute by unbridled capitalism, exploitative communism, or inhuman colonialism, may steal food to satisfy their hunger, scientists and citizens, exposed to an enforced famine of scholarly knowledge, may seek to regain control of that knowledge, which has been created by publicly funded researchers pursuing scientific truth for the benefit of humanity as a whole.

This article has sought to construct a (derivative) "right to research" under the REBSPA in Article 15(1)(b) of the ICESCR (and associated rights) that comprises both a domestic and an extraterritorial dimension. It has sought to interpret Article 15(1)(b) purposively, thus following a more human rights-oriented approach, which places the emphasis on the concept of "adequacy for science." In this way, it was sought to ensure that the "right to research" would be consonant with quality science, autonomy for scientists, a positive organizational culture, low hierarchies, reduced emphasis on evaluation, and trust. Accordingly, much more emphasis has been placed on the scientific/academic freedom of researchers than is customarily the case in existing official interpretations of the REBSPA. The article finds that, indeed, a strong case can be made for such a "right to research." The implications thereof for copyright and digital science are twofold: remaining within a traditional copyright paradigm, various reforms of copyright law are necessary in the interim to facilitate scientists' right "to do research" and that of citizens to enjoy "access to the benefits of research." In the long run, however, it will be necessary to move toward "another science," a genuinely open science, entailing notably the creation of a "true" scholarly knowledge commons. To a greater or lesser extent, such a science will have to move beyond the (traditional) "copyright" paradigm to adequately realize unimpeded dissemination of, access to, and use of scholarly publications. This transition is needed because, in the digital era, copyright has mainly come to have the effect of siphoning off public resources for research to a

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[409] *See* Daniel S. Himmelstein et al., *Sci-Hub Provides Access to Nearly All Scholarly Literature*, ELIFE 7:e32822, DOI: 10.7554/eLife.32822 1, 1 (2018) ("For the first time, nearly all scholarly literature is available gratis to anyone with an Internet connection").

[410] Elsevier Inc. et al. v. Sci-Hub et al., 15 Civ. 4282(RWS) (S.D.N.Y. Oct. 28, 2015), Letter addressed to Judge Robert W. Sweet from Alexandra Elbakyan re: Clarification of details, entered Sept. 15, 2015, https://storage.courtlistener.com/recap/gov.uscourts.nysd.442951.50.0.pdf.

[411] *See* "About Sci-Hub," https://sci.hubg.org.

[412] Reporting on Sci-Hub, *see* Bohannon, *supra* note 7; Karaganis, *supra* note 62, at 1–3.

scholarly publishing industry that adds little value to the research process. "Less innovation, not more, is the predictable result over time."[413] But not only that, the (copyright-based) practices of the commercial scholarly publishers corrupt science also in a more general sense. It was explained that academic science increasingly assumes the nature of industrial science, contrary to the normative demands of the REBSPA and the "right to research." The immense economic power of the scholarly publishing industry and its effective control over institutionalized science must be held to be founded on proprietary claims which have their basis in the monopoly conferred by copyright. This design of that industry is directly linked to the shift toward industrial science.

At the outset, this writer had reported that he had been unable to digitally retrieve Reto Hilty's article on "Copyright Law and the Scientist" in doing the research for this article. This begs the question, is the privatization of scholarly knowledge the right answer to preserving, and facilitating the generation of further, scholarly knowledge? Does it work better than the commons idea? Another article I have not been able to find through affordable available channels despite a major search effort was Garrett Hardin's "The Tragedy of the Commons." The irony of this, I believe, answers the question.

[413] Reichman & Okediji, *supra* note 28, at 1426.