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Open Access 'Unaccomplished' – Reforming Copyright or Reconceptualizing Science? Access to Scholarly Publications under a (Reinterpreted) Right to Science

Klaus D. Beiter *

ABSTRACT

This article identifies the impediments to science created by copyright and suggests ways to overcome these. It focuses on scholarly publishing—primarily of digital content—and queries whether 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 light of the right of everyone 'to enjoy the benefits of scientific progress and its applications' ('REBSPA' or 'right to science'), as protected in Article 15(1)(b) of the International Covenant on Economic, Social and Cultural Rights of 1966. I find that, while, in the shorter term, existing copyright law needs to undergo certain reforms (which would all be supported by the REBSPA) to accommodate the needs of science, in the longer term, the right to science requires something else—much more, in fact. Firstly, there needs to be a move towards another science, a science reconceptualized so as not to be primarily driven by instrumental and profit motives. Secondly, following from that, science would need to be genuinely open. Among other things, this requires the creation of a true scholarly knowledge commons, necessitating far-reaching changes in the way copyright applies, or potentially its abolition, in science. Thirdly, the envisaged scholarly knowledge commons would have to be globally inclusive in scope—which is to be achieved by recognizing and respecting the mostly ignored international dimension of the right to science. This article questions the traditional role of the commercial scholarly publishers and argues for a paradigm shift in the sphere of copyright and science. Identifying flaws and gaps in the current official interpretations of the REBSPA, the right to science is reinterpreted in various respects here. In making my case, I rely on the notion of a 'right to research' under the REBSPA and am aided by the deconstructive concept of 'adequacy for science'.

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1. Introduction

Copyright increasingly impedes the dissemination of, access to, and use or reuse of scholarly knowledge, negatively impacting the validation of research findings, further research and innovation, and ordinary citizens' access to scientific knowledge. This obstruction is directly linked to the increase in power of commercial scholarly publishers over the last 40 years or so,[1] greatly facilitated in the digital era by the transition from resource-intensive physical to much cheaper desktop publishing, where, 'surprisingly, journal prices never really sink'.[2] In the digital age, through practices of licensing rather than selling content and via digital locks and fences, copyright is concomitant with a comprehensive power to exclude. In the field of scholarly publishing the exclusion is particularly absolute because scientific publications licensed to research libraries, in competition law terms, are not substitutable: it is not sufficient for a library to offer similar content of another licensor. This strengthens monopolistic tendencies in the market.[3] Copyright has thus become the instrument that allows commercial scholarly publishers to perpetually expand their economic power to the detriment of access to scientific knowledge.

Dissatisfaction with this subscription or paywall model of access to scholarly publications is unsurprising. It is understandable why the United Nations Educational, Scientific and Cultural Organization (UNESCO) adopted a Recommendation on Open Science in 2021.[4] Yet while the Recommendation idealizes, inter alia, open access to scholarly publications, it does not really address copyright issues and largely accepts the status quo of a world of science in which commercial publishers play a dominant role. As will be explained, in such a setting open-access publishing will continue to come at an enormous price for individual researchers, their universities, funders, and the public purse. In open-access publishing, copyright remains with the author and the principle that 'the author pays' (rather than the library) prevails. This currently often requires copyright to be redeemed at exorbitant prices charged by commercial publishers in the form of so-called article processing charges (APCs).[5] While this in itself is problematic, it systemically disadvantages the (poorer) Global South, where most research will accordingly not be accessible at all or remain behind paywalls.[6] In open-access publishing as it exists today, commercial publishers therefore retain a de facto copyright monopoly.

This article assesses the deficits of copyright law in science – specifically in the sphere of digital scholarly publishing – and potential solutions thereto, in 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

[1] Already in 2006, 62% of academic journals were either commercially owned or commercially published society journals: Heather Morrison, *Scholarly Communication for Librarians* (Chandos Publishing 2009) 37.

[2] 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' (2005) 53 J Copyright Soc'y U.S.A. 103, 120-21.

[3] See Peter Weingart, 'On the Situation and Development of Academic Libraries' in Peter Weingart and Niels Taubert (eds), *The Future of Scholarly Publishing: Open Access and the Economics of Digitisation* (African Minds 2017) 95, 97, 100. Five publishers – Elsevier, Springer, Wiley, Taylor & Francis, and SAGE – jointly, published more than 50% of all papers in 2013: Vincent Larivière, Stefanie Haustein and Philippe Mongeon, 'The Oligopoly of Academic Publishers in the Digital Era' (2015) 10(6) PLoS One e0127502 1, 3-4.

[4] UNESCO General Conference, Recommendation on Open Science, Doc. 41 C/Res 22 (23 Nov. 2021).

[5] See David J Solomon and Bo-Christer Björk, 'A Study of Open Access Journals Using Article Processing Charges' (2012) 63 J Am Soc'y Info Sci & Tech 1485, 1485 ('average APC … $906 U.S. dollars').

[6] Hence, UNESCO recognizes that high APCs 'may be causes of inequality for the scientific communities around the world': UNESCO Recom. (2021) para 20.

and Cultural Rights (ICESCR) of 1966.[7] While the impediments which copyright law entails for science, and potential reforms to remove them, have been addressed in the past, scholars have seldom done so from the perspective of the REBSPA, the right to science.[8] Reform proposals have largely remained within the existing copyright paradigm for science, namely the model based on the positioning of a (more and more often commercial) copyright-holding intermediary between scientist and audience.

The essential question this article poses is whether a right to science does not require more than incremental reforms within that paradigm, and indeed—in the longer term—a new paradigm anchored within a science that is less commercial and more open and inclusive, and which therefore accords a reduced role to commercial scholarly publishers and the copyright they hold. Remaining within the existing paradigm could be held to reflect a desire by some to preserve the traditional interests of publishers, who, however, in the digital era, seem to add ever diminishing value to science at the expense of unlimited science for citizens' benefit. That is what science as a human right is all about: scientists' unfettered freedom to conduct research (which requires access to scholarly publications), in order to produce scientific progress, linked to citizens' right to freely access and enjoy the various benefits of scientific progress (inter alia, scholarly publications). Limitations of human rights, as is well-known, must promote a higher-order goal and not be more excessive than is necessary to achieve that goal. In the digital era, does safeguarding the customary interests of the scholarly publishing industry, and its copyright claims, still satisfy that higher-order goal and, if so, does it do so in a proportionate manner?

If this article does find that a paradigm shift is required as part of a necessary move towards another, reconceptualized science—less commercial and more open and inclusive—related questions are: What would the implications be for the design of copyright? How must, or could, copyright be redesigned to accomplish that paradigm shift? Can the shift be achieved within the parameters of existing international copyright law, or would the latter need to be changed to accommodate such a shift?

The article is structured as follows. Section 2 provides an overview of the deficiencies of copyright law in science. It explains the importance of functioning scholarly communication processes for science, and why copyright, although in principle only creating a relative monopoly, has an absolute excluding effect in science. Section 3 asks whether the scholarly publishing industry continues to add value to the research process in the digital era. Copyright in digital science today, while reinforcing pressures from governments and institutions to publish, simultaneously amounts to the economic perfection of performative governmental/institutional research evaluation systems. Section 4 then introduces the right to science, commenting on the REBSPA in Article 15(1)(b) of the ICESCR and its relevance for science communication. Section 5 provides an inventory of what appear plausible solutions to the 'copyright and science' dilemma, several of which have been endorsed in the existing literature. While these solutions are, no doubt,

[7]International Covenant on Economic, Social and Cultural Rights, 16 Dec. 1966, 993 U.N.T.S. 3 (entered into force 3 Jan. 1976), Art. 15(1)(b) [hereinafter ICESCR]. The REBSPA is also often termed the 'right to science'. The travaux préparatoires of the ICESCR suggest viewing the social sciences and the humanities as science as well: Sebastian Porsdam Mann, 'The Right to Science or to *Wissenschaft*? Five Lessons from the *travaux préparatoires*' (2024) 42 Neth Q Hum Rts 153, 168-69. See also Asbjørn Eide, 'Cultural Rights as Individual Human Rights' in Asbjørn Eide, Catarina Krause and Allan Rosas (eds), *Economic, Social and Cultural Rights: A Textbook* (Martinus Nijhoff, 2nd rev. ed., 2001) 289, 295 (without discussing this further, holding that science includes the social sciences and the humanities).

[8]For articles that do argue from the right to science, see nn 10 and 11, and accompanying text, below.

supported by the right to science, they remain, in many ways, within the existing copyright paradigm for science. The essential submission here is that the right to science, if taken seriously, likely would require more than such reforms, as many of these merely scratch the surface of current scientific copyright practices detrimental to scientific progress.

In what follows then, the article thus does three things. Firstly, it suggests that the political economy of the current, increasingly commercialized, science system—of which economic copyright (or intellectual property in general) is a constituent element—must be fundamentally questioned because this system obstructs scientific progress. The existing official interpretations of the REBSPA, such as relevant UNESCO recommendations or general comments of the Committee on Economic, Social and Cultural Rights (CESCR), are of only limited use in this endeavour. While they yield some useful clues, they have flaws and gaps. They do not, I argue, sufficiently address the reality of an increasingly bureaucratized and instrumentalized, or worse, commercialized science. It is this environment which creates a lucrative market for scholarly publications, which is then buttressed by copyright restricting access to scholarly knowledge and impeding progress in science. The REBSPA should accordingly be reinterpreted in accordance with what could be called a more human rights-oriented approach, its guiding concept being 'adequacy for science', a concept borrowed from German law but developed further. Section 6 critiques the commercialization of the current science system and explains the concept of 'science adequacy'. Section 7 attempts a reinterpretation by identifying some of the normative claims encompassed by a 'right to research' under the REBSPA, namely those of relevance to the copyright and science, or scholarly publication, context. This identification process is aided by recourse to the concept of 'science adequacy', with its emphasis on free, disinterested, and open science.

Secondly, cognisant of such a derivative 'right to research' under the REBSPA, and its various normative claims, I ask whether science should not be more genuinely open. It might be necessary to construct a true scholarly knowledge commons. What would the features of such a commons have to be, in light of the right to research (based on considerations of science adequacy)? Moreover, how could it be realized from the perspective of copyright? Would these copyright solutions comply with the three-step test of international copyright law, or would it be necessary to amend international copyright law? Section 8 addresses these questions. Thirdly and finally, a true scholarly knowledge commons would clearly have to be globally inclusive in scope—that is, operate beyond national borders. I investigate how this could be achieved. Section 9 enquires whether the REBSPA, or the right to research under it, has an international dimension that would mandate the recognition of transboundary rights of disseminating, accessing, and using or reusing scholarly knowledge. Here again, the implications thereof for copyright are considered.

Of the previous legal studies dealing with the question of how the tension between copyright and the needs of science could be resolved more doctrinally, three are particularly salient: the seminal 2012 analysis of Reichman and Okediji,[9] that of Skre and Eide from 2013,[10] and that of Geiger and Jütte from 2023.[11] This article differs from each in

[9]Jerome H Reichman and Ruth L Okediji, 'When Copyright Law and Science Collide: Empowering Digitally Integrated Research Methods on a Global Scale' (2012) 96 Minn L Rev 1362.

[10]Alf Butenschøn Skre and Asbjørn Eide, 'The Human Right to Benefit from Advances in Science and Promotion of Openly Accessible Publications' (2013) 31 Nordic J Hum Rts 427.

[11]Christophe Geiger and Bernd J Jütte, 'Conceptualizing a "Right to Research" and Its Implications for Copyright Law: An International and European Perspective' (2023) 38 Am U Int'l L Rev 1.

important respects.[12] Reichman and Okediji do not use human rights as the basis for their argument. Their analysis is remarkable even so in that—as an exception to the general trend referred to above—they argue for reforms that transcend the existing copyright paradigm for science, as defined here. They propose a form of 'self-help' by institutionalized science that seeks to bypass commercial publishers and neutralize the undesirable effects of copyright law. The analysis here considers this an option, but perhaps only the second best from a right to science perspective. Skre and Eide do argue on the basis of human rights, specifically the REBSPA, but do not fundamentally question the political economy of the current science system. They remain open as to whether reforms are to be achieved within the existing paradigm or whether that paradigm needs transcending. Geiger and Jütte endeavour to distil a 'right to research' at European Union (EU) level from a combined reading of existing EU fundamental rights; this right could, they argue, aid in reshaping copyright law for research in the EU. It is worth noting here that neither EU nor Council of Europe instruments recognize the REBSPA as such. In this article, I too rely on the concept of a right to research, here a right to research under the REBSPA in Article 15(1)(b) of the ICESCR, in whose construction, while relying on provisions of UNESCO recommendations, CESCR general comments, and other relevant documents, I am centrally guided by the concept of science adequacy.

2. The Deficiencies of Existing Copyright Law

The Berne Convention for the Protection of Literary and Artistic Works requires copyright protection to be granted to 'literary and artistic works', these including all productions 'in the literary, scientific and artistic domain'.[13] In its current 1971 version, the Convention does not expressly allow members to provide for limitations and exceptions (L&Es) to copyright protection benefiting research; it was considered that the Article 9(2) exception to the general reproduction right of Article 9(1) would sufficiently cater for research needs. Article 9(2) introduced the well-known three-step test for permissible reproductions.[14] Because all L&Es that countries may adopt are now subject to the three-step test under the Agreement on Trade-Related Aspects of Intellectual

[12]The doctrinal basis for the argument made here is laid in Klaus D Beiter, 'Reforming Copyright or Toward Another Science? – A More Human Rights-Oriented Approach under the REBSPA in Constructing a "Right to Research" for Scholarly Publishing' (2022) 48 Brook J Int'l L 88. The groundwork for this article's crucial reliance on scientific and academic freedom, a human rights as opposed to a neoliberal approach to universities, and the concept of 'science adequacy', in understanding the right to science, has been doctrinally laid in Klaus D Beiter, Terence Karran and Kwadwo Appiagyei-Atua, 'Yearning to Belong: Finding a "Home" for the Right to Academic Freedom in the U.N. Human Rights Covenants' (2016) 11 Intercultural Hum Rts L Rev 107; 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' (2019) 52 Isr L Rev 233; Klaus D Beiter, '"The Emperor Is Naked!" – Rebuilding Moral Universities in the Light of the Rights to Education and Science of International Law', Inaugural Lecture, North-West University, Potchefstroom, South Africa, 8 June 2023, available at https://www.youtube.com/watch?v=mSR8j2hl4Xg; Klaus D Beiter, 'Academic/Scientific Freedom? Or "New" Freedom (Neoliberalism)? – Rebuilding Moral Universities in the Light of the Rights to Education and Science of International Law' (2023) [2023](2) Zeitschrift für Menschenrechte/J Hum Rts 94; Klaus D Beiter, Terence Karran and Denis Roynard, 'The Commercial Attack on Universities: Academic Freedom – An Orphan under the European Human Rights Framework?' in Philip Czech and others (eds), *European Yearbook on Human Rights: 2023* (Intersentia 2023) 261.

[13]Berne Convention for the Protection of Literary and Artistic Works, 9 Sept. 1886, revised at Paris 24 July 1971, 1161 U.N.T.S. 3 (entered into force 15 Dec. 1972), and amended 28 Sept. 1979, Art. 2(1), (6) [hereinafter Berne or Berne Convention].

[14]ibid Art. 9(1), (2). On the 'three steps', see n 15.

Property Rights (TRIPS),[15] and due to trends of unjustifiably strict interpretations of the test,[16] the utilization of works for research purposes can hardly be claimed to enjoy the legal standing it should to further science.[17] In 1996, the World Intellectual Property Organization (WIPO) adopted the WIPO Copyright Treaty (WCT) specifically aimed at making copyright fit for the digital age. In its preamble, the WCT recognizes the need to protect the public interest in 'education, research and access to information'.[18] Yet the treaty does not add special clauses on L&Es in science; it repeats the three-step test of Berne and TRIPS.[19]

In the digital era, digital publishing gaining traction from the 1990s onwards, copyright problems in science have become more acute. Printed scholarly literature is physically sold to research institutions. Hence, many of the right holders' copyright entitlements are considered exhausted on first sale. A library thus becomes the owner of physical books or journals it acquires and can freely lend them to users. Moreover, in the world of physical books and journals, and the absence of access technology, full recourse to L&Es and their generous interpretation in practice are possible. During the period where this was the essential way libraries operated, the first sale doctrine substantially facilitated the use of works by scientists. Digital works, however, are commonly kept behind a paywall and then licensed (not sold) to libraries and other users. Their lending/communication and utilization are therefore subject to the perpetual contractual control of publishers.[20] Copyright law is usually read as not covering any L&Es permitting digital lending/communication by libraries.[21] In many countries, digital library uses are limited to the premises of the specific institution. This proved a serious obstacle during the COVID-19 pandemic, when researchers worked remotely.[22] Payment of licensing fees remains a continuous obligation. While library budgets remain stagnant, prices for digital scholarly products have increased at astronomical rates.[23]

It has also become customary in the digital environment—with many copyright systems countenancing (or turning a blind eye to) this—for publishers to summarily

[15]Agreement on Trade-Related Aspects of Intellectual Property Rights, 15 Apr. 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299 (entered into force 1 Jan. 1995), Art. 13 (requiring TRIPS countries to confine L&Es to '[1.] certain special cases [2.] which do not conflict with a normal exploitation of the work and [3.] do not unreasonably prejudice the legitimate interests of the right holder') [hereinafter TRIPS].

[16]See Christophe Geiger, Jonathan Griffiths, Reto M Hilty and others, 'Declaration on a Balanced Interpretation of the "Three-Step Test" in Copyright Law' (2008) 39 Int'l Rev Intell Prop & Competition L 707, 711 (Preamble).

[17]Superbly describing the state of affairs, and its effects in the digital age, see the thorough analysis by Reichman and Okediji (n 9) 1362.

[18]WIPO Copyright Treaty, 20 Dec. 1996, 2186 U.N.T.S. 121 (entered into force 6 Mar. 2002), Preamble, Recital 5 [hereinafter WCT].

[19]ibid Art. 10.

[20]On the first sale doctrine, its facilitation of access in public libraries, and the loss of its balancing effects where works are distributed online, see R Anthony Reese, 'The First Sale Doctrine in the Era of Digital Networks' (2003) 44 Bost Coll L Rev 577, 577-78. Digital works as such are usually considered to be 'communicated to the public' (WCT, Art. 8), rather than 'distributed', 'lent', or 'rented' (WCT, Arts. 6, 7). See, however, n 21 below.

[21]Under EU law, authors are granted a public lending right in respect of print and now also digital books. Libraries are often permitted by law to lend these books to the public, but authors must be reimbursed. Jim Parker, The Public Lending Right and What It Does, WIPO MAGAZINE (June 2018), https://www.wipo.int/wipo_magazine/en/2018/03/article_0007.html.

[22]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) (22 Mar. 2021), https://infojustice.org/archives/43020 (drawing attention to this problem).

[23]See Weingart (n 3) 96 ('an aggressive policy regarding prices'). It may also be mentioned that secrecy clauses in the licensing agreements concluded with the big publishers often forbid details of subscription deals being disclosed to the public. Beyond the prevalent excessive pricing, this facilitates another anticompetitive practice, price discrimination.

render L&Es that were available in the analogue era wholly or partially inapplicable by contract, and also factually through technological protection measures (TPMs), thus prejudicing research. Digital rights management tools now often entail electronic contracts strictly regulating access to digital content, which are combined with TPMs that make it practically impossible to access and use or reuse content in accordance with legitimate access needs.[24] International copyright law forbids the circumvention of TPMs; yet countries must—but in practice often fail to—exempt circumvention undertaken to enable the exercise of L&Es granted for purposes such as teaching or research from this prohibition.[25] Furthermore, science has changed with the advent of new research technologies: it is now possible to rely on facilities that permit browsing, analysing, 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, and it is not clear whether current copyright L&Es would permit this in respect of the accessible collections of a research institution.[26]

Although the focus here is on scholarly publications, it should also be mentioned that sui generis database protection, as, for example, provided for under the EU's Directive on the Legal Protection of Databases of 1996,[27] constitutes a major stumbling block to research. Exclusive rights are here granted to those producing—'substantially investing' in—collections of data, even if they are wholly unoriginal.[28] Especially if there are no adequate L&Es for research purposes, notably for TDM, sui generis database protection stifles meaningful research.[29] Granting database protection would be quite catastrophic for science if it were accorded to collections of actual research data.[30]

Copyright today also obstructs dissemination and use or reuse by authors of their own works. In exchange for publication, authors frequently hand over their copyright to publishers. While digital locks and fences will restrain access and use or reuse by others, authors themselves also lose many of their rights—rights to republish their work, distribute it, or produce derivative versions. All these are acts that would enhance a work's dissemination.[31]

All the above problems are magnified in developmental contexts. As already pointed out by the famous 2002 Report of the UK Commission on Intellectual Property Rights, 'unduly strong copyright rules' prevent affordable access to scientific works essential for development in countries of the Global South.[32] The report refers to paywalls,[33] as well as

[24]See, eg, P Bernt Hugenholtz, 'Copyright vs. Freedom of Scientific Communication' (2000) 13 Learned Publishing 77, 80-81.
[25]WCT, Art. 11.
[26]As Reichman and Okediji (n 9) 1412, 1426-28 explain, one way of seeing this is to argue that TDM constitutes an instrument of 'massive infringement' of copyright. For an overview of how outdated copyright laws in many countries obstruct TDM, see Sean M Fiil-Flynn and others, 'Legal Reform to Enhance Global Text and Data Mining Research' (2 Dec. 2022) 378(6623) Science 951.
[27]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.
[28]ibid Art. 7(1).
[29]See, eg, Reichman and Okediji (n 9) 1414-25, who are highly critical of the EU's database protection regime insofar as its effects on research are concerned. Note should now be taken of the EU's recent reforms in the sphere of TDM: see nn 111-16, and accompanying text, below.
[30]Reichman and Okediji (n 9) 1422-23.
[31]See Lucie Guibault, 'Owning the Right to Open Up Access to Scientific Publications' in Lucie Guibault and Christina Angelopoulos (eds), *Open Content Licensing: From Theory to Practice* (Amsterdam University Press 2011) 137, 148-51 (describing the far-reaching transfer of rights that often takes place in practice).
[32]Commission on Intellectual Property Rights (CIPR), Integrating Intellectual Property Rights and Development Policy (Sept. 2002 Report of the UK CIPR, 3rd edn 2003) 18.
[33]ibid 100.

contract law that allows, and recourse in practice to TPMs entailing, restrictions of forms of fair use for research.[34] Many national copyright systems in the developing world fail to adequately cater for TDM.[35] Differential pricing in licensing, applied to benefit developing countries, yet produces 'a system that operates at the edge of affordability for all players'.[36]

In response to the deficiencies of the subscription model there is a move towards open access (OA). Under UNESCO's 2021 Recommendation on Open Science, OA signifies that content is openly available online, and accessible and reusable for everyone free of charge and without undue restrictions, immediately or as quickly as possible after publication.[37] In practice, two forms of OA have crystallized for scholarly publications: gold OA publishing and green OA self-archiving.[38]

In the gold path, the author customarily grants a publisher the non-exclusive licence to publish a work and communicate it to the public. The publisher publishes the work open access and deposits it in an online archive. The author retains the copyright and may grant an open content licence facilitating wide and free use or reuse of the work by the public. A journal may also be 'mixed' in that publication occurs in the toll access mode by default, but the OA mode may be negotiated for individual articles. L&Es retain their relevance in the gold path as the exact scope of permitted uses or reuses ultimately depends on the nature of the specific open content licence granted (which might confer only limited rights of use or reuse). OA publishing is financed in various ways, substantially through APCs. Reference has been made to the problems associated with high APCs. The principle that the author pays in OA publishing entails that the more articles a journal accepts, the higher its profits. In the current science environment, this spurs predatory publishing practices. It should be noted, however, that, in principle, OA relates to access and not to the absence of peer review.

In the green path, essentially directed at wholly or partially publicly funded subscription articles, but also books for which the author does not wish to be paid, authors deposit their works in an OA subject or institutional archive. As copyright has been handed over to the publisher, authors' right of deposit needs to be granted by the publisher. Legislation should thus grant authors an inalienable right to self-archive. Publishers often set embargo periods of 6 to 12 months, which is in tension with the 'immediacy/no delay' principle of OA. Furthermore, they do not allow the archiving of articles in their published format, but often only of a pre-print, which means that the actual article will still need to be consulted for citation purposes. Archiving entails only the limited costs relating to establishing and maintaining a repository. Access to archived articles is *gratis* (i.e., access is cost-free for the user), but usually not *libre* (i.e., use or reuse is not free from copyright/licensing restrictions). Enacting new or wider copyright L&Es therefore remains important also in this instance. Self-archiving does not require

[34]ibid.
[35]Fiil-Flynn and others (n 26).
[36]Joe Karaganis, 'Introduction: Access from Above, Access from Below' in Joe Karaganis (ed), *Shadow Libraries: Access to Knowledge in Global Higher Education* (MIT Press 2018) 1, 12.
[37]UNESCO Recom. (2021) paras 6, 7, opening section, (a), 8.
[38]ibid para 7(a). For good descriptions of the gold and green OA paths, see, eg, David Ball, 'Open Access: Effects on Publishing Behaviour of Scientists, Peer Review and Interrelations with Performance Measures' in Weingart and Taubert (n 3) 165; Guibault (n 31); Morrison (n 1) esp ch 6.

separate peer review, which has usually already been completed for the subscription publication.

To properly understand why copyright can be so destructive to the science system, the importance of scholarly communication to the functionality of science needs to be fully appreciated. Scholarly communication includes, as the next paragraph will demonstrate, free circulation of the published formal versions of record of scholarly knowledge. In laying out his 'CUDOS' norms of science in 1942, Merton identified 'communism' (alongside 'universalism', 'disinterestedness', and 'organized scepticism') as a fundamental principle of science.[39] That is, science is conceptually a part of the public domain, which requires the 'full and open communication' of findings,[40] and the public includes other scientists, students, and society at large.[41] Such communication of scientific discovery is linked to extending the boundaries of (providing access to) knowledge and facilitating reputation-building by scientists,[42] thus motivating them, through the possibility of claiming priority in science, to do the important research in the first place.[43] 'Originality' and 'scepticism' constitute another two fundamental principles of science.[44] While originality requires that every paper must endeavour to contribute something new to the existing archive of scientific knowledge,[45] scepticism requires that any such knowledge claims be subjected to verification by the scientific community.[46] Publication signifies the formal endeavour of registering an addition to existing knowledge. The circulation thereof is necessary as part of the science verification mechanism, that is, to enable other scientists to test and validate the knowledge claims made, and, further, to enable other scientists to rely on such knowledge in the creation of yet new knowledge. 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'.[47]

It may be tempting to argue that copyright does not confer any economic ownership claims with regard to the scientific knowledge created as such. Unlike patents, which do confer such claims with regard to an inventive idea as such, copyright extends 'to expressions and not to ideas'.[48] This means that the knowledge represented by copyright-protected scientific publications can be freely shared, unrestrained by copyright. Yet this fails to take account of the aforementioned scientific knowledge verification and (follow-on) creation mechanisms inherent in the normative structure of science. In science, respect for accepted authors' rights of attribution and integrity—facilitating reputation-building, accuracy in science, and the staking of claims to particular arguments or lines of reasoning (the form and not only the content of knowledge often does play a role in science)—requires access to the specific scientific source concerned,

[39]Robert K Merton, 'The Normative Structure of Science' (1942) in Norman W Storer (ed), *The Sociology of Science: Theoretical and Empirical Investigations* (University of Chicago Press 1973) 267, 273-75; John Ziman, *Real Science: What It Is, and What It Means* (CUP 2003) 33-36.
[40]Merton (n 39) 274.
[41]Ziman (n 39) 33.
[42]Merton (n 39) 274.
[43]Robert K Merton, 'Priorities in Scientific Discovery' (1957) in Storer (n 39) 286.
[44]Merton (n 39) 277-78; Ziman (n 39) 40-44. While Merton still referred to 'organized scepticism', Ziman identifies the two elements of 'originality' and 'scepticism'.
[45]Ziman (n 39) 40-42.
[46]ibid 42-44.
[47]John Ziman, Paul Sieghart and 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* (OUP 1986) 41.
[48]TRIPS, Art. 9(2); WCT, Art. 2.

engagement with the formally recorded rendering of any scientific knowledge, and the citation of exact page numbers.[49] It is not sufficient for scientists to broadly refer to knowledge claims made. Where a scientific publication cannot be accessed, for example because of copyright, access to similar publications by the same or other scientists does not suffice. One cannot even consider access to the very similar green version of a publication with different pagination and bearing its own date of initial release or archiving as sufficient in this respect. Not only scientists but also ordinary citizens interested in science seek access to the exact rendering of scientific knowledge. Unlike a patent, copyright usually only confers a relative monopoly because the same or similar content can often still be accessed through alternative sources. In science, however, copyright does confer an absolute monopoly. This is what is meant when it is said that scientific publications are not substitutable.[50] For that reason, any research library that does not provide access to the whole body of published scientific knowledge available is, from the standpoint of science, incomplete. What Helfer and Austin state is thus pertinent in the science context: 'limitations on the scope of copyright should be regarded as particularly appropriate where such limitations directly assist in the realization of a human right and, *in addition*, other factors are present, such as the absence of the capacity to ensure that substitute works are available'.[51]

To conclude this section, copyright, which in science creates an absolute monopoly, seriously impedes science in the digital era. Digital articles and books do not benefit from the first sale doctrine. TPMs further make it possible to absolutely control dissemination, access, and use or reuse. Neither international nor national copyright law adequately caters for TDM. Research L&Es may be, and often are, contractually excluded. While copyright in the analogue era still permitted some flexibility in its operation, in the digital era it can—and by reason of the profit motive does—mean comprehensive control and strict copyright. Even in 1987, prior to the full swing of the digital era, Brand noted that:

> Information 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 endless wrenching debate about price, copyright, 'intellectual property', and the moral rightness of casual distribution, because each round of new devices makes the tension worse, not better.[52]

Or, in the words of Peukert and Sonnenberg, digitization 'creates the digital dilemma in copyright of scientific works: digitalisation allows maximum access and at the same time maximum control'.[53] Gold OA publishing and green OA self-archiving seek to alleviate some of the shortcomings of copyright under the subscription model, but gold OA remains expensive and green OA, while not yet widely institutionalized, does not

[49] A scientific publication fulfils a number of purposes. These include formally registering new scientific knowledge and certifying a certain validity thereof (by virtue of peer review). See Niels Taubert and Peter Weingart, 'Changes in Scientific Publishing: A Heuristic for Analysis' in Weingart and Taubert (n 3) 1, 4. The specific publication, as the formal version of record, is therefore associated with claims of priority and a certain veracity of scientific knowledge. On authors' moral rights, see nn 99 and 261-62, and accompanying text, below.

[50] Weingart (n 3) 100.

[51] Laurence R Helfer and Graeme W Austin, *Human Rights and Intellectual Property: Mapping the Global Interface* (CUP 2011) 360.

[52] Stewart Brand, *The Media Lab: Inventing the Future at MIT* (Viking 1987) 202.

[53] Alexander Peukert and Marcus Sonnenberg, 'Copyright and Changing Systems of Scientific Communication' in Weingart and Taubert (n 3) 199, 218.

facilitate access to the actual version of record. The consequences of copyright impediments in science are acutely felt in the Global South, where such impediments seriously obstruct development.

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

The current publishing model in science, the 'pay thrice' model, is 'grotesque'.[54] Academic faculty, (often) paid by the public, write articles but then donate them to commercial publishers. Other scholars then peer review the articles for free. Yet university libraries buy back the results of faculty's labour at high prices, the public thus paying a second time for the same content. Added to this, universities 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, the public hence paying a third time. Big international publishers have profit margins of up to 40 percent, comparable to those of Apple Inc. or the big oil companies.[55] This raises the question of what the value added by scholarly publishers is, that would justify their high prices? In the analogue era, publishers still created a physical product, whose creation required technical skill, machinery, and material resources. Logistics were also necessary to ship products to different parts of the world. Much of this falls away in the digital era. A report produced by Deutsche Bank in 2005 accordingly found the multiple-pay model 'bizarre', journals' working capital requirements 'minimal', and professional publishers, overall, to 'add little value to the research process'.[56] Simultaneously, universities and research institutions are struggling to cope financially.

Some might argue that commercial scholarly publishers are gatekeepers who ensure that only quality science is published through the peer-review processes they organize. But peer review can be organized as effectively by institutionalized science itself, and indeed it is fundamentally problematic for science to outsource one of its central responsibilities, quality control, to a private industry in whose hands it is vulnerable to being instrumentalized for profit.

The science evaluation systems that governments have insisted upon, in conjunction with peer review by journals, form the basis of the economic power of commercial scholarly publishers. Evaluation systems require publication in journals with high 'journal impact factors' (JIFs). JIFs are the product of the way peer-review processes are organized by journals (employing, e.g., artificially high rejection rates).[57] Based on (what are often bogus) perceptions of journal quality, authors seek publication with, but also cite articles

[54]Guibault (n 31) 138; Hilty (n 2) 123.

[55]See Morrison (n 1) ch 3 (on scholarly publishing and 'the multi-billion-dollar industry'); also Anna Fazackerley, '"Too Greedy": Mass Walkout at Global Science Journal over "Unethical" Fees', The Guardian (7 May 2023), https://www.theguardian.com/science/2023/may/07/too-greedy-mass-walkout-at-global-science-journal-over-unethical-fees; Jon Tennant, 'Elsevier Are Corrupting Open Science in Europe', The Guardian (29 June 2018), https://www.theguardian.com/science/political-science/2018/jun/29/elsevier-are-corrupting-open-science-in-europe.

[56]See Samuel J Klein, 'Turning the Supertanker: Deutsche Bank on Elsevier's Excess' (5 Aug. 2019) KFG Notes, https://notes.knowledgefutures.org/pub/supertanker/release/3 (quoting from the report). Similarly, Richard Van Noorden, 'The True Cost of Science Publishing' (28 Mar. 2013) 495 Nature 426, 426 ('Cheap open-access journals raise questions about the value publishers add for their money').

[57]See Bill Cope and Mary Kalantzis, 'Signs of Epistemic Disruption: Transformations in the Knowledge System of the Academic Journal' in Bill Cope and Angus Phillips (eds), *The Future of the Academic Journal* (Chandos Publishing, 1st edn 2009) 13, 44 ('another frequently used quantitative measure of journal quality is its rejection rate').

published in, these journals. The citations again contribute to the formation of a journal's JIF.[58] While JIFs thus reflect journals' claim to significance, they lack scientific justification. Research demonstrates the absence of any 'compelling evidence' that journal rank can reliably predict scientific impact or quality.[59] Yet authors (are compelled to) seek publication in journals with high JIFs. For researchers in the developing world, where most journals are not indexed, getting published in a journal with a high JIF requires writing about the problems of the developed world, in the languages of the developed world, and satisfying a readership in the developed world.[60] In order to be published in journals with high JIFs, most of which are still paywalled, authors are willing to hand over their copyright, this leading to restrictions on dissemination, access, and use or reuse. JIFs determine the prices of journals.[61] Overall, then, the JIF indicates the commercial rather than scientific value of a journal. The role of copyright here is to buttress publishers' economic power.

Evaluation systems do not just reward (often bogus) quality. A scholar's success in science depends also on the quantity of their publications. The 'publish or perish' ideology ('PoP') at the heart of modern science significantly relates to quantity.[62] Global scientific output grows by 8 to 9 percent every year.[63] This 'overproduction of truth', as Pacchioni calls it,[64] while leading to a thriving scholarly publishing industry, on the one hand, entails the corruption of science, on the other. PoP tends to crowd out a scholar's 'intrinsically motivated curiosity',[65] which is required for ground-breaking discovery.[66] It negatively affects accepted tasks of scholars related to the sharing of knowledge with wider society and participation in public policy development (e.g., provision of expertise in the media, to non-governmental organizations (NGOs), to governments, etc.).[67] It leads to a decline in scientific quality. In certain fields of science, up to 90 percent of papers detail irreproducible research.[68] In some fields, more than 80 percent of published papers are never cited.[69] Altbach and De Wit, among many others, accordingly

[58]The JIF means the average number of times articles from a specific journal that were published in the past two years have been cited in the calculation year. This reflects the Thomson-Reuters, now Clarivate, journal impact factor, as the standard used.

[59]Björn Brembs, Katherine Button and Marcus Munafò, 'Deep Impact: Unintended Consequences of Journal Rank' (2013) 7 Front Hum Neurosci ArtID: 291, 1, 4-5.

[60]Sami Mahroum, '"Publish or Perish": The New Brain Drain in Science', World Economic Forum (8 Nov. 2016), https://www.weforum.org/agenda/2016/11/publish-or-perish-the-new-brain-drain-in-science. For an account of the devastating effect of JIFs and the major global citation indexes (Web of Science and Scopus) on science in Africa, see David Mills and others, *Who Counts? Ghanaian Academic Publishing and Global Science* (African Minds 2023).

[61]See Weingart (n 3) 98 (explaining the connection between the JIF and economic power).

[62]See Imad A Moosa, *Publish or Perish: Perceived Benefits Versus Unintended Consequences* (Edward Elgar 2018) 77, 181 (explaining that PoP, as a neoliberal device, holds universities accountable for the quantity and quality of publications).

[63]Lutz Bornmann and Rüdiger Mutz, 'Growth Rates of Modern Science: A Bibliometric Analysis Based on the Number of Publications and Cited References' (2015) 66 J Ass'n Info Sci & Tech 2215, 2218.

[64]Gianfranco Pacchioni, *The Overproduction of Truth: Passion, Competition, and Integrity in Modern Science* (OUP 2018).

[65]Margit Osterloh and Bruno S Frey, 'Ranking Games' (2015) 39 Eval Rev 102, 111.

[66]See Michael Park, Erin Leahey and Russell J Funk, 'Papers and Patents Are Becoming Less Disruptive over Time' (5 Jan. 2023) 613 Nature 138, 138, 143-44 (showing that 'innovative activity is slowing' (also) due to PoP).

[67]Hendrik P Van Dalen and Kène Henkens, 'Intended and Unintended Consequences of a Publish-or-Perish Culture: A Worldwide Survey' (2012) 63 J Am Soc'y Info Sci & Tech 1282, 1290-92.

[68]See Moosa (n 62) 71-73 (citing various studies demonstrating the irreproducibility problem).

[69]See Lokman I Meho, 'The Rise and Rise of Citation Analysis' (2007) 20 Physics World 32, 32 (finding that 'some 90% of papers … are never cited'); Sierra Williams, 'Are 90% of Academic Papers Really Never Cited? Reviewing the Literature on Academic Citations', LSE Impact Blog (23 Apr. 2014), https://blogs.lse.ac.uk/impactofsocialsciences/2014/04/23/academic-papers-citation-rates-remler (querying the 90% figure, yet finding that about 82% of articles in the humanities are never cited).

suggest drastic cutbacks in academic publishing.[70] Again, while quantity means enhanced profits for publishers, copyright's role is to buttress their economic power.

A transition to OA publishing will not by itself bring about a change to the current state of affairs. While commercial publishers have now accepted OA as an inevitable reality, the transition will take considerable time. Only 28 percent of all scholarly publications are currently open access.[71] Commercial publishers retain their economic power in various ways. On average, APCs of nearly US$1000 are payable—and journals with high JIFs charge particularly high APCs.[72] Furthermore, while texts in their basic format will become accessible free of charge, publishers will in the future provide a gamut of indispensable ancillary services that must be paid for, such as access to data, TDM, evaluation of reference lists, etc.[73] They may also require that readers be limited to non-commercial reuses, reserving commercial reuse to themselves.[74] Simultaneously, the 'author pays' principle of OA, in conjunction with the 'perverse incentives' that research evaluation systems create through their emphasis on quantity, functions as 'a key driver of predatory journals'[75]—a new business model premised on the exploitation of copyright monopoly. The copyright monopoly will thus remain with commercial scholarly publishers.

4. The Right to Science of International Law and Science Communication

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.[76]

[70]Philip G Altbach and Hans De Wit, 'Too Much Academic Research Is Being Published' (7 Sept. 2018) University World News, https://www.universityworldnews.com/post.php?story=20180905095203579.

[71]Heather Piwowar and others, 'The State of OA: A Large-Scale Analysis of the Prevalence and Impact of Open Access Articles' (2018) PeerJ 6:e4375, DOI: 10.7717/peerj.4375 1, 1.

[72]InterAcademy Partnership, *Combatting Predatory Academic Journals and Conferences* (InterAcademy Partnership 2022) 62.

[73]See Weingart (n 3) 100 (referring to Elsevier's strategy in this regard).

[74]See Michael W Carroll, 'Why Full Open Access Matters' (2011) 9 PLoS Biology e1001210 1, 2-3 (describing this as 'pseudo open access').

[75]*Combatting Predatory Academic Journals* (n 72) 63, 65, 67.

[76]ICESCR (n 7) Art. 15. While a provision largely according with Article 15 may be found in the Inter-American human rights system (Article 14 of the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights ('Protocol of San Salvador') of 1988), no comparable provision, not even as soft law, exists in the European or African human rights system. In lieu of an extensive list of literature on the REBSPA in the

Article 15's overall purpose is 'to advance access to science and culture for all'.[77] The REBSPA in Article 15(1)(b) must be understood in the context of the other provisions of Article 15. Hence, as for scholarly communication, the references to 'the diffusion of science' (para 2), 'freedom indispensable for scientific research' (para 3), and 'international contacts' between scientists (para 4) strengthen the notion of access to scientific knowledge and publications already inherent in Paragraph 1(b).

The latest official statement on the REBSPA is the CESCR's General Comment No. 25 of 2020.[78] It emphasizes that 'benefits' of science under the REBSPA mean (1) technology, (2) scientific knowledge as such (this would cover scholarly publications), (3) the capability for critical citizenship in a democracy, and (4) enhanced well-being, peace, and human rights through science ((1), (3), and (4) also imply access to scientific writings).[79] The exact normative implications of the REBSPA may be expressed in the 'AAQAF' format as laid out in General Comment No. 25: availability, accessibility, quality, acceptability, and freedom of scientific research.[80] States must make the necessary infrastructure for the conservation, development, and diffusion of science *available*.[81] Diffusion, as Shaheed observes, includes 'the dissemination of scientific knowledge […] within the scientific community and in society at large, including through publishing research findings'.[82] Instruments for diffusion are, for instance, the internet and libraries.[83] There should be a 'strong research infrastructure',[84] and such an infrastructure must be held to include publication avenues. Barriers to *access* the benefits of science must be removed. Copyright could thus restrict access. Access must be ensured without discrimination,[85] for example, on the ground of economic situation (and, as we know, high subscription fees or APCs ultimately impact especially access by poorer communities). '[O]pen source publication of research' is to be promoted, and '[r]esearch findings and research data funded by States should be accessible to the public'.[86] *Quality*, for instance of the scientific process (e.g., upholding research integrity) or technological applications, is to be assured.[87] Scholarly publications would have to be of a high quality too (rigor, replicability, honesty). *Acceptability* means that science needs

context of Article 15 here, reference is made to the 27 sources we mention in Beiter, Karran and Appiagyei-Atua (n 12) 166-67 n.216 and Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 234-35 n.7. For a recent article providing a good concise analysis of the right to science, see Sebastian Porsdam Mann, Helle Porsdam and Yvonne Donders, '"Sleeping Beauty": The Right to Science as a Global Ethical Discourse' (2020) 42 Hum Rts Q 332.

[77] Ben Saul, David Kinley and Jaqueline Mowbray, 'Article 15: Cultural Rights' in *The International Covenant on Economic, Social and Cultural Rights: Commentary, Cases, and Materials* (OUP 2014) 1175, 1212.

[78] CESCR, General Comment No. 25: Science and Economic, Social and Cultural Rights (Art. 15(1)(b), (2), (3), and (4) of the ICESCR), UN Doc. E/C.12/GC/25 (30 Apr. 2020). See, however, also the earlier expert Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and Its Applications of 2009 (in UNESCO, *The Right to Enjoy the Benefits of Scientific Progress and Its Applications: Venice, Italy, 16-17 July 2009* (UNESCO 2009) 13), and 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, UN Doc. A/HRC/20/26 (14 May 2012), both containing statements mandating facilitating access to scientific knowledge and publications. In arguing for open access as a human right, Skre and Eide (n 10) 435-36 rely considerably on Shaheed's report.

[79] As condensed from General Comment No. 25 (n 78) paras 6-8.

[80] ibid paras 16-20.

[81] ibid para 16 ('availability').

[82] Shaheed (n 78) para 48.

[83] General Comment No. 25 (n 78) para 16.

[84] ibid.

[85] ibid para 17 ('accessibility').

[86] ibid para 16.

[87] ibid para 18 ('quality').

to be explained to facilitate acceptance in different sociocultural contexts, its applications be tailored to suit the particularities of various beneficiaries, and ethics in science be respected.[88] Acceptability must surely cover diversified forms of science communication so as to reach the larger public. Finally, *freedom* of scientific research is to be guaranteed.[89] This must be held to include the freedom of researchers to disseminate, access, and use or reuse scholarly publications. Failure to redress the extraordinary expansion of intellectual property (IP) law in the sphere of scientific publishing could, therefore, be seen as violating Article 15(1)(b).[90]

In terms of international human rights law, states are required to 'respect', 'protect', and 'fulfil' human rights. General Comment No. 25 confirms this for the REBSPA.[91] The negative obligation to respect, requiring that states refrain from action that infringes a right, would, for instance, expect states not to interfere with the freedom to undertake scientific research, disseminate its results, or co-operate with scientists nationally and internationally.[92] The positive obligation to protect requires that states put in place measures protecting citizens against other private actors—for example, scientists and others against the excesses of the scholarly publishing industry.[93] The positive obligation to fulfil requires that states actively facilitate and promote the advancement of science and invest resources towards this end.[94] Hence, General Comment No. 25 posits that states parties are obliged to ensure 'equitable and open access to scientific literature'.[95] Insofar as the obligation to fulfil is resource-intensive and does not concern minimum core obligations, states parties under the ICESCR must, in accordance with Article 2(1) of the Covenant, realize the REBSPA 'progressively […] to the maximum of [their] available resources'.

The REBSPA in Article 15(1)(b) must also be read with Article 15(1)(c), which protects authors' moral and material interests in their scientific (and other) productions. At first sight it seems that this provision might counteract the realization of the REBSPA, and the more open science that it envisages. One might be tempted to read Article 15(1)(c) as mandating a human rights guarantee of copyright.[96] This would be highly problematic, certainly for science, as it would constitutionally legitimize obstacles for access to, and high

[88]ibid para 19 ('acceptability').
[89]ibid para 20 ('freedom of scientific research').
[90]Similarly, see Christine Mitchell, 'Epilogue: Tensions in the Right to Science Then and Now' in Helle Porsdam and Sebastian Porsdam Mann (eds), *The Right to Science: Then and Now* (CUP 2022) 286, 295 (implying that not addressing the unprecedented expansion of intellectual property (IP) regimes and profits from science applications and publishing conflicts with Article 15 of the ICESCR).
[91]General Comment No. 25 (n 78) paras 41-50.
[92]See Audrey R Chapman, 'Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications' (2009) 8 J Hum Rts 1, 18 (mentioning these three examples of respecting the REBSPA).
[93]See General Comment No. 25 (n 78) para 43 (universities/non-state actors interfering with access).
[94]For a list of generic positive duties under the obligation to fulfil the REBSPA, see Chapman (n 92) 25.
[95]General Comment No. 25 (n 78) para 49.
[96]The relationship between IP rights and human rights is complex. See Laurence R Helfer, 'Human Rights and Intellectual Property: Conflict or Coexistence?' (2003) 5 Minn Intell Prop Rev 47 (arguing that IP rights can be used to promote human rights); Peter K Yu, 'Reconceptualizing Intellectual Property Interests in a Human Rights Framework' (2006-2007) 40 UC Davis L Rev 1039 (considering aspects of IP rights themselves to have human rights quality; where non-human rights components of IP rights conflict with human rights, the latter enjoy priority); Lea Shaver, 'The Right to Science and Culture' (2010) [2010] Wis L Rev 121 (holding that, under a right to science/culture approach, access to knowledge as a public good enjoys priority over private IP rights); Ruth L Okediji, 'Does Intellectual Property Need Human Rights?' (2018) 51 NYU J Int'l L & Pol 1 (contending that human rights are insufficient to correct development-related deficits of IP rights). See also generally Helfer and Austin (n 51), or Christophe Geiger (ed), *Research Handbook on Human Rights and Intellectual Property* (Edward Elgar 2015).

prices for, scholarly publications, even where these have no grounding in human dignity.[97] As pointed out above, the essential objective of Article 15, as a whole, is to advance access to science and culture for all. Article 15(1)(c) must be read in light of these overarching access concerns. The CESCR, in a General Comment of 2006, underlines that Article 15(1)(c) safeguards 'the personal link between authors and their creations […] as well as their basic material interests'.[98] This has two important implications. Firstly, creators' moral rights (rights of attribution, integrity, and so on) deserve protection.[99] Moreover, protection under the provision is accorded to the actual creator only—and not to any subsequent assignee of rights, such as a publisher. A related point is that Article 15(1)(c) protects human persons only, i.e., not legal persons.[100] This per se excludes any publishing company as human right holder. Only humans can create and be authors as understood by Article 15(1)(c). Secondly, material interests are protected only to the extent necessary to enjoy an adequate standard of living, as contemplated in Article 11(1) of the Covenant.[101] This covers modest, not extravagant, benefits. Materials interests are not concomitant with comprehensive economic rights under copyright law. IP regimes protect investments, the right in Article 15(1)(c) protects inherent dignity.[102] It is, therefore, important not to equate IP rights with the human right in Article 15(1)(c).[103] Article 15(1)(c) does not afford an institutional guarantee of copyright, certainly not in the sphere of science.[104]

5. The Short or Medium Term: Copyright Law Reforms within the Existing Paradigm

The above analysis shows that the REBSPA covers the freedom to disseminate, access, and use or reuse scholarly publications. Publicly funded research findings and data

[97] General Comment No. 25 (n 78) para 61 already notes the problem of 'significant obstacles' IP creates for access to the benefits of science and 'the excessive price of some scientific publications'.

[98] CESCR, 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), UN Doc. E/C.12/GC/17 (12 Jan. 2006) para 2.

[99] See ibid para 13 (the Committee considering 'moral interests' to specifically include the rights of attribution and integrity).

[100] See ibid para 7 (the Committee stating that the entitlements of legal entities, 'because of their different nature, are not protected at the level of human rights').

[101] See ibid para 15 (the Committee emphasizing the link with Article 11(1)). See also Aurora Plomer, 'IP Rights and Human Rights: What History Tells Us and Why It Matters' in Porsdam and Porsdam Mann (n 90) 54, 60-74, who—on the basis of an analysis of the travaux préparatoires on the second paragraph of Article XIII of the socialist-inspired American Declaration on the Rights and Duties of Man of 1948, the historical antecedent of Article 27(2) of the Universal Declaration of Human Rights (UDHR) of 1948, in turn the predecessor of Article 15(1)(c) of the ICESCR—holds that material interests cannot be equated with a copyright holder's (comprehensive) economic rights. In the American Declaration, material interests meant 'material/physical' well-being.

[102] General Comment No. 17 (n 98) paras 1, 2.

[103] ibid para 3. See also Aurora Plomer, 'The Human Rights Paradox: Intellectual Property Rights and Rights of Access to Science' (2013) 35 Hum Rts Q 143, 166-75, holding that an analysis of the travaux préparatoires on Article 27(2) of the UDHR (the predecessor of Article 15(1)(c) of the ICESCR) shows that 'the rights protected by Article 27(2) are not coextensive with IP rights'.

[104] A topic not further addressed here is that of the potential protection of IP rights under the right to property. The right to property, while not laid down in the UN human rights covenants of 1966, does feature in the UDHR and various regional human rights treaties. It should be remembered, however, that the raison d'être of human rights—and thus of the right to property—is to protect human dignity. As constitutional property law scholar Van der Walt has explained, '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' (2014-2015) 1 J L Prop & Soc'y 15, 101-102. The copyright claims of publishing companies have no or weak backing in human dignity.

should be accessible to the public. OA must be promoted. Failure to eliminate undue copyright restrictions in the sphere of scientific publishing violates the REBSPA, and this must have implications for existing strict copyright protection in digital science. It is submitted that the way forward is, in the short or medium term, to move towards a milder subscription model while, at the same time, expanding opportunities for, and improving, green and gold OA.

Various reforms of copyright—in the stated sense—could be, and have been, suggested and to various degrees implemented. An inventory of reforms could or should encompass the following (an overview must suffice here as the overall argument sought to be made wishes to emphasize the longer-term perspective):

Dissemination (the problem of limited authors' rights in the case of subscription publications): 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 dissemination and use or reuse (to republish, distribute/communicate, produce derivatives, etc.) are preserved.[105]

Access (the problem of libraries being charged high prices for access to subscription publications): Price control will be necessary. A statutory body could determine maximum charges. A copyright tribunal could find certain fees unreasonable.[106] Under competition law, subscription charges might be considered excessive. Secrecy clauses in licensing agreements must be forbidden to ensure transparency and prevent price discrimination.[107] Developed states should require 'their' publishers to apply differential pricing to benefit libraries in developing states.

Use or reuse (the problem of use or reuse often being too limited or excluded, and/or 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, storage, archiving, format-shifting, data extraction, linking, quotation, translation and other forms of derivative use, communication to the public, etc.), subject to a broad fairness test.[108] Computational uses, including TDM, should specifically be provided for.[109] In this respect, all relevant uses should be catered for—reproduction, data extraction, communication to the public (sharing a database with other scientists, also those in another country), adaptation (e.g., to make texts machine-readable), storage, and so on—subject to the broad fairness test.[110] The EU adopted a Directive in 2019 that obliges EU members to provide for an exception permitting TDM for the purposes of scientific

[105]See Guibault (n 31) 161-62 (referring to model clauses that may be used in this regard).

[106]See, eg, Jerome H Reichman and Jonathan A Franklin, 'Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information' (1998) 147 U Pa L Rev 875, 930 (arguing that, respecting the public interest in education, science, research (etc.), 'take-it-or-leave-it' contracts for information goods must be made on reasonable terms).

[107]Niels Taubert, 'Recent Processes of Change from the Perspective of Academic Publishers' in Weingart and Taubert (n 3) 69, 89.

[108]See Geiger and Jütte (n 11) 76-77; Reichman and Okediji (n 9) 1439-41 (both analyses endorsing a broad research exemption). As regards the fairness test, Flynn and others propose a general 'fair use' or 'fair dealing' test that does not include conditions other than such 'fairness'. They state that fairness would usually be met for 'any use that does not express works to the public, and therefore does not harm markets for copyright-protected subject-matter': Sean Flynn and others, 'Implementing User Rights for Research in the Field of Artificial Intelligence: A Call for International Action' (2020) 42 Eur Intell Prop Rev 393, 396-97.

[109]See Geiger and Jütte (n 11) 78 (arguing that 'a specific exception for TDM … clarifies the lawfulness of TDM in principle'); Reichman and Okediji (n 9) 1440 (emphasizing that a broad research exemption must specifically cover TDM).

[110]See Flynn and others (n 108) 393, 396-97 (holding that 'mechanisms' are needed 'to authorise TDM research', including these uses).

research,[111] but only non-commercial research.[112] It lays down an additional general TDM exception that would cover commercial research,[113] but copyright holders may explicitly reserve its applicability,[114] and it may be contractually limited or excluded.[115] Its usefulness is therefore severely restricted.[116] It has further been stated that copyright law should, as of right, permit digital lending/communication of e-books by libraries.[117] The Court of Justice of the EU (CJEU) has, in the 2016 case of *Vereniging Openbare Bibliotheken v. Stichting Leenrecht*, held that digital books are subject to the EU's (hitherto analogue) book-lending regime, permitting libraries to lend these to users, provided authors are remunerated.[118] It is important that libraries be explicitly allowed to take such measures as are necessary to preserve works or replace them in certain instances. Copyright law should, moreover, allow remote access[119]—as appropriate, even from overseas—to library collections. Use or reuse should widely encompass commercial uses or reuses, because these are often in the public interest.[120]

One other word on the *Stichting Leenrecht* case: as the court subsumed use in this case under the concept of lending, usually associated with physical works, the case could have served as the basis for a further development of EU law in terms of which the right of distribution and the related doctrine of exhaustion (first sale doctrine)—the distribution right also usually associated with physical works—would apply to certain digital content as well, like scientific e-books, as inter alia entailing relieving research institutions, as the 'owners' of digital content, from the obligation to pay licensing fees on a perpetual basis. The court appears reluctant, however, to develop a doctrine of digital exhaustion. In the subsequent *Tom Kabinet* case, the CJEU ruled that the supply to the public by downloading, for permanent use, of an e-book is a 'communication to the public', and not a 'distribution' of the work.[121] Suber has argued in favour of establishing the first sale doctrine for digital content,[122] while Mezei argues that the WCT's Article 6 rules on the distribution right, and contracting parties' freedom to regulate exhaustion, are not per se excluded from application to digital content.[123] The doctrine of exhaustion is a balancing device of copyright law available to countries,[124] and recourse thereto beyond an assessment under the three-step test.[125]

[111]Directive (E.U.) 2019/790, of the European Parliament and of the Council of 17 April 2019 on Copyright and Related Rights in the Digital Single Market, and amending Directives 96/9/EC and 2001/29/EC, (2019) O.J. (L 130) 92, Art. 3 (subject to the three-step test, Art. 7(2)).
[112]ibid Art. 2(1), (3).
[113]ibid Art. 4 (subject to the three-step test, Art. 7(2)).
[114]ibid Art. 4(3).
[115]ibid Art. 7(1). (The Art. 3 exception cannot be limited or excluded.)
[116]Geiger and Jütte (n 11) 78-80. Important TDM research by, for example, pharmaceutical companies developing essential medicines or start-ups developing beneficial artificial intelligence (AI) solutions could thus be seriously hampered.
[117]See Giorgio Spedicato, 'Digital Lending and Public Access to Knowledge' in Jessica C Lai and Antoinette Maget Dominicé (eds), *Intellectual Property and Access to Im/material Goods* (Edward Elgar 2016) 149, 156-57, 162-65 (in favour of an L&E permitting digital lending of e-books by libraries).
[118]*Vereniging Openbare Bibliotheken v. Stichting Leenrecht*, Case C-174/15, 10.11.2016, ECLI:EU:C:2016:856.
[119]See Statement on Copyright … COVID-19 (n 22) (in favour of 'remote digital uses of works for essential activities'). For a frequently-referenced international model law aimed at meeting the various interests of libraries, see Electronic Information for Libraries (EIFL), Draft Law on Copyright: Including Model Exceptions and Limitations for Libraries and Their Users (EIFL 2016), https://www.eifl.net/system/files/resources/201607/eifl_draft_law_2016_online.pdf.
[120]See, eg, Flynn and others (n 108) 397; Geiger and Jütte (n 11) 76-80; Reichman and Okediji (n 9) 1440-41.
[121]*Nederlands Uitgeversverbond and Groep Algemene Uitgevers v. Tom Kabinet Internet BV and Others*, Case C-263/18, 19.12.2019, ECLI:EU:C:2019:1111.
[122]Peter Suber, 'Creating an Intellectual Commons through Open Access' in Charlotte Hess and Elinor Ostrom (eds), *Understanding Knowledge as a Commons: From Theory to Practice* (MIT Press 2007) 171, 178.
[123]Péter Mezei, *Copyright Exhaustion: Law and Policy in the United States and the European Union* (CUP 2018) 164-65.
[124]ibid 6-8, 11-14.

In developmental contexts, L&Es may legitimately permit much wider research uses. In its 2002 Report, the UK Commission on Intellectual Property Rights held that, to improve access, '[d]eveloping countries should be allowed to maintain or adopt broad exemptions for educational, research and library uses in their national copyright laws'.[126] Subscription agreements should cover not only access charges but also fixed compensatory charges for 'all needed research uses', and even APCs for researchers at the research institution concerned, all built into the subscription price, to facilitate more transparent and affordable deals.[127]

The contractual restriction or exclusion of L&Es for research must be forbidden.[128] Because TPMs easily obstruct legitimate use or reuse, they should, as far as possible, be avoided for scientific literature. Where TPMs are in place, their circumvention must be permissible where this is to secure user rights otherwise available by law.

Green and gold open access: Legislation should grant authors an inalienable right to self-archive and restrict embargo periods to a minimum. A 2022 study for the EU accordingly recommends that the EU legislator introduce an EU-wide secondary publication right.[129] Countries such as the Netherlands and Germany have already, by way of legislation, introduced such a right for cases where a paper has at least in part been publicly funded.[130] Research institutions must set up repositories for self-archiving. In the case of gold OA, APCs should be fair and borne by research institutions or other funders. A global APC fund should be created for the benefit of scientists working in the Global South.[131] Developed states should require their publishers to offer waiver schemes for APCs to benefit scientists in developing states. Gold OA cannot be mandated. Green OA should be encouraged rather than mandated to protect scientific freedom. New or wider copyright L&Es, and, for authors, improved contract law/contracts, need to secure robust rights of dissemination and use or reuse.

Under the three-step test of international copyright law, all the above reforms would have to be assessed for whether they could be said to be confined to, firstly, certain special cases, which, secondly, do not conflict with a normal exploitation of the work, and, thirdly, do not unreasonably prejudice the legitimate interests of the right holder.[132]

Without examining this here in any detail, many of the above reforms could be, and some have been, argued to meet the demands of the three-step test. For instance, the above study for the EU holds that the secondary publication right, if limited to publicly funded articles, would likely comply with the three-step test.[133] In applying the three-step test, public interest considerations and clearly also the fact that science has been proclaimed a human right would need to be taken into account, especially as part of

[125]ibid 18.
[126]CIPR (n 32) 104.
[127]See Reichman and Okediji (n 9) (making this bundling suggestion for 'all needed research uses').
[128]See, eg, Hugenholtz (n 24) 81; Reichman and Franklin (n 106) 929-31, 946; Reichman and Okediji (n 9) 1447.
[129]Christina Angelopoulos, Study on EU Copyright and Related Rights and Access to and Reuse of Scientific Publications, including Open Access: Exceptions and Limitations, Rights Retention Strategies and the Secondary Publication Right (Independent Expert Report, E.U., 2022) 55.
[130]Dirk Visser, 'The Open Access Provision in Dutch Copyright Contract Law' (2015) 10 J Intell Prop L & Prac 872.
[131]See Marc Scheufen, *Copyright Versus Open Access: On the Organisation and International Political Economy of Access to Scientific Knowledge* (Springer 2015) 155-56 (proposing a transnational funding agency).
[132]On the three-step test, see nn 14-16 and 19, and accompanying text, above.
[133]Angelopoulos (n 129) 55.

the third step.[134] Article 7 of TRIPS ultimately considers the dissemination of (and access to) technology/knowledge a TRIPS objective.[135] Under Article 8, upstream science must be held to be linked to most or all socio-economic objectives that a state may, under that provision, legitimately promote in its development policies, even if such promotion requires measures limiting IP rights.[136] Moreover, as the WCT posits in its preamble, research is in the public interest.[137] All these provisions create a bridge between TRIPS and international human rights law.[138]

In summary, therefore, and somewhat simplified, current copyright reforms could be said to be undertaken at three levels: firstly, TDM is sought to be considered a permissible use in relation to copyright or database-protected works or collections; secondly, there is the endeavour to recognize the legitimacy of a secondary publication right for open access, and, thirdly, mechanisms are being developed to decrease the costs for researchers in developing countries to publish open access in the journals of, and access research published in, the developed world. Mechanisms under the last point are, however, designed as voluntary. Gold OA, in view of the price at which it comes for the science system as a whole, can hardly be considered another level of reform.

One may note, however, that, even where many or most of the reforms enumerated above are realized, copyright remains an issue. Hence, the EU's TDM exceptions do not properly apply to commercial research, which is in the public interest too. They do not facilitate access to IP-protected materials not part of the collection available in a specific library.[139] A milder subscription model still entails enormous fees for libraries and substantial restrictions on dissemination, access, and use or reuse for users. The green and gold OA model ultimately leads to scientific knowledge that is dispersed over many archives, with some documents in their published format, others in a pre- or post-print format, with different conditions of use pertaining to each document that may also be unclear, with some information available only after an embargo period, and so on. APCs remain expensive.

More conceptually, the reforms remain within the existing copyright paradigm for science—a paradigm which insists on an intermediary between scientist and audience, who is responsible for producing products that capture the scientist's results and then distributing them. It is based on granting economic copyright, or its de facto monopoly, as notably in the case of gold OA, to scholarly publishers, many now powerful commercial corporations. Such arrangements, which were meaningful in the analogue age (insofar as publishers did not abuse them), have meanwhile become embedded in an extensively commercialized science system (as Section 3 above and the next section demonstrate).

[134]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 three-step 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. Geiger and others (n 16) 712, para 6.

[135]TRIPS, Art. 7.

[136]ibid Art. 8.

[137]WCT, Preamble, Recital 5.

[138]Peter K Yu, 'The Objectives and Principles of the Trips Agreement' (2009) 46 Hous L Rev 979, 1037, 1039. Treaties, thus also those on IP rights, must be interpreted in the light of inter alia 'any relevant rules of international law applicable in the relations between the parties' (Vienna Convention on the Law of Treaties (1969), Art. 31(3)(c)), thus also rules of international human rights law.

[139]Reto M Hilty and Heiko Richter, 'Text and Data Mining (Article 3 COM(2016) 593 final)' in Reto M Hilty and Valentina Moscon (eds), *Modernisation of the EU Copyright Rules: Position Statement of the Max Planck Institute for Innovation and Competition* (Max Planck Inst for Innov & Competition 2017) 25, paras 25-28.

All the mentioned reforms are clearly supported by the right to science. Yet, while some of them would, or could, also be relevant as part of a system beyond the existing paradigm,[140] as proposed below,[141] on their own, as part of the existing paradigm, they do not penetrate to the core of the problems caused by copyright in science in a way required by the right to science, especially when viewed from a longer term perspective. If science is a human right—that is, if scientists have a right to do research and citizens have a right to enjoy access to the benefits of scientific progress—then science must be allowed to function properly by guaranteeing a 'science adequate' research environment (the concept of 'science adequacy' examined in the next section), so that it can actually produce benefits, whether scientific knowledge, technology, general enlightenment, or democracy, etc., for citizens. Under the existing copyright paradigm for science, even with reforms, dissemination, access, and use or reuse remain significantly obstructed, while, simultaneously, enormous sums of public revenue that could enhance science flow to private intermediaries whose net contribution to digital science is seriously questionable.

That a right to science must ultimately mean more than the reforms set out in this section is also evident from the fact that very few of the arguments for the above-mentioned reforms have been framed from the right to science,[142] many not even from human rights. Some arguments do rely on human rights, such as freedom of expression[143] or scientific freedom,[144] yet many rely on the functionality, the needs of, or the public interest in science—but not specifically on human rights, let alone a right to science. The right to science must, therefore, add something more substantial to the debate.

6. Countering Commercialization: The Concept of 'Adequacy for Science' as the Basis for Another Science

The question of whether the right to science supports a paradigm shift in the sphere of copyright and science depends on the exact normative quality or force of that right—as will be explained, specifically on whether the right continues to be inspired by the ideal of free and disinterested science, by what has also been called a liberal science script.[145] According to Merton's writings and the drafting history of the founding instruments of international human rights law, 'disinterestedness' ('purposefreeness') and extensive scientific freedom are the hallmarks of academic science,[146] the guarantors of

[140]Much would depend on how 'copyright-free' such a system would be. Even in a world 'without copyright' in scientific publications, a research or TDM exception would, for example, remain relevant insofar as research relies on non-scientific publications or protected databases.

[141]See Sections 8 and 9 below.

[142]See, eg, Geiger and Jütte (n 11).

[143]Reichman and Franklin (n 106).

[144]Hugenholtz (n 24).

[145]See Katrin Kinzelbach, 'The Origin and Meaning of Freedom in the Human Right to Science' (2024) Glob Const (forthcoming) (distinguishing between 'liberal' and 'illiberal' contestations of the right to science). Similarly, see Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) (arguing that scientific or academic freedom must be understood to be 'the best guarantor of scientific progress'); Beiter, 'Academic/Scientific Freedom? Or "New" Freedom (Neoliberalism)?' (n 12) (explaining that 'moral' universities can only be established on the foundational value of scientific or academic freedom); Sebastian Porsdam Mann, Helle Porsdam, Maximilian M Schmid and Péter Vilmos Treit, *Scientific Freedom: The Heart of the Right to Science* (Rowman & Littlefield 2024) (holding that scientific freedom must be understood to be 'the heart of the right to science').

[146]Merton (n 39) 275-77; as regards the drafting history of the founding instruments, see Kinzelbach (n 145); William A Schabas, 'Looking Back: How the Founders Considered Science and Progress in their Relation to Human Rights' (2015)

path-breaking discovery and of scientists finding answers to the fundamental questions of humankind. As Dasgupta and David argued in 1994, to maintain the economic structure of science—that is, to ensure upstream science in universities can successfully yield downstream technology and innovation in the research and development (R&D) sector—a special role for science in universities needs to be carved out, a space where science can flourish freely, unfettered by external norms that demand research to be 'useful'.[147] In 1939, Flexner highlighted 'the usefulness of useless knowledge' for scientific progress.[148]

One may wonder if current official interpretations of the REBSPA, such as the CESCR's General Comment No. 25 or UNESCO's 2021 Open Science Recommendation, are still wholeheartedly committed to a liberal science script as endorsed by post-World War II international human rights instruments, and as generally believed in prior to the implementation of neoliberalism from the 1980s onwards. As a fundamental structural element of academic science, 'disinterestedness' prevents the instrumentalization of science for ideological purposes (including, as prevalent today, neoliberal economic purposes) and ensures the functionality of science.[149] During the drafting of Article 27(1) of the Universal Declaration of Human Rights (UDHR) of 1948, the predecessor provision of the right to science in Article 15(1)(b) of the ICESCR, a Soviet-proposed formulation whereby science should serve democracy, peace, and co-operation was rejected by the Western group.[150] Eleanor Roosevelt stated that the US delegation 'would under no circumstances agree that science should be placed at the service of politics'.[151] René Cassin for France argued 'that principle might be invoked to justify the harnessing of science to political ends'.[152] Article 27(1) accordingly protects a liberal vision of science by not stipulating any purposes of science, protecting everyone's right '*freely* […] to share in scientific advancement and its benefits'.[153] Despite the illiberal limitation in Article 15(3) of the ICESCR to the effect that states parties need only protect the freedom 'indispensable' for scientific research, also Article 15(1)(b) of the ICESCR protects a liberal vision of science.[154] A proposal by the Soviet Union to include political goals in the right to

[2015] Eur J Hum Rts 504; Tara Smith, 'Scientific Purpose and Human Rights: Evaluating General Comment No 25 in Light of Major Discussions in the *Travaux Préparatoires* of the Universal Declaration of Human Rights and International Covenant on Economic, Social, and Cultural Rights' (2020) 38 Nordic J Hum Rts 221.

[147]Partha Dasgupta and Paul A David, 'Toward a New Economics of Science' (1994) 23 Rsch Pol'y 487.

[148]Abraham Flexner, 'The Usefulness of Useless Knowledge' (1939) 179, June/November Harper's Magazine 544.

[149]On 'disinterestedness', see Merton (n 39) 275-77 and Ziman (n 39) 38-40. On the presently pervasive neoliberal commercial science ideology, see generally Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12); Beiter, 'Academic/Scientific Freedom? Or "New" Freedom (Neoliberalism)?' (n 12); Beiter, Karran and Roynard (n 12). See also Council of Europe, European Parliamentary Assembly, Resolution 2352 (2020), Threats to Academic Freedom and Autonomy of Higher Education Institutions in Europe, paras 1, 6, 9.3 (warning that the 'commercialisation of knowledge [… is] increasingly damaging the quality of […] research').

[150]Schabas (n 146) 511.

[151]ibid.

[152]ibid 512.

[153]UNGA Res 217 (III) A, Universal Declaration of Human Rights (UDHR) (10 Dec. 1948), Art. 27(1) (emphasis added). On how the word 'freely' came to be added by the drafters, its significance in adding the freedom dimension to science, and the liberal science script of Article 27(1), see Kinzelbach (n 145) 3-8 (post-print). The freedom dimension had still been absent in the first paragraph of Article XIII of the American Declaration on the Rights and Duties of Man, the historical antecedent of Article 27(1) of the UDHR. Interestingly, however, Article IV of the American Declaration on the right to freedom of expression also protects 'the right to freedom of investigation'. See Cesare P Romano, 'The Origins of the Right to Science: The American Declaration on the Rights and Duties of Man' in Porsdam and Porsdam Mann (n 90) 33, 44, 50.

[154]See Kinzelbach (n 145) 8-13 (post-print).

science had again been defeated.[155] However, General Comment No. 25 now provides that 'the development of science in the service of peace and human rights should be prioritized by States over other uses'.[156] Smith argues that, although the purposes of science spelled out in the General Comment are more nuanced than the purposes suggested during the drafting of the UDHR and the ICESCR, the concerns raised then regarding the dangers of assigning specific purposes to science, even if somewhat attenuated after the CESCR's adoption of General Comment No. 25, remain valid today.[157] Kinzelbach similarly claims that the General Comment includes certain illiberal ideas on science: 'the very argument that states—rather than scientists—should prioritize what science be focused on, amounts to an illiberal perspective on how governments should guide (if not control) science'.[158]

Current official interpretations of the REBSPA, I argue, have 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 realise Covenant rights—seems to be naively understood to signify that states parties must comprehensively control all aspects of science.[159] From here it is not a big step to require that the efficiency and productivity of science be enhanced. Introducing 'new public management' (NPM), meaning *bureaucracy*, to science—entailing the introduction of a business analogy, even in universities, to accelerate production—might then potentially be justified as Covenant-compliant. NPM denotes the installation of hierarchy (line management) and evaluations in the form of audits measuring outcome (performance management). Line management would provide the power to order the production of outcome (e.g., publications), performance management a mechanism to ensure that it is, in fact, produced (here one may think of, for example, 'publish or perish').

On the other hand, the understanding of science in the existing documents is, in many ways, instrumental and results-based, in that science is summarily expected to solve the world's problems.[160] Simultaneously, the tone of the documents remains neutral and a clear stance on the increasing commercialization of science, especially in universities, is missing.[161] Modern science, including many universities, increasingly adopts commercialization strategies—entailing its *industrialization*. IP constitutes a central element in these strategies. The reference in the documents is merely to a 'balance' between IP law and the interests of science, however,[162] which may not be enough. In this

[155]See ibid 13 (post-print) (describing the Soviet proposal as '[t]he most blatant attempt to utilise the ICESCR negotiations for illiberal purposes').

[156]General Comment No. 25 (n 78) para 6. In the view of the main CESCR author of the General Comment, the Soviet proposal (referring here to the similar proposal made at the time of drafting the UDHR) 'seemed reasonable enough, certainly, except when considered under the perverse Cold War logic dominant at the time'. Mikel Mancisidor, 'The Dawning of a Right: Science and the Universal Declaration of Human Rights (1941-1948)' in Porsdam and Porsdam Mann (n 90) 17, 22-23.

[157]Smith (n 146) 236.

[158]Kinzelbach (n 145) 17 (post-print).

[159]Hence, General Comment No. 25 (n 78) does not, for example, carve out a special role for science in universities. Universities have historically provided a space where pure science could flourish as a cultural form, largely unfettered by external norms. This was crucial to enabling overall scientific progress.

[160]See, eg, Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 273-74 (regarding UNESCO's Recommendation on Science and Scientific Researchers of 2017).

[161]See, eg, ibid 281-82 (regarding UNESCO's 2017 Recommendation).

[162]See, eg, Venice Statement (n 78) para 10 or General Comment No. 25 (n 78) para 62.

conception, science that solves practical problems and leads to economic growth (including profits for scientific publishers) is seen, it seems, as satisfying the public interest in science.

What we are witnessing today is the industrialization of academic science in the pursuit of so-called impact,[163] its bureaucratization (NPM) in the endeavour of enhancing productivity,[164] and neoliberal economic goals being imposed on universities.[165] Current official interpretations of the REBSPA do not seem to offer bold protection against these phenomena.

What does the problem of copyright in science have to do with the commercialization strategies increasingly adopted by universities? These strategies appear to relate to the marketization of patents rather than copyright.[166] However, the corporate university's ability to attract paying students as customers, research funds from the public and private sector, and generally investment, depends on its 'brand' value or its position in rankings, which in turn depends, inter alia, on publications (citations).[167] Thus publications become part of a university's commercialization strategy. This creates a market in publications, buttressed by copyright. More generally, the same values underlying the marketization of technological innovation contribute to the copyright dilemma—the values emanating from the notion that scientific knowledge is not a shared resource but a tradable commodity. This changes the motivation for and organization of knowledge production. Copyright and industrial property are structural components of commercialized or industrial science. While academic science should be based on the CUDOS norms of science as expounded by Merton—communism, universalism, disinterestedness, and organized scepticism[168]—the norms of industrial science, following the PLACE pattern, are increasingly applied in universities: Science here is Proprietary (not communalist; the results are privately owned), Local (not universal, but solving specific local problems), Authoritarian (not disinterested; the goals are predefined),

[163]See, eg, Philip Moriarty, 'Science as a Public Good' in John Holmwood (ed), *A Manifesto for the Public University* (Bloomsbury 2011) 56; Richard R Nelson, 'The Market Economy, and the Scientific Commons' (2004) 33 Rsch Pol'y 455; Ziman (n 39) 77-79.

[164]See, eg, You-Na Lee and John P Walsh, 'Rethinking Science as a Vocation: One Hundred Years of Bureaucratization of Academic Science' (2022) 47 Sci, Tech, & Hum Values 1057; Michael Power, *The Audit Society: Rituals of Verification* (OUP 1999) 94-104; Ziman (n 39) 79-82.

[165]See, eg, Helga Nowotny and others (eds), *The Public Nature of Science under Assault: Politics, Markets, Science and the Law* (Springer 2005); Sharon Rider, Ylva Hasselberg and Alexandra Waluszewski (eds), *Transformations in Research, Higher Education and the Academic Market: The Breakdown of Scientific Thought* (Springer 2013); Sheila Slaughter and Larry L Leslie, *Academic Capitalism: Politics, Policies, and the Entrepreneurial University* (Johns Hopkins University Press 1997). More recently, see Beiter, 'Where Have All the Scientific and Academic Freedoms Gone? (n 12); Beiter, 'Academic/Scientific Freedom? Or "New" Freedom (Neoliberalism)?' (n 12); Beiter, Karran and Roynard (n 12).

[166]On current systems of university patenting of inventions flowing from publicly funded research, the extension of exclusive rights to even basic research results, restrictions on access to knowledge/technology for the research community, follow-on innovators, and the general public, surging private profits, and the negative consequences this system produces for the progress of science and technology, see, eg, Nelson (n 163) 455, 462, or Aurora Plomer, *Patents, Human Rights and Access to Science* (Edward Elgar 2015) 10-13.

[167]By way of example, citations count for 30% in the Times Higher Education World University Rankings 2023. THE, World University Rankings: Methodology for Overall and Subject Rankings for the Times Higher Education World University Rankings 2023, October 2022, 10, 12, https://www.timeshighereducation.com/world-university-rankings/world-university-rankings-2023-methodology. An abundance of literature on the commercialization (including branding and ranking) of universities has been published. See the literature cited in Klaus D Beiter, Terence Karran and Kwadwo Appiagyei-Atua, 'Academic Freedom and Its Protection in the Law of European States: Measuring an International Human Right' (2016) 3 Eur J Comp L & Govern 254, Sect. 10, and generally in Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12).

[168]Merton (n 39) 270-78; Ziman (n 39) 33-44.

Commissioned (not original, but serving the goals of the principal), and Expert (rather than sceptical, biased towards a certain outcome).[169]

Overall, instrumental conceptions in science may readily be implemented in a way that is concomitant with overregulation, hyperincentives, productivist and market-oriented agendas, and performative behaviour, all detrimental to science. It is these facets that create a lucrative market for scholarly publications, in which copyright serves to buttress the economic power of the scholarly publishing industry and entails a diversion of scarce public resources for research towards publishers. Section 3 above explained how governmental and institutional research evaluation systems, peer review, and copyright operate together to restrict access to scientific knowledge and damage science more generally.

The CESCR's General Comment No. 25 observes that 'the excessive price of some scientific publications is an obstacle for low-income researchers', and implicitly that copyright may pose 'significant obstacles' for citizens wishing to access scholarly publications as a benefit of scientific progress.[170] The Committee's response is to call for 'a balance' between IP rights and open access and the sharing of scientific knowledge,[171] which seems to suggest remaining within the current paradigm and accommodating commercial copyright interests. When concretizing OA in relation to scientific publications, UNESCO's 2021 Recommendation on Open Science mentions OA publishing platforms and OA repositories, but does not further elaborate on possibilities of reuse.[172] OA does not cover free publishing for researchers or sincerely require reorientation towards affordable publishing that protects funders and institutions. Paragraph 8 of the Recommendation states that access to knowledge should (need only?) be as open 'as possible'.[173] Access restrictions are justifiable on the basis of 'the protection of intellectual property rights'.[174] Paragraph 16(c) requires a 'diversity of business models' to be recognized in the sphere of publishing.[175] It seems that also under this document the traditionally powerful role of publishers is intended to remain intact.

A necessary step to achieving a paradigm shift in the sphere of copyright and science is to construe the right to science in a way that reaffirms the centrality of academic science for our time. In effect, what this requires is that, in construing the positive dimension of the REBSPA—that of providing access to, notably creating, the benefits of science for citizens' enjoyment—far greater account needs to be taken of the right's negative dimension, particularly as laid down in Article 15(3) of the ICESCR.[176] Far greater account must thus be taken of the scientific or academic freedom of the creators of science and its benefits, that freedom's normative demands for the scientific enterprise, and, here, its implications for copyright in science. General Comment No. 25 does mention scientists' freedom

[169]Ziman (n 39) 77-82.
[170]General Comment No. 25 (n 78) para 61.
[171]ibid para 62.
[172]UNESCO Recom. (2021) para 7(a).
[173]ibid para 8.
[174]ibid.
[175]ibid para 16(c). Similarly, Paragraph 20(j) does not require a move towards non-commercial publishing models, but only their 'support'. ibid para 20(j). Paragraph 17(i), while somewhat helplessly stating that there should not be 'inequitable extraction of profit from publicly funded scientific activities', yet envisages a clear role for private actors in open science. ibid para 17(i).
[176]On the centrality of academic science, and the crucial role of scientific or academic freedom, for a proper understanding of the right to science, see Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12); Beiter, 'Academic/Scientific Freedom? Or "New" Freedom (Neoliberalism)?' (n 12); Beiter, Karran and Roynard (n 12).

claims, but in a rather brief, enumerative, and formalistic manner.[177] It is necessary to recalibrate the REBSPA's interpretation, and on that basis reassess the need for the reform of copyright in science. The deconstructive concept of 'adequacy for science' could guide the recalibration process.

'Adequacy for science', as used here, is modelled on the German law concept of *Wissenschaftsadäquanz*, which has a related meaning. In German law, the concept is often used as a yardstick to assess whether governance arrangements in institutions of science are constitutional, in that they ensure that what are, in principle, collective decisions on science respect freedom of science and are thus 'adequate for science'.[178] The concept could be used in a much broader sense, as I have written elsewhere:

> In 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.[179]

Structures, arrangements, and decisions are in the best interest of science and scholarship when they facilitate the discovery of disinterested truth,[180] as opposed to when they serve goals of political, economic, or social usefulness or expedience. Respect for the intrinsic requirements of science means respect for its autonomous character and for the role of intuition, anarchy, inefficiencies, delay, risk, and openness in science.[181] A central role should be accorded to scientists themselves in organizing science, as they, by reason of their training and experience, understand its needs best; institutional autonomy, self-governance, and collegiality therefore need to be ensured.[182] Scientists must be fully enabled to remain masters of the scientific endeavour itself; hence, individual autonomy, adequate working conditions, and voluntary co-operation need to be guaranteed.[183] The adequacy concept thus allows one to deduce the parameters of another, reconceptualized science. That other science, postulated as the ideal in this article, is open[184] and guided by

[177] See General Comment No. 25 (n 78) (specifically) paras 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 ibid paras 13, 22, 50, 52, 55, 57, 86. It is also restrictively stated that scientific freedom covers 'the sharing of scientific data and analysis with policymakers, and with the public *wherever possible*'. ibid para 13 (emphasis added).

[178] See, eg, Hamburgisches Hochschulgesetz [Hamburg Higher Education Law], Decision of 20 July 2010, BVerfG [Fed. Const. Ct., Germany], BVerfGE 127, 87, para 91.

[179] Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 286.

[180] This is commonly accepted as the rationale for academic/scientific freedom: see, eg, Eric Barendt, *Academic Freedom and the Law: A Comparative Study* (Hart 2010) 53-63.

[181] See, eg, Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 240, 249-50, 252-53, 255-58, 265-66, 273-74, 282-84.

[182] See, eg, Martin Schulte, 'Grund und Grenzen der Wissenschaftsfreiheit' in *Kultur und Wissenschaft* (Veröffentlichungen der Vereinigung der deutschen Staatsrechtslehrer, Vol. 65, 2006) 110, 125 (emphasizing the need for legislation in the field of science exhibiting only a medium level of regulatory density complemented by sets of rules produced by the scientific fraternity itself).

[183] See, eg, Stefan Collini, *What Are Universities For?* (Penguin Books 2012) ch 7.1 (describing voluntary co-operation and individual autonomy as two of the most important sources of efficiency in intellectual activity).

[184] 'Open science' covers open scientific knowledge (including scientific publications), open science infrastructures, open engagement of various societal actors in science, and open dialogue with other knowledge systems: UNESCO Recom. (2021) para 6.

the truth rather than the utility or profit motive. It is primarily that science that needs to be protected by the right to science.

7. Constructing a 'Right to Research' in Light of Notions of 'Science Adequacy'

This section identifies the normative claims encompassed by a 'right to research' under the REBSPA of relevance to the copyright and science, or scholarly publication, context. The REBSPA in Article 15(1)(b) may be stated to cover a derivative 'right to research', concretizing normative entitlements under the REBSPA in research. Its content, or elements thereof, may be inferred from existing official texts, such as UNESCO recommendations or CESCR general comments, that may be seen as interpretations of the REBSPA, but the adequacy concept, with its emphasis on free, disinterested, and open science, must guide the overall constructive effort, and, where the official texts have flaws or gaps, correct these flaws and fill those gaps.

The right to research has a conceptually more negative and a conceptually more positive side. The former is reflected in the right or freedom of scientists, but also others, 'to do research', the latter in the right of citizens 'to enjoy access to the benefits of research'. The former dimension applies most comprehensively in the realm of the creation of 'pure' scientific knowledge in universities and similar institutions. The latter dimension signifies that securing access to the benefits of research, including scientific knowledge, can only be achieved in a proactive way.

The negative right 'to do research' encompasses various normative claims of specific relevance in the copyright and science context. UNESCO's 2017 Recommendation on Science and Scientific Researchers thus calls for 'utmost respect for […] freedom of research' and emphasises that 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'.[185] The earlier 1997 Recommendation concerning the Status of Higher-Education Teaching Personnel guarantees, as part of expressly protected academic freedom, the right to carry out research work.[186] Institutional autonomy, self-governance, and collegiality constitute institutional safeguards of scientific or academic freedom, notably in universities, but also beyond.[187] Collegiality means that low hierarchies should prevail in the science sector.[188] In universities, line management should be abolished. The scientific fraternity enjoys rights of self-regulation; it should inter alia adopt a publishing code protecting the interests of scientists and science.[189] Generally, NPM in science must be held to be inimical to freedom of research. As Merton and Barber explain, mere 'general planning' (the absence of detailed planning), 'will preserve a freedom of inquiry, a freedom of

[185]UNESCO General Conference, Recommendation on Science and Scientific Researchers, Doc. 39 C/Res 85 (13 Nov. 2017) paras 10, 16(a)(i).
[186]UNESCO General Conference, Recommendation concerning the Status of Higher-Education Teaching Personnel, Doc. 29 C/Res 11 (11 Nov. 1997) paras 27, 29. See also General Comment No. 25 (n 78) para 13 ('[S]cience requires the robust protection of freedom of research').
[187]As for universities, see UNESCO Recom. (1997) paras 17-21, 31, 32. As for non-university research institutes, see Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 284-85. For a discussion of academic freedom and its institutional safeguards, see Beiter, Karran and Appiagyei-Atua (n 12) 119-40.
[188]Beiter, Karran and Appiagyei-Atua (n 12) 137-38.
[189]See Eberhard Schmidt-Aßmann, 'Free Access to Research Findings and Its Limitations' in Nowotny and others (n 165) 109, 122.

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'.[190] Another component of freedom of research is attractive terms and conditions of employment. The UNESCO Recommendations require security of employment, good salaries, a workload that is not excessive, and proper social security benefits.[191] Good salaries obviate the need for remuneration deriving from copyright. As Bellia and Moscon have suggested, it is in the best interest of science to reward scientists with 'salaries not directly related to scientific outputs'.[192] All the above normative claims are necessary elements of an adequate research environment.

Researchers in universities and other public research institutes may claim 'ownership' of their research data and scientific works. It is usually said that, contrary to the orthodox rule that copyright vests in the employer, copyright in scientific works belongs to the employee.[193] While the bearer of 'ownership' here indeed is the researcher, this need not, as shown further below, take the form of economic rights under copyright law to comply with the REBSPA, or authors' rights under Article 15(1)(c) of the Covenant. Merton wrote that because scientific findings belong to all and must be communicated, '[p]roperty 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', that is, the moral rights.[194] Provided good salaries are paid, this is the solution adequate for science. The official texts, moreover, confirm scientists' rights of access to information (access to the internet and up-to-date research libraries), to share information with other scientists, policymakers, and the public, within and across national borders, and to collaborate with each other within and across national borders.[195]

The principle of the 'open communication' of findings or 'open scientific knowledge' underlies the pertinent UNESCO Recommendations, which emphasize that this has its basis in academic freedom and serves the purpose of validation.[196] In the digital age, gold and green OA have become significant means towards greater openness regarding publicly funded publications.[197] Publishing should, however, be free for researchers, and costs be borne by research institutions or other funders. Researchers are entitled to publish their findings 'in books, journals and databases of their own choice'.[198] This must also include the right not to publish a text. Limitations on the right to publish must be 'strictly minimized'.[199] Researchers should be encouraged to make their research data openly available so that it is 'findable, accessible, interoperable, and

[190]Robert K Merton and Elinor Barber, *The Travels and Adventures of Serendipity: A Study in Sociological Semantics and the Sociology of Science* (Princeton University Press 2004) 192 (internal quotation marks omitted).
[191]UNESCO Recom. (1997) paras 7, 45-46, 57, 58(a), (c), 62, 63; UNESCO Recom. (2017) paras 1(e), 11, 24(a), 27(c), (d).
[192]Marco Bellia and Valentina Moscon, Academic Authors, Copyright and Dissemination of Knowledge: A Comparative Overview (Max Planck Inst for Innov & Competition, Research Paper No. 21-27, 2021) 2.
[193]See, eg, American Association of University Professors, Statement on Copyright (1999), https://www.aaup.org/report/statement-copyright.
[194]Merton (n 39) 273-74.
[195]International Covenant on Civil and Political Rights (1966) Art. 19(2); Venice Statement (n 78) para 14(a), (c); UNESCO Recom. (1997) paras 11, 14, 22(o); UNESCO Recom. (2017) paras 13(e), 16(a)(v), 18(a), (d), 27(f), 28, 31; General Comment No. 25 (n 78) paras 13, 16, 49, 78.
[196]UNESCO Recom. (1997) Preamble, Recital 8; UNESCO Recom. (2017) Preamble, Recital 4(c); UNESCO Recom. (2021) para 6.
[197]Both are provided for in UNESCO Recom. (2021) para 7(a). The Recommendation requires open access for publicly funded scientific publications: ibid para 16(b).
[198]UNESCO Recom. (1997) paras 12, 27; UNESCO Recom. (2017) para 38; General Comment No. 25 (n 78) para 50.
[199]UNESCO Recom. (2017) para 38(a).

reusable'.[200] Moreover, researchers are required to always respect and acknowledge others' scholarly work.[201] Researchers are entitled to various forms of support that would help them publish their research findings, inter alia, open access.[202] States are obliged to remove barriers to publishing, sharing, and archiving scientific outputs.[203]

Academic freedom and progress in science require 'stable' financing.[204] High levels of funding should be available for pure science. Freedom of research depends on the necessary infrastructure, including good quality dissemination avenues for research.[205] Not-for-profit scientific publishers should be well subsidized by states.[206] Public funds that support freedom of research need to be protected against private abuse. Public resources should thus not flow to commercial actors if the value they add to research ill-compares with their profits. A science adequate research environment requires providing scientists with access to research funds without their participation in 'increasingly complex grant applications and baroque research assessment exercises' that come 'at the expense of research effort'[207] via immersion in a 'publish or perish' culture, where funders need to see long lists of costly publications and articles in 'high impact' journals, which are also the most expensive. Not only does this mean funds lost to the research system,[208] but it also leads to a performative research environment in which there is an 'accelerating transformation of academic labour into an atomised, post-Fordist research proletariat that is, for the most part, constitutionally incapable of critical imagination'.[209] The ways of academia and current publication practices have led to mentally exhausted and conformist intellectuals.[210]

The following three aspects derive essentially from the adequacy concept.[211] Firstly, Pieper holds that 'academic freedom has been lost, exactly […] to the extent that the totalitarian demands of the working world have conquered the realm of the university'.[212] There should accordingly be a renewed emphasis on 'slow science'.[213] 'Publish or perish' as a central tool of research management impedes the discovery process, spurs scholarly dishonesty, and results in publications of deteriorating quality. Hence, it is crucial to 'giv[e] scholars the gift of time needed to […] inoculate themselves from the

[200]UNESCO Recom. (2017) paras 27(f), 35, 36; Mark D Wilkinson and others, 'The FAIR Guiding Principles for Scientific Data Management and Stewardship' (15 Mar. 2016) 3:160018 Sci Data 1. The FAIR principles have also been endorsed by UNESCO Recom. (2021) para 7(b).
[201]See, eg, UNESCO Recom. (1997) para 34(e).
[202]UNESCO Recom. (2017) paras 27(f), 35, 36.
[203]General Comment No. 25 (n 78) para 49.
[204]Bonn Declaration on Freedom of Scientific Research, Ministerial Conference on the European Research Area, Bonn (20 Oct. 2020). Similarly, Council of Europe, Resolution 2352 (2020) (n 149) para 9.3 (requiring 'adequate' public funding for research to maintain academic freedom).
[205]UNESCO Recom. (1997) paras 5, 12.
[206]Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 290.
[207]Peter A Lawrence, 'The Mismeasurement of Science' (2007) 17 Curr Biol R583, R585.
[208]'The only people who benefit from the intense pressure to publish are those in the publishing industry.' David Colquhoun, 'Publish-or-Perish: Peer Review and the Corruption of Science', The Guardian (5 Sept. 2011), https://www.theguardian.com/science/2011/sep/05/publish-perish-peer-review-science.
[209]Rebecca Boden and Debbie Epstein, 'Managing the Research Imagination? Globalisation and Research in Higher Education' (2006) 4 Glob, Soc'ies & Educ 223, 234.
[210]Frank Furedi, 'Afterword: The Downsizing of Intellectual Authority' (2003) 6 Crit Rev Int'l Soc & Pol Phil 172-78, esp 175.
[211]For more detail in this regard, see Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) 265-69, 274-76, 283-84, Sect. 6, and Beiter, 'Reforming Copyright or Toward Another Science?' (n 12) 147-60.
[212]Josef Pieper, *Leisure: The Basis of Culture* (Gerald Malsbary tr, St. Augustine's Press 1998) 93-94.
[213]See, eg, Isabelle Stengers, *Another Science Is Possible: A Manifesto for Slow Science* (Stephen Muecke tr, Polity Press 2018).

publish or perish culture'.[214] Secondly, as Kitcher reminds us, freedom of inquiry forbids 'moral, political, and religious judgments' entering 'the appraisal of evidence for conclusions'.[215] If disinterestedness constitutes a fundamental structural element of academic science,[216] regular reliance on impact criteria in traditional peer review, especially by anonymous (and thus unaccountable) reviewers, is in tension with scientific freedom—particularly in the digital age when journal length need not be restricted. Open post-publication peer review and peer-to-peer review are very promising options for OA publications. If a 'light' initial review reveals a text's scientific soundness, it qualifies for publication. After publication, non-anonymous reviewers may be assigned a more thorough review role that is visible online. There could then be 'an open scientific discourse' involving the author, peer reviewers, and others 'in real time on the web in front of the eyes of anybody interested'.[217] Potential changes to reviewed texts remain within the discretion of the author. The organization of peer review should be the responsibility of institutionalized science because, notably via impact decisions, peer review is prone to abuse for profit purposes in the hands of the publishing industry.[218] Thirdly, evaluations must play a reduced role in science. Over-incentivisation, for example through output-based funding, needs to be terminated. Performance management leads to the avoidance of risk in science, compromises scholarly integrity, and results in excessively numerous and inferior quality publications. Input—that is, the selection and socialization of researchers—rather than output should be controlled.[219] Publication metrics or altmetrics may play no role in assessments. JIFs must be abolished. Quantitative performance audits are not acceptable in academic science. Publications may only be assessed by experts reading them.[220]

The existing official interpretations of the REBSPA do not adequately address these three aspects.[221] Regarding the first, the documents do contain references to 'quality',[222] but provide little clarity on what that means, on what the research process constitutionally requires to function properly, or on how to prevent industrial science from usurping the space of academic science,[223] where ground-breaking discovery quintessentially takes place. Regarding the second aspect, while it should be for the scientific fraternity to decide which forms of quality control it considers appropriate, UNESCO's 2017 Science Recommendation paternalistically requires states to impose a peer-review

[214]Park and others (n 66) 143-44. On the destructive effects of 'publish or perish' on science, see generally Moosa (n 62).
[215]Philip Kitcher, *Science, Truth, and Democracy* (Prometheus Books 2001) 3.
[216]See esp nn 146 and 149, and accompanying text, above.
[217]Richard Smith, 'Peer Review: A Flawed Process at the Heart of Science and Journals' (2006) 99 J Royal Soc'y Med 178, 181. In support of open peer review and also post-publication review, see also UK Parliament, House of Commons, Science and Technology Committee, 8th Report, Peer Review in Scientific Publications (28 July 2011) paras 78, 211, https://publications.parliament.uk/pa/cm201012/cmselect/cmsctech/856/85602.htm.
[218]See the discussion in support of this assertion at nn 57-61 and 75, and accompanying text, above.
[219]Margit Osterloh and Bruno S Frey, 'Academic Rankings between the "Republic of Science" and "New Public Management"' in Alessandro Lanteri and Jack Vromen (eds), *The Economics of Economists: Institutional Setting, Individual Incentives, and Future Prospects* (CUP 2014) 77, 88-90.
[220]On the destructive effects of existing research evaluation systems on science, see *Combatting Predatory Academic Journals* (n 72) 65-69. On the negative consequences of the audit culture in academia, see Power (n 164) 94-104.
[221]See Beiter, 'Where Have All the Scientific and Academic Freedoms Gone?' (n 12) notably Sect. 5 (demonstrating aspects of these deficits with regard to UNESCO's Recommendation on Science and Scientific Researchers of 2017), and Beiter, 'Reforming Copyright or Toward Another Science?' (n 12) 147-60 (demonstrating these deficits in more detail with regard to existing official interpretations of the REBSPA).
[222]See, eg, General Comment No. 25 (n 78) para 18.
[223]On 'academic' and 'industrial' science, see nn 168-69, and accompanying text, above.

requirement.[224] There is no definition of peer review or any assessment of its problems. Regarding the third aspect, although UNESCO's 2021 Open Science Recommendation does point out that there should be 'an increased focus on the quality of research outputs rather than quantity',[225] the overall paradigm remains one of output rather than input control.

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 would essentially seem to be their claims of access to, and use or reuse of, scholarly publications and research data. The best way to facilitate such access and use or reuse is open access. Article 15(2) of the ICESCR clearly backs the positive right. Porsdam underlines that where Article 15(2) enjoins states parties to take steps necessary for the dissemination of science, this covers dissemination of scientists' research to the broader public in a language understood by non-experts.[226] OA scientific knowledge provides citizens with scientific information of interest to them, enhances critical citizenship for democracy, and promotes citizens' overall well-being.[227] NGOs and governments require access to many types of knowledge to assist in policy formulation.[228] OA to research for the R&D sector may lead to new technology and innovation, which may be stated to further the public interest.[229] OA would even likely advance science by ordinary citizens. Boyle cautions against underestimating the power of a lay audience with free access to scholarly work 'to add richness and depth to the world of scholarship'.[230] A crucial precondition to realizing the right of the public to OA scholarly knowledge is respect for all the above entitlements covered under the negative right to do research, the latter as inspired by notions of science adequacy. This ensures that quality knowledge is or may be available for dissemination. States should 'encourage and facilitate' (but not incentivize) publication, including open access, of research findings by scientists to promote access to scientific knowledge benefiting the public.[231] General Comment No. 25, addressing this as part of the obligation to fulfil the REBSPA, underlines that '[s]tates must exert every effort to ensure equitable and open access to scientific literature'.[232]

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.[233] Yet caution needs to be exercised to safeguard scientific freedom. Such policies or laws must be considered invariably 'green', this being more inclusive, as it allows OA publishing and OA archiving.[234] Furthermore, an OA archiving requirement is only compatible

[224]UNESCO Recom. (2017) paras 1(a)(1), 2(c), 26, 34(c).
[225]UNESCO Recom. (2021) para 20(c).
[226]Helle Porsdam, *Science as a Cultural Human Right* (University of Pennsylvania Press 2022) 63-66.
[227]General Comment No. 25 (n 78) paras 6-8.
[228]See Jonathan P Tennant and others, 'The Academic, Economic and Societal Impacts of Open Access: An Evidence-Based Review' [version 3] (2016) 5:632 F1000Research 1, 8, 15 (regarding OA having wider societal impact).
[229]See ibid 14-15 (regarding OA benefiting R&D).
[230]James Boyle, 'Mertonianism Unbound? Imagining Free, Decentralized Access to Most Cultural and Scientific Material' in Hess and Ostrom (n 122) 123, 130.
[231]UNESCO Recom. (2017) paras 27(f), 35, 36.
[232]General Comment No. 25 (n 78) para 49.
[233]See, eg, OECD, *OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation* (OECD Publishing 2017) 100 ('Government funds 70% of [higher education research and development] on average').
[234]Morrison (n 1) 121. See also Scheufen (n 131) 154 ('legal concerns originating in the "freedom to publish" principle'); Skre and Eide (n 10) 452-53 (gold mandate 'limits faculty freedom').

with scientific freedom if the right to self-archive is made an inalienable entitlement vis-à-vis publishers.[235] If this were not so, publishers' contracts could deny archiving, thus limiting scientists' publication choices. Finally, respecting scientific freedom, the approach should be to encourage (not enforce) self-archiving by scientists.

In sum, a right to research under the right to science, inspired by notions of science adequacy, entails adequate science funding by governments, reduced competitive research funding, the protection of public resources against private capture, a move away from the economic hyperincentivization of science,[236] good working conditions for scientists, adequate salaries, and satisfying researchers' 'taste for the lifestyle of science'.[237] It stands for slow science, open post-publication peer review and peer-to-peer review, and a reduced role for science evaluation, notably in the form of quantitative assessments. It also stands for a strengthening of authors' moral rights and a demotion of economic copyright in science. All these facets facilitate realizing the right of the public to OA scholarly knowledge.

8. The Long Term: Constructing a True Scholarly Knowledge Commons

Section 5 provided an inventory of copyright law reforms to be implemented in the short or medium term. Appreciating, however, that the REBSPA, like all Covenant rights, is to be realized progressively until an ideal state of realization has been reached,[238] and cognisant of the profound claims covered by a right to research, as inspired by notions of science adequacy, as just identified, it becomes apparent that the normative quality or force of the right to science is such as to require a paradigmatic shift in the organization and practice of science, and the regulation of related copyright, in the long term. Incremental changes within the paradigm are not sufficient in the long term.

Assessing open access as currently practiced, Poynder recently pronounced the failure of the OA movement.[239] He states that while accessibility has improved, pay-to-publish has led to an increase in the cost of scholarly publishing, a worsening of the affordability problem, and the scientific disenfranchisement of unfunded scholars and those based in the Global South. Responsibility for OA has moved from civil society to entities with very different interests. OA 'has helped commercial publishers embed themselves so deeply into the research infrastructure that dislodging them might seem all but impossible'. Moreover, the founding principle of voluntarism has been dispensed with; universities and funders have started introducing 'increasingly bureaucratic rules, sanctions, and reporting tools to ensure compliance'. OA has allowed better micromanagement of faculty and fundees while serving the further proletarianization of researchers.[240]

Copyright reform needs to transcend practiced forms of green and gold open access, complex and yet limited TDM exceptions, and benefits in the nature of charity by commercial publishers to researchers in the Global South. The discussion

[235]Bellia and Moscon (n 192) 13-14, 17; Scheufen (n 131) 155.
[236]See Marc A Edwards and Siddhartha Roy, 'Academic Research in the 21st Century: Maintaining Scientific Integrity in a Climate of Perverse Incentives and Hypercompetition' (2017) 34 Environ Eng Sci 51, 51 (lamenting a system of 'perverse incentives' and 'hypercompetition' corrupting science).
[237]Dasgupta and David (n 147) 515.
[238]ICESCR, Art. 2(1).
[239]Rick Anderson, 'Where Did the Open Access Movement Go Wrong?: An Interview with Richard Poynder', The Scholarly Kitchen (7 Dec. 2023), https://scholarlykitchen.sspnet.org/2023/12/07/where-did-the-open-access-movement-go-wrong-an-interview-with-richard-poynder.
[240]ibid.

has borne out the excesses of the scholarly publishing industry and the role copyright plays in making them possible. The question 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 scientific literature and data?'[241] Copyright limitations cannot be justified by mere reference to the fact that they sustain a scholarly publication industry as a sector of the economy, if it cannot be shown that that industry adds significant value to the scientific enterprise. As indicated, it will be necessary to move towards another science, inspired by the concept of science adequacy. In the longer term, the full reconceptualization of institutionalized science requires the realization of genuinely open science and the creation of a true scholarly knowledge commons (SKC).

What then would be the demands for a true SKC? A true SKC should facilitate enjoyment of 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 (including scholarly publications) (see Section 7 on the right to research). The SKC should operate globally, that is, it must be fully functional across borders (as elaborated on in Section 9). It should maximize the benefits of OA. These include facilitating validation and enhancing impact, benefits for the reputation of scientists, easy and fast sharing of knowledge, avoiding duplication and blind alley research, the ability to perform TDM and reuse material, the generation of further research, technological innovation, economic growth, the public's insight into scientific outcomes, meeting the needs of a knowledge-based society, and advancing culture.

As to the essential OA parameters, UNESCO's 2021 Recommendation on Open Science considers OA to signify that content is openly available online, and accessible and reusable for everyone free of charge and without undue restrictions, immediately or as quickly as possible after publication.[242] As explained earlier, the Recommendation does not really envisage free OA publishing for researchers or a reorientation towards affordable publishing that protects funders and institutions. If OA is to be considered a human right, as Skre and Eide say it is,[243] a true SKC must include free publishing for researchers and, overall, a reorientation towards affordable scholarly publishing to safeguard research resources and protect funders and institutions. Otherwise the SKC would essentially be a libertarian project. Also the Recommendation's commitment to largely unrestricted reuse for scientific publications is undermined by an overall deference to IP rights protection.[244]

The SKC must exist in consonance with criteria of science adequacy.[245] Hence, published research should result from slow science. Peer-review procedures need to undergo reform. Following only a light initial review, articles and books could be subjected to

[241]Reichman and Okediji (n 9) 1413.

[242]UNESCO Recom. (2021) paras 6, 7, opening section, (a), 8. Before the UNESCO Recommendation, various civil society statements affirmed these OA principles: Budapest Open Access Initiative, Budapest Declaration, Budapest, Hungary (14 Feb. 2002) 3rd section; Bethesda Statement on Open Access Publishing, adopted by representatives of the wider biomedical research community, Bethesda, MD, US (20 June 2003); Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, adopted by German research organisations and certain other signatories, Berlin, Germany (22 Oct. 2003); more recently, São Paulo Statement on Open Access, Joint Declaration by the African Open Science Platform, AmeliCA, cOA-lition S, OA2020, and SciELO, São Paulo, Brazil (1 May 2019).

[243]See Skre and Eide (n 10) 430-40 ('Approaching Open Access as a Human Right').

[244]See, eg, UNESCO Recom. (2021) paras 8, 16(c), 20(j).

[245]See Section 6, esp nn 178-84, and accompanying text, above.

open post-publication peer review and peer-to-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. Information should not be censored or filtered. Access for the visually impaired must be ensured. Language barriers must be removed (e.g., by offering automated translation services).[246] There should be a move towards mega journals and huge subject archives, facilitating overall coherence in science. Typical features of a mega journal include judging articles only on scientific soundness (not impact), a very broad subject scope, open access, and a large editorial board of academic (not professional) editors.[247] Wehrmeijer has argued that over time there should be one or a few platforms, owned by one or more consortia of universities and other research institutions, that encompass all fields.[248] Platforms could use open-source software providing a guided path to authors from submission to publication. Datasets should accompany books and articles. Journal quality should be overseen by editorial boards of established experts. Lay summaries to publications should be provided. States should encourage (but not incentivize) scientists to publish their research findings. Scientists need to diversify their writing, ensuring that they also address lay audiences. To respect scientific freedom, OA publishing or archiving should be encouraged and facilitated, but not enforced or incentivized.

The creation of the true SKC is based on demands for genuine open access (open access 2.0) extending beyond current understandings of green and gold OA. How could such a SKC be realized from the perspective of copyright? Three ways of accomplishing this are presented here.

Firstly, there could be a system of automatic OA of researchers' scientific works through statutory (compulsory) licensing against fair compensation for publishers by research institutions and funders, reimbursement organized collectively. Such a model has been proposed by Willinsky.[249] In this model, in which copyright remains with authors, the public enjoys open access and rights of (free) use or reuse, including TDM.[250] Willinksy maintains that his model complies with the three-step test, as it applies to the limited cases of scientific works, envisages fair remuneration (determined by royalty judges), and advances science.[251] This model retains the category of copyright and the traditional role of the commercial scholarly publishers, but limits economic abuse, while ensuring OA.[252] Willinsky specifically argues his case from the right to science in the US Constitution, that is, Congress's power 'To promote the Progress of Science and useful Arts' (ArtI.S8.C8.1).[253] However, a substantial financial burden

[246]Similarly, on these four points, see Suber (n 122) 183.
[247]Peter Binfield, 'Novel Scholarly Journal Concepts' in Sönke Bartling and Sascha Friesike (eds), *Opening Science: The Evolving Guide on How the Internet Is Changing Research, Collaboration and Scholarly Publishing* (Springer 2014) 155, 158.
[248]Margot Wehrmeijer, Exposing the Predators: Methods to Stop Predatory Journals (Master thesis, Leiden University 2014) 71, https://studenttheses.universiteitleiden.nl/handle/1887/28943.
[249]John Willinsky, *Copyright's Broken Promise: How to Restore the Law's Ability to Promote the Progress of Science* (MIT Press 2023).
[250]ibid notably ch 6.
[251]ibid 145-46.
[252]ibid 146.
[253]ibid 3.

would likely still rest on institutions and funders. The reimbursement claimed by a publisher would depend on the quantity it publishes, incentivizing superfluous publication and spurring 'publish or perish'. Moreover, this collective model would clearly pose practical challenges if realized on an international level.

The second and the third way of realizing the SKC are based on the same foundational idea. There could be a move towards peer production by the scientific community. 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'.[254] Authors, research institutions, and scientific communities regain ownership over their articles and chapters, journals, books, and book series. Copyright does not vest in publishers. Authors would be enabled, or agree, to publish open access, that is, to make their research openly and globally available online, accessible free of charge, and reusable for free without undue restrictions. Publishers would not require reimbursement based on copyright or a de facto copyright monopoly. Publication could occur with or without the infrastructure, facilities, or technical support of publishers, whether commercial, learned-society, or university-based; they may assist with copy-editing, lay-out, production, circulation, and indexing. A new, reduced role is envisaged for scholarly publishers. They may contribute to producing a certain product, but would not hold proprietary rights in that product. Their reimbursement would be based on delivering a contracted service.[255] Publication costs would be borne by research institutions and funders. As the enormous profit potential no longer exists, commercial scholarly publishing, in its current form, would lose its lucrativeness. Overall, such an understanding of OA would remove most or all copyright restraints to the dissemination of, access to, and use or reuse of scholarly publications.

Two manifestations of the above foundational idea are discernible. In the second way of realizing the SKC here, copyright continues to apply in the world of science, but its default positions are contractually modified to make the model work. Via open content licences, authors waive exclusive entitlements of use or reuse which copyright grants them, or agree to far-reaching and free use or reuse by the public. In the third way, copyright is dispensed with. While the second way amounts to a form of self-help by the scientific community, the third way entails the formal, legal endorsement of the genuine OA vision by the state. With the second way in mind, Reichman and Okediji have argued that '[s]cientists, 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'.[256] The second way is practical in that it could be implemented unilaterally. It need not be justified in terms of the three-step test. Ultimately, nobody can be forced to contract with a publisher. It does not presuppose any amendment of existing copyright treaties.

The following may be said in favour of the third way.[257] There is no problem of underproduction of articles in science. Scientists are intrinsically motivated to do research by

[254]Skre and Eide (n 10) 446.
[255]In this sense, see also Reichman and Okediji (n 9) 1466.
[256]Advocating this approach, see ibid 1459, 1471-72, generally Part III.
[257]Advocating this approach, see, eg, Valentina Moscon, 'Academic Freedom, Copyright, and Access to Scholarly Works: A Comparative Perspective' in Roberto Caso and Frederica Giovanella (eds), *Balancing Copyright Law in the Digital Age:*

reason of their curiosity; they are extrinsically motivated to publish because publishing helps them gain a reputation. Copyright as an economic incentive is therefore not needed to inspire publication.[258] In any event, authors traditionally do not receive payment for academic articles from publishers. While authors are customarily entitled to claim payment for academic books, the publication of academic books is steadily declining—which stands in contrast to the increasing number of academic articles being published.[259] Clearly, then, copyright seems not to fulfil the incentive function commonly ascribed to it insofar as academic books are concerned either. Scientists are entitled to a reward and depend on financial, employment, and science-adequate work environment security, but this could come in the form of adequate salaries, permanent contracts or tenure, and wide scientific or academic freedom, including easier access to research funding. These do not only guarantee more security than a copyright approach (and scientists, in any event, traditionally donate their articles to science), but also disincentivize the overproduction, occasioned by hypercompetition and output control, which congests science.[260] One might argue that the economic incentive of copyright is needed for the scholarly publishing industry to flourish. The argument in this article, however, has been that commercial scholarly publishers add little value to the research process.

While economic copyright can therefore be dispensed with, rights currently protected as moral rights (rights of attribution, integrity, and so on) remain important.[261] Some of the economic rights, stripped of their remunerative element, are also important. Hence, the right to publish is a crucial right of scientists. In constructing the right to research above, it has been shown, however, that what are now moral rights and rights such as the (non-economic) right to publish are part of the right to research. It may be necessary to strengthen some of these. A robust right of integrity, for instance, could offer protection against any adaptation of a scientific work clearly lacking in quality. The right of attribution of old needs to be reinvigorated to again become 'the engine of a public dialogue and of a dynamic relationship between individual contribution and collective advancement of knowledge'.[262]

This third way is not tantamount to saying that authors' rights, as human rights, insofar as scientific works are concerned, should not be protected. Consequently, it does not conflict with Article 15(1)(c) of the ICESCR, obliging states parties to protect authors' moral and material interests resulting from their scientific, literary, or artistic productions. Scientific productions, as the CESCR points out, include 'scientific publications'.[263] 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.[264] Nevertheless,

Comparative Perspectives (Springer 2015) 99, 128-29; Steven Shavell, 'Should Copyright of Academic Works Be Abolished?' (2010) 2 J Legal Anal 301.

[258]See, eg, Bellia and Moscon (n 192) 4; Thomas Eger and Marc Scheufen, *The Economics of Open Access: On the Future of Academic Publishing* (Edward Elgar 2018) 10-11; Shavell (n 257) 315; Skre and Eide (n 10) 439.

[259]Pacchioni (n 64) 84.

[260]These claims are constituent elements of the right to research. See also Moscon (n 257) 101 (explaining the important role of adequate salaries and job security); Skre and Eide (n 10) 439 (stressing the role of salaries).

[261]Berne Convention, Art. 6*bis*(1); General Comment No. 17 (n 98) para 13; Moscon (n 257) 128; Shavell (n 257) 336-37, 341; Skre and Eide (n 10) 439.

[262]Roberto Caso, 'The Academic Copyright in the Age of Commodification of Scientific Research' (2020) 10 (Spec. Iss.) Sci Rsch & Info Tech 25, 29.

[263]General Comment No. 17 (n 98) para 9.

[264]See generally General Comment No. 17.

the third way, it must be conceded, would require an amendment of the Berne Convention, which requires copyright protection to be granted to scientific works.[265]

It needs to be underlined that both the second and the third way can 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. Genuine OA therefore does require a renunciation of the neoliberal approach to science based on the state's deliberate underfunding, hyperincentivization, competitivization, and commercialization of science. A new science environment, in turn, would free significant time resources lost in the current bureaucratic system.[266] Being formally endorsed by the state, the third way is more likely to be accompanied by much-needed state legislation and policies that increase public funds for science and renounce the neoliberal approach. As explained here, adequate—and more non-competitive—science funding is part of a right to research.

I argue that the third way, namely dispensing with copyright in science, best complies with the normative demands of the right to science and the right to research under the REBSPA. Doctrinally speaking, it is the soundest, as it eliminates the need for constant changes to copyright's default positions to make it work. It provides absolute legal certainty on the rights situation. It ensures most securely that commercial scholarly publishers cannot exploit copyright to cause harm to the fabric of science. Simultaneously, it leaves sufficient 'ownership' (control) to institutionalized science to ensure the SKC would be of good quality and properly maintained. Crucially, it is also most likely to be accompanied by state legislation and policies that, materially and morally, support an environment in which a SKC can thrive. It appears, therefore, to be most conducive to creating a true SKC.

Having said all that, an amendment of the Berne Convention is not easily achieved. Any revision requires 'the unanimity of the votes cast',[267] giving each member country a right to veto any revision.[268] But this dilemma does not make any need for amendment disappear. Fully aware of the unanimity requirement, Gervais, a copyright scholar espousing moderate views, has recently, in light of the challenges posed by the digital revolution, argued in favour of an overhaul or redrafting of the Berne Convention.[269] Respecting the customary doctrine of acquired rights,[270] and the right to property of international human rights law, any revision could likely not apply retrospectively to scientific works already published in a way that constituted a wholesale expropriation. However, as explained above, neither the right to property nor authors' right to the protection of their moral and material interests in their scientific works stands in the way of the Berne revision contemplated here, as applicable to future scientific works published. As pointed out, authors' human rights cannot be relied on by corporate publishing

[265]Berne Convention, Art. 2(1), (6).
[266]See Jeff Noonan, 'Thought-Time, Money-Time, and the Temporal Conditions of Academic Freedom' (2015) 24 Time & Soc'y 109, 113 ('The push to make educational institutions more money-valuable … is the primary driver of the loss of thought-time').
[267]Berne Convention, Art. 27(3).
[268]Guide to the Berne Convention for the Protection of Literary and Artistic Works (Paris Act, 1971) (WIPO 1978) para 27.4.
[269]Daniel J Gervais, *(Re)Structuring Copyright: A Comprehensive Path to International Copyright Reform* (Edward Elgar 2017) 295-98.
[270]Certain German Interests in Polish Upper Silesia (Merits), Permanent Court of International Justice, Series A, No. 7 (25 May 1926) 42.

houses,[271] and, as for authors, the required protection need not assume the form of economic copyright.[272] As regards the right to property, without physical production in the digital age, economic copyright in scientific works must be seen to constitute excessive proprietary protection in conflict with the dignity demands of the right to science.[273] This, it is submitted, would even justify certain inroads on the very rights or property already acquired under Berne if necessary to establish harmony with the right to science. Under the UDHR's right to property, for example, such inroads would be allowed to the extent that they could be considered not arbitrary.[274] The doctrine of acquired rights, as all treaties and customary rules, must be interpreted in the 'systemic integration' fashion, having regard to the relevant normative environment,[275] as encompassing human rights and also the right to science.

9. Global Science Inclusiveness: A Global as a True Scholarly Knowledge Commons

One final point of crucial importance to creating a true SKC needs special consideration. A SKC will only be true if it operates globally. It would have to be fully functional across borders and facilitate the free flow of knowledge for all, within the Global North, within the Global South, and between the two. Increasingly, it is emphasized that science is a global public good.[276] 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'.[277] The dissemination of, access to, and use or reuse of scholarly information should therefore be possible and facilitated across national borders. 'Global science inclusiveness' signifies that no country or region, including the Global South, may be excluded from participation in what is ultimately a universal scientific enterprise.[278] Surprisingly, however, all endeavours to enhance global inclusiveness in access to scholarly publications at present remain within the realm of the voluntary, not the law.

By virtue of Article 15(4) of the ICESCR, calling on states parties to encourage and develop international contacts and co-operation in the scientific field, the international dimension of the right to science is already built into the very structure of Article 15. Based on group rights to development and international solidarity, with a legally binding basis in (inter alia) the ICESCR, and on extraterritorial state obligations (ETOs) to respect, protect, and fulfil human rights, one can identify collective and

[271] See nn 96-104, and accompanying text, above.
[272] See nn 257-65, and accompanying text, above.
[273] See n 104; Section 6; nn 254-55, and accompanying text, above.
[274] UDHR, Art. 17(2).
[275] Confirming the applicability of 'systemic integration' to the interpretation of customary international rules, see Panos Merkouris, 'Interpreting Customary International Law: You'll Never Walk Alone' in Panos Merkouris, Jörg Kammerhofer and Noora Arajärvi (eds), *The Theory, Practice, and Interpretation of Customary International Law* (CUP 222) 347, 358-59. As for treaties, the rule of 'systemic integration' is contained in Article 31(3)(c) of the Vienna Convention on the Law of Treaties (1969).
[276] See, eg, UNESCO Recom. (2021) paras 13(b), 18.
[277] Chapman (n 92) 27.
[278] Hence, UNESCO's Recommendation on Open Science of 2021 posits that open science is 'an inclusive construct' and that 'scientific knowledge should be openly available and its benefits universally shared': UNESCO Recom. (2021) paras 6, 13(b).

individual claims under the right to science, or the right to research under it, envisaging the enjoyment of unimpeded dissemination of, access to, and use or reuse of scientific knowledge across borders. For lack of space, just ETOs will be considered here.[279] According to the expert Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights of 2011, ETOs to respect, protect, and fulfil arise under all human rights, including the right to science/research.[280] ETOs create obligations for states, in appropriate circumstances, to safeguard and advance the human rights of those beyond their own borders.[281]

ETOs to protect (citizens against private actors), for example, would require states to regulate and monitor the copyright-related conduct of 'their' home publishing companies doing business abroad, where this affects the right to science/research abroad.[282] Even within the existing copyright paradigm for science, publishing companies could thus be legally mandated to grant the right to self-archive to researchers in all countries. They might be expected to apply differential pricing in licensing content to libraries, and offer waiver schemes for APCs, benefiting institutions and researchers in developing states. Many of these measures are voluntary at the moment.

ETOs to respect, protect, and fulfil, when read in conjunction with domestic state obligations under the right to science/research, imply rights of scientists and citizens to seek, receive, use or reuse, impart, and publish scholarly knowledge across borders. One state must allow, facilitate, and contribute to knowledge exportation (under ETOs), the other must allow, create capacity for, and actively support knowledge importation (under domestic state obligations).[283] Of particular significance in the present context are ETOs to facilitate (as a form of ETO to fulfil). The Maastricht Principles thus require states to take steps, separately, and jointly through international co-operation, to create an international enabling environment conducive to the universal fulfilment of economic, social, and cultural rights.[284] This would cover facilitating conducive conditions for the international transfer of scientific knowledge under the right to science/research. Consequently, states are obliged to negotiate IP treaties or adopt domestic IP regimes in a way that fosters, or direct their efforts in the World Intellectual Property Organization or the World Trade Organization towards fostering, the right to science/research and international scientific knowledge transfer globally.[285] In developmental contexts, copyright limitations and exceptions should be allowed to permit much wider research uses or reuses.[286] Ultimately, states would be required to co-operate in facilitating the

[279]For a more thorough discussion of all the aspects, see Beiter, 'Reforming Copyright or Toward Another Science?' (n 12) 177-85.

[280]Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights (2011) Principle 3. For a reproduction of, and commentary to, the Maastricht Principles, see Olivier De Schutter and others, 'Commentary to the Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights' (2012) 34 Hum Rts Q 1084.

[281]For a detailed explanation in this respect, see De Schutter and others (n 280).

[282]See ibid 1141 (on 'parent-based extraterritorial regulation'). See also General Comment No. 25 (n 78) para 84 (confirming ETOs to protect under the right to science).

[283]See also Chapman (n 92) 28 (referring to obligations for the country in which knowledge originates and the receiving country).

[284]Maastricht Principles (n 280) Principle 29.

[285]See General Comment No. 25 (n 78) para 83 (confirming ETOs to facilitate of this nature under the right to science, also in the IP context).

[286]CIPR (n 32) 104; (civil society) Proposal for Treaty of Access to Knowledge, Art. 3-12(a)(3) (10 May 2005 Draft), https://www.keionline.org/book/proposalfortreatyofaccesstoknowledgemay102005draft.

implementation of a suitable way (see the previous heading) aimed at realizing a SKC that operates globally. In this sense, and accepting the priority of human rights and ETOs over other international law (see my arguments elsewhere),[287] the right to science/research might even oblige states to amend the Berne Convention to abolish economic copyright in science to help accomplish the much-needed paradigm shift on a global scale. This 'obligation to amend' would also apply in as far as free trade agreements granting similar or more extensive copyright protection to scientific works are concerned.[288]

10. Conclusion

The CESCR's General Comment No. 25 is not courageous enough to acknowledge the needed changes to the Berne Convention. Like most documents, it presumes that some form of alignment of the interests of science and commercial scholarly publishers is possible and even desirable. However, the pursuit of scholarship is 'inherently incompatible with' the profit goal.[289] The practices of commercial scholarly publishers conflict with slow and quality science, editorial independence, and the unimpeded dissemination of, access to, and use or reuse of scholarly publications.[290] Copyright's main function in science currently is to make these corrupting practices possible in the interest of profit. In the digital era, copyright not only impedes access but has mainly come to serve as an instrument by which scarce public resources for research are siphoned off to a scholarly publishing industry that adds little value to science and, in fact, damages it. 'Less innovation, not more, is the predictable result over time',[291] as Reichman and Okediji pointed out over a decade ago, and this is contrary to what a right to science promises citizens.

While current copyright reforms aim to achieve essentially three things—firstly, consider TDM a permissible use in relation to copyright or database-protected collections; secondly, recognize the legitimacy of a 'secondary publication right' for open access; and, thirdly, develop voluntary mechanisms to decrease the costs for researchers in developing countries to publish open access in the journals of, and access research published in, the developed world—this article has argued instead for a paradigm shift in the sphere of copyright and science. This would require the following three moves: firstly, reconceptualizing science, that is, moving towards another science, a science that is open and guided by the truth rather than the utility or profit motive; secondly, the installation of genuine open access (open access 2.0) via the creation of a true scholarly knowledge commons; and, thirdly, ensuring that this SKC is globally inclusive. In respect of commercial publishers, a paradigm shift necessitates a demotion of their current status and the copyright they hold. It may need pointing out that the scholarly publication industry does not enjoy a 'constitutionally enshrined' institutional guarantee.[292]

[287]Klaus D Beiter, 'Establishing Conformity between TRIPS and Human Rights: Hierarchy in International Law, Human Rights Obligations of the WTO and Extraterritorial State Obligations under the International Covenant on Economic, Social and Cultural Rights' in Hanns Ullrich and others (eds), *TRIPS plus 20: From Trade Rules to Market Principles* (Springer 2016) 445, 470-75, 486-87; 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' (2019-2020) 26 Buff Hum Rts L Rev 1, 68-77.
[288]On the amendment of Berne, see nn 265 and 267-75, and accompanying text, above.
[289]Morrison (n 1) 51.
[290]ibid.
[291]Reichman and Okediji (n 9) 1426.
[292]Peukert and Sonnenberg (n 53) 226.

The right to science could serve as the basis for such a paradigm shift, but only if it is reinterpreted to safeguard another science, a science inspired by a liberal science script, guided by notions of science adequacy, and which, under a derivative right to research—encompassing scientists' right to do research and that of citizens to enjoy access to the benefits of research—covers claims such as adequate science funding by governments, reduced competitive funding, the protection of public resources against private capture, economic deincentivization, bold researcher autonomy, slow science, open post-publication peer review and peer-to-peer review, a reduced role for science evaluation, a strengthening of authors' moral rights, a demotion of economic copyright in science, and full OA scholarly knowledge for ordinary citizens. Moreover, the international dimension of the right to science or research would need to be consolidated to accomplish global science inclusiveness. As for copyright, open access 2.0 and the creation of a true SKC might perhaps be achieved via a system of automatic OA of researchers' scientific works through statutory (compulsory) licensing against fair compensation for publishers by research institutions and funders, reimbursement organized collectively; better still via institutionalized science's principled resolve to move towards peer production, bypassing commercial publishers (without changing formal copyright law, but only contractually modifying copyright's default positions); or, best of all from a right to science or research perspective, via the abolition of economic copyright in science. The latter would, however, require amending the Berne Convention.

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